ENGINEERING SUBMITTAL DATA

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MICROTECH® APPLIED ROOFTOP UNIT CONTROLLER

BACNET® AND LONWORKS® NETWORK INTEGRATION

Rebel® and Rebel Applied® Packaged Rooftop Systems
Model DPSA with R-410A or R-32 Refrigerant
Model DPS with R-32 Refrigerant

LONMARK® 3.4

Member of BACnet International

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Introduction

This manual describes how to integrate the MicroTech® unit controller to a BAS (building automation system) using BACnet® or LonWorks® network protocols.

Network parameters include setpoints, system status, monitoring, and alarm objects. BACnet object data applies to both BACnet MS/TP and BACnet IP protocol layers.

NOTE: Network setup and addressing is performed from the unit controller HMI keypad display. Once commissioned, the unit controller is ready for network communication and configuration.

A factory or field-installed BACnet or LonWorks communication module must be attached to the unit controller for network integration. There are three separate communication modules: BACnet/IP, BACnet MS/TP, and LonWorks (which is configured as either a Space Comfort Control (SCC) or Discharge Air Controller (DAC).

It is assumed that the user is familiar with BACnet or LonWorks integration. Contact the Daikin Applied Controls Customer Support group at (800)-432-1342 or AAHTechsupport@daikinapplied.com for additional assistance, if necessary.

Software Revision

This document supports the latest version of software for Rebel Applied DPSA (with R-32 and R-410A) and Rebel DPS (R-32 only) unit controller applications and all subsequent versions.

The revision of application software can be determined from the unit controller HMI under the 'About This AHU' menu. The software version can also be read from the Application_ Software_Version property of the Device Object.

Hazard Identification

⚠ DANGER

Danger indicates a hazardous situation, which will result in death or serious injury if not avoided.

⚠ WARNING

Warning indicates a potentially hazardous situations, which can result in property damage, personal injury, or death if not avoided.

⚠ CAUTION

Caution indicates a potentially hazardous situations, which can result in minor injury or equipment damage if not avoided.

NOTICE

Notice indicates practices not related to physical injury.

NOTE: Indicates important details or clarifying statements for information presented.

Reference Documents

Company	Number	Title	Source
Daikin Applied	OM 1288	MicroTech 4 unit controller for Rebel Applied Rooftop Systems	www.DaikinApplied.com
	IM 916	BACnet IP Communication Module Installation Manual for Applied Rooftop Systems with MicroTech 4 and MicroTech III Unit Controls	
	IM 917	BACnet MS/TP Installation Manual for Applied Rooftop Systems with MicroTech 4 and MicroTech III Unit Controls	
	IM 918	LonWorks Installation Manual for Applied Rooftop Systems with MicroTech 4 and MicroTech III Unit Controls	
American Society of Heating, Refrigeration, and Air-Conditioning Engineers	ANSI/ASHRAE 135-2014	BACnet A Data Communication Protocol for Building Automation and Control Networks	www.ashrae.org
LonMark Interoperability Association	078-0120-01G	LonMark® Layers 1-6 Interoperability Guidelines, Version 3.4	www.lonmark.org
	078-0120-01G	LonMark Application Layer Interoperability Guidelines, Version 3.4	
	8500_10	LonMark Functional Profile: Space Comfort Controller, Version 1.0	
	8600_10	LonMark Functional Profile: Discharge Air Controller, Version 1,0	
Echelon Corporation	078-0156-01G	LonWorks FTT-10A Free Topology Transceiver Users Guide	www.echelon.com

BACnet Networks

BACnet Agency Conformance

The MicroTech unit controller supports the American National Standards Institute and American Society of Heating, Refrigeration and Air-Conditioning Engineers (ANSI/ASHRAE) standard 135-2014.

The unit controller is tested according to the BACnet Testing Laboratory (BTL) Test Plan. It is designed to meet the requirements of the BACnet Standard as stated in the Protocol Implementation and Conformance Statement (PICS). However, it is not BTL listed. The PICS is found in BACnet PICs.

BACnet Device Object

Object Types

The unit controller incorporates standard BACnet object types (i.e., object types defined in the BACnet Standard) that conform to the BACnet Standard. Each object has properties that control unit variables or data points. Some object types occur more than once in the unit controller; each occurrence or instance has different properties and controls different unit variables or data points. Each instance is designated with a unique object identifier. Some properties can be adjusted from the network and others can only be interrogated (read-only properties).

See BACnet Data Points for all BACnet objects available to the network.

Each BACnet compatible device can only have a single BACnet Device Object.

⚠ CAUTION

If another device in the network already has this object identifier, you must change the instance number of one device object so that all devices in the network have a unique object identifier.

Device Object Properties

The Device Object contains other informative properties as shown in Table 2.

Device Object Identifier

The unit controller Device Object_Identifier uniquely specifies the unit within the network. The initial device object instance number is calculated depending on either the production code (IP) or the MAC Address (MS/TP). This number must be unique on the entire BACnet network. The device instance number can be changed via the keypad display. Select Apply Changes under the BACnet MSTP or BACnet IP Set Up Menu for the change to take effect.

Device Object_Name

Each device has a unique Object_Name by default. The Object_Name is MT4_AHU_#####. The ##### represents the Device Instance. If the Device Instance changes, and the "MT4_AHU_" portion of the Object_Name is retained, the Device Name is updated as well.

Network Configuration

There are various parameters involved in setting up the MicroTech unit controller. These parameters are set differently depending on which communication module is ordered and shipped with the unit. Table 1 describes the BACnet addressing parameters needed to establish communication between the unit controller and BACnet network.

See MicroTech unit controller for Rebel Applied Rooftop Systems, OM 1288 (www.DaikinApplied.com) for additional details.

Table 1: Communication Parameter Settings

Parameter Name	BACnet IP	BACnet MS/TP
DHCP	**On**	NA
Actual IP Address	DHCP Enabled	NA
Actual IP Subnet Mask	DHCP Enabled	NA
Actual Gateway Address	DHCP Enabled	NA
Given IP Address[1]	127.0.0.1	NA
Given IP Subnet Mask[1]	255.255.255.0	NA
Given Gateway Address[1]	127.0.0.1	NA
UDP Port Number	47808	NA
MS/TP MAC Address[2]	NA	18
MS/TP Baud Rate	NA	38400
Device Instance Number	Variable	Variable
Max APDU Length	1476	480
Device Object Name	MT4_AHU_#####[3]	MT4_AHU_#####[4]
Receive Heartbeat	NA	NA
Max Master	NA	127
Max Info Frames	NA	1
Term Resistor	NA	No[5]

Note that the parameters in boldface can be changed using the unit controller HMI.

[1]These addresses are used if DHCP (Dynamic Host Configuration Property) is set to Off. For changes to take effect, use the unit controller HMI and set Apply Changes on the BACnet IP Setup menu to Yes. This causes the power on the unit controller to reset.

[2]The MS/TP MAC Address is set via the unit controller HMI. Set Apply Changes to Yes for changes to take effect.

[3]The last 6 digits are the last 6 digits of the MAC address. The MAC address is a printed sticker affixed to the BACnet communication module.

[4]The last 8 digits are computed from the production number and date code.

[5]Term Resistor is only changeable via the unit controller HMI. This item can be set to Yes for the first and last unit on the MS/TP network. On all other units, this variable should be set to No (default). *It is important to note that this is a software resistor, and resistance is lost when the controller is powered off. For this reason, a physical resistor is recommended.*

BACnet MS/TP

The BACnet MS/TP device address (Media Access Control [MAC] address) of the unit controller in a BACnet Master Slave/Token Passing (MS/TP) Local Area Network (LAN) is set using the unit controller HMI. Navigate to the BMS Communications\ MSTP Set-Up menu to change this value. Set Apply MSTP Chgs to Yes in order for the new address to take effect. This causes the power on the unit controller to reset.

BACnet IP

The BACnet/Internet Protocol (BACnet/IP) address consists of the four-octet Internet Protocol address followed by the two-octet UDP (User Datagram Protocol) port number. The BACnet/IP address is a six-octet value analogous to a MAC address. The IP address portion of the BACnet/IP address must be unique in the BACnet/IP network segment. The default UDP port number in the MicroTech unit controller is 47808 (BAC0 in hexadecimal).

The device object contains a Given Internet Protocol Subnet Mask (Default is 255.255.255.0) and a default Given IP address of 127.0.0.1. The controller does support DHCP (Dynamic Host Configuration Protocol) IP addressing which is enabled by default.

The unit controller HMI is used to configure the BACnet/IP addressing.It displays the current IP address only when the network is connected.

Table 2: MicroTech Unit Controller Device Object Properties

Property	ID	Default Value	Data Type
Object Identifier	75	device	BACnetObjectIdentifier
Object Name	77	MT4_AHU_#####[1] (variable)	Character String
Object Type	79	8	BACnetObjectType
System Status	112		BACnetDeviceStatus
Vendor Name	121	Daikin Applied	Character String
Vendor Identifier	120	3	Unsigned 16
Model Name	70	MT4 AHU	Character String
Firmware Revision	44	variable	Character String
Application Software Version	12	variable	Character String
Location	58		Character String
Description	28	AHU	Character String
Protocol Version	98	1.14	Unsigned
Protocol Services Supported	97		BACnetServices Supported
Protocol Object Types Supported[2]	96	AI, AO, AV, BI, BO, BV, Cal, Device, MSI, MSO, MSV, NC, Alarm Mgmt, Trending, File, Event Enrollment, Calendar, DateTime Pattern Value	BACnetObjectTypes Supported
Object List	76		Sequence of BACnetObject Identifer
Max APDU Length Accepted	62	1476 (IP) / 480 (MS/TP)	Unsigned 16
Segmentation Supported	107	none	BACnetSegmentation
Max Segments Accepted	167	16	Unsigned
Local Time[3]	57	variable	Time
Local Date[3]	56	variable	Date
UTC Offset	119	-60 (Range: –780 .. 780)	Integer
Daylight Savings Status	24	variable	Boolean
APDU Segment Timeout	10	2000	Unsigned
APDU Timeout	11	6000	Unsigned
Number of APDU Retries	73	3	Unsigned
Device Address Binding	30		Sequence of BACnet AddressBinding
Database Revision	115	1	Unsigned
Active COV Subscriptions	152		List of BACnetCOV Subscriptions

[1]For BACnet IP, the last 6 digits are the last 6 digits of the MAC address. The MAC address is printed on a sticker affixed to the BACnet communication module. For BACnet MS/TP, the last 8 digits are computed from the production number printed on the bar code label affixed to the side of the BACnet communication module.

[2]While the unit controller supports the entire set of object types, not all object types are used.

[3]The BACnet communication module and the unit controller both have their own time clocks. The date and time read via BACnet could differ from the date and time in the unit controller the date or time is changed via the keypad display. The two time clocks re-synchronize approximately every 60-68 minutes and after every power cycle of the controller or BACnet communication module.

LonWorks Networks

LonMark Certification

LonMark certification is an official acknowledgement by the LonMark Interoperability Association that a product communicates using the LonTalk protocol and transmits and receives data per a standard LonMark functional profile. The LonWorks communication module conforms to the LonMark Discharge Air Controller functional profile_8610 and is LonMark 3.4 certified. Refer to www.lonmark.org for certification conformance information.

LonMark File Types

The LonWorks communication module software translates the LonMark Standard Network Variable Types (SNVTs) and Standard Configuration Property Types (SCPTs) in accordance with the LonMark profiles used on the LonWorks network into the variables and parameters used in the unit controller. These include both resource and device file types.

Device Files

The Device External Interface File (a specially formatted PC text file with an extension (.XIF) is the primary device file type. The XIF and other device files are required for displaying the standard network variables (SNVTs) and configuration properties (SCPTs).

Resource Files

Resource files are custom (user-specific) functional profiles, network variables types (UNVTs), configuration property types (UCPTs), and enumerations. Resource files are required for displaying these UNVT and UCPTs that are not included in the standard device profile. They are available on www.DaikinApplied.com and www.lonmark.org.

External Interface File (XIF)

LonMark guidelines specify exact documentation rules so that proprietary software is not required to commission and configure Lonworks devices. The MicroTech LonWorks Communication Module is self-documenting so that a LonWorks network management tool can obtain the information needed to connect, configure, and manage the device over the network.

An External Interface File (a specially formatted PC text file with an extension .XIF) is also available so that any network tool can design and configure it prior to installation.

The device XIF and resource files must be downloaded and mapped for network configuration. See www.DaikinApplied.com and www.lonmark.org.

Neuron ID

The basis of the LonWorks communication module is an Echelon Neuron integrated circuit (Neuron chip). Every Neuron chip has a unique 48-bit Neuron ID or physical address. The Neuron ID can be used to address the device on the LonWorks network. The Neuron ID is generally used only during initial installation or for diagnostic purposes. For normal network operation, a device address is used.

Network Addressing

The LonWorks communication module conforms to the LonMark standard for device addressing, which is defined at the time of network configuration. Device addresses have three parts:

1. The Domain ID - designates the domain. Devices must be in the same domain in order to communicate with each other.
2. The Subnet ID - specifies a collection of up to 127 devices that are on a single channel or a set of channels connected by repeaters. There may be up to 255 subnets in a domain.
3. The Node ID - identifies an individual device within the subnet.

LonWorks Commissioning

Pressing the service pin on the LonWorks Communication Module generates a service pin message, which contains the Neuron ID and the program code identification of the node. A service pin message is a network message that is generated by a node and broadcast on the network. It can be used to commission the LonWorks network. A network configuration tool maps device Neuron IDs to the domain/subnet/node logical addressing scheme when it creates the network image, the logical network addresses and connection information for all devices (nodes) on the network.

Receive Heartbeat

The integrity of some data depends on a valid network connection to maintain current values. Receive Heartbeat variables require a valid network connection if bound. If these variables do not change after a given time, the MicroTech unit controller reverts to local control, and the variables will revert to their default values. The heartbeat time is set via the unit controller HMI or via the network. The heartbeat time can be overridden by setting the Receive Heartbeat time = 0. However, in doing so, the corresponding controller variable remains at the last valid value upon loss of communication The list of Receive Heartbeat variables and descriptions can be found in Table 27.

Network Configuration

As a general rule, the communication module does not require configuration unless advised by the network integrator. The unit controller, along with the communication module, is ready to operate with the default parameter values in the unit controller.

However, be aware that *Receive Heartbeat, Max Send Time,* and *Min Send Time* are typical parameters that may need to be changed for your network. They should be modified on an as-needed basis. Maintain default values if possible.

Verifying Network Addressing (Wink)

A Wink command is initiated by the BAS or through the LonWorks commissioning software. The Wink function allows verification of an individual unit network address without opening the unit access panel.

NOTE: The Wink command is allowed during all operating modes unless a Shutdown alarm is present.

When the network issues a Wink command, unit controller performs a sequence of steps as described in the Rebel Applied Unit Controller OM 1288.

BACnet Data Points

This section describes the MicroTech unit controller network parameters. The BACnet object types include: multistate variables (MSV), analog value (AV), analog input (AI), binary input (BI) and notification class (NC) object types. In addition to the general data tables, a select group of network points are available for optional monitoring and unit configuration options.

All BACnet parameters available to the BAS remain at the last valid value upon loss of communication. If the network input value is invalid, the controller reverts to a default value. In the case of network sensor inputs, the controller reverts to the corresponding local sensor input. Refer to the Rebel Applied Unit Controller OM 1288 for the HMI menu display structure. The HMI is used to set BACnet addressing parameters to establish network communication.

NOTE: From the BACnet network, all MSV object types that are also unit configuration string code string items will read with an additional number or letter in parenthesis "(#)" at the end of the State_Text description. This additional (#) is used as a reference to the item location in the code string. Be aware that this information does not appear in the other data tables. As an example, MSV:101 shows "2=OnOffT" vs "OnOffT(1)" when read from BACnet.

Table 3: Unit Status

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Unit State	UnitState	MSV:15	R	1=Off 2=Start 3=Recirc 4=FanOnly 5=MinDAT 6=Htg 7=Econo 8=Clg	NA	The current operating mode of the unit.
Unit Status	DaikinStatus	MSV:1	R	1=Enable 2=OffMan 3=OffManCtrl 4=OffNet 5=OffAlm 6=OffRetry 7=OffPassVnt 8=OffSnsrCfg 9=OffEvac	NA	Indicates whether or not the unit is enabled to operate. If the unit status is not enabled, the unit remains in an Off operating state. Does not apply when Control Type = RefOnly. 1 = Enable (Unit is in operation. Conditions #2-9 are not active) 2 = OffMan (Control Mode = Off) 3 = OffManCtrl (Manual Control = On) 4 = OffNet (Control Mode = Auto and NetApplicMode = Off) 5 = OffAlm (Fault alarm is active) 6 = OffRetry (Fan Retry is active) 7 = OffPassVnt (Optional passive ventilation functionality is active, forcing the unit to an Off state. Also see MSV:17) 8 = OffSnsrCfg (Forces the unit to an Off state during space temperature sensor configuration or power-up. This allows the sensor enough time to configure so that it can provide reliable data to the Unit controller. Applies when space temperature is used for the control temperature source) 9=OffEvac (Evac mode is active)
Cooling Status	ClgStatus	MSV:2	R	1=Enabled 2=None 3=OffAmb 4=OffAlm 5=OffNet 6=OffMan 7=NA 8=CfgErr*	NA	Indicates if cooling is currently enabled. If not, the reason is displayed. *ClgErr = cooling is disabled due to an incorrect unit configuration.

Table 3: Unit Status, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Primary Cool Enable	CoolEnable	AV:36	W	-1=Null 0=Off (Disabled) 1= Enable	-1 (Null)	Allows primary cooling to be enabled or disabled by the network when Cooling Status is set to Enabled. Applies only when Ctrl Mode = Auto. CoolEnablePct reflects the percentage of cooling capacity in an enabled state. • If CoolEnable = 0, then the primary cooling is disabled by the network and ClgStatus = OffNet. • If CoolEnable is = -1 (null), it is not controlled by the network. • If CoolEnable = 1 and CoolEnablePct is greater than 0, the primary cooling is enabled by the network and takes precedent over local enable/disable configuration. • If CoolEnable = 1 and CoolEnablePct = 0, primary cooling is disabled and ClgStatus is set to OffNet.
	CoolEnablePct	AV:37	W	0-100%	100%	
Economizer Status	EconoStatus	MSV:3	R	1=Enabled 2=None 3=OffAmb 4=OffAlm 5=OffNet 6=OffMan 7=OffDehum 8= CfgErr	NA	Indicates if the economizer is currently enabled. If the economizer is disabled, the reason is indicated.
Economizer Enable	EconEnable	AV:34	W	-1=Null 0=Off (Disabled) 1= Enable	-1 (Null)	Allows economizer cooling to be enabled or disabled by the network when Economizer Status is set to Enabled. Applies if the unit is configured for modulating economizer and when Ctrl Mode = Auto. • If EconEnable = 0, then the economizer is disabled by the network and EconoStatus is set to OffNet. • If EconEnable = -1 (null), it is not being limited by the network. • If EconEnable = 1 and EconEnablePct is greater than 0, the economizer is enabled to a maximum EconEnablePct by the network and takes precedent over local enable/disable configuration. • If EconoEnable = 1 and EconolEnablePct = 0, economizing is disabled and EconoStatus is set to OffNet. Economizer operation is disabled locally when the unit is in dehumidification, regardless of the network Economizer Enable settings.
	EconEnablePct	AV:35	W	0-100%	100%	
Heating Status	PrimaryHtgStatus	MSV:4	R	1=Enabled 2=None 3=OffAmb 4=OffAlm 5=OffNet 6=OffMan 7=OffDehum 8=CfgErr	NA	Indicates the current heating status. If primary heating is disabled, the reason is indicated.
Secondary Heating Status	Secondary HtgStatus	MSV:27	R	1=Enabled 2=None 3=OffAmb 4=OffAlm 5=OffNet 6=OffMan 7=NA 8= NA	NA	Indicates the current heating status for heat pump units. If heating is disabled, the reason is indicated.
Primary Heat Enable	HeatEnable	AV:38	W	-1=Null 0=Off (Disabled) 1= Enable	-1 (Null)	Allows primary heating to be enabled or disabled by the network when Heating Status is set to Enabled. Applies only if 1) the unit is configured for heating and 2) when Ctrl Mode = Auto. • If HeatEnable = 0, then the primary heating is disabled by the network and heating status is set to OffNet. • If HeatEnable = -1 (null), it is not being controlled by the network. • If HeatEnable = 1 and HeatEnablePct is greater than 0, the primary heating is enabled to a maximum of HeatEnablePct by the network and takes precedent over local enable/disable configuration. • If HeatEnable = 1 and HeatEnablePct = 0, primary heating is disabled and HeatingStatus is set to OffNet.
	HeatEnablePct	AV:39	W	0-100%	100%	

Table 3: Unit Status, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Application Mode	ApplicCmd	MSV:5	W	1=Off 2=HeatOnly 3=CoolOnly 4=FanOnly 5=Auto 6=NA	6=NA	Sets the unit in an application mode. While it does not "force" the unit into any state, it does disable certain unit operations. For example, an Application Mode of "Cool Only" disables heating, "Heat Only" disables cooling, and "Fan Only" disables heating and cooling. Application Mode has no affect unless Control Mode is set to Auto (Ctrl Mode = Auto). Control Mode is only set at the Unit controller HMI.
Emergency Override	EmergOverride	MSV:10	W	1=Normal 2=Off	1=Normal	Shuts off the Unit controller. If it is set to Off, the Unit controller cannot start based on a time clock or any other means. Doing so also shuts off a network signal and puts Unit Status = OffNet. The only way to start the Unit controller is to change the value to Normal.
BACnet Units of Measurement	UnitSupport	MSV:16	W	1=Metric 2=English	2=English	Sets the type of units (English or Metric) that are passed from the Unit controller to the BACnet network.
Unit Local/Network Control	AHULoc/Net	MSV:19	R	1=Network 2=Local	1=Network	Indicates if the Unit controller is set to use local or network inputs. AHU Loc/Net can only be changed from the unit controller HMI (applicable parameters in this table denoted with a "1"). It must be set to Network (1) for most of the writeable network properties to apply.
Remote Setpoint Source	RemSptSrc	MSV:25	W	1=None 2=AI 3=QMX1* 4=QMX2* 5=QMX3* *See Description	1=None	Allows setting occupied setpoints via a remote input from an optional remote mounted space temperature sensor. When RemSptSrc is set to None, the occupied cooling setpoint (OccClgSpt) and the occupied heating setpoint (OccHtgSpt) are configurable from both the Unit controller HMI and the network. Note that occupied heating/cooling setpoint values change with the last valid value set from either the network or Unit controller. [1]States 3-5 are only available when configured for 1, 2 or 3 QMX1 space sensors.
Dehumidification Status	DehumStatus	MSV:21	R	1=Inactive 2=Active	NA	Indicates if the dehumidification operation is currently active.
Network Demand Shed Enable	DemandShed	MSV:22	W	1=Inactive 2=Auto 3=Manual	NA	Enables the demand shed functionality. For this feature to be active, 1) the DemandShed object in the HtgClg ChgOvr Set-Up HMI menu must be set to Enable, and 2) Network Demand Shed Enable must be set to Auto or Manual.
Morning Warmup Status	MWUStatus	MSV:23	R	1=Inactive 2=Active	NA	Indicates if morning warmup is currently active.
Free Cooling Status	FreeClgStatus	MSV:24	R	1=Unavail 2=Avail	NA	Indicates if free cooling is currently available.
Outdoor Air Damper Position	EconCapacity	AV:16	R	0-100%	NA	The current percentage of economizer capacity or outdoor air damper position.
Filter Pressure Input	FilterPress1	AI:21	R	0.0 -5.02 in 0.0-1250 Pa	NA	Filter pressure input. Used to generate a filter pressure alarm when the setpoint value has been exceeded. See Alarms and Events section for more information.
	FilterPress2	AI:22				
	FilterPress3	AI:23				
VAV Box Output Status	VAVBoxOutput	MSV:14	R	1=Heat 2=Cool	1=Heat	The VAV box output is provided for interlocking field VAV operation with the unit heating or cooling. In most cases: Heat = Unit is in any heating state, Start, or Recirc. Cool = Unit is in any other state. Applies only to units configured with supply fan VFDs.

[1]A QMX room sensor(s) is installed on the process bus and wired directly to the unit controller.

Table 4: Occupancy

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Occupancy Status	EffectOccup	MSV:6	R	1=Occ 2=Unocc 3=TntOvrd	NA	Indicates if the unit is currently in an occupied, unoccupied, or tenant override mode of operation.
Occupancy Source	OccSrc	MSV:46	R	1=None 2=NetSchd 3=IntSchd 4=OneEvnt 5=RemoteSw 6=NetManCmd 7=OccMode 8=TstatTO 9=ManTO 10=UnitDsbld	NA	Indicates the reason the Occupancy Status (MSV:6) is Occupied or in Tenant Override.
Unoccupancy Source	UnoccSrc	MSV:47	R	1=UnoccDehum 2=UnoccClg 3=UnoccHtg 4=IntOptStrt 5=NetOptStrt 6=IntPurge 7=NetPurge 8=None 9=A2LSnsrPrb 10=A2LLeakPrb	NA	Indicates the reason the Occupancy Status (MSV:6) is Unoccupied.
Minimum Outdoor Air Source	MinOASrc	MSV:48	R	1=VentLmt 2=OAFlw 3=ExtAI 4=CO2 5=PM25 6=TVOC 7=Network 8=BSP 9=RstTLmt 10=MaxPos 11=HiDwpt 12=FanDiff 13=ZeroOA	NA	Indicates the function controlling the Effective Outdoor Air Minimum Position, EffOAMinPos.
Occupancy Mode (Network)	OccManCmd	MSV:7	W	1=Occ 2=Unocc 3=TntOvrd 4=Standby 5=Auto	5=Auto	Sets the unit into a different occupancy mode. The request is typically sent by a wall-mounted occupant-interface module or a supervisory device used to manually control occupancy modes or to override the scheduled occupancy. Note that OccManCmd is used only as an override. Also see Current State, MSV:8.
Current State	CurrentState	MSV:8	W	1=Occ 2=Unocc 3=TntOvrd 4=Standby 5=NA	5=NA	Commands the occupancy function of the unit controller when Occupancy Mode is set to Auto. A scheduler or a supervisory node typically sends the request. Note that Current State is generally used for daily Occupancy (Occ/Unocc) commands. It is active only when OccManCmd, MSV:7 = Auto.
Next State	NextState	MSV:9	W	1=Occ 2=Unocc 3=TntOvrd 4=Standby 5=NA	5=NA	Commands the occupancy function of the unit controller when Occupancy Mode is set to Auto. A scheduler or a supervisory node typically sends the request. Next State and TimeToNextState, AV:3 are used only when implementing “Optimal Start” functionality.
Time to Next State	TimeToNextState	AV:3	W	0-65535	65535 (Null)	Network input that determines the occupancy scheduler time from one state to the next (occupied, unoccupied, standby, auto). TimeToNextState and NextState, MSV:9 are used only when implementing “Optimal Start” functionality.
Maximum Purge Time	MaxPurgeTime	AV:53	W	0-300 Min	0 Min	Enables purge operation prior to any scheduled start by the amount of time defined by the maximum purge time. Purge operation is disabled if maximum purge time is set to zero.

Table 5: Temperatures/Control Sensor Setpoints

Point Name	BACnet Object Name[1]	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Effective Space Temperature	EffSpaceTemp	AI:3	R	0-150°F -17.8-65.6°C	NA	Reflects the space temperature input from a local sensor(s) if installed and configured properly. The space temperature input may be provided by up to three Modbus sensors. Space temperature may also be provided by a network input (SpaceTempInput, AV:3) if value is present and valid Otherwise, effective space temperature defaults to an invalid value (327.67°C/621.806°F). The LONWORKS variable, nviSpaceTemp, takes precedence over BACnetSpaceT in the event that both are present.
Space Temperature Input1	SpaceTempInput	AV:31	W	-83.2-621.8°F -64-327.7°C	621.8°F 327.7°C	The current space or zone temperature network value. If this network value becomes unreliable, the temperature reverts to the local space temperature sensor value.[1]
Space Temperature Sensor 1	SpaceTemp1	AI:4	R	0-150°F -17.8-65.6°C	NA	The current space or zone temperature. Applies only if the unit is configured for one or more locally installed and wired sensors. If the optional space temperature sensor is not installed, set SpaceTCfg = None from the unit controller Unit Configuration display menu. This disables the alarm function associated with an open circuit at the space temperature sensor input. See Alarms and Events section for alarm enumerations.
Space Temperature Sensor 2	SpaceTemp2	AI:5				
Space Temperature Sensor 3	SpaceTemp3	AI:6				
Return Air Temperature Sensor	RATemp	AI:2	R	-20-200°F -28.9-93.3°C	NA	The current reading from the unit return air temperature sensor. An alarm is generated depending on sensor reliability or when acceptable operating limits are exceeded. See Alarms and Events section for alarm enumerations.
Control Temp Source	CtrlTempSrc	MSV:20	W	1=RAT 2=Space 3=OAT 4=None	1=RAT	Selects the temperature sensor input to be used for the unit heating/cooling changeover or zone cooling and heating capacity change decisions. For example, if CtrlTempSrc is set to "Return Air Temperature (RAT)," then the Control Temp parameter reads the same value as the Return Air parameter. When CtlrTempSrc is set to "None" during regular occupied operation, the unit uses the discharge air temperature (DAT) sensor to heat or cool to the cooling DAT setpoint. 1=RAT (Not available on 100% outdoor air temperature (OAT) units) 2=Space 3=OAT (Available on ControlType=DAT only) 4=None (Available on ControlType=DAT only)
Control Temperature	ControlTemp	AI:14	R	-461-525°F -274-274.2°C	NA	The current control temperature sensor reading. The control temperature sensor is selected with Control Temp Source (CtrlTempScr, MSV:20).
Effective Outdoor Air Temperature	OutdoorTemp	AI:8	R	-50-200°F -45.6-93.3°C	NA	The current value of a unit-mounted outdoor air temperature sensor. Effective outdoor temperature reflects the BACnetOAT value with valid configuration. EffOAT reflects the local outdoor air temperature if neither a valid nviOutdoorTemp or BACnetOAT value is present. See Alarms and Events section for alarm enumerations. Note that the LONWORKS variable, nviOutdoorTemp , takes precedence over BACnetOAT in the event that both are present and valid.
Outdoor Air Temperature	LocalOATemp	AV:5	R	-83-147°F -64-64°C	NA	Current value of the outdoor air sensor attached to the unit. Used to display this value in the event the BAS is overriding the local sensor.
Outdoor Air Temperature Input	OutdoorTempInput	AV:32	W	-83-622°F -64-327.7°C	622°F 327.7°C	The current outdoor air temperature input supplied by the network. If this network value becomes unreliable, the temperature reverts to the local outdoor temperature sensor value.[1]
Effective Discharge Air Temperature Setpoint	EffDATempSP	AV:26	R	-83-147°F -64-64°C	NA	Reflects the Effective Heating Discharge Temperature Setpoint if the unit is in the heating state. If not, it reflects the Discharge Air Cooling Setpoint when the unit is in any other operating state.

Table 5: Temperatures/Control Setpoints, Continued

Point Name	BACnet Object Name[1]	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Discharge Air Temperature Sensor	DischAirTemp	AI:1	R	-50-250°F -45.6-121.1°C	NA	The current reading of the unit discharge air temperature sensor. Up to 3 alarms are generated depending on sensor reliability or when acceptable operating limits are exceeded. Also see BACnet Alarms and Events for alarm enumerations.
Entering Fan/Leaving Coil Temperature Sensor	EFT_LCT	AI:7	R	-50-200°F -45.6-93.3°C	NA	The current value of the unit entering fan/leaving coil air temperature sensor. Applies only to units configured for this type of sensor. See Alarms and Events section for alarm enumerations.
Discharge Line Refrigerant Temperature Circuit 1	C1DischLnTemp1	AI:50	R	-83-392°F -64-200°C	NA	The inverter compressor circuit 1 discharge line refrigerant temperature sensor value. Applies only to units configured for variable compressors or units with an optional refrigerant system monitoring package. See Alarms and Events section for alarm enumerations.
	C1DischLnTemp3	AI:69				
	C1DischLnTemp5	AI:70				
Discharge Line Refrigerant Temperature Circuit 2	C2DischLnTemp	AI:60	R	-83-392°F -64-200°C	NA	The inverter compressor circuit 2 discharge line refrigerant temperature sensor value. Applies only to units configured for variable compressors or units with an optional refrigerant system monitoring package. See Alarms and Events section for alarm enumerations.
	C2DischLnTemp4	AI:71				
	C2DischLnTemp6	AI:72				
Liquid Line Refrigerant Temperature Circuit 1	C1RefLiqLnTemp	AI:54	R	-83-212°F -64-100°C	NA	The unit inverter compressor circuit 1 or 2 liquid line refrigerant temperature sensor value. Applies only to units configured for variable compressors or units with an optional refrigerant system monitoring package. See Alarms and Events section for alarm enumerations.
Liquid Line Refrigerant Temperature Circuit 2	C2RefLiqLnTemp	AI:64				
Variable Compressor 1 Temperature	VCmp1Temp	AI:55	R	-83-392°F -64-200°C	NA	The refrigerant temperature sensor value for variable compressor 1, 2, or 3. See Alarms and Events section for alarm enumerations.
Variable Compressor 2 Temperature	VCmp2Temp	AI:65				
Variable Compressor 3 Temperature	VCmp3Temp	AI:135				
Fixed Compressor 1 Temperature Circuit 1	C1FCmp1Temp	AI:56	R	-83-392°F -64-200°C	NA	Circuit 1 refrigerant temperature sensor value for fixed compressors 1,3 or 5. See Alarms and Events section for alarm enumerations.
Fixed Compressor 3 Temperature Circuit 1	C1FCmp3Temp	AI:57				
Fixed Compressor 5 Temperature Circuit 1	C1FCmp5Temp	AI:58				
Fixed Compressor 2 Temperature Circuit 2	C2FCmp2Temp	AI:66	R	-83-392°F -64-200°C	NA	Circuit 2 refrigerant temperature sensor value for fixed compressors 2,4 or 6. See Alarms and Events section for alarm enumerations.
Fixed Compressor 4 Temperature Circuit 2	C2FCmp4Temp	AI:67				
Fixed Compressor 6 Temperature Circuit 2	C2FCmp6Temp	AI:68				
Fixed Compressor 1 Temperature Circuit 3	C3FCmp1Temp	AI:136	R	-83-392°F -64-200°C	NA	Circuit 3 refrigerant temperature sensor value for fixed compressors 1,3 or 5. See Alarms and Events section for alarm enumerations.
Fixed Compressor 3 Temperature Circuit 3	C3FCmp3Temp	AI:137				
Fixed Compressor 5 Temperature Circuit 3	C3FCmp5Temp	AI:138				

[1]Circuit designations C1, C2, or C3 supported in unit controller software v1.18, 2506036118 and newer.

Table 6: Supply Air Fan

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Supply Air Fan Type	SAFType	MSV:104	R	1=Anlg 2=1M 3=2M 4=3M 5=4M 6=6M 7=VFDMB	2=1M	Indicates the supply air fan type for the unit. Normally each supply air fan is controlled using one ECM motor for each fan but additional configurations are supported as indicated below. Each motor is designated as either a “master” or “slave” motor. Each master motor is controlled via a Modbus interface. 1=Anlg (Locally-supplied analog input to the unit controller) 2=1M (1 ECM fan motor master) 3=2M (2 ECM fan motor masters) 4=3M (3 ECM fan motor masters) 5=4M (4 ECM fan motor masters) 6=6M (6 ECM fan motor masters) 7=VFDMB (Supply air fan with VFD Modbus)
Supply Air Fan 1-6 Status	SAF1Status SAF2Status SAF3Status SAF4Status SAF5Status SAF6Status	MSV:28 MSV:29 MSV:30 MSV:31 MSV:32 MSV:33	R	1=OK 2=HLL 3=TFEI 4=TFM 5=TFE 6=LK 7=SKF 8=PHA 9=UzLo 10=UzHi 11=UeLo 12=UeHi 13=NoCm 14=OC 15=OT 16=RRP 17=EE 18=POC 19=AC_OV 20= AC_UV	NA	Indicates the status of the 1-6 ECM supply air fans. 1=OK (No Error) - fan operating normally 2=HLL (Hall Sensor Error) - possible external voltage spikes or hardware problem with the fan 3=TFEI (Electronics Interior Overheated) - operating temperature for EC fan control components has been exceeded, or a hardware problem with the fan 4=TFM (Motor Overheated) operating conditions for fan motor is outside of the expected temperature range, fan load has been exceeded, or a hardware problem with the fan 5=TFE (Power Mod Overheated) - operating conditions for module have exceeded the design temperature, input power supply is over/under voltage or fan overload 6=LK (Locked Motor) - fan motor may be blocked due to counter flow, dirt, ice, or other impurity 7=SKF (Communication Error) - possible voltage spikes or a hardware problem of the fan 8=PHA (Phase failure) 9=UzLow (DC bus under-voltage) 10=UzHigh (DC bus over-voltage) 11=UeLow (Main under-voltage) 12=UeHigh (Main over-voltage) 13=NoCm (No Communication) 14=OC (DC bus over-current) 15=OT (DC bus over-voltage) 16= RRP (backward rotating fan) 17=EE (EEPROM read/write fail) 18=POC (DC bus peak over-current) 19=AC_OV (AC bus average over-voltage) 20=AC_AU (DC bus average under-voltage) Note the options above may indicate DC or main voltage parameter values not within the specified range, insufficient fan power supply/experiencing signal disturbances, or a hardware problem with the fan.

Table 6: Supply Air Fan, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Supply Fan Capacity Control	SupFanCtrl	MSV:11	W	1= DSP 2= Spd/Net 3= 1ZnVAV 4= BSP 5=CO2 6=Flow 7= CAV	7=CAV	Supply fan control options are described as follows: 1=DSP (Duct Static Pressure. The supply fan modulates to maintain the duct static pressure at the duct static pressure setpoint, SAFDSPSpt. Does not apply when the Ctrl Type is configured for 1ZnVAV). 2=Spd/Net (The supply fan modulates to maintain a speed command provided by the unit controller HMI or network command). 3=1ZnVAV (Single Zone VAV. The supply fan modulates to maintain the control temperature at the Occupied Cooling Setpoint (OccClgSpt) or the Occupied Heating Setpoint (OccHtgSpt) when the unit is running. Only applies when Ctrl Type is configured for 1ZnVAV). 4=BSP (Building Static Pressure. The supply fan modulates to maintain the BSP setpoint (BSPSpt). Available when the unit is running and configured for damper type 100OA. Does not apply when Ctrl Type is configured for 1ZnVAV). 5=CO_2 (The supply fan modulates based on the CO_2 level between allowable range. Available when the unit is running and configured for damper type 100OA (100% outdoor air). Does not apply when the Ctrl Type is configured for 1ZnVAV). 6=Flow (The supply fan modulates to maintain the supply airflow setpoint (SAFlowSpt). Available when the unit is running and configured for damper type 100OA. Does not apply when Ctrl Type is configured for 1ZnVAV). 7=CAV (Constant Air Volume. Unit controls to a constant effective maximum supply fan (SAF) capacity, EffMaxSAFCap. Does not apply when the Ctrl Type is configured for single zone VAV (1ZnVAV)).
Supply Fan Duct Static Pressure Setpoint (DSP)	SAFDSPSpt	AV:7	W	0.2-4 in	1 in	Supply fan is modulated to maintain the DSP at this setpoint when SupFanCtrl is set to DSP=1. Only applies to units configured with a supply fan DSP sensor.
Duct Static Pressure Sensor	StaticPSens	MSV:112	R	1=NA:NA 2=DSP:NA 3=DSP:DSP 4=DSP:BSP 5=BSP:NA 6=NA:DSP 7=NA:BSP	1=NA	Indicates if a static pressure sensor is installed. Sensor configuration types are described below: 1=NA (Not available on supply or return/exhaust fan static pressure sensor input) 2=DSP:NA (Duct static pressure (DSP) sensor on the supply fan input, no sensor on the return/exhaust fan input) 3=DSP:DSP (DSP sensor is present on the supply and return/exhaust fan inputs) 4=DSP:BSP (DSP sensor on the supply fan input, Building Static Pressure (BSP) sensor is present on the return/exhaust fan input) 5=BSP:NA (BSP sensor on the supply fan input, no sensor on the return/exhaust fan input) 6=NA:DSP (No sensor on the supply fan input, DSP sensor on the return/exhaust fan input) 7=NA:BSP (No sensor on the supply fan input, BSP sensor on the return/exhaust fan input)
Supply Fan Building Static Pressure (BSP) Setpoint	SAFBSPSpt	AV:8	W	-0.25-0.25 in -62.2-62.2 Pa	0.05 in 12.4 Pa	Supply fan is modulated to maintain the BSP at this setpoint when SupFanCtrl is set to BSP=4. Only applies to units configured with a supply fan BSP sensor.
Supply Fan Capacity Input	SupFanCapNetIn	AV:24	W	0-164%	164% (Invalid)	Network command for the supply fan speed capacity. The percentage represents the Max SAF RPM value set from the unit controller. The invalid value of 164% indicates the network is not controlling to the point.

Table 6: Supply Air Fan, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Effective Supply Fan Capacity	SAFCap	AI:10	R	0-100% (Normal) 101-110% (Sensor Fail)	NA	The effective supply air fan capacity reflects input from unit supply fan motor drives. The SAFCap value depends on the type and number of supply fan motors currently operating.
Supply Fan Duct Static Pressure	SAFDSP	AI:19	R	0.0-5.02 in 0-1250 Pa	NA	Reflects the current supply fan duct static pressure. Applies to units configured with a supply fan DSP sensor.
Supply Fan Airflow	SAFFlow	AI:29	R	0-60000 CFM	NA	Displays the current supply airflow value. Parameter is available for monitoring purposes when an outdoor air unit is configured with an outdoor airflow measuring station.
Supply Fan Flow Setpoint	SAFFlowSpt	AV:56	W	0-6000 CFM	2000 CFM	Sets the supply fan so it can modulate airflow to maintain this setpoint. Applies when the SAF Capacity Control (SupFanCtrl) is set to Flow, the Damper Type is either 300A or Econ or Econ_FDD, and Supply Fan Flow Input (SAFFlowInput) is not None.
Supply Fan Flow Input[1]	SAFFlowInput	MSV:110	R	1=None 2=1Fan 3=2Fan 4=3Fan 5=4Fan 6=6Fan	1=None	Indicates the supply fan(s) configured for outdoor air flow measurement. Applies when the unit is configured with an outdoor airflow measuring device.
Supply Fan Outdoor Air Flow Setpoint	SAFOAFlowSpt	AV:58	W	0-6000 CFM	2000 CFM	Setpoint used to control the supply fan when the Supply Air Fan Capacity Control (MSV:11) is set to Flow and the unit is configured for a Damper Type of 100OA(2) or 100wRec(5).

[1]Object is read-only from BACnet but can be configured from the unit controller HMI. See Table 17 for complete list of Rebel Applied unit controller configuration code options.

Table 7: Return/Exhaust Air Fan

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Return Air Fan Type	RFEFType	MSV:105	R	1=None 2=RFAnlg 3=EFAnlg 4=1ECMRF 5=2ECMRF 6=3ECMRF 7=4ECMRF 8=1ECMEF 9=2ECMEF 10=3ECMEF 11=4ECMEF 12=RFVFD 13=EFVFD	1=None	Indicates the type of return air fan installed in the unit.[1] 1=None (No return fan control selected) 2=RFAnlg (Return fan control via analog output from the unit controller) 3=EFAnlg (Exhaust fan control via analog output from the unit controller) 4=1ECMRF (1 ECM Modbus-controlled return fan) 5=2ECMRF (2 ECM Modbus-controlled return fans) 6=3ECMRF (3 ECM Modbus-controlled return fans) 7=4ECMRF (4 ECM Modbus-controlled return fans) 8=1ECMEF (1 ECM Modbus-controlled exhaust fan) 9=2ECMEF (2 ECM Modbus-controlled exhaust fans) 10=3ECMEF (3 ECM Modbus-controlled exhaust fans) 11=4ECMEF (4 ECM Modbus-controlled exhaust fans) 12=RFVFD (Return fan VFD Modbus control) 13=EFVFD (Exhaust fan VFD Modbus control)
Return Fan Capacity Input	RFEFCapNetIn	AV:25	W	0-164%	164%	Sets the return/exhaust fan VFD speed when ExhRetFanCtrl is set to Speed=5. It uses maximum and minimum limits, so if the Present Value is set beyond these limits from the network, the value is ignored and the unit controller continues to control to the last valid value.
Return Fan Duct Static Pressure	RAFDSP	AI:20	R	-5.02-0 in -1250-0 Pa	NA	Reflects the current return fan duct static pressure. Applies to units configured with a return fan DSP sensor.
Building Static Pressure Sensor	BldgStatPress	AI:9	R	-0.249-0.249 in -62-62 Pa	NA	Reflects the current building static pressure based on return plenum static pressure setpoint (RAFDSPSpt). Applies to units configured with a return fan BSP sensor.
Building Static Pressure Setpoint	BldgStaticSP	AV:9	W	-0.25-0.25 in -62.2-62.2 Pa	0.05 in 12.4 Pa	The return air or exhaust fan is modulated to maintain the building static pressure sensor input at this setpoint when the ExhRetFanCtrl is set to BSP=2. Applies only if the unit is configured for a modulating return/exhaust fan.
Return Fan Capacity	RFEFCap	AI:18	R	0-100%	NA	Reflects the input from the VFD controlling one or more return/exhaust fan motors.
Exhaust Air Plenum Static Pressure	ExhPSP	AI:24	R	0-1.0 in 0-249 Pa	NA	Reflects the exhaust plenum static pressure. Applies to units with a set of modulating relief dampers. Used in conjunction with return duct static pressure input to maintain desired static pressure of the exhaust plenum.
ReturnFan Airflow	RFEFFlow	AI:30	R	0-6000 CFM	NA	Displays the effective return/exhaust fan airflow. Available for monitoring purposes when a unit is configured with a return or exhaust airflow measuring station.
Return Fan Capacity Control	ExhRetFanCtrl	MSV:12	W	1=CAV 2=BSP 3=Tracking 4=DSP 5=Speed 6=Flow 7=OAD 8=FlowDiff	2=BSP	Selects the method used to control the return or exhaust fan airflow. 1=CAV (Return/Exhaust fan is held at the MaxRFEFCap value when in operation) 2=BSP (Return/exhaust fan airflow is controlled independently of the supply fan to maintain building static pressure setpoint) 3=Tracking (If unit is equipped with VFD, airflow is controlled based on an adjustable tracking relationship between the supply fan and return fan) 4=DSP (Return fan is modulated to maintain the Duct Static Pressure at the RAFDSPSpt when in operation) 5=Speed (Return/exhaust fan airflow is controlled to a VFD speed setpoint adjusted via the Return Fan Capacity Input) 6=Flow (unit modulates to maintain the RFEFflow Setpoint when in operation) 7=OAD (Exhaust fan airflow is controlled independently of the supply fan airflow based on the outdoor air damper position) 8=FlowDiff (Return/exhaust fan tracks to the SAFFlow)

Table 7: Return/Exhaust Air Fan, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Return Fan 1-4 Status	RFEF1Status	MSV:37	R	1=OK 2=HLL 3=TFEI 4=TFM 5=TFE 6=LK 7=SKF 8=PHA 9=UzLo 10=UzHi 11=UeLo 12=UeHi 13=NoCm 14=OC 15=OT 16=RRP 17=EE 18=POC 19=AOV 20=AU	NA	Indicates the status of the 1-4 ECM return/exhaust air fans. 1=OK (No Error) - fan operating normally 2=HLL (Hall Sensor Error) - possible external voltage spikes or hardware problem with the fan 3=TFEI (Electronics Interior Overheated) - operating temperature for EC fan control components has been exceeded, or a hardware problem with the fan 4=TFM (Motor Overheated) operating conditions for fan motor is outside of the expected temperature range, fan load has been exceeded, or a hardware problem with the fan 5=TFE (Power Mod Overheated) - operating conditions for module have exceeded the design temperature, input power supply is over/under voltage or fan overload 6=LK (Locked Motor) - fan motor may be blocked due to counter flow, dirt, ice, or other impurity 7=SKF (Communication Error) - possible voltage spikes or a hardware problem of the fan 8=PHA (Phase failure) 9=UzLow (DC bus under-voltage) 10=UzHigh (DC bus over-voltage) 11=UeLow (Main under-voltage) 12=UeHigh (Main over-voltage) 13=NoCm (No Communication) 14=OC (DC bus over-current) 15=OT (DC bus over-voltage) 16= RRP (backward rotating fan) 17=EE (EEPROM read/write fail) 18=POC (DC bus peak over-current) 19=AOV (AC bus average over-voltage) 20= AU (DC bus average under-voltage) Note the options above may indicate DC or main voltage parameter values not within the specified range, insufficient fan power supply/experiencing signal disturbances, or a hardware problem with the fan.
	RFEF2Status	MSV:38				
	RFEF3Status	MSV:39				
	RFEF4Status	MSV:40				
Return Fan VFD Status	VFD_RFEFStatus	MSV:37	R	1=OK 2=Fault 3=No Comm	NA	Indicates the status of the return/exhaust fan drive. 1=OK 2=Fault (controller has shut down the VFD due to a fault condition 3=No Comm (controller is not receiving digital input data from the VFD)
ReturnFan Flow Input[1]	RFEFFlowInput	MSV:111	R	1=None 2=1Fan 3=2Fan 4=3Fan	1=None	Indicates the return or exhaust fan available for outdoor air flow measurement. Available only when the unit is configured with an outdoor airflow measuring device. 1=None (No return/exhaust fan configured) 2=1Fan (One return/exhaust fan configured) 3=2Fan (Two return/exhaust fans configured) 4=3Fan (Three return/exhaust fans configured)
Return/Exhaust Fan Flow Setpoint	RFEFFlowSpt	AV:57	W	0-6000 CFM	2000 CFM	Sets the return or exhaust fan flow setpoint. The return/exhaust fan is modulated to maintain this setpoint when the Return/Exhaust Fan Control Method is set to Flow. Applies when the unit is configured for an RFEF Flow Input.
Return Air Fan DSP Setpoint	RAFDSPSpt	AV:59	W	-5.0-0 in w.c 1250-0 Pa	-1.0 in w.c. -249 Pa	The return air fan duct static pressure setpoint. When the RAF/EAF control is set to DSP, the return/exhaust fans are modulated to maintain DSP at this setpoint.
Effective Exhaust Plenum Static Pressure Setpoint	EFFPSPSpt	AV:60	R	0-1 in 0-249 Pa	NA	Effective plenum static pressure setpoint. When the unit is equipped with a set of modulating relief dampers, the dampers are modulated to maintain the measured exhaust air plenum static pressure at this setpoint.

[1] Object is read-only from BACnet but can be configured from the unit controller HMI. See Table 17 for complete list of Rebel Applied unit controller configuration code options.

Table 8: Cooling

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Refrigerant Type[1]	RefrigType	MSV:116	R	1=None 2=R410A 3=R32 4=R32HP 5=R32HP75 6=R32HP50 7=R32HP25 8=R32HP0	2=R410A	Indicates the type of refrigerant in the unit.
Unit Cooling Capacity	ClgCapacity	AV:1	R	0-100%	NA	The cooling capacity of compressors when the circuit state is normal.
Discharge Air Cooling Setpoint	DAClgSetpt	AV:14	W	40-100°F 4.4-37.8°C	55°F 12.8°C	The effective discharge air cooling setpoint that the unit is attempting to maintain.
Minimum Discharge Air Cooling Setpoint	DefaultDATClgSetpt	AV:15	W	40-100°F 4.4-37.8°C	55°F 12.8°C	The network discharge air temperature cooling setpoint. It is also changeable via the unit controller unit controller HMI. The controller uses the last valid value it last received from either the network or the unit controller HMI.
Discharge Air Temperature Economizer Setpoint	DATEconSpt	AV:6	W	40-100°F 4.4-37.8°C	55°F 12.8°C	Controls the discharge air temperature to this setpoint when the unit is in economizer mode and UseDATClgSpt = No (from the Cooling Set-Up menu).
Occupied Cooling Setpoint	OccCoolSP	AV:10	W	0-100°F -17.8-37.8°C	72°F 22.2°C	Sets the Occupied Cooling Setpoint value when it is not controlled by another function. It uses maximum and minimum limits, so if the Present Value is set beyond the acceptable range from the network, the value is ignored and the unit controller continues to control to the last valid value.
Unoccupied Cooling Setpoint	UnoccCoolSetpt	AV:11	W	40-100°F 4.4-37.8°C	85°F 29.4°C	Sets the temperature above which the unit starts and provides cooling during unoccupied periods. An optional space temperature sensor is required for unoccupied cooling operation. It uses maximum and minimum limits, so if the Present Value is set beyond these limits from the network, the value is ignored and the unit controller continues to control to the last valid value.
Reheat Capacity	ReheatCapacity	AV:45	R	0-100%	NA	Indicates the current percentage of the unit's reheat capacity. Applies only to units configured for reheat. With full control, the unit's cooling, heating and reheat capacity is controlled based on temperature inputs to the controller.
Electronic Hot Gas Bypass Input[1]	EHGBPCfg	MSV:115	R	1=None 2=Circ12 3=Circ1 4=Circ2	1=None	Indicates which circuit (1, 2, or both circuits) that are configured for electronic hot gas bypass (EHGBPS). Used to maintain circuit suction pressure during light load conditions when only one fixed capacity compressor is operating.

[1]Object is read-only from BACnet but can be configured from the unit controller HMI. See Table 17 for complete list of Rebel Applied configuration code options.

Table 9: Heating

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Heating Type[1]	HtgType	MSV:103	R	0=None 1=FBP 2=HWStm 3=M1G5-1 4=M1G5-1 5=M1G5-1 6=M1G10-1 7=M1G10-1 8=M2G10-1 9=M3G10-1 10=M2G20-1 11=M3G20-1 12=2StgE 13=2StgG 14=4StgE 15=4StgG 16=SCR 17=SCRSRht 18=Not Used 19=M4G10-1 21=M1G12-1 22=MDT5-1 23=MDT20-1	1=None	Defines the type of heating in the unit. Not all options are available in all applications. 0=None (No heating type selected) 1=FBP (Face and bypass) 2=HWStm (Hot water or steam) 3=M1G5-1 (Modulating gas, 5-1) 4=M1G5-1 (Modulating gas, 5-1) 5=M1G5-1 (Modulating gas, 5-1) 6=M1G10-1 (Modulating gas, 10-1) 7=M1G10-1 (Modulating gas, 10-1) 8=M2G10-1 (Modulating gas, 10-1) 9=M3G10-1 (Modulating gas,10-1) 10=M2G20-1 (Modulating gas, 20-1) 11=M3G20-1 (Modulating gas, 20-1) 12=2StgE (Two-stage electric) 13=2StgG (Two-stage gas) 14=4StgE (Four-stage electric) 15=4StgG (Four-stage gas) 16=SCR (SCR electric) 17=SCRSRht* (SCR electric/supplemental reheat) 18=Not Used 19=M4G10-1 (Modulating gas, 10-1) 21=M1G12-1 (Modulating gas, 12-1) 22=MDT5-1 (Modulating gas drum and tube, 5-1) 23=MDT20-1 (Modulating gas drum and tube, 20-1) *SCR modulates the time the electric heater is powered on in order to satisfy the zone requirements.
Primary Heating Capacity	PrimaryHtgCap	AV:2	R	0-100%	NA	Reflects the capacity using a standard heating source for non-heat pump units (and standard heating is not being used for reheat purposes). Otherwise, it reflects the capacity from a compressorized heating source for heat pump units.
Seconday Heating Capacity	SecondaryHtgCap	AV:22	R	0-100%	NA	Reflects the capacity from a standard heat source for heat pump units. Otherwise, secondary heating capacity is not applicable.
Occupied Heating Setpoint	OccHeatSP	AV:12	W	0-100°F -17.8-37.8°C	68°F 20°C	Sets the Occupied Heating Setpoint value when it is not controlled by other function. It uses maximum and minimum limits, so if the Present Value is set beyond these limits from the network, the value is ignored and the unit controller continues to control to the last valid value.
Unoccupied Heating Setpoint	UnoccHeatSetpt	AV:13	W	40-100°F 4.4-37.8°C	55°F 12.8°C	Sets the temperature below which the unit starts and provides heating during unoccupied periods. An optional space temperature sensor is required for unoccupied heating operation. It uses maximum and minimum limits, so if the Present Value is set beyond these limits from the network, the value is ignored and the unit controller continues to control to the last valid value.
Discharge Air Heating Setpoint (No Electric Heat)	DAHtgSetpt	AV:18	W	40-140°F 4.4-60°C	85°F 29.4°C	The effective discharge air heating setpoint that the unit is attempting to maintain.
Discharge Air Heating Setpoint (Electric Heat or Compressorized Heating)	DAHtgSetpt	AV:18	W	40-130°F 4.4-48.9°C	85°F 29.4°C	The effective discharge air heating setpoint that the unit is attempting to maintain. Applies to units configured for electric heat or compressorized heating.
Maximum Discharge Air Heating Setpoint (No Electric Heat)	DefaultDATHtgSetpt	AV:19	W	40-130°F 4.4-54.4°C	120°F 48.9°C	The maximum discharge air temperature heating setpoint. The controller uses the last valid value it last received from either the network or the unit controller HMI.
Maximum Discharge Air Heating Setpoint (Electric Heat or Compressorized Heating)	DefaultDATHtgSetpt	AV:19	W	40-105°F 4.4-54.4°C	100°F 37.8°C	The maximum discharge air temperature heating setpoint. The controller uses the last valid value it last received from either the network or the unit controller HMI. Applies to units configured for electric heat or compressorized heating.
Maximum Heat Rise[1]	MaximumHeatRise	AV:153	R	0-100	100	When the unit is equipped with any type of gas or electric heat, MaximumHeatRise prevents the discharge air temperature heating setpoint (DATHtgSpt) from exceeding the entering fan temperature by more than this value.

Table 9: Heating, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Reheat Type[1]	ReheatType	MSV:107	R	1=None 2=PriHtg 3=PriHtBP 4=MHG 5=MHGBP 6=HG_LSC 7=HGLSCBP 8=DXBP 9=MLSC	1=None	Indicates the type of reheat control for the unit.[1] 1=None (No reheat) 2=PriHtg (Primary heating reheat) 3=PriHtBP (Primary heating reheat with DX bypass) 4=MHG (Modulating hot gas) 5=MHGBP (Modulating hot gas with DX bypass) 6=HG_LSC (Modulating hot gas and liquid subcooling reheat) 7=HGLSCBP (Modulating hot gas and liquid subcooling reheat with DX bypass) 8=DXBP (DX bypass only) 9=MLSC (Modulating liquid subcooling reheat) Notes: • Modulating hot gas with DX coil bypass configurations are only allowed on 100% outdoor air damper units. • Primary heating and primary DX coil heating are only available with selected hot water steam unit configurations.

[1]Object is read-only from BACnet but can be configured from the unit controller HMI. See Table 17 for complete list of unit controller configuration code options.

Table 10: Dehumidification

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Relative Humidity Sensor 1	SpaceRH1	AI:11	R	0-100%	NA	The current reading of the optional space relative humidity sensor(s). Applies only if the unit is configured for one or more locally installed and wired sensors.
Relative Humidity Sensor 2	SpaceRH2	AI:12				
Relative Humidity Input 1	SpaceRH1NetIn	AV:20	W	0-164%	164%	Sets the space relative humidity from the network. If the network value becomes unreliable, the humidity reverts to the value provided by the attached relative humidity sensor.
Relative Humidity Input 2	SpaceRH2NetIn	AV:21				
Humidity Sensor 1 Setpoint Input	Humidity1SP	AV:40	W	0-100%	50%	Current humidity sensor setpoint from one of the two available sensors. Relative Humidity 1 uses Humidity1SP and Relative Humidity 2 uses Humidity2SP. The temperature reverts to the local space temperature sensor value if this network value becomes unreliable. It is valid only if Dehum Method is RelHum1, RelHum2, or RelHum12.
Humidity Sensor 2 Setpoint Input	Humidity2SP	AV:41				
Dewpoint Setpoint 1	Dewpoint1SP	AV:42	W	0-100°F -17.8-37.8°C	50°F 10°C	Current dewpoint setpoint. Used for dehumidification control, which also corresponds to one of the two relative humidity sensor inputs.
Dewpoint Setpoint 2	Dewpoint2SP	AV:43				
Return Air Relative Humidity	RARelHum	AI:25	R	0-100%	NA	The current reading of the optional return air relative humidity sensor. Applies only if the unit is configured for a locally installed and wired sensor.
Return Air Dewpoint	RADewpoint	AI:26	R	-50-150°F -45.6-65.6°C	NA	The return air dewpoint temperature value, calculated from the optional return air relative humidity sensor.
Outdoor Air Relative Humidity	OARelHum	AI:27	R	0-100%	NA	The current reading of the optional outdoor air relative humidity sensor. Applies only if the unit is configured for a locally installed and wired sensor.
Outdoor Air Dewpoint	OADewpoint	AI:28	R	-50-150°F -45.6-65.6°C	NA	The outdoor air dewpoint temperature value; calculated from the optional outdoor air humidity sensor.
Minimum Leaving Coil Temperature Setpoint	MinLCTSpt	AV:47	W	45-65°F 7.2-18.3°C	45°F 7.2°C	Determines the minimum value for the leaving coil temperature (LCT) setpoint. Is also used in calculating the LCT setpoint when the the LCTSptRst is not set to None or Network.
DX Coil Bypass Minimum Leaving Coil Temperature Setpoint	DXBPMinLCTSpt	AV:48	W	45-65°F 7.2-18.3°C	45°F 7.2°C	Determines the minimum value for the DX Coil Bypass (DXBP) leaving coil temperature (LCT) setpoint. Is also used in calculating the LCT setpoint when the DXBPLCTSptRst is not set to None or Network.
Maximum Leaving Coil Temperature Setpoint	MaxLCTSpt	AV:49	W	45-65°F 7.2-18.3°C	52°F 11.1°C	Determines the maximum value for the leaving coil temperature (LCT) setpoint. Is also used in calculating the LCT setpoint when the the LCTSptRst is not set to None or Network.
DX Coil Bypass Maximum Leaving Coil Temperature Setpoint	DXBPMaxLCTSpt	AV:50	W	45-65°F 7.2-18.3°C	45°F 7.2°C	Determines the maximum value for the DX Coil Bypass (DXBP) leaving coil temperature (LCT) setpoint. Is also used in calculating the LCT setpoint when the DXBPLCTSptRst is not set to None or Network.
Leaving Coil Temperature Setpoint	LCTSetpoint	AV:51	W	45-65°F 7.2-18.3°C	52°F 11.1°C	The current effective leaving coil setpoint when dehumidification is active (Dehum Status = Active). This setpoint applies only if the unit is equipped with modulating cooling (such as chilled water or variable speed compressor) and the reheat type is not None or DX Bypass Only. This value can only be written when LCTSptRst is set to Network.
Leaving Coil Temperature Setpoint	DXBPLCTSetpoint	AV:52	W	45-65°F 7.2-18.3°C	52°F 11.1°C	The current effective leaving coil setpoint when the DX coil bypass (DXBP) function is active. This setpoint applies only if the unit is equipped with modulating cooling (such variable speed compressor), the reheat type includes DX coil bypass (DXBP) and when the DXBP function is active. This value can only be written when DXBPLCTSptRst is set to Network.

Table 11: Outdoor Air

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Minimum Outdoor Air Reset	NetworkReset	MSV:41	W	1=No 2=Yes	1=No	Enables the network to control the outdoor air minimum position (NetOAMinPos) value. It also allows the network to assume control of the effective minimum ventilation position (MinVentPos), if needed.
Damper Type	DamperType	MSV:102	R	1=None 2=30A 3=100A 4=Econ 5=EconFDD 6=100wRec	4=Econ	Indicates the type of damper installed in the unit based on the options as follows: 1 = None (No damper) 2 = 30A (Single position 0-30% OA fixed damper) 3 = 100A (Single position 100% OA fixed damper) 4 = Econ (Modulating airside economizer) 5 = EconoFDD (Modulating arside economizer with fault detection) 6= 100wRec (Single position 100% with recirculating air)
Outdoor Air Fan Control	OAFanCtrl	MSV:101	R	1=None 2=OnOffT 3=OnOffP 4=VarVFD 5=VarECM1 6=VarECM2 7=VarDK1 8=VarDK2	1=None	Indicates the outdoor air fan control strategy for the unit. 1=None (No outdoor fan control selected) 2=OnOffT (Staged on/off control using outdoor air temperature) 3=OnOffP (Outdoor fan control using discharge refrigerant pressure) 3=VarVFD (Variable outdoor fan control using single VFD) 4=VarECM1 (Variable outdoor fan control using ECM motor, circuit 1) 5=VarECM2 (Variable outdoor fan control using ECM motor, circuit 2) 7=VarDK1 (Variable frequency fan with ECM motor, circuit 1) 8=VarDK2 (Variable frequency fan with ECM motor, circuit 2)
Outdoor Air Damper Minimum Position Input	MinOAPosNetIn	AV:17	W	0-100%	0%	Sets the Outdoor Air Damper Minimum Position setpoint. The Minimum Outdoor Air Damper Position Input setpoint uses this value when 1) it is not controlled by another function and 2) when Min OAPosNetIn = Network via the unit controller HMI. The controller limits the Present Value written between the DCV Limit and the Vent Limit in the Min OA Damper menu. Applies only to units configured with an airside economizer.
Outdoor Air Damper Maximum Position	MaxOAPos	AV:55	R	0-100%	100%	Effective Outdoor Air Damper Maximum Position.
External Outdoor Air Input	ExtOAInput	MSV:108	R	1=None 2=ExtVDC 3=ExtmA 4=CO2VDC 5=CO2mA 6=CO2QMX+ 7=IAQMB	1=None	Indicates the type of input signal available to the unit controller for outdoor air damper reset from a local CO_2 sensor, QMX sensor[1] or other device. 1=None 2= ExtVDC (Generic external VDC input) 3=ExtmA (Generic external mA analog input) 4=CO2VDC (VDC input for local CO_2 sensor) 5=CO2mA (mA input for local CO_2 sensor) 6=CO2QMX+ (Input from QMX CO_2 sensor) 7=IAQMB (CO_2 input from Modbus IAQ sensor)
Outdoor Air Flow Input	OAFlowInput	MSV:109	R	1=None 2=VDC 3=mA	1=None	Indicates if voltage or current is used to measure outdoor airflow.
Outdoor Airflow	OAFlow	AV:44	R	0-60000 CFM 0-28320 l/s	NA	The amount of outdoor airflow entering the unit. Applies only to units configured with Outdoor Air Flow Signal set to VDC or mA.
Outdoor Airflow Setpoint	OAFlowSpt	AV:46	W	0-60000 CFM 0-28320 l/s	2000 CFM 944 l/s	Minimum outdoor air setpoint. Applies only to units configured with Outdoor Air Flow Signal set to VDC or mA.

Table 11:Outdoor Air, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Space Temperature Sensor	SpaceTConfig	MSV:113	R	1=None 2=1AI 3=2AI 4=3AI 5=1QMXS 6=2QMXS 7=3QMXS 8=1QMX+ 9=2QMX+ 10=3QMX+	1=None	Configures the type of space temperature sensor input to the unit controller.[1] If this parameter is set to None, the network can still provide a space temperature value. The network can override a local sensor. 1=None (No local sensors installed) 2=1AI (10k analog input available for local sensor) 3=2AI (Two 10k analog inputs available for local sensors) 4=3AI (Three 10k analog inputs available for local sensors) 5=1QMXS (Input from 1 QMX space temp sensor) 6=2QMXS Input from 2 QMX space temp sensors) 7=3QMXS (Input from 3 QMX space temp sensors) 8=1QMX+ (Input from 1 QMX space/hum/CO_2 sensor) 9=2QMX+ (Input from 2 QMX space/hum/CO_2 sensors) 10=3QMX+ (Input from 3 QMX space/hum/CO_2 sensors) Note: All sensors must be one type. A mix of local analog sensors and Modbus/QMX sensors1 is not supported.
Space CO_2	SpaceCO2	AI:13	R	0-5000 ppm	NA	The current space CO_2 level from the optional space CO_2 sensor. This value reflects the SpaceIAQ Input (if valid) or the value from a locally wired sensor.
Space IAQ (CO_2) Input	SpaceIAQNetIn	AV:33	W	0-32767 ppm	32767 ppm	Indicates the current space CO_2 level from the network. This value takes priority over a locally wired sensor. It is used for minimum OA damper control and only applies if ExtOAInput = CO2VDC, CO2mA or CO2QMX1.
Passive Ventilation	PassiveVent	MSV:17	W	1=Off 2=On	1=Off	Passive ventilation is activated by a locally-supplied contact closure or from a network command. When Passive ventilation is active, the following occurs: 1. Fan output is overridden to On 2. The Unit State is forced to Off 3. The return/exhaust fan is commanded on and set to the return/exhaust fan air fan ventilation capacity value 4. Outdoor air dampers are held at 0% 5. A passive ventilation Event message is generated Note that the Unit Status is forced to Off when the optional passive ventilation function is active.

[1]A QMX room sensor(s) is installed on the process bus and wired directly to the unit controller.

Table 12: Energy Recovery

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default[1]	Description
Energy Recovery	EnergyRec	MSV:106	R	1=None 2=CS 3=CSRH 4=ECM1 5=ECM2 6=VFD 7=Anlg	1=None	Indicates if there is an energy recovery wheel installed, and if so, what type. 1=None (No energy wheel control) 2=CS (Constant speed energy wheel) 3=CSRH (Constant speed energy wheel with reheat) 4=ECM1 (Energy wheel control by ECM fan motor 1) 5=ECM2 (Energy wheel control by ECM fan motor 2) 6=VFD (Energy wheel with VFD control) 7=Anlg (Generic analog input to the unit controller)
Energy Recovery Wheel Status	ERWhlOnOff	MSV:18	R	1=Off 2=On	NA	The command status (On or Off) of the energy recovery wheel.
Energy Recovery Wheel Capacity	ERWheelCap	AI:15	R	0-100%	NA	The current energy recovery wheel capacity reflects the energy recovery wheel speed feedback (ERCapFbk) parameter converted to a percentage of the total capacity. Applies to units with an ECM motor or Daikin VFD.
Energy Recovery Leaving Wheel Temperature	ERLWT	AI:16	R	-50-200°F -45.6-93.3°C	NA	The current value of the energy recovery leaving wheel temperature sensor.
Energy Recovery Entering Wheel Temperature	EREWT	AI:17	R	-50-200°F -45.6-93.3°C	NA	The current value of the energy recovery entering wheel temperature sensor.

Table 13: Unit Operation Hours

Point Name	BACnet Object Name[2]	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description[1]
Supply Fan Hours	SupplyFanHrs	AV:100	W	0-999999 Hrs	NA	The accumulated supply fan operating hours.
Return Fan Hours	RF_EFHrs	AV:101	W	0-999999 Hrs	NA	The accumulated return or exhaust fan operating hours.
Reheat Hours	ReheatHrs	AV:102	W	0-999999 Hrs	NA	The accumulated hours of unit reheat operation.
Cooling Hours	CoolingHrs	AV:103	W	0-999999 Hrs	NA	The accumulated mechanical cooling operating hours.
Compressor 1 Hours Circuit 1	C1Comp1Hrs	AV:104	W	0-999999 Hrs	NA	The accumulated operating hours for each compressor.[2]
Compressor 2 Hours Circuit 2	C2Comp2Hrs	AV:105				
Compressor 3 Hours Circuit 1	C1Comp3Hrs	AV:106				
Compressor 4 Hours Circuit 2	C2Comp4Hrs	AV:107				
Compressor 5 Hours Circuit 1	C1Comp5Hrs	AV:108				
Compressor 6 Hours Circuit 2	C2Comp6Hrs	AV:109				
Heating Hours	HeatingHrs	AV:112	W	0-999999 Hrs	NA	The accumulated heating operating hours.
Economizer Hours	EconoHrs	AV:113	W	0-999999 Hrs	NA	The accumulated economizer operating hours.
Tenant Override Hours	TenantORHrs	AV:114	W	0-999999 Hrs	NA	The accumulated tenant override operating hours.
Dehumidification Hours	DehumHrs	AV:115	W	0-999999 Hrs	NA	The accumulated dehumidification operating hours.
Energy Recovery Hours	ERWhlHrs	AV:116	W	0-999999 Hrs	NA	The accumulated energy recovery wheel operating hours.
Variable Compressor 1 Hours	VarCmp1Hrs	AV:117	W	0-999999 Hrs	NA	The accumulated operating hours for each variable compressor.
Variable Compressor 2 Hours	VarCmp2Hrs	AV:118				
Variable Compressor 3 Hours	VarCmp3Hrs	AV:119				
SCR Preheat Hours	SCRPrehtHrs	AV:121	W	0-999999 Hrs	NA	The accumulated preheat operating hours for SCR heating type.
UV Light Hours	UVLightHrs	AV:122	W	0-999999 Hrs	NA	The accumulated operating hours for the UV light. Applies when an IAQ sensor is present.
Compressor 1 Hours Circuit 3	C3FCmp1Hrs	AV:125	W	0-999999 Hrs	NA	Circuit 3 fixed compressor accumulated operating hours.
Compressor 3 Hours Circuit 3	C3FCmp3Hrs	AV:126				
Compressor 5 Hours Circuit 3	C3FCmp5Hrs	AV:127				

[1] Operational hour parameters can be reset via the network.
[2] Circuit designation "C1, "C2, or C3" is supported in unit controller software v2506036118 and newer.

Table 14: Alarm Objects

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description[1]
Alarm Value	AlarmValue	AV:30	R	0-255	NA	The alarm value allows individual notification of the highest priority active alarm. This object is set to zero if no alarms are active.
Warning Alarm	ActiveWarning	AV:27	R	0-60	NA	Allows individual notification of the highest priority active warning alarm. The value in Table 31 is the largest number in its enumeration that corresponds to an active alarm. This object is set to zero if no warning alarms are active.
Clear Alarms	ClearAlarms	MSV:13	W	1=No 2=ClrFlts 3=ClrPrblms 4=ClrWrngs 5=ClrAllAlms	1=No	Clears all active alarms or all active alarms in a particular alarm class.
Problem Alarm	ActiveProblem	AV:28	R	0, 61-199	NA	Allows individual notification of the highest priority active problem alarm. The value in Table 32 is the largest number in its enumeration that corresponds to an active alarm. This object is set to zero if no problem alarms are active.

[1]Refer to Alarms and Events section for complete details.

System Monitoring Options

This section describes the optional monitoring packages available to BACnet. The network can display these system parameters when the unit is configured properly, equipped as needed, and has required sensor inputs. Also see the Alarms and Events section for suported alarms and events. Energy management requires a power meter package. Also refer to the table notes for standard terminology used in the power calculations.

Table 15: Refrigerant Monitoring Parameters

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Suction Refrigerant Pressure Circuit 1	C1RefSuctionP	AI:52	R	0-725 psi 0-5000 kPa	NA	The current reading of the circuit 1 or 2 suction line refrigerant pressure sensor.
Suction Refrigerant Pressure Circuit 2	C2RefSuctionP	AI:62				
Suction Line Refrigerant Temperature Circuit 1	C1SucnRefTemp	AI:51	R	-83-212°F -64-100°C	NA	The current reading of the circuit 1 or 2 refrigerant temperature sensor.
Suction Line Refrigerant Temperature Circuit 2	C2SucnRefTemp	AI:61				
Discharge Refrigerant Pressure Circuit 1	C1RefDischP	AI:53	R	0-725 psi 0-5000 kPa	NA	The current reading of the circuit 1 or 2 discharge line refrigerant pressure sensor.
Discharge Refrigerant Pressure Circuit 2	C2RefDischP	AI:63				
Discharge Line Refrigerant Temperature Circuit 1	C1DischLnTemp	AI:50	R	83-212°F -64-100°C	NA	The current reading of the circuit 1 or 2 discharge line refrigerant temperature sensor.
Discharge Line Refrigerant Temperature Circuit 2	C2DischLnTemp	AI:60				
Liquid Line Refrigerant Temperature Circuit 1	C1RefLiqLnTemp	AI:54	R	-83-212°F -64-100°C	NA	The current reading of the circuit 1 or 2 liquid line refrigerant temperature sensor.
Liquid Line Refrigerant Temperature Circuit 2	C2RefLiqLnTemp	AI:64				
Suction Superheat Circuit 1	SSH1	AI:120	R	-115-115°F -81.8-46°C	NA	Reflects the calculated suction superheat for circuit 1 or 2. The suction superheat function is used to control the indoor expansion valve in the variable capacity compressor circuit.
Suction Superheat Circuit 2	SSH2	AI:125				
Discharge Superheat Circuit 1	DSH1	AI:121	R	-115-115°F -81.8-46°C	NA	Reflects the calculated discharge superheat for circuit 1 or 2.
Discharge Superheat Circuit 2	DSH2	AI:126				
Subcooling Circuit 1	Subcooling1	AI:122	R	-115-115°F -81.8-46°C	NA	Reflects the calculated temperature which is used to control the modulation of the liquid subcooling reheat valve.
Subcooling Circuit 2	Subcooling2	AI:127				
Suction Superheat Circuit 3	SSH3	AI:128	R	-115-115°F -81.8-46°C	NA	Reflects the calculated suction superheat for circuit 3. The suction superheat function is used to control the indoor expansion valve in the variable capacity compressor.
Discharge Superheat Circuit 3	DSH3	AI:129	R	-115-115°F -81.8-46°C	NA	Reflects the calculated discharge superheat for for circuit 3.
Subcooling Circuit 3	Subcooling3	AI:130	R	-115-115°F -81.8-46°C	NA	Reflects the circuit 3 calculated temperature used to control the modulation of the liquid subcooling reheat valve.
Suction Refrigerant Temperature Circuit 3	C3SucnRefTemp	AI:131	R	-83-212°F -64-100°C	NA	The current reading of the circuit 3 suction refrigerant temperature sensor.
Suction Refrigerant Pressure Circuit 3	C3RefSuctionP	AI:132	R	0-725 psi 0-5000 kPa	NA	The current reading of the circuit 3 suction line refrigerant pressure sensor.
Discharge Refrigerant Pressure Circuit 3	C3RefDischP	AI:133	R	0-725 psi 0-5000 kPa	NA	The current reading of the circuit 3 discharge line refrigerant pressure sensor.
Liquid Line Refrigerant Temperature Circuit 3	C3RefLiqLnTemp	AI:134	R	-83-212°F -64-100°C	NA	The current reading of the circuit 3 liquid line refrigerant temperature sensor.
Discharge Line Refrigerant Temperature 1 Circuit 3	C3DischLnTemp1	AI:139	R	83-212°F -64-100°C	NA	The current reading of the circuit 3 discharge line refrigerant temperature sensor 1, 3, or 5.
Discharge Line Refrigerant Temperature 3 Circuit 3	C3DischLnTemp3	AI:140				
Discharge Line Refrigerant Temperature 5 Circuit 3	C3DischLnTemp5	AI:141				

BACnet Configurable I/O

When an EMB (expansion module B) is attached to the unit controller, there are four dedicated digital outputs and eight configurable universal I/O points available for field use. The universal points can be modified using the unit controller HMI. Input points can be monitored and output points can be commanded from an external device through the BACnet network.

- Universal I/O points can be configured as digital or analog inputs. Digital inputs are available to the network using BACnet Binary Input objects, BI:50-BI:57. Analog inputs can be configured for a 0-10 vdc, 4-20 mA or 10K NTC thermistor. They are available to the network using BACnet Analog Input objects, AI:150-AI:157.
- Universal I/O points can also be configured as 0-10 vdc or 4-20 mA analog outputs. They are commandable from the network using BACnet Analog Output objects, AO:1-AO:12.
- Four dedicated digital output points are commandable from the network using BACnet Binary Output objects, BO:1-BO:4.

Complete details about the configurable I/O options described above are provided in Table 16.

Table 16: Configurable I/O Options

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Digital I/O						
Generic Digital Inputs 1-8	X1	GenericDI1	BI:50	R	0=Open 1=Closed	If an EMB (expansion module B) is attached to the unit controller and one or more of the eight universal I/O points (X1-X8) is configured as a digital input, a corresponding network point (BI:50-BI:57) is available to read the status. XI-X8 support 0-10 vdc, 4-20 mA or 10K NTC thermistor input types.
	X2	GenericDI2	BI:51			
	X3	GenericDI3	BI:52			
	X4	GenericDI4	BI:53			
	X5	GenericDI5	BI:54			
	X6	GenericDI6	BI:55			
	X7	GenericDI7	BI:56			
	X8	GenericDI8	BI:57			
Generic Digital Outputs 1-4	DO1	GenericBO1	BO:1	W	0=Off 1=On	If an EMB is attached to the unit controller, up to four digital outputs (DO1-DO4) are available to the network as commandable objects via BO:1-BO:4. Outputs DO1-DO4 support a 0-10 or 0-20 vdc signal.
	DO2	GenericBO2	BO:2			
	DO3	GenericBO3	BO:3			
	DO4	GenericBO4	BO:4			
Analog I/O						
Generic Analog Inputs 1-8	X1	GenericInput1	AI:150	R	0-10 vdc 4-20 mA NTC10K (temp sensor signal)	If an EMB is attached to the unit controller and one or more of the eight universal I/O points (X1-X8) is configured for an analog input, a corresponding network point (AI:150-AI:157) is available to read the status.
	X2	GenericInput2	AI:151			
	X3	GenericInput3	AI:152			
	X4	GenericInput4	AI:153			
	X5	GenericInput5	AI:154			
	X6	GenericInput6	AI:155			
	X7	GenericInput7	AI:156			
	X8	GenericInput8	AI:157			
Generic Analog Outputs 1-8	X1	Generic VDC A01	AO:1	W	0-10 vdc	If an EMB is attached to the unit controller, the analog outputs X1-X8 are available to the network as commandable objects via AO:1-AO:8. Only X1-X4 can be configured for *either* a 0-20 mA current output *or* a 0-10 VDC direct voltage output signal. X1-X4 can be one or the other, but not both. Outputs X5-X8 only support a 0-10 VDC signal.
	X2	Generic VDC A02	AO:2			
	X3	Generic VDC A03	AO:3			
	X4	Generic VDC A04	AO:4			
	X5	Generic VDC A05	AO:5			
	X6	Generic VDC A06	AO:6			
	X7	Generic VDC A07	AO:7			
	X8	Generic VDC A08	AO:8			
	X1	Generic mA AO1	AO:9		0-20 mA	
	X2	Generic mA AO2	AO:10			
	X3	Generic mA AO3	AO:11			
	X4	Generic mA AO4	AO:12			

Table 17 describes the selection of Rebel Applied unit configuration code string options that can be read from the network. They can be changed from the unit controller HMI.

NOTE: From the BACnet network, all MSV object types that are also unit configuration string code string items will display an additional number or letter in parenthesis "(#)" at the end of the State_Text description. This additional (#) is used as a reference to the item location in the code string. Be aware that this information does not appear in the MSVs in either Table 17 or other data tables in this document. As an example, MSV:101 shows "2=OnOffT" vs "OnOffT(1)" when read from BACnet.

Table 17: Unit Configuration

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Control Type	CtrlType	MSV:100	R	1=Zone 2=DTC 3=1ZnVAV 4=RO_FC 5=RO_FCGE 6=RO_DCSA	2=DTC	Indicates the control strategy configured for the unit controller. 1=ZTC (Zone temperature control) 2=DTC (Discharge temperature control) 3=1ZnVAV (Single zone VAV control) 4=RO_FC (Refrigeration-only control for fans/compressors) 5=RO_FCGE (Refrigeration-only control for fans/compressors gas heat/electric heat) 6=RO_DCSA (Refrigeration-only control for DCSA)
Fixed Compressors	BNNumVarComps	AV:151	R	0-8	-	Indicates the number of fixed compressors on the unit.
Variable Compressors	BNNumFixedCmps	AV:150	R	0-4	-	Indicates the number of variable compressors on the unit.
Compressor Circuits	BNNumClgCir	AV:152	R	0-4	-	Indicates the number of compressor cooling circuits available on the unit.
Outdoor Air Fan Control	OAFanCtrl	MSV:101	R	1=None 2=OnOffT 3=OnOffP 4=VarVFD 5=VarECM1 6=VarECM2 7=VarDK1 8=VarDK2	1=None	Indicates the outdoor air fan control strategy for the unit. 1=None (No outdoor fan control selected) 2=OnOffT (Staged on/off control using outdoor air temperature) 3=OnOffP (Outdoor fan control using discharge refrigerant pressure) 3=VarVFD (Variable outdoor fan control using single VFD) 4=VarECM1 (Variable outdoor fan control using ECM motor, circuit 1) 5=VarECM2 (Variable outdoor fan control using ECM motor, circuit 2) 7=VarDK1 (Variable frequency fan with ECM motor, circuit 1) 8=VarDK2 (Variable frequency fan with ECM motor, circuit 2)
Damper Type	DamperType	MSV:102	R	1=None 2=30A 3=100A 4=Econ 5=EconFDD 6=100wRec	4=Econ	Indicates the type of damper installed in the unit based on the options as follows: 1 = None (No damper) 2 = 30A (Single position 0-30% OA fixed damper) 3 = 100A (Single position 100% OA fixed damper) 4 = Econ (Modulating airside economizer) 5 = EconoFDD (Modulating arside economizer with fault detection) 6= 100wRec (Single position 100% with recirculating air)
Heating Type	HtgType	MSV:103	R	1=None 2=F&BP 3=HW_Stm 4=MG1StgL 5=MG1StgL 6=MG1StgL 7=MG1StgH 8=MG1StgH 9=MG2StgL 10=MG3StgL 11=MG2StgH 12=MG3StgH 13=2StgE 14=2StgG 15=4StgE 16=4StgG 17=SCR* 18=SCRSRht* 19=Not used 20= MG4StgL 21= MG4StgH	1=None	Defines the type of heating in the unit. Not all options are available in all applications. 1=None (No heating type selected) 2=F&BP (Face and bypass) 3=HW_Stm (Steam or hot water) 4=MG1StgL (Modulating gas, 5-1) 5=MG1StgL (Modulating gas, 5-1) 6=MG1StgL (Modulating gas, 5-1) 7=MG1StgH (Modulating gas, 10-1) 8=MG1StgH (Modulating gas, 10-1) 9=MG2StgL (Modulating gas, 10-1) 10=MG3StgL (Modulating gas, 10-1) 11=MG2StgH (Modulating gas, 20-1) 12=MG3StgH (Modulating gas, 20-1) 13=2StgE (Two-stage electric) 14=2StgG (Two-stage gas) 15=4StgE (Four-stage electric) 16=4StgG (Four-stage gas) 17=SCR* (SCR electric) 18=SCRSRht* (SCR electric/supplemental reheat) 19=Not used 20= MG4StgL (Modulating gas, 20-1) 21= MG4StgH (Modulating gas, 40-1) *SCR (silicon controlled rectifier) modulates the time the electric heater is powered on in order to satisfy the zone requirements.

Table 17: Unit Configuration, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Maximum Heat Rise	MaximumHeatRise	AV:153	R	0-100	100	When the unit is equipped with any type of gas or electric heat, MaximumHeatRise prevents the discharge air temperature heating setpoint (DATHtgSpt) from exceeding the entering fan temperature by more than this value.
Supply Air Fan Type	SAFType	MSV:104	R	1=Anlg 2=1M 3=2M 4=3M 5=4M 6=6M 7=8M 8=9M 9=SAFVFD 10=8M4S 11=8M8S	2=1M	Indicates the supply air fan type for the unit. Normally each supply air fan is controlled using one ECM motor for each fan but additional configurations are supported as indicated below. Each motor is designated as either a “master” or “slave” motor. Each master motor is controlled via a Modbus interface. 1=Anlg (Locally-supplied analog input to the unit controller) 2=1M (1 ECM fan motor master) 3=2M (2 ECM fan motor masters) 4=3M (3 ECM fan motor masters) 5=4M (4 ECM fan motor masters)
Return Air Fan Type	RFEFType	MSV:105	R	1=None 2=RFAnlg 3=EFAnlg 4=1ECMRF 5=2ECMRF 6=3ECMRF 7=4ECMRF 8=1ECMEF 9=2ECMEF 10=3ECMEF 11=4ECMEF 12=RFVFD 13=EFVFD	1=None	Indicates the type of return air fan installed in the unit.1 1=None (No return fan control selected) 2=RFAnlg (Return fan control via analog output from the unit controller) 3=EFAnlg (Exhaust fan control via analog output from the unit controller) 4=1ECMRF (1 ECM Modbus-controlled return fan) 5=2ECMRF (2 ECM Modbus-controlled return fans) 6=3ECMRF (3 ECM Modbus-controlled return fans) 7=4ECMRF (4 ECM Modbus-controlled return fans) 8=1ECMEF (1 ECM Modbus-controlled exhaust fan) 9=2ECMEF (2 ECM Modbus-controlled exhaust fans) 10=3ECMEF (3 ECM Modbus-controlled exhaust fans) 11=4ECMEF (4 ECM Modbus-controlled exhaust fans) 12=RFVFD (Return fan VFD Modbus control) 13=EFVFD (Exhaust fan VFD Modbus control)
Energy Recovery	EnergyRec	MSV:106	R	1=None 2=CS 3=CSRH 4=ECM1 5=ECM2 6=VFD 7=Anlg	1=None	Indicates if there is an energy recovery wheel installed, and if so, what type. 1=None (No energy wheel control) 2=CS (Constant speed energy wheel) 3=CSRH (Constant speed energy wheel with reheat) 4=ECM1 (Energy wheel control by ECM fan motor 1) 5=ECM2 (Energy wheel control by ECM fan motor 2) 6=VFD (Energy wheel with VFD control) 7=Anlg (Generic analog input to the unit controller)
Reheat Type	ReheatType	MSV:107	R	1=None 2=PriHtg 3=PriHtBP 4=MHG 5=MHGBP 6=HG_LSC 7=HGLSCBP 8=DXBP 9=MLSC	1=None	Indicates the type of reheat control for the unit.[1] 1=None (No reheat) 2=PriHtg (Primary heating reheat) 3=PriHtBP (Primary heating reheat with DX bypass) 4=MHG (Modulating hot gas) 5=MHGBP (Modulating hot gas with DX bypass) 6=HG_LSC (Modulating hot gas and liquid subcooling reheat) 7=HGLSCBP (Modulating hot gas and liquid subcooling reheat with DX bypass) 8=DXBP (DX bypass only) 9=MLSC (Modulating liquid subcooling reheat)
External Outdoor Air Input	ExtOAInput	MSV:108	R	1=None 2=ExtVDC 3=ExtmA 4=CO2VDC 5=CO2mA 6=CO2QMX+ 7=IAQMB	1=None	Indicates the type of input signal available to the unit controller for outdoor air damper reset from a local CO_2 sensor, QMX sensor[2] or other device. 1=None 2= ExtVDC (Generic external VDC input) 3=ExtmA (Generic external mA analog input) 4=CO2VDC (VDC input for local CO_2 sensor) 5=CO2mA (mA input for local CO_2 sensor) 6=CO2QMX+ (Input from QMX CO_2 sensor) 7=IAQMB (CO_2 input from Modbus IAQ sensor)

Table 17: Unit Configuration, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Outdoor Air Flow Input	OAFlowInput	MSV:109	R	1=None 2=VDC 3=mA	1=None	Indicates if voltage or current is measuring outdoor airflow.
Supply Air Fan Flow Input	SAFFlowInput	MSV:110	R	1=None 2=1Fan 3=2Fan 4=3Fan 5=4Fan 6=6Fan	1=None	Indicates the supply fan configured for outdoor air flow measurement. Available only when the unit is configured with an outdoor airflow measuring device. 1=None (No supply fan configured) 2=1Fan (One supply fan configured) 3=2Fan (Two supply fans configured) 4=3Fan (Three supply fans configured) 5=4Fan (Four supply fans configured) 6=6Fan (Six supply fans configured)
Return Fan Flow Input	RFEFFlowInput	MSV:111	R	1=None 2=1Fan 3=2Fan 4=3Fan	1=None	Indicates the return or exhaust fan available for outdoor air flow measurement. Available only when the unit is configured with an outdoor airflow measuring device. 1=None (No return/exhaust fan configured) 2=1Fan (One return/exhaust fan configured) 3=2Fan (Two return/exhaust fans configured) 4=3Fan (Three return/exhaust fans configured)
Duct Static Pressure Sensor	StaticPSens	MSV:112	R	1=NA:NA 2=DSP:NA 3=DSP:DSP 4=DSP:BSP 5=BSP:NA 6=NA:DSP 7=NA:BSP	1=NA:NA	Indicates if a static pressure sensor is installed. Sensor configuration types are described below: 1=NA:NA (Not available on supply or return/exhaust fan static pressure sensor input) 2=DSP:NA (Duct static pressure (DSP) sensor on the supply fan input, no sensor on the return/exhaust fan input) 3=DSP:DSP (DSP sensor is present on the supply and return/exhaust fan inputs) 4=DSP:BSP (DSP sensor on the supply fan input, Building Static Pressure (BSP) sensor is present on the return fan input) 5=BSP:NA (BSP sensor on the supply fan input, no sensor on the return/exhaust fan input) 6=NA:DSP (No sensor on the supply fan input, DSP sensor on the return/exhaust fan input) 7=NA:BSP (No sensor on the supply fan input, BSP sensor on the return/exhaust fan input)
Space Temperature Sensor	SpaceTConfig	MSV:113	W	1=None 2=1AI 3=2AI 4=3AI 5=1QMXS 6=2QMXS 7=3QMXS 8=1QMX+ 9=2QMX+ 10=3QMX+ 11=1IAQMB	1=None	Configures the type of space temperature sensor input to the unit controller.[2] If this parameter is set to None, the network can still provide a space temperature value. The network can override a local sensor. 1=None (No local sensors installed) 2=1AI (10k analog input available for local sensor) 3=2AI (Two 10k analog inputs available for local sensors) 4=3AI (Three 10k analog inputs available for local sensors) 5=1QMXS (Input from 1 QMX space temp sensor) 6=2QMXS Input from 2 QMX space temp sensors) 7=3QMXS (Input from 3 QMX space temp sensors) 8=1QMX+ (Input from 1 QMX space/hum/CO_2 sensor) 9=2QMX+ (Input from 2 QMX space/hum/CO_2 sensors) 10=3QMX+ (Input from 3 QMX space/hum/CO_2 sensors) 11=1IAQMB (Input from QMX IAQ sensor) Note: All sensors must be one type. A mix of local analog sensors and Modbus/QMX sensors is not supported.[2]
Unit Size	UnitSize	AV:154	R	0-999	50	Three-digit configuration parameter that indicates the unit model size.
Monitoring Packages	MonitorPkgs	MSV:114	R	1=None 2=RefSys	1=None	Indicates the type of monitoring package installed on the unit. 1=None (No refrigerant or power monitoring package) 2=RefSys (Refrigerant monitoring only)
Electronic Hot Gas Bypass Input	EHGBPCfg	MSV:115	R	1=None 2=Circ12 3=Circ1 4=Circ2	1=None	Indicates which circuit (1, 2, or both circuits) that are configured for electronic hot gas bypass (EHGBPS). Note that EHGPS is used to keep the circuit suction pressure up during light load conditions when only one fixed capacity compressor is operating in the unit.

Table 17: Unit Configuration, Continued

Point Name	BACnet Object Name	Object Type/ Instance	Read/ Write Access	Range (In Units)	Default	Description
Refrigerant Type	RefrigType	MSV:116	R	1=None 2=R410A 3=R32 4=R32HP 5=R32HP75 6=R32HP50 7=R32HP25 8=R32HP0	2=R410A	Indicates the type of refrigerant in the unit. 1=None 2=R410A (No heat pump) 3=R32 (No heat pump) 4=R32HP (Heat pump with no auxilliary heat limit) 5=R32HP75 (Heat pump with 75% auxilliary heat limit) 6=R32HP50 (Heat pump 50% auxilliary heat limit) 7=R32HP25 (Heat pump 25% auxilliary heat limit) 8=R32HP0 (Heat pump 0% auxilliary heat limit)
Unit Voltage	UnitVoltage	MSV:117	R	1=208_60Hz 2=230_60Hz 3=460_60Hz 4=575_60Hz	3=460_60Hz	Defines the voltage applied to the unit controller.
Preheat Type	PreheatType	MSV:118	R	1=None 2=HW_Stm 3=F&BP 4=SCR	1=None	Indicates the preheat control method. A dedicated hot water/steam coil or heating face and bypass is located upstream of the cooling coil to maintain the leaving cooling coil temperature above an adjustable preheat leaving coil temperature setpoint. 1=None (No preheat selected) 2=HW_Stm (Hot water/steam) 3=F&BP (Face and bypass) 4=SCR (Electric heat)
Expansion Valve Type	EVType	MSV:119	R	1=NA/TXV 2=DFETS 3=DFCol 4=FJPAM2 5=FJPAM3 6=Spln 7=Fj2/Fj3 8=Fj3/Fj2 9=DFC/Fj2 10=DFC/Fj3 11=Spr/Fj2 12=Spr/Fj3 13=Spr/DFC 14=Fj2/Spr 15=Fj3/Spr 16=DFC/Spr	1=None	Indicates the expansion valve model type configured for the unit. 1=NA/TXV (None/thermal expansion valve) 2=Danfoss ETS DFETS (DFETS) 3=Danfoss Colibri (DFCol) 4=Fujikoki_PAM 2000 (FJPAM2) 5= Fujikoki_PAM 3000 (FJPAM3) 6= Sporlan (Spln) 7=Fujikoki_PAM 3000/Fujikoki_PAM 2000 (Fj3/Fj2) 8=Fujikoki_PAM 3000/Fujikoki_PAM 2000 (Fj2/Fj3) 9=Danfoss Colibri/Fujikoki_PAM 2000 (DFC/Fj2) 10=Danfoss Colibri/Fujikoki_PAM 3000 (DFC/Fj3) 11=Sporlan/Fujikoki_PAM 2000 (Spr/Fj2) 12=Sporlan/Fujikoki_PAM 3000 (Spr/Fj3) 13=Sporlan/Danfoss Colibri (Spr/DFC) 14=Fujikoki_PAM 2000/Sporlan (Fj2/Spr) 15=Fujikoki_PAM 3000/Sporlan (Fj3/Spr) 16=Danfoss Colibri/Sporlan (DFC/Spr)
I/O Configuration	IOConfig	MSV:120	R	0=RebApp 1=Rebel 2=DCSA	0=RebApp	Defines the I/O configuration used for the unit.
Sensor Config	SensorCfg	AV:155	R	0-8	0	Defines the number of A2L sensors equipped with the unit.

[1]Fan and reheat options are based on unit configuration. Not all options are available to the network.
[2]A QMX room sensor(s) is installed on the process bus and wired directly to the unit controller.

LonWorks Data Points

This section describes the MicroTech unit controller data available to the LonWorks network.

Input variable types (.nvi, .nci, or .cpi) are writeable from the network. The output variable type (.nvo) is read-only and can only be viewed from the network. Default values do not apply to nvos.

⚠ CAUTION

Please note that anytime a command is written to a configuration property (nci), this information is stored in the unit controller's non-volatile memory. Writing to non-volatile memory is an operation that has a finite limit. For this reason, the number of writes made to these network inputs must be limited to avoid damage to the hardware. Non-volatile parameters are saved every 20 minutes.

Table 18: Unit Status

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)[1]	Default	Description
Unit State	nvoUnitStatus.Mode	SNVT_hvac_status (112)	N	1=HEAT 6=OFF 7=COOL 9=FAN_Only 10=FREE_COOL	NA	The current operating state of the unit. The base variable (nvoUnitStatus) includes additional variables that reflect various unit sub-states.
Heating Capacity	nvoUnitStatus.heat_output_primary			0-100%		The current percentage of unit maximum heating capacity. Applies when unit is configured for heating. For heat pump units, primary heating capacity refers to the compressor heating capacity.
Secondary Heating Capacity	nvoUnitStatus.Heat_output_secondary			0-100%		Secondary heating capacity applies only to heat pump units and corresponds to the capacity of the standard heat installed (as defined by Heating Type).
Cooling Capacity	nvoUnitStatus.cool_output			0-100%		The current percentage of unit maximum cooling capacity. Applies only if the unit is configured for cooling.
Outdoor Air Damper Position	nvoUnitStatus.econ_output			0-100%		The current economizer capacity or outdoor air damper position.
Supply Fan Capacity	nvoUnitStatus.fan_output			0-100%		The current supply fan capacity. It reads 0% when the fan is off. If the unit is configured as constant volume, it reads 100% when the fan is on. Otherwise, it reads the feedback from the VFD.
Active Alarm	nvoUnitStatus_in_alarm			0-255		The alarm value allows notification of the highest priority active alarm. See Alarms and Events.

Table 18: Unit Status, Continued

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)[1]	Default	Description
Economizer Status	nvoMcQAHUStatus. EconoEnable	UNVTmcQAHUStatus	N	0=Enabled 1=None 2=OffAmb 3=Not Used 4=OffNet 5=OffMan 6=OffDehum	NA	Indicates if the economizer is currently enabled. If the economizer is disabled, the reason is indicated.
Cooling Status	nvoMcQAHUStatus. CoolEnable			0=Enabled 1=None 2=OffAmb 3=OffAlm 4=OffNet 5=OffMan 6=NA 7=CfgErr*		Indicates if cooling is currently enabled. If not, the reason is displayed. *ClgErr = cooling is disabled due to an incorrect unit configuration.
Heating Status	nvoMcQAHUStatus. HeatEnable			0=Enabled 1=None 2=OffAmb 3=OffAlm 4=OffNet 5=OffMan		Indicates if heating is currently enabled. If heating is disabled, the reason is indicated.
Unit Status	nvoMcQAHUStatus. Mode			0=Enabled 1=OffMan 2=OffManCtrl 3=Off Net 4=OffAlm 5=OffRetry 6=OffPassVnt 7=OffSnsrCfg		The current operating mode of the unit. If the unit status is not enabled, the unit remains in an Off operating state. Does not apply when Control Type = RefOnly. Unit Status (Mode) Descriptions 0 = Enable (Unit is in operation. Items #2-8 are not active) 1 = OffMan (Control Mode=Off) 2 = OffManCtrl (Manual Control=On) 3 = OffNet (Control Mode=Auto and NetApplicMode=Off) 4 = OffAlm (Fault alarm is active) 5 = OffRetry (Fan Retry is active) 6 = OffPassVnt (Optional passive ventilation function is active, forcing the unit to an Off state 7 = OffSnsrCfg (Forces the unit to an Off state during space temperature sensor configuration or power-up. Applies when space temperature is used as the control temperature source.)
Primary Cool Enable	nviPriCoolEnable. State	SNVT_switch (95)	Y	-1=Auto (Invalid) 0=Disabled 1= Enabled	-1	Allows primary cooling to be enabled or disabled by the network when Cooling Status is set to Enabled. Applies only when Ctrl Mode = Auto. The nviPriCoolEnable.Value reflects the percentage of cooling capacity in an enabled state. • If nviPriCoolEnable.State = 0, then the primary cooling is disabled by the network and Cooling Status is set to OffNet. • If nviPriCoolEnable.State = -1 (null), it is not being controlled by the network. • If nviPriCoolEnable.State = 1 and nviPriCoolEnable.Value is greater than 0, primary cooling is enabled by the network and takes precedent over local enable/disable configuration. Maximum cooling capacity is limited to nviPriCoolEnable.Value. • If nviPriCoolEnable.State = 1 and nviPriCoolEnable.Value = 0, primary cooling is disabled and Cooling Status is set to OffNet. If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts to its default value.
	nviPriCoolEnable. Value			0-100%	100%	

Table 18: Unit Status, Continued

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)[1]	Default	Description
Primary Heat Enable	nviPrHeatEnable.State	SNVT_switch (95)	Y	-1=Auto (Invalid) 0=Disabled 1= Enabled	-1	Allows primary heating to be enabled or disabled by the network when Heating Status is set to Enabled. Applies only when Ctrl Mode = Auto. The nviPriHeatEnable.Value reflects the percentage of heating capacity in an enabled state. • If nviPriHeatEnable.State = 0, then the primary heating is disabled by the network and Heating Status is set to OffNet. • If nviPriHeatEnable.State = -1 (null), it is not being controlled by the network. • If nviPriHeatEnable.State = 1 and nviPriHeatEnable.Value is greater than 0, the primary heating is enabled by the network and takes precedent over local enable/disable configuration. Maximum heating capacity is limited to nviPriHeatEnable.Value. • If nviPriHeatEnable.State = 1 and nviPriHeatEnable.Value = 0, primary heating is disabled and Heating Status is set to OffNet. • If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts to its default value.
	nviPriHeatEnable.Value			0-100%	100%	
Economizer Enable	nviEconEnable.State	SNVT_switch (95)	Y	-1=Auto (Invalid) 0=Disabled 1= Enabled	-1	Allows economizer cooling to be enabled or disabled by the network when Economizer Status is set to Enabled. Applies if the unit is configured for modulating economizer and when Ctrl Mode = Auto. • If nviEconoEnable.State = 0, then the economizer is disabled by the network and Economizer Status is set to OffNet. • If NviEconoEnable.State = -1 (null), it is not being limited by the network. • If nviEconoEnable.State = 1 and nviEconoEnable.Value is greater than 0, the economizer is enabled to a maximum nviEconoEnable.Value by the network and takes precedent over local enable/disable configuration. • If nviEconoEnable.State = 1 and nviEconoEnable.Value = 0, economizing is disabled and Economizer Status is set to OffNet. Economizer operation is disabled locally when the unit is in dehumidification, regardless of the network Economizer Enable settings. Applies only to a unit with a modulating economizer. If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts to its default value.
	nviEconEnable.Value			0-100%	100%	
Application Mode	nviApplicMode	SNVT_hvac_mode (108)	Y	0=Null 1=Off 2=Heat 3=Cool 4=FanOnly 5=Auto 6=Invalid	6=Invalid	Sets the unit in an application mode. While it does not “force” the unit into any state, it does disable certain unit operations. For example, an Application Mode of “Cool Only” disables heating, “Heat Only” disables cooling, and “Fan Only” disables heating and cooling. If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts to its default value. Application Mode has no affect unless Control Mode is set to Auto (Ctrl Mode = Auto). Control Mode is vset at the unit controller HMI.
Emergency Override	nviEmergOverride	SNVT_hvac_emerg (103)	N	0=Normal 1=Off	0=Normal	Shuts off the unit controller. If it is set to Off, the unit controller cannot start based on a time clock or any other means. Doing so also disables the network signal and puts Unit Status = OffNet. The only way to start the unit controller is to change the value to Normal.
Return FanFan Status	nvoExhFanStatus.State	SNVT_switch (95)	N	0=Off 1=On	NA	The current return/exhaust fan operational state.
	nvoExhFanStatus.Value	SNVT_hvac_status (112)		0-100%		The current return/exhaust fan speed or capacity. It reflects the input from the VFD controlling one or more supply fan motors.

Table 19: Occupancy

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)[1]	Default	Description
Occupancy	nvoEffectOccup	SNVT_occupancy (109)	N	0=Occ 1=Unocc 2=TntOvrd	NA	Indicates if the unit is currently in an occupied, unoccupied, or tenant override mode of operation.
Occupancy Mode (Network)	nviOccManCmd	SNVT_occupancy (109)	N	0=Occ 1=Unocc 2=TntOvrd 3=Standby 255=Auto	255=Auto	Sets the unit into a different occupancy mode. The request is typically sent by a wall-mounted occupant-interface module or a supervisory device used to manually control occupancy modes or to override the scheduled occupancy. This input is used with nviOccSchedule to determine the Effective Occupancy mode.
Occupancy Scheduler[1,2]	nviOccSchedule. Current_State	SNVT_tod_event (128)	Y	Null 0=Occ 1=Unocc 2=TntOvrd 3=Standby Any other value=Auto	255=Auto	Indicates current scheduled occupancy state. Commands the occupancy function of the unit controller when Occupancy Mode is set to Auto. Intended to be used for daily occupancy commands. A scheduler or a supervisory node typically sends the request.
	nviOccSchedule. Next_State			Null 0=Occ 1=Unocc 2=TntOvrd 3=Standby Any other value=Auto	255=Auto	Indicates next scheduled occupancy state. Used in conjunction with Optimal Start functionality. Commands the occupancy function of the unit controller when Occupancy Mode is set to Auto. A scheduler or a supervisory node typically sends the request.
	nviOccSchedule. Time_To_Next_ State			0 to 65534	65535 (Null)	Network input that determines the occupancy scheduler time from one state to the next (occupied, unoccupied, standby, auto). Used in conjunction with Optimal Start functionality. If time_to_next_state is valid, the unit controller uses this time to determine when the unit will start. If time_to_next_state is not valid, the unit controller uses an internal calculation to determine when the unit should start.

[1] AHU Loc/Net must be set to Network (1) for this property to apply. AHU Loc/Net can only be changed from the unit controller HMI.
[2] If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts to its default value.

Table 20: Temperature Control Setpoints

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)[1]	Default	Description
Temperature Setpoint Input	nviSetpoint	SNVT_temp_p (105)	N	0-100°F -17.8-37.7°C	621.8°F 327.7°C	Allows Effective Heat Enable and Effective Cool Enable setpoints to be commanded via the network. A valid value determines the Effective Setpoint. A value beyond 100°F/37.7°C is considered invalid and thus ignored. In this case, the effective setpoint value does not respond. This variable does not affect unoccupied setpoints. If theTstat setpoint has been enabled via the unit controller HMI, then the space setpoint adjustment on the optional space sensor overrides nviSetpoint.
Effective Discharge Air Temperature Setpoint	nvoEffDATempSp	SNVT_temp_p (105)	N	-83.2-147.2°F -64-64°C	NA	Reflects the Effective Heating Discharge Temperature Setpoint if the unit is in the heating state. If not, it reflects the Discharge Air Cooling Setpoint when the unit is in any other operating state.
Space Temperature Input	nviSpaceTemp	SNVT_temp_p (105)	Y	0-150°F -64-327.7°C	621.8°F 327.7°C	The current space or zone temperature network value. If a valid network input value has not been provided within the specified amount of heartbeat time, the temperature reverts to the local sensor value.
Local Space Temperature	nvoLocalSpaceTmp	SNVT_temp_p (105)	N	0-150°F -17.8-65.6°C	NA	The current effective local space air temperature. This value is provided by one of the following means: 1. A single local temperature sensor setpoint input 2. The min/max from 2- 3 sensor inputs 3. The average calculated from 2-3 sensor inputs
Outdoor Air Temperature	nvoOutdoorTemp	SNVT_temp_p (105)	Y	-50-200°F -45.6-93.3°C	NA	The current value of the effective outdoor air sensor, either attached to the unit or provided by the network.
Space CO_2 Input	nviSpaceIAQ	SNVT_ppm (29)	Y	0-5000 ppm Default: 32767 (Null)	32767 ppm	Indicates the current space CO_2 level from the network. This value takes priority over a locally wired sensor. It is used for minimum OA damper control and only applies if the external outdoor air input is set to CO2VDC, CO2mA, or CO2QMX.[1] If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts the locally wired sensor value.
Outdoor Air Temperature Input	nviOutdoorTemp	SNVT_temp_p (105)	Y	-50-150°F -45.6-65.6°C	621.8°F 327.7°C	The current outdoor air temperature input supplied by the network. If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts the locally wired sensor value.
Discharge Air Temperature	nvoDischAirTemp	SNVT_temp_p (105)	N	-50-250°F -45.6-121.1°C	NA	The current reading from the unit discharge air temperature sensor attached to the unit. See Alarm Management for additional information about potential alarms generated for this object.
Return Air Temperature	nvoRATemp	SNVT_temp_p (105)	N	-50-200°F -45.6-93.3°C	NA	The current reading from the return air temperature sensor attached to the unit. Also see Alarms and Events.
Space Temperature	nvoSpaceTemp	SNVT_temp_p (105)	N	0-150°F -17.8-65.6°C	NA	The current reading from the effective space temperature sensor. If a space sensor(s) is not installed, this obect is still available. However, an invalid value is displayed until a valid value is provided from the network via nviSpaceTemp. If the value is provided by the unit controller, it can reflect the min/max, the average temperature of up to three local sensors, or the individual value of one of up to three sensors. Also see Alarms and Events.
Entering Fan/Leaving Coil Temperature Sensor	nvoEFT_LCT	SNVT_temp_p (105)	N	-50-250°F -45.6-121.1°C	NA	The current value of the unit entering fan/leaving coil air temperature sensor. Applies only to units configured for this type of sensor. See Alarm Management for additional information about potential alarms generated for this object.
Effective Temperature Setpoint	nvoEffectSetpt	SNVT_temp_p (105)	N	0°-100°F -17.8-37.7°C	NA	Reflects the current changeover setpoint used by the unit. This is either the Occupied Heating Setpoint or the Occupied Cooling Setpoint, depending on the unit state. Otherwise, it reflects the Effective Discharge Cooling Setpoint when Control Temp Source = None.
Local Outdoor Air Temperature	nvoLocalOATemp	SNVT_temp_p (105)	N	-50-200°F -45.6-93.3°C	NA	The current value of a unit-mounted outdoor air temperature sensor.

[1]A QMX room sensor(s) is installed on the process bus and wired directly to the unit controller.

Table 21: Supply Air Fan

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)[1]	Default	Description
Supply Air Fan Capacity Input	nviSupFanCtrl	UNVTsupFanCtrl	N	0-100%	33%	Indicates the remote supply air fan capacity input.
Duct Static Pressure Setpoint	nviDuctStaticSP	SNVT_press_p (113)	N	0.2-4 in 50-996 Pa	1 in 249 Pa	Sets the duct static pressure sensor setpoint used to control the supply air fan when the supply air fan capacity control is set to DAT. If the value is set beyond these limits from the network, it is ignored and the controller continues to control to the last valid value.
Duct Static Pressure[1]	nvoDuctStatPress	SNVT_press_p (113)	N	0-5.02 in 0-1250 Pa	NA	Reflects the current supply fan duct static pressure. Applies to units configured with a supply fan DSP sensor.
Remote Supply Fan Capacity Input	nviSupFanCap	SNVT_lev_percent (81)	Y	0-100%	163.835	Sets the remote supply fan capacity input. If the value is set beyond these limits from the network, it is ignored and the controller continues to control to the last valid value.
VAV Box Output[1]	nvoVAVBoxOut	UNVTvavBoxOutput	N	1=Heat 2=Cool	NA	The VAV box output is provided for interlocking field VAV box operation with the unit heating or cooling. In most cases, the value = 1 when the unit is in any heating state, Start, or Recirc. The value = 2 when the unit is in any other state. Applies only to units configured with a supply fan VFD or ECM.

[1]Applies only to DAC units.
[2] AHU Loc/Net must be set to Network (1) for this property to apply. AHU Loc/Net can only be changed from the unit controller HMI.

Table 22: Return/Exhaust Air Fan

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)[1]	Default	Description
Return Fan Capacity Control	nviExhRetFanCtrl	UNVTexhRetFanCtrl	N	0=CAV 1=BSP 2=Tracking 3=DSP 4=Speed 5=Flow 6=OAD 7=FlowDiff	0=CAV	Selects the method used to control the return or exhaust fan airflow. 1=CAV (Return/Exhaust fan is held at the MaxRFEFCap value when in operation) 2=BSP (Return/exhaust fan airflow is controlled independently of the supply fan to maintain building static pressure setpoint) 3=Tracking (If unit is equipped with an ECM or VFD, airflow is controlled based on an adjustable tracking relationship between the supply fan and return fan) 4=DSP (Return fan is modulated to maintain the duct static pressure at the return air discharge setpoint when in operation) 5=Speed (Return/exhaust fan airflow is controlled to an ECM or VFD speed setpoint adjusted via the return fan capacity input) 6=Flow (unit modulates to maintain the return/exhaust fan flow setpoint when in operation) 7=OAD (Exhaust fan airflow is controlled independently of the supply fan airflow based on the outdoor air damper position) 8=FlowDiff (Return/exhaust fan tracks to the supply air fan flow)
Building Static Pressure (BSP) Setpoint	nviBldgStaticSP	SNVT_press_p (113)	N	-0.25-0.25 in -62.2-62.2 Pa	0.05 in 12.4 Pa	Determines the building static pressure setpoint used for controlling the return air or exhaust fan inlet ECM or VFD. It uses the network input when valid. Otherwise, it is ignored and the controller continues to control to the last valid value. Applies only if the unit is configured for a modulating return/exhaust fan.
Building Static Pressure	nvoBldgStatPress	SNVT_press_p (113)	N	-0.25-0.25 in -62-62 Pa	NA	The current building static pressure sensor value. Applies only to units configured for return/exhaust fan BSP sensor.
Return Fan Capacity Input	nviExhFanCap	SNVT_lev_percent (81)	Y	0-100%	163.835	Remote exhaust/return fan capacity input. Overrides the local exhaust fan capacity control. RFEFCapCtrl must=Speed for the unit controller to use this remote capacity for control. Applies only to units that are configured for modulating exhaust fan or units that are configured for prop exhaust. If a valid network input value has not been provided within the specified amount of heartbeat time, the parameter reverts to its default value.

Table 23: Cooling

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)	Default	Description
Discharge Air Cooling Setpoint Input	nviDACISP	SNVT_temp_p (105)	N	40-100°F 4.4-37.8°C	55°F 12.8°C	Sets the network Discharge Air Cooling Setpoint when ClgDATReset = Network. The unit controller limits the commanded value between the min/max cooling setpoints. The input is commanded by the network but can also be changed from the controller HMI. The controller uses the last valid value.
Default Discharge Air Cooling Setpoint Input	nciDACISP	SNVT_temp_p (105)	N	40-100°F 4.4-37.8°C	55°F 12.8°C	Sets the default Discharge Air Cooling Setpoint. The input is commanded by the network but can also be changed from the controller HMI. The controller uses the last valid value it received from either the network or controller HMI.
Occupied Cooling Setpoint	nciSetpoints. occupied_cool	SNVT_temp_setpt (106) SCPTsetPnts (60)	N	0-100°F -17.8-37.8°C	72°F 22.2°C	Sets the Occupied Cooling Setpoint value when it is not controlled by another function. It uses the network input when valid. Otherwise, it is ignored and the controller continues to control to the last valid value.
Unoccupied Cooling Setpoint	nciSetpoints. unoccupied_cool	SNVT_temp_setpt (106) SCPTsetPnts (60)	N	40-100°F 4.4-37.8°C	85°F 29.4°C	Sets the temperature above which the unit starts and provides cooling during unoccupied periods. An optional space temperature sensor is required for unoccupied cooling operation. The controller uses the last valid value it received from either the network or controller HMI.

[1] Standy Cooling (nciSetpoints_standby_cool) is a standard LonWorks variable but not supported in the MicroTech unit controller.

Table 24: Heating

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)	Default	Description
Occupied Heating Setpoint	nciSetpoints. occupied_heat	SNVT_temp_setpt (106) SCPTsetPnts (60)	N	0-100°F -17.8-37.8°C	68°F 20°C	Sets the Occupied Heating Setpoint value when it is not controlled by other function. It uses maximum and minimum limits, so if the Present Value is set beyond the acceptable range, the value is ignored and the controller continues to control to the last valid value. Note that the Occupied Heating Setpoint serves as the "morning warmup" temperature setpoint for Zone control and DAT units.
Unoccupied Heating Setpoint	nciSetpoints. unoccupied_heat	SNVT_temp_setpt (106) SCPTsetPnts (60)	N	40-100°F 4.4-37.8°C	55°F 12.8°C	Sets the temperature below which the unit starts and provides heating during unoccupied periods. An optional space temperature sensor is required for unoccupied heating operation. It uses maximum and minimum limits, so if the Present Value is set beyond the acceptable range, the value is ignored and the controller continues to control to the last valid value.
Discharge Air Heating Setpoint	nviDAHtSP	SNVT_temp_p (105)	N	40-140°F 4.4-60°C	85°F 29.4°C	Sets the heating discharge setpoint when a valid value is provided within range. Only applies when HtgReset = Network. It uses the network input when valid. Otherwise, it is ignored and the controller continues to control to the last valid value.
Maximum Discharge Air Heating Setpoint	nciDAHtSP	SNVT_temp_p (105) SCPTdischargeAir HeatingSetpoint (184)	N	40-140°F 4.4-60°C	120°F 48.9°C	Sets the maximum allowable discharge air heating setpoint default. It uses the network input when valid. Otherwise, it is ignored and the controller continues to control to the last valid value.

[1] Standy Heating (nciSetpoints_standby_heat) is a standard LonWorks variable but not supported in the MicroTech unit controller.

Table 25: Dehumidification

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)	Default	Description
Space Relative Humidity	nvoSpaceRH	SNVT_lev_percent (81)	N	0-100%	NA	The current reading of the effective space relative humidity input, either attached to the unit or provided by the network.
Dewpoint Setpoint	nviSpaceDewPtSP	SNVT_temp_p (105)	N	0-100°F -18-38°C	50°F 10°C	Sets the dewpoint setpoint. It uses the network input when valid. Otherwise, it is ignored and the controller continues to control to the last valid value from the network or controller HMI.
Relative Humidity Setpoint	nviSpaceDehumSP	SNVT_lev_percent (81)	N	0-100% Default: NA	50%	Sets the relative humidity sensor setpoint. It uses the network input when valid. Otherwise, it is ignored and the controller continues to control to the last valid value from the network or controller HMI.
Space Relative Humidity	nviSpaceRH	SNVT_lev_percent (81)	Y	0-100%	163.835	Sets the relative humidity from the network. If a valid network input value has not been provided within the allowable heartbeat time, the value reverts to the local sensor value.
Space Dewpoint	nvoSpaceDewPt	SNVT_temp_p (105)	N	-50-150°F -45.6-65.6°C	NA	The current dewpoint value based on inputs from effective space relative humidity and the temperature sensor.

Table 26: Outdoor Air

Point Name	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)	Default	Description
Outdoor Airflow	nvoOAFlow	SNVT_flow (15)	N	0-60000 CFM 0-28320 l/s	NA	The current value from an airflow station input connected to the unit. Applies only to units configured for Outdoor Air Flow Signal = VDC or mA.
Outdoor Air Damper Minimum Position Input	nviOAMinPos	SNVT_lev_percent (81)	N	0-100%	0%	Sets the Outdoor Air Damper Minimum Position setpoint. The Minimum Outdoor Air Damper Position Input setpoint uses this value when 1) it is not controlled by another function and 2) when the OAD min position = Network via the unit controller HMI. The controller limits the Present Value that is written between the DCV (Demand Control) Ventilation Limit and the Vent Limit in the Min OA Damper menu. Applies only to units configured with an airside economizer.
Space CO_2	nvoSpaceCO2	SNVT_ppm (29)	N	0-5000 ppm	NA	Current value of the effective CO_2 input, either attached to the unit or provided by the network. This value reflects the SpaceIAQ Input (if valid) or the value from a locally wired sensor. CO_2 is configured via the unit controller HMI.

Table 27: LonWorks Set-up

Point Name	LonWorks Variable	SNVT/SCPT Type (SNVT/SCPT Index)	Receive Heart-beat	Range (In Units)	Default	Description
HVAC Type	nciHvacType	SNVT_hvac_type (145) SCPThvacType (169)	N	0=Generic 1=FanCoil 2=VAV 3=Hpump 4=RTU 5=UV 6=ChilCeil 7=Rad 8=AHU 9=SCU	4=RTU	Indicates the primary application and equipment type. nciHvacType applies only to SCC units. For other SCC object types, the application and equipment type can be determined directly from the object type and corresponding device class within the standard program ID. HVAC Unit Type Identifier can be polled by a network tool to identify the type of equipment. Equipment Type = HVT_GENERIC is set during manufacturing and is read-only.

Table 27: LONWORKS Set-up, Continued

Point Name	LONWORKS Variable	SNVT/SCPT Type (SNVT/SCPT Index)	Receive Heart-beat	Range (In Units)	Default	Description
Receive Heartbeat	nciRcvHrtBt	SNVT_time_sec (107) SCPTmaxRcvTime (48)	N	0-6553.4 Sec	0 Sec	Receive Heartbeat defines the maximum amount of time that can elapse (in seconds) before the Receive Heartbeat variables listed below return to their default values if the LONWORKS network has not updated them. Note that a value of 0 seconds (default) disables Receive Heartbeat functionality. Receive Heartbeat Variables nviOccSchedule / nviEconEnable nviApplicCmd / nviExhFanCap nviSupFanCap / nviRetFanCap nviOutdoorTemp / nviCWFlow nviSpaceTemp / nviSpaceIAQ nviPriCoolEnable / nviSpaceRH nviPriHeatEnable
Send Heartbeat	nciSndHrtBt	SNVT_time_sec (107) SCPTmaxSendTime (49)	N	0-6553.4 sec	60 sec	Defines the maximum period of time that elapses before the network variable outputs (nvos) shown below are automatically updated. Note that a value of 0 seconds disables the auto update feature. Send Heartbeat Variables nvoMcQAHUStatus / nvoOutdoorTemp nvoUnitStatus / nvoLocalSpaceTmp nvoEffectOccup / nvoLocalOATemp nvoDischAirTemp / nvoEFT_LCT nvoRATemp / nvoDuctStatPress nvoSpaceTemp
Minimum Send Time	nciMinSndTm	SNVT_time_sec (107) SCPTminSendTime (52)	N	0-6553.4 Sec	0 Sec	The minimum period of time between automatic network variable output transmissions. It is used to reduce traffic on the network. The following Send Heartbeat variables are limited by nciMinOutTm if the timer is greater than zero: nvoMcQAHUStatus, nvoUnitStatus, nvoEffectOccup, nvoDischAirTemp, nvoRATemp, nvoSpaceTemp, nvoOutdoorTemp, nvoLocalSpaceTmp, nvoLocalOATemp / nvoEFT_LCT, nvoDuctStatPress, nvoBldgStatPress, nvoSpaceRH, nvoSpaceDewPt, nvoSpaceCO2, nvoEffDATempSp, nvoEffectSetpt, nvoExhFanStatus, nvoOAFlow
Object Request	nviRequest	SNVT_obj_request (92)	N	0=RQ_ NORMAL 2=RQ_ UPDATE_ STATUS 5=RQ_ REPORT_ MASK -1(0xFF) = OC_NUL	NA	Provides the mechanism to request an operation or a mode for a functional block within a device. A request consists of an object ID (the object_id field) and an object request (the object_request field). The object ID is the functional block index for a functional block on the device. The Node Object functional block is index zero. The remaining functional blocks are numbered sequentially, starting with one. 0=RQ_NORMAL (Enable object and remove override) 2= RQ_UPDATE_STATUS (Report object status) 5=RQ_REPORT_MASK (Report status bit mask) -1(0xFF)=OC_NUL (Invalid) Refer to www.lonmark.org for more information on object request structure and supported functions.

Table 27: LonWorks Set-up, Continued

Point Name	LonWorks Variable	SNVT/SCPT Type (SNVT/SCPT Index)	Receive Heart-beat	Range (In Units)	Default	Description
Object Status	nvoStatus	SNVT_obj_status (93)	N	object_id= 0-65,535 invalid_ id=0,1 invalid_ request=0,1 report_ mask=0,1	NA	Reports the status for any functional block on a device. It is also used to report the status of the entire device and all functional blocks on the device. A status update consists of an object ID (the object_id field) and multiple status fields. The object ID is the functional block index as described under nviRequest. If the object ID is zero, the status of the device itself and all functional blocks on the device is reported. The status fields are one-bit bitfields. The only supported status fields are the report_mask, invalid_id, and invalid_request fields; all other status fields are not supported. Refer to www.lonmark.org for the complete SNVT type description.

Table 28: Alarms

Point Name[1]	LonWorks Variable	SNVT/UNVT (SNVT/UNVT Index)	Receive Heart-beat	Range (In Units)	Default	Description[1]
Active Alarm	nvoUnitStatus_in_ alarm	SNVT_hvac_status (112)	N	0-255	NA	The alarm value allows individual notification of the highest priority active alarm. This object is set to zero if no alarms are active.
Warning Alarm	nvoWarnAlarm	SNVT_hvac_status (112)	N	61-199	NA	Allows individual notification of the highest priority active warning alarm. The value in Table 31 is the largest number in its enumeration that corresponds to an active alarm. This object is set to zero if no warning alarms are active.
Problem Alarm	nvoProbAlarm	SNVT_hvac_status (112)	N	1-60	NA	Allows individual notification of the highest priority active problem alarm. The value in Table 32 is the largest number in its enumeration that corresponds to an active alarm. This object is set to zero if no problem alarms are active.
Fault Alarm	nvoFaultAlarm	SNVT_hvac_status (112)	N	200-255	NA	Allows individual notification of the highest priority active fault alarm. The value in Table 33 is the largest number in its enumeration that corresponds to an active alarm. This object is set to zero if no fault alarms are active.
Clear Alarms	nviClearAlarms	UNVTclearAlarm	N	1=No 2=ClrFlts 3=ClrPrbIms 4=ClrWrngs 5=ClrAllAlms	1=No	Clears all active alarms or all active alarms in a particular alarm class.

[1] Refer to the Alarms and Events section for complete details.

NOTE: The variables nvoMATemp,nvoMixedAirTemp, nvoConductivity, and nviCWFlow may appear when commissioning from the network. However, they are not available from the MicroTech 4 Rebel Applied unit controller. The variables appear because the Rebel Applied shares the same LON firmware as the legacy MicroTech III unit controller, which does support these nvos.

Alarms and Events

The MicroTech unit controller has various ways of managing alarms, depending on the network protocol. Alarms can be monitored and cleared using more than one method.

Alarm Classes

Alarms in the unit controller are divided into three classes: Faults, Problems, and Warnings. Fault alarms have the highest priority. Problem alarms have the next priority. Warning alarms have the lowest priority. The alarms within each class are also prioritized.

Fault Alarms

Faults are conditions that are serious enough to completely shut down the unit. In this case, the Unit Status parameter indicates *OffAlm*. The alarm condition must be corrected and the alarm cleared before unit operation can resume. Fault alarms have the highest priority.

Problem Alarms

Problem alarms do not cause unit shutdown but do limit operation of the unit in some way. Some of these alarms must be cleared manually, others clear automatically when conditions return to normal. Problem alarms have the next highest priority.

Warning Alarms

Warnings are conditions that should be addressed, but do not limit operation in any way. Some of these alarms must be cleared manually, others will clear automatically when conditions return to normal. Warning alarms have the lowest priority.

Alarm Notification

Each alarm is assigned a priority number from 1-255. Faults (200-255) have a higher priority than Problems (61-199) which have a higher priority than Warnings (1-60).

The alarm priority number is mapped to both LonWorks and BACnet networks. The alarm priority number is set to 0 to indicate no alarm or to the enumeration of the highest priority active alarm.

NOTE: Applies when unit control type is ZTC, DTC, or 1ZnVAV.

BACnet Alarm Notification

Individual alarm notification is supported through *AlarmValue* (AV:30) The highest priority active alarm can be read directly from the *AlarmValue* object's Present_Value property.

Three separate values indicate the highest active alarm numbers by Fault, Problem and Warnings. BACnet alarm objects are set to zero if no alarms are active. Alarm objects are read-only. Refer to Table 29 and the following alarm tables for more information.

Table 29: BACnet Alarm Values

Point Name	BACnet Object Name	Object Type/ Instance	Range	Description
Alarm Value	AlarmValue	AV:30	0-255	Highest priority active alarm. Alarm object = 0 if no alarms are active or to the enumeration of the highest priority active alarm.
Warning Alarm	ActiveWarning	AV:27	0-60	Highest priority active problem alarm.
Problem Alarm	ActiveProblem	AV:28	0, 61-199	Highest priority active warning alarm.
Fault Alarm	ActiveFault	AV:29	0, 200-255	Highest priority active fault alarm.
Clear Alarms	ClearAlarms	MSV:13	1=None 2=ClrFlts 3=ClrPrblms 4=ClrWrngs 5=ClrAllAlms	Clears all active alarms or all active alarms in a particular alarm class. Default = 1 (None)

It is often necessary for event notifications to be sent to multiple destinations or to different destinations based on the time of day or day of week. The controller uses Notification Classes (NC) supported by standard BACnet intrinsic reporting requirements. See table below for descriptions. The Notification Class priority specifies a priority from 0 to 255 (0 being most important, 255 least important).

The unit controller can generate event notifications directed to one or more recipients (maximum 20 recipients). There is one notification class object for each class of alarms. Subscribe to the notification class objects in order to use them. The Recipient List property must indicate when and to which device notification should be made.

Notification Class (NC)	BACnet Object Name	Instance Number
NC 1	Faults	1
NC 2	Problems	2
NC 3	Warnings	3
NC 4	Events	4

The Event_Enable property of each object enables and disables the reporting of To-OffNormal, To-Fault, and To-Normal events. For example, if it has been determined that an event is not to be generated when the alarm object returns to a normal state, set the To-Normal bit of the objects Event_Enable property to 0.

Alarm Acknowledgement

In some systems, a device may need to know that someone has seen and responded to the alarm notification. The BACnet object keeps track of the acknowledgement of each of the three event transitions separately. Notification Class objects have an Ack_Transitions property that determines if acknowledgments have occurred for the To-OffNormal, To-Fault, and To-Normal bit fields. This property cannot be changed. Each one of the states (To-OffNormal, To-Fault, and To-Normal) can require a separate acknowledgement. A Time Stamp is used to identify this event acknowledgment.

Recipient List Property (Destinations)

The recipient list property (Recipient_List) of the Notification Class object is a list of standard BACnet data type BACnetDestination elements. Within each destination (Recipient_List) record is a set of Valid Days of the week (Monday - Sunday) and a From Time and To Time, during which the destination is sent a notification. Also specified is the applicable event transition(s) (To-OffNormal, To-Fault, and To-Normal) for which the destination is sent a notification.

NOTE: For a specific event transition (To-OffNormal, To-Fault, and To-Normal) to reach a recipient, the transition choice has to be selected BOTH in the source object AND in the destination (recipient) record.

If the BAS supports intrinsic alarming but is unable to subscribe to the recipient list property of the Notification Class object, the BAS can still receive an alarm notification by adding its Device Instance to the “NC Dev 1=” or “NC Dev 2=” items on the unit controller HMI under the BACnet MSTP or BACnet IP Setup menu. Cycle power on the unit controller for changes to take effect. Once power is cycled, the unit controller sends out a “Who-Is” command directed at the device. If the device responds, the unit controller sends Unconfirmed Notifications for all alarms that are generated in the application. If the device does not respond to the Who-Is, the unit controller periodically sends out the Who-Is until the device responds.

Refer to ASHRAE 135-2014 Section 13-Alarm and Event Services for more information.

LonWorks Alarm Notification

The highest priority active alarm is indicated by the network variable, *nvo_UnitStatus_in_alarm*.

Separate alarm values are also provided that indicate the highest priority active Warning, Problem, and Fault alarms. It is possible to have multiple active alarms, but only the highest priority is displayed.

Refer to Table 30 and the following alarm tables for more information.

Table 30: LonWorks Alarm Variables

Variable Name	LonWorks Variable	SNVT Type/Index	Range	Receive Heart-beat	Description
Alarm Value	nvoUnitStatus_in_alarm	SNVT_hvac_status (112)	0-255	N	Highest priority active alarm. Alarm object = 0 if no alarms are active or indicates the enumeration of the highest priority active alarm.
Problem Alarm	nvoProbAlm		0-60		Highest priority active problem alarm.
Warning Alarm	nvoWarnAlm		0, 61-199		Highest priority active warning alarm.
Fault Alarm	nvoFaultAlm		0, 200-255		Highest priority active fault alarm.
Clear Alarms	nviClearAlarms	UNVTclearAlarm	0=None 1=ClrFlts 2=ClrPrblms 3=ClrWrngs 4=ClrAllAlms	N	Clears all active alarms or all active alarms in a particular alarm class. Default = 1 (None)

Alarm Clearing

All alarms and groups of alarms can be cleared via the network by setting the *ClrAlms* variable to a non-zero value as indicated. *ClrAlms* automatically reverts to zero when the alarms are cleared.

All active alarms are cleared automatically when power is cycled to the unit controller. If conditions that triggered the alarm are still present after a power cycle, the active alarm is re-initiated with a new date/time stamp.

BACnet

Alarms can be cleared by alarm class using the C*learAlarms* multistate object. To clear alarms in a particular class, set the value of *ClearAlarms* to the appropriate value (2-4). After the alarms are cleared, this object returns to 1 = None.

1 = None
2 = Clear All Faults
3 = Clear All Problems
4 = Clear All Warnings
5 = Clear All Alarms

LonWorks

Alarms can be cleared by alarm class using the network variable, *nviClearAlarms*. To clear alarms in a particular class, set the value of *nviClearAlarms* to the appropriate value (1-3). After the alarms are cleared, this variable returns to 0 = None.

0 = None
1 = Clear All Faults
2 = Clear All Problems
3 = Clear All Warnings
4 = Clear All Alarms

Alarm Tables

The following section describes alarm enumerations available to BACnet and LonWorks networks (Table 31 - Table 33). A higher alarm number indicates a higher priority alarm.

See Table 34 - Table 36 for BACnet-only events and alarms. Alarms can be monitored and cleared as described in the previous section. Not all alarms are available for every application. Refer to Rebel Applied unit controller OM 1288 for full alarm generation descriptions.

Table 31: Warning Alarms

Alarm Number	Alarm Name	Clear	Description
0	No Active Alarm		No active alarms.
4	Hi Humidity Warning	Manual	Indicates that a space or return air humidity sensor has exceeded the setpoint high limit for longer than the Hi Humid time. Applies when units are configured for IAQ monitoring and have the proper sensor installed.
5	Lo Humidity Warning	Manual	Indicates that a space or return air humidity sensor is below the setpoint low limit for longer than the Lo Humid time. Applies when units are configured for IAQ monitoring and have the proper sensor installed.
6	Lo Bldg Press Warning	Automatic	Indicates the building static pressure (BSP) is below the low BSP setpoint. Applies when units are configured for IAQ monitoring and have the proper sensor installed.
7	Hi CO2 Warning	Manual	Indicates the amount of CO_2 in the space is at poor or hazard conditions for longer than the Hi CO_2 time. Applies when units are configured for IAQ monitoring and have the proper sensor installed.
24	Main Filter Warning	Manual	Indicates the status of the main filter switch.[1]
25	Final Filter Warning	Manual	Indicates the status of the final filter switch.[1]
34	Return / Exhaust Fan Warning	Automatic	An active alarm indicates that there is a problem with the return or exhaust fan operation. Applies to units with a VFD or ECM return/exhaust fan.[2]
50	Over Economizing Warning	Automatic	An active alarm indicates that the unit is economizing when it should not be economizing.[2]
52	Under Economizing Warning	Automatic	An active alarm indicates that the unit is not economizing when it should be economizing.[2]
54	Excess Outdoor Air Warning	Automatic	An active alarm indicates that the unit is delivering excess outdoor air.[2]
56	Outdoor Air Damper Stuck Warning	Automatic	An active alarm indicates that the outdoor air dampers may be stuck.[2]
58	Energy Wheel Warning	Automatic	An active alarm indicates that the energy recovery wheel is not functioning as expected.[2]

[1] Normal = 0, In Alarm = 1
[2] Open or short-circuited = 0, Closed = 1

Table 32: Problem Alarms

Alarm Number	Alarm Name[5]	Clear	Description
0	No Active Problems		No active alarms.
61	HiDptClDsbld Problem	Automatic	Indicates that the outdoor air dewpoint is above the setpoint and dewpoint cooling is disabled.
62	CondOverflow Problem	Manual	Indicates that the condensate input is open continuously for 10 seconds. Alarm is generated on units with R32 refrigerant.
64	C1HiC1FCmpTmp1 Problem	Automatic[3]	Indicates that the fixed compressor high temperature 1 is above 120°F continuously for 5 seconds.
65	C1HiC1FCmpTmp3 Problem	Automatic[3]	Indicates that the fixed compressor high temperature 3 is above 120°F continuously for 5 seconds.
66	C1HiC1FCmpTmp5 Problem	Automatic[3]	Indicates that the fixed compressor high temperature 5 is above 120°F continuously for 5 seconds.
67	C1FCmpTmp1 Problem	Manual	Indicates that the fixed compressor temperature sensor 1 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
68	C1FCmpTmp3 Problem	Manual	Indicates that the fixed compressor temperature sensor 3 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
69	C1FCmpTmp5 Problem	Manual	Indicates that the fixed compressor temperature sensor 5 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
70	C1DRT3Sensor Problem	Manual	Indicates that the DRT sensor 3 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
71	C1DRT5Sensor Problem	Manual	Indicates that the DRT sensor 5 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
74	C2Hi FCmpTmp2 Problem	Automatic[3]	Indicates that the fixed compressor high temperature 2 is above 120°F for five seconds.
75	C2Hi FCmpTmp4 Problem	Automatic[3]	Indicates that the fixed compressor high temperature 4 is above 120°F for five seconds.
76	C2Hi FCmpTmp6 Problem	Automatic[3]	Indicates that the fixed compressor high temperature 6 is above 120°F for five seconds.

Table 32: Problem Alarms, Continued

Alarm Number	Alarm Name[5]	Clear	Description
77	C2FCmpTmp2 Problem	Manual	Indicates that the fixed compressor temperature sensor 2 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
78	C2FCmpTmp4 Problem	Manual	Indicates that the fixed compressor temperature sensor 4 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
79	C2FCmpTmp6 Problem	Manual	Indicates that the fixed compressor temperature sensor 6 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
80	C2DRT4Sensor Problem	Manual	Indicates that the DRT sensor 4 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
81	C2DRT6 Sensor Problem	Manual	Indicates that the DRT sensor 6 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
82	DFT1Sensor Problem	Manual	Indicates the defrost sensor 1 is present and either shorted or opened for longer than the temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range. Applies to heat pump units.
83	DFT2Sensor Problem	Manual	Indicates the defrost sensor 2 is present and either shorted or opened for longer than the temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range. Applies to heat pump units.
84	DFT3Sensor Problem	Manual	Indicates the defrost sensor 3 is present and either shorted or opened for longer than the temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range. Applies to heat pump units.
85	HiC3FCmpTmp1 Problem	Automatic	Indicates that the circuit 3 fixed compressor 1 has remained above the maximum allowable temperature of 120°C (248°F) continuously for 5 seconds.
86	HiC3FCmpTmp3 Problem	Automatic	Indicates that the circuit 3 fixed compressor 3 has remained above the maximum allowable temperature of 120°C (248°F) continuously for 5 seconds.
87	HiC3iFCmpTmp5 Problem	Automatic	Indicates that the circuit 3 fixed compressor 5 has remained above the maximum allowable temperature of 120°C (248°F) continuously for 5 seconds.
88	C3FCmpTmp1 Problem	Manual	Indicates that the circuit 3 fixed compressor temperature sensor 1 is shorted and either open circuited for longer than temperature alarm delay default of 30 seconds or is not detected, or the sensor value has exceeded the allowable range.
89	C3FCmpTmp3 Problem	Manual	Indicates that the circuit 3 fixed compressor temperature sensor 3 is shorted and either open circuited for longer than temperature alarm delay default of 30 seconds or is not detected, or the sensor value has exceeded the allowable range.
90	C3FCmpTmp5 Problem	Manual	Indicates that the circuit 3 fixed compressor temperature sensor 5 is shorted and either open circuited for longer than temperature alarm delay default of 30 seconds or is not detected, or the sensor value has exceeded the allowable range.
91	C3DRT3Sensor Problem	Manual	Indicates that the circuit 3 DRT sensor 3 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
92	C3DRT5Sensor Problem	Manual	Indicates that the circuit 3 DRT sensor 5 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
95	4WV3 Problem	Manual	The 4-way reversing valve 3 indicates a problem with compressor cooling and heating operation. Applies to heat pump units.
97	C3DRT1 Sensor Problem	Manual	Indicates that the circuit 3 DRT sensor 1 is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
101	MHGRhtVlv1 Problem	Manual	Indicates that the modulating hot gas reheat valve 1 motor and driver are not synchronizing.[1]
102	MHGRhtVlv2 Problem	Manual	Indicates that the modulating hot gas reheat valve motor 2 and driver are not synchronizing.[1]
105	C1DRT1 Sensor Problem	Manual	Indicates that the DRT sensor 1 is present and either shorted or opened for longer than the temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
106	C2DRT2 Sensor Problem	Manual	Indicates that the DRT sensor 2 is present and either shorted or opened for longer than the temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
107	4WV1 Problem	Manual	The 4-way reversing valve 1 indicates a problem with compressor cooling and heating operation. Applies to heat pump units.
108	4WV2 Problem	Manual	The 4-way reversing valve 2 indicates a problem with compressor cooling and heating operation. Applies to heat pump units.
109	ProtIntrlck Problem	Manual	The Protection Interlock Problem alarm is generated when the effective compressor capacity input is greater than 5% and the system safety protection interlock input is Open or the safety switch command is Off for 90 seconds. Compressor operation is disabled under these conditions. Applies to refrigeration-only units.

Table 32: Problem Alarms, Continued

Alarm Number	Alarm Name[5]	Clear	Description
110	VCmp 1 Problem	Manual	Indicates the current status of the variable speed compressor problem alarm on circuit 1. Applies to units with VFD compressors.[1]
111	VCmp 2 Problem	Manual	Indicates the current status of the variable speed compressor problem alarm on circuit 2. Applies to units with VFD compressors.[1]
112	VCmp 3 Problem	Manual	Indicates the current status of the variable speed compressor problem alarm on circuit 3. Applies to units with VFD compressors.[1]
115	SRT Sensor 1 Problem	Manual	Indicates that suction refrigerant temperature sensor on circuit 1, 2, or 3 is present and either shorted or opened for longer than the temperature alarm delay default of 30 seconds, or the sensor value has exceeded the allowable range.
116	SRT Sensor 2 Problem		
117	SRT Sensor 3 Problem		
120	Hi DL Temp_1 Problem	Manual	Indicates if the high discharge line temperature problem alarm on variable compressor circuit 1, 2 or 3 has exceeded the high temperature limit. Applies to units with VFD compressors.[1]
121	Hi DL Temp_2 Problem		
122	Hi DL Temp_3 Problem		
125	Exp Valve 1 Problem	Manual	Indicates the status of the circuit 1, 2 or 3 expansion valve problem alarm.[1]
126	Exp Valve 2 Problem		
127	Exp Valve 3 Problem		
130	OA Fan 1 Problem	Manual	Indicates if an outdoor air fan problem alarm on circuit 1, 2 or 3 is active.[1]
131	OA Fan 2 Problem		
132	OA Fan 3 Problem		
133	Refrigerant Leak Problem	Manual	The MT6210 A2L board has detected a refrigerant concentration level above the desired threshold.
134	Refrigerant Sensor Problem	Automatic	The MT6210 A2L board has detected a fault with one or more of the refrigerant sensors.
135	PTS1 Sensor Problem	Manual	The suction refrigerant pressure sensor is present and the following are true for 30 seconds: 1. Charge Loss Problem is Inactive 2. The sensor value is less than -96.53 kPa (-14.0 psi)
136	PTS2 Sensor Problem		
137	PTS3 Sensor Problem		
140	PTD1 Sensor Problem	Manual	The discharge refrigerant pressure sensor 1, 2, or 3 is present and the sensor value is greater than 4619.5 kPa (670 psi) or less than -96.53 kPa (-14.0 psi).
141	PTD2 Sensor Problem		
142	PTD3 Sensor Problem		
145	Lo Charge 1 Problem	Manual	Indicates the status of the low refrigerant charge problem alarm on circuit 1, 2, or 3.[1]
146	Lo Charge 2 Problem		
147	Lo Charge 3 Problem		
150	ChargeLoss 1 Problem	Manual	Indicates if the refrigerant system charge on circuit 1, 2, or 3 has been lost and the following are true for 20 seconds:[1] 1. The discharge refrigerant pressure sensor is less than or equal to 68.94 kPa (10 psi) 2. The suction refrigerant pressure sensor is less than or equal to 68.94 kPa (10 psi)
151	ChargeLoss 2 Problem		
152	ChargeLoss 3 Problem		
155	VCmp1LoDSH Problem	Manual	Indicates if the discharge superheat problem alarm on circuit 1, 2, or 3 is active because of a low superheat reading. Applies to units with VFD compressors[1]
156	VCmp2LoDSH Problem		
157	VCmp3LoDSH Problem		
160	Lo Press 1 Problem	Manual	Indicates the status of the low pressure switch input. When it is in the alarm (Open) position, the low pressure problem alarm is active. This means that the low pressure switch input has been in the alarm (Open) position for longer than the default of two seconds or that the compressor on circuit 1, 2, or 3 has been on for longer than 5 seconds[1]
161	Lo Press 2 Problem		
162	Lo Press 3 Problem		
165	Hi Press 1 Problem	Manual	Indicates the status of the high pressure switch input. When it is in the alarm (Open) position, the high pressure problem alarm is active and the inverter compressor refrigerant circuit 1, 2, or 3 high limits have been exceeded. Applies to units with VFD compressors.[1]
166	Hi Press 2 Problem		
167	Hi Press 3 Problem		
170	Lo Press Diff 1 Problem	Manual	Current status of the low discharge pressure problem alarm on circuit 1, 2, or 3. Applies to units with VFD compressors.[1]
171	Lo Press Diff 2 Problem		
172	Lo Press Diff 3 Problem		
175	HiVCmp1Temp Problem	Manual	Indicates the status of the variable compressor high temperature problem alarm on circuit 1, 2, or 3. Applies to variable speed compressors. Alarm requires a manual clear after VCmp1Temp is below 212°F (100°C) continuously for one minute.[1]
176	HiVCmp2Temp Problem		
177	HiVCmp3Temp Problem		
180	VCmpTSnsr1 Problem	Manual	Indicates that the variable compressor temperature sensor 1, 2, or 3 is present but has been shorted. It can also indicate that the sensor is in the alarm (Open) position, or that no sensor is detected.
181	VCmpTSnsr2 Problem		
182	VCmpTSnsr 3 Problem		
185	VCmp1HiDSH Problem	Manual	Indicates the high discharge superheat problem alarm on cooling circuit 1, 2, or 3. Applies to units with VFD compressors.[1]
186	VCmp2HiDSH Problem		
187	VCmp3HiDSH Problem		

Table 32: Problem Alarms, Continued

Alarm Number	Alarm Name[5]	Clear	Description
189	IFB3 Comm Problem	Automatic[4]	An interruption has occurred between the unit controller and an inverter compressor interface communication board (IFB) board, if installed. This indicates that both the high pressure switch HP1, HP2 or HP3 switch input is in the normal (Close) position. Note: The high pressure switch disables a 16VDC power input from the variable compressor controller. This may cause an erroneous IFB1/IFB2 Comm problem alarm.
190	IFB1 Comm Problem		
191	IFB2 Comm Problem		
192	EFT/LCT Snsr Problem	Automatic	Indicates that the entering fan/leaving coil temperature sensor is present and either shorted or open circuited for longer than temperature alarm delay default of 30 seconds. Applies when unit control type is ZTC, DTC, or 1ZnVAV.
193	RAT Sensor Problem	Automatic	The return air temperature sensor is present and either shorted or opened for longer than the temperature alarm delay default of 30 seconds. Applies when unit control type is ZTC, DTC, or 1ZnVAV. Alarm clears automatically when the sensor becomes reliable.
194	Space Sensor 1 Problem	Automatic	Indicates that the local space sensor input is shorted or open circuited for longer than the temperature alarm delay of 30 seconds. Applies when unit control type is ZTC, DTC, or 1ZnVAV. Alarm clears automatically when the sensor becomes reliable.
195	Space Sensor 2 Problem		
196	Space Sensor 3 Problem		
197	OAT Sensor Problem	Manual	Indicates that a valid network outdoor air temperature input value is not present and that the local outdoor air temperature sensor is either shorted or open circuited. Applies when unit control type is ZTC, DTC, or 1ZnVAV.
198	Freeze Problem	Automatic	Indicates that the freezestat input is in the Open position.[1] Applies when unit control type is ZTC, DTC, or 1ZnVAV.
199	Heat Fail Problem	Automatic	Indicates the heat fail problem alarm is active.[1] Applies when unit control type is ZTC, DTC, 1ZnVAV or RO_FCGE.

[1] Normal = 0, In Alarm = 1
[2] Open or short-circuited = 0, Closed = 1
[3] Requires a manual reset if the alarm occurs three times within 100 minutes
[4] Requires a manual reset if the alarm occurs five times within 100 minutes
[5] Circuit designation "C1" or "C2" is supported in unit controller software v2506036118 and newer

Table 33: Fault Alarms

Alarm Number	Alarm Name	Clear	Description
0			No active alarms.
205	HiDptClDsbld: Fault	Automatic	Indicates the outdoor air dewpoint is greater than the OA dewpoint maximum value (HiOADwptValue) setpoint. Applies to 100% OA damper units.
208	Airflow Fault	Manual	Indicates the condition of the airflow switch used to determine whether or not sufficient supply air flow is present for unit operation.[1] Does not apply to refrigeration-only units.
212	Low Discharge Air Temperature Fault	Manual	Indicates that the discharge air temperature is below the low discharge temperature setting and that the discharge air temperature sensor reading is reliable (not open or short-circuited).
216	High Discharge Air Temperature Fault	Manual	Indicates that the discharge air temperature is greater than the high discharge temperature limit and that the discharge air temperature sensor reading is reliable (not open or short-circuited).[2]
220	High Return Air Temperature Fault	Manual	Indicates that the return air temperature is greater than the high return temperature limit of 120°F for longer than the high/low temperature alarm delay of 35 seconds and that the return air temperature sensor reading is reliable (not open or short-circuited).
224	Duct High Limit Fault	Manual	Indicates that the Duct High Limit Fault alarm is active. Applies only to Variable Air Volume (VAV) units configured for a VFD or ECM supply fan.
228	Discharge Air Temperature Sensor Fault	Manual	Indicates that the discharge air temperature sensor is not reliable[2] for longer than the temperature sensor alarm delay default of 30 seconds.
244	Control Temperature Fault	Manual	Indicates that the sensor configured for control temperature is not present, is not reliable[2] or is out of range. Also, no other sensor (the return air temperature, outdoor air temperature, or space temperature senor) is available.
250	Emergency Off Fault	Manual[3]	Indicates that the emergency off switch input is in the alarm (Open) position and either of the following are true: 1. BACnet EmergencyOverride is set to Off 2. LON nviEmergOverride is set to Off
252	Freeze Fault	Manual	Indicates that the freezestat input is in the alarm (Open) position and the supply air fan is on for at least 30 seconds.[2] Applies when the unit heating is face and bypass or hot water steam, or the unit cooling is chilled water.

[1] Normal = 0, In Alarm = 1
[2] Open or short-circuited = 0, Closed = 1
[3] Alarm is manual when the Emergency Off Reset parameter is set to ManClr. Otherwise, it is automatic when Emergency Off Reset is set to AutoClr from the HMI

Table 34: BACnet Binary Alarm Inputs

Alarm Message	Object Type/ Instance	BACnet Object Name	Clear	Description
Airflow Fault (208)	BI:1	AirFlwFlt	Manual	Indicates the condition of the airflow switch[1]. It is the object that generates the alarm. Determines whether or not sufficient supply air flow is present for unit operation. Does not apply to refrigeration-only units.
	BI:2	AirFlwStatus	NA	Indicates the airflow status (0=NoFlow, 1=Flow).
Main Filter Switch Input	BI:3	FilterSw	NA	Indicates the position of the main filter switch.[2]
Main Filter Warning (24)	BI:5	FilterWrn	Manual	Generates a Main Filter Warning alarm under any one of the following conditions: • The main filter switch input (FilterSw) is in the alarm (open) position. • Filter pressure 1 analog input 21 is above the high filter pressure 1 setpoint. • Filter pressure 2 analog input 22 is above the high filter pressure 2 setpoint.
Final Filter Switch Input	BI:4	FilterSw2	NA	Indicates the status of the Final Filter Switch input.[2] It is one of the reasons for generating a Final Filter Warning alarm (25).
Final Filter Warning (25)	BI:6	FilterWrn2	Manual	Generates a Final Filter Warning alarm when the final filter switch input (FilterSw2) is in the alarm (open) position or when the filter pressure 3 analog input 23 is above the high filter pressure 3 setpoint.
Energy Wheel Warning (58)	BI:7	ERWheelWrn	Automatic	Indicates that the energy recovery wheel is not functioning as expected and the Energy Wheel Warning alarm is active.[1]
High Return Air Temperature Fault (220)	BI:8	HiRATFlt	Manual	Indicates that the return air temperature is greater than the high return temperature limit of 120°F for longer than the high/low temperature alarm delay of 35 seconds and that the return air temperature sensor is not reliable (shorted or open circuited).[1]
Over Economizing Warning (50)	BI:9	OverEconoWrn	Automatic	An active alarm indicates that the unit is economizing when it should not be economizing. The OffNormal state of this object indicates the Over Economizing Warning alarm is active.[1]
Under Economizing Warning (52)	BI:10	UnderEconoWrn	Automatic	An active alarm indicates that the unit is not economizing when it should be economizing. The OffNormal state of this object indicates the Under Economizing Warning alarm is active.[1]
Excess Outdoor Air Warning (54)	BI:11	ExcessOAWrn	Automatic	An active alarm indicates that the unit is delivering excess outdoor air. The OffNormal state of this object indicates the Excess Outdoor Air Warning alarm is active.[1]
Outdoor Air Damper Stuck Warning (56)	BI:12	OADStuckWrn	Automatic	An active alarm indicates that the air dampers may be stuck. The OffNormal state of this object indicates the Outdoor Air Damper Stuck Warning alarm is active.[1]
Return / Exhaust Fan Warning (34)	BI:13	RetExhFanWrn	Automatic	An active alarm indicates that there is a problem with the return or exhaust fan operation. The OffNormal state of this object indicates a Return / Exhaust Fan Warning. Applies to units with a VFD or ECM return/exhaust fan.[1]
Freeze Fault (252)	BI:14	FreezeStat	Manual	Indicates that the freezestat is in the open position and an alarm has been generated.[2]
Freeze Problem (198)	BI:15	FreezePrb	Automatic	Activates the Freeze Problem alarm when input is in the Open position.[1]
Heat Fail Problem (199)	BI:16	HeatFailPrb	Automatic	Indicates the status of the Heat Fail Problem alarm.[1]
Duct High Limit Fault (224)	BI:17	DuctHiLmtSw	Manual	Indicates the status of the local duct high limit switch with input from the local sensor. This is the object that generates a Fault alarm when in the Open position.[2]
Emergency Off Fault (250)	BI:18	EmergencyOffSw	Manual	Indicates the status of the emergency off switch. Input is from either a local sensor or the network. This is the object that generates a Fault alarm when in the Open position.[2]
Refrigerant Sensor Problem (134)	BI:19	RefrigSnsrPrb	Automatic	The A2L mitigation board has detected a fault with one or more of the refrigerant sensors.
Refrigerant Leak Problem (133)	BI:20	RefigLeakPrb	Manual	The A2L mitigation board has detected a refrigerant concentration level above the allowable threshold.
High Dewpint Cooling Disable Problem (61)	BI:21	HiDwptClgDsbdPrb	Automatic	Indicates that the outdoor air dewpoint is above the setpoint and dewpoint cooling is disabled.
High Dewpint Cooling Disable Fault (205)	BI:22	HiDwptClgDsbdFlt	Automatic	Indicates the outdoor air dewpoint is greater than the OA dewpoint maximum value (HiOADwptValue) setpoint. Applies to 100% OA damper units.
Condensate Overflow Problem (62)	BI:23	CondOverflowPrb	Manual	Indicates that the condensate input is open continuously for 10 seconds. Alarm is generated on units with R32 refrigerant.

Table 34: BACnet Binary Alarm Inputs, Continued

Alarm Message	Object Type/ Instance	BACnet Object Name	Clear	Description
High Pressure Problem Circuit 1 (165)	BI:100	C1HiPressPrb	Manual	Indicates the status of the high pressure switch input. When it is in the alarm (Open) position, the High Pressure Problem alarm is active and the inverter compressor refrigerant circuit 1, 2, or 3 high limits have been exceeded.[1]
High Pressure Problem Circuit 2 (166)	BI:200	C2HiPressPrb		
High Pressure Problem Circuit 3 (167)	BI:300	C3HiPressPrb		
Low Pressure Problem Circuit 1 (160)	BI:101	C1LoPressPrb	Automatic	Indicates the status of the low pressure switch input. When it is in the alarm (Open) position, the Low Pressure Problem alarm is active. This means that the low pressure switch input has been in the alarm (Open) position for longer than the default of two seconds or that the compressor on circuit 1, 2, or 3 has been on for longer than five seconds.[1]
Low Pressure Problem Circuit 2 (161)	BI:201	C2LoPressPrb		
Low Pressure Problem Circuit 3 (162)	BI:301	C3LoPressPrb		
Low Discharge Pressure Problem Circuit 1 (170)	BI:102	C1LoDPPrb	Manual	Current binary status of the Low Discharge Pressure Problem alarm for circuit 1, 2, or 3 of VFD compressor units.[1]
Low Discharge Pressure Problem Circuit 2 (171)	BI:202	C2LoDPPrb		
Low Discharge Pressure Problem Circuit 3 (172)	BI:302	C3LoDPPrb		
Outdoor Air Fan 1 Problem (130)	BI:103	C1OAFPrb	Manual	Indicates if an Outdoor Air Fan Problem alarm is active.[1]
Outdoor Air Fan 2 Problem (131)	BI:203	C2OAFPrb		
Outdoor Air Fan 3 Problem (132)	BI:303	C3OAFPrb		
Inverter Compressor Board (IFB) 1 Problem (190)	BI:104	C1IFBCommPrb	Manual	Indicates if an interruption has occurred between the unit controller and an inverter compressor interface communication board (IFB) board, if installed.[1]
Inverter Compressor Board (IFB) 2 Problem (191)	BI:204	C2IFBCommPrb		
Inverter Compressor Board (IFB) 3 Problem (189)	BI:304	C3IFBCommPrb		
Charge Loss Problem Circuit 1 (150)	BI:105	C1ChargeLossPrb	Manual	Indicates if the refrigerant system charge on circuit 1, 2, or 3 has been lost.[1]
Charge Loss Problem Circuit 2 (151)	BI:205	C2ChargeLossPrb		
Charge Loss Problem Circuit 3 (152)	BI:305	C3ChargeLossPrb		
Low Refrigerant Charge Problem Circuit 1 (145)	BI:106	C1LoChargePrb	Manual	Indicates the status of the Low Refrigerant Charge Problem alarm for circuit 1, 2 or 3.[1]
Low Refrigerant Charge Problem Circuit 2 (146)	BI:206	C2LoChargePrb		
Low Refrigerant Charge Problem Circuit 3 (147)	BI:306	C3LoChargePrb		
High Variable Speed Compressor Temperature Problem Circuit 1 (175)	BI:107	C1HiVCmpTPrb	Manual	Indicates if the variable speed compressor for circuit 1, 2 or 3 has exceeded the high temperature setpoint. Alarm can be cleared manually after VCmp1Temp has been below 212°F (100°C) continuously for one minute.[1]
High Variable Speed Compressor Temperature Problem Circuit 2 (176)	BI:207	C2HiVCmpTPrb		
High Variable Speed Compressor Temperature Problem Circuit 3 (177)	BI:307	C3HiVCmpTPrb		

Table 34: BACnet Binary Alarm Inputs, Continued

Alarm Message	Object Type/ Instance	BACnet Object Name	Clear	Description
Variable Speed Compressor Problem Circuit 1 (110)	BI:108	C1VarCompPrb	Manual	Indicates the status of the Variable Speed Compressor Problem alarm on circuit 1, 2, or 3. Applies to units with VFD compressors.[1]
Variable Speed Compressor Problem Circuit 2 (111)	BI:208	C2VarCompPrb		
Variable Speed Compressor Problem Circuit 3 (112)	BI:308	C3VarCompPrb		
Low Discharge Superheat Problem Circuit 1 (155)	BI:109	C1LoDischSHPrb	Manual	Indicates if the circuit 1, 2, or 3 Discharge Superheat Problem alarm is active because of a low superheat reading. Applies to units with VFD compressors.[1]
Low Discharge Superheat Problem Circuit 2 (156)	BI:209	C2LoDischSHPrb		
Low Discharge Superheat Problem Circuit 3 (157)	BI:309	C3LoDischSHPrb		
High Discharge Superheat Problem Circuit 1 (185)	BI:110	C1HiDischSHPrb	Manual	Indicates the status of the circuit 1, 2, or 3 Discharge Superheat Problem alarm. Applies to units with VFD compressors.[1]
High Discharge Superheat Problem Circuit 2 (186)	BI:210	C2HiDischSHPrb		
High Discharge Superheat Problem Circuit 3 (187)	BI:310	C3HiDischSHPrb		
High Discharge Line Temperature Problem Circuit 1 (120)	BI:111	C1HiDLTmpPrb	Manual	Indicates if the High Discharge Line Temperature Problem alarm on circuit 1, 2 or 3 has exceeded the high temperature limit. Applies to units with VFD compressors.[1]
High Discharge Line Temperature Problem Circuit 2 (121)	BI:211	C2HiDLTmpPrb		
High Discharge Line Temperature Problem Circuit 3 (122)	BI:311	C3HiDLTmpPrb		
Expansion Valve Problem Circuit 1 (125)	BI:112	C1EVPrb	Manual	Indicates the status of the circuit 1, 2 or 3 Expansion Valve Problem alarm.[1]
Expansion Valve Problem Circuit 2 (126)	BI:212	C2EVPrb		
Expansion Valve Problem Circuit 3 (127)	BI:312	C3EVPrb		
Modulating Hot Gas Reheat Valve 1 Problem (101)	BI:113	MHGRhtVlv1Prb	Manual	Indicates that the modulating hot gas reheat valve motor and driver are not synchronizing as expected.[1]
Modulating Hot Gas Reheat Valve 2 Problem (102)	BI:213	MHGRhtVlv2Prb		
Four-Way Valve Problem Circuit 1 (107)	BI:114	C14WVPrb	Manual	Indicates the status of the 4WV1, 4WV2 or 4WV3 Problem alarm. Applies to R-32 variable compressor units with heat pump configurations.[1]
Four-Way Valve Problem Circuit 2 (108)	BI:214	C24WVPrb		
Four-Way Valve Problem Circuit 3 (95)	BI:314	C34WVPrb		

[1] Normal (Inactive) = 0, In Alarm (Active) = 1
[2] Open or short-circuited = 0, Closed = 1

BACnet Event Tables

Events

The purpose of Events is to prevent alarms and ensure continuous equipment operation.

Standby Events

Standby Events occur when certain conditions restrict unit operation in order to prevent equipment damage. See Table 35 (Events) and Table 36 (Standby Events).

Table 35: BACnet Binary Inputs - Events

Event Name	Object Type/ Instance	BACnet Object Name	Clear	Description
Fan Retry Event	BI:40	FanRetryEvnt	Automatic	Supply Fan Retry Event control is active.
Tenant Override Event	BI:41	TenantOREvnt	Automatic	Tenant Override Event operation control is active.
Passive Ventilation Active Event	BI:42	PassVentEvnt	Automatic	Passive Ventilation Active Event sequence control is active.
Reheat Limiting Control	BI:43	ReheatLmtgEvnt	Automatic	Reheat Compressor Limiting Event control is active.
Heat Rise Limiting Event	BI:44	HtRiseLmtgEvnt	Automatic	The Discharge air Heat Rise Limiting Event occurs when the DAT – Effective/LCT has exceeded the Max Heat Rise value.
Backup Reheat Active Event	BI:45	BkUpRhtActEvnt	Automatic	The Backup Reheat Event control is active.
Heat Pump Emergency Heat Event	BI:46	HPEmrgHtEvnt	Automatic	The Heat Pump Emergency Heat control is active.
Fin Temperature Unload Event Circuit 1	BI:141	C1FinTULEvnt	Automatic	Circuit 1, 2, or 3 High Fin Temperature Unloading Event control is active. Applies to units with inverter compressors.
Fin Temperature Unload Event Circuit 2	BI:241	C2FinTULEvnt		
Fin Temperature Unload Event Circuit 3	BI:341	C3FinTULEvnt		
High Compression Ratio Unloading Event Circuit 1	BI:142	C1HCRULEvnt	Automatic	Circuit 1, 2, or 3 High Compression Ratio Unloading Event control is active.
High Compression Ratio Unloading Event Circuit 2	BI:242	C2HCRULEvnt		
High Compression Ratio Unloading Event Circuit 3	BI:342	C3HCRULEvnt		
High Discharge Line Temperature Unload Event Circuit 1	BI:144	VCmp1HDLTULEvnt	Automatic	A circuit 1 Variable or Fixed Compressor High Discharge Line Temperature Unloading Event is active.
	BI:144	C1HDLT1ULEvnt		
	BI:174	C1HDLT3ULEvnt		
	BI:175	C1HDLT5ULEvnt		
High Current Unload Event Circuit 1	BI:145	C1HiAmpULEvnt	Automatic	Circuit 1, 2, or 3 High Amp Unloading Event control is active.
High Current Unload Event Circuit 2	BI:245	C2HiAmpULEvnt		
High Current Unload Event Circuit 3	BI:345	C3HiAmpULEvnt		
High Pressure Unload Event Circuit 1	BI:149	C1HPULEvnt	Automatic	Circuit 1, 2, or 3 High Pressure Unloading Event control is active.
High Pressure Unload Event Circuit 2	BI:249	C2HPULEvnt		
High Pressure Unload Event Circuit 3	BI:349	C3HPULEvnt		
Low Differential Pressure Unload Event Circuit 1	BI:151	C1LDPULEvnt	Automatic	Circuit 1, 2, or 3 Low Differential Pressure Unloading Event control is active.
Low Differential Pressure Unload Event Circuit 2	BI:251	C2LDPULEvnt		
Low Differential Pressure Unload Event Circuit 3	BI:351	C3LDPULEvnt		
Low Discharge Superheat Disable Event Circuit 1	BI:152	C1LoDSHDsbEvnt	Automatic	The Low Discharge Superheat Disable Event indicates the discharge superheat temperature is below the DSH setpoint for more than 100 minutes. Low superheat protection is enabled on units with variable compressors. Also see VCmp1LoDSH Problem Alarm (155). Applies to units configured for optional refrigerant monitoring system.
Low Discharge Superheat Disable Event Circuit 2	BI:252	C2LoDSHDsbEvnt		
Low Discharge Superheat Disable Event Circuit 3	BI:352	C3LoDSHDsbEvnt		
Low Pressure Unload Event Circuit 1	BI:155	C1LPULEvnt	Automatic	Circuit 1, 2, or 3 Low Differential Pressure Unloading Event control is active.
Low Pressure Unload Event Circuit 2	BI:255	C2LPULEvnt		
Low Pressure Unload Event Circuit 3	BI:355	C3LPULEvnt		
Unload Request Event Circuit 1	BI:157	C1ReqULEvnt	Automatic	Circuit 1, 2, or 3 Unload Request Control control is active.
Unload Request Event Circuit 2	BI:257	C2ReqULEvnt		
Unload Request Event Circuit 3	BI:357	C3ReqULEvnt		
High Ambient Limiting Control Circuit 1	BI:160	C1HiAmbLmtgEvnt	Automatic	Fixed Compressor Circuit 1, 2, or 3 High Ambient Limiting control is active.
High Ambient Limiting Control Circuit 2	BI:260	C2HiAmbLmtgEvnt		
High Ambient Limiting Control Circuit 3	BI:360	C3HiAmbLmtgEvnt		

Table 35: BACnet Binary Inputs - Events, Continued

Event Name	Object Type/ Instance	BACnet Object Name	Clear	Description
Low Suction Superheat Event Circuit 1	BI:161	C1LoSSH_Evnt	Automatic	Circuit 1, 2, or 3 Low Suction Superheat Event is active when the SSH1 < 5°F for at least 60 minutes. Applies to units configured for optional refrigerant monitoring system.
Low Suction Superheat Event Circuit 2	BI:261	C2LoSSH_Evnt		
Low Suction Superheat Event Circuit 3	BI:361	C3LoSSH_Evnt		
High Suction Superheat Event Circuit 1	BI:162	C1HiSSH_Evnt	Automatic	Circuit 1, 2, or 3 High Suction Superheat Event is active when SSH1 > 30°F for at lest 60 minutes. Applies to units configured for optional refrigerant monitoring system.
High Suction Superheat Event Circuit 2	BI:262	C2HiSSH_Evnt		
High Suction Superheat Event Circuit 3	BI:362	C3HiSSH_Evnt		
Low Discharge Superheat Event Circuit 1	BI:163	C1LoDSH_Evnt	Automatic	The Low Discharge Superheat Event is active when DSH1, DSH2 or DSH3 < 20°F for at least 60 minutes. Applies to units configured for optional refrigerant monitoring system.
Low Discharge Superheat Event Circuit 2	BI:263	C2LoDSH_Evnt		
Low Discharge Superheat Event Circuit 3	BI:363	C3LoDSH_Evnt		
High Discharge Superheat Event Circuit 1	BI:164	C1HiDSH_Evnt	Automatic	The High Discharge Superheat Event is active when DSH1, DSH2 or DSH3 < 20°F for at least 60 minutes. Applies to units configured for optional refrigerant monitoring system.
High Discharge Superheat Event Circuit 2	BI:264	C2HiDSH_Evnt		
High Discharge Superheat Event Circuit 3	BI:364	C3HiDSH_Evnt		
Low Subcooling Event Circuit 1	BI:165	C1LoSubCl_Evnt	Automatic	The Low Subcooling Event is active when all of the following are true for at least 60 minutes: • Subcooling1 < 1°F • All compressors in the circuit are running • OA Problem alarm inactive • Effective OAT > 75°F • Unit State = Cooling • The Dehumidification Status is Inactive Applies to units configured for optional refrigerant monitoring system.
Low Subcooling Event Circuit 2	BI:265	C2LoSubCl_Evnt		
Low Subcooling Event Circuit 3	BI:365	C3LoSubCl_Evnt		
High Subcooling Event Circuit 1	BI:166	C1HiSubCl_Evnt	Automatic	The High Subcooling Event is active when all of the following are true for at least 60 minutes: • Subcooling1 > 25°F • All compressors in the circuit are running • The OA Problem alarm is inactive • Effective OAT > 75°F • Unit State = Cooling • The Dehumidification Status is Inactive Applies to units configured for optional refrigerant monitoring system.
High Subcooling Event Circuit 2	BI:266	C2HiSubCl_Evnt		
High Subcooling Event Circuit 3	BI:366	C3HiSubCl_Evnt		
Low Tc Event Circuit 1	BI:167	C1LoT_Evnt	Automatic	LoTc inputs are determined from the circuit's average discharge pressure (PTD) analog input. An event is triggered when the corresponding circuit Tc value is below the acceptable range. Applies to units configured for optional refrigerant monitoring system.
Low Tc Event Circuit 2	BI:267	C2LoT_Evnt		
Low Tc Event Circuit 3	BI:367	C3LoT_Evnt		
High Tc Event Circuit 1	BI:168	C1HiT_Evnt	Automatic	HiTc inputs are determined from the circuit's average discharge pressure (PTD) analog input. An event is triggered when the corresponding circuit Tc value is above the acceptable range. Applies to units configured for optional refrigerant monitoring system.
High Tc Event Circuit 2	BI:268	C2HiT_Evnt		
High Tc Event Circuit 3	BI:368	C3HiT_Evnt		
Low Te Event Circuit 1	BI:169	C1LoTeg_Evnt	Automatic	LoTe inputs are determined from the circuit's average suction pressure analog input. An event is triggered when the corresponding circuit Tc value is below the acceptable range. Applies to units configured for optional refrigerant monitoring system.
Low Te Event Circuit 2	BI:269	C2LoTeg_Evnt		
Low Te Event Circuit 3	BI:369	C3LoTeg_Evnt		
High Te Event Circuit 1	BI:170	C1HiTe_Evnt	Automatic	HiTe inputs are determined from the circuit's average suction pressure analog input. An event is triggered when the corresponding circuit Te value is above the acceptable range.
High Te Event Circuit 2	BI:270	C2HiTe_Evnt		
High Te Event Circuit 3	BI:370	C3HiTe_Evnt		
High Discharge Refrigerant Temperature Event Circuit 1	BI:171	C1HiDRT_Evnt	Automatic	The Discharge Refrigerant Temperature Event is active when the corresponding circuit DRT sensor input is > 275°F for at least 30 minutes. Applies to units configured for optional refrigerant monitoring system.
High Discharge Refrigerant Temperature Event Circuit 2	BI:271	C2HiDRT_Evnt		
High Discharge Refrigerant Temperature Event Circuit 3	BI:371	C3HiDRT_Evnt		
High Suction Return Temperature Event Circuit 1	BI:172	C1HiSR_Evnt	Automatic	The High Suction Return Temperature Event is active when the corresponding circuit SRT sensor input is > 95°F for at least 45 minutes. Applies to units configured for optional refrigerant monitoring system.
High Suction Return Temperature Event Circuit 2	BI:272	C2HiSR_Evnt		
High Suction Return Temperature Event Circuit 3	BI:372	C3HiSR_Evnt		

Table 35: BACnet Binary Inputs - Events, Continued

Event Name	Object Type/ Instance	BACnet Object Name	Clear	Description
Low Oil Prevention Event Circuit 1	BI:173	C1LowOilPrvntEvnt	Automatic	The Low Oil Prevention Event is active when compressors are operating under extreme conditions and low oil protection is required. Applies to variable compressor units.
Low Oil Prevention Event Circuit 2	BI:273	C2LowOilPrvntEvnt		
Low Oil Prevention Event Circuit 3	BI:373	C3LowOilPrvntEvnt		
High Discharge Line Temperature Unload Event Circuit 2	BI:244	VCmp2HDLTULEvnt	Automatic	A circuit 2 Variable or Fixed Compressor High Discharge Line Temperature Unloading Event is active.
	BI:244	C2HDLT2ULEvnt		
	BI:274	C2HDLT4ULEvnt		
	BI:275	C2HDLT6ULEvnt		
High Discharge Line Temperature Unload Event Circuit 3	BI:344	VCmp3HDLTULEvnt	Automatic	A circuit 3 Variable or Fixed Compressor High Discharge Line Temperature Unloading Event is active.
	BI:344	C3HDLT1ULEvnt		
	BI:374	C3HDLT3ULEvnt		
	BI:375	C3HDLT5ULEvnt		
Oil Return Event Circuit 1	BI:176	C1OilRetActvEvnt	Automatic	Compressor circuit oil return mode is active. Indicates that oil is returned from the field piping system to the compressors.
Oil Return Event Circuit 2	BI:276	C2OilRetActvEvnt		
Oil Return Event Circuit 3	BI:376	C3OilRetActvEvnt		
High Suction Superheat Reheat Override Event Circuit 1	BI:177	C1HiSSHRHOvrd Evnt	Automatic	Circuit 1 or 2 High Suction Superheat Reheat Override Event is active.
High Suction Superheat Reheat Override Event Circuit 2	BI:277	C2HiSSHRHOvrd Evnt		

Table 36: BACnet Binary Inputs - Standby Events

Event Message (Present_Value)	Object Type/ Instance	BACnet Object Name	Clear	Description[1]
Expansion Valve Synchronization Standby Event Circuit 1	BI:140	C1EVISyncSBEvnt	Automatic	The circuit compressor state is forced into Standby because of expansion valve re-synchronization.
Expansion Valve Synchronization Standby Event Circuit 2	BI:240	C2EVISyncSBEvnt		
Expansion Valve Synchronization Standby Event Circuit 3	BI:340	C3EVSyncSBEvnt		
High Discharge Line Temperature Sensor Standby Event Circuit 1	BI:143	C1HDLTSBEvnt	Automatic	The circuit compressor state is forced into Standby because of high discharge line temperature unloading.
High Discharge Line Temperature Sensor Standby Event Circuit 2	BI:243	C2HDLTSBEvnt		
High Discharge Line Temperature Sensor Standby Event Circuit 3	BI:343	C3HDLTSBEvnt		
High Discharge Superheat Standby Event Circuit 1	BI:146	C1HiDSHSBEvnt	Automatic	The circuit compressor state is forced into Standby because of high discharge superheat protection.
High Discharge Superheat Standby Event Circuit 2	BI:246	C2HiDSHSBEvnt		
High Discharge Superheat Standby Event Circuit 3	BI:346	C3HiDSHSBEvnt		
Compressor Body High Temperature Standby Event Circuit 1	BI:147	C1HiTSBEvnt	Automatic	The circuit compressor state is forced into Standby because of compressor body high temperature protection.
Compressor Body High Temperature Standby Event Circuit 2	BI:247	C2HiTSBEvnt		
Compressor Body High Temperature Standby Event Circuit 3	BI:347	C3HiTSBEvnt		
High Pressure Standby Event Circuit 1	BI:148	C1HPSBEvnt	Automatic	The circuit compressor state is forced into Standby because of high pressure unloading control.
High Pressure Standby Event Circuit 2	BI:248	C2HPSBEvnt		
High Pressure Standby Event Circuit 3	BI:348	C3HPSBEvnt		

Table 36: BACnet Binary Inputs - Standby Events, Continued

Event Message (Present_Value)	Object Type/ Instance	BACnet Object Name	Clear	Description[1]
Low Pressure Differential Pressure Standby Event Circuit 1	BI:150	C1LDPSBEvnt	Automatic	The circuit compressor state is forced into Standby because of low differential pressure protection unloading control.
Low Pressure Differential Pressure Standby Event Circuit 2	BI:250	C2LDPSBEvnt		
Low Pressure Differential Pressure Standby Event Circuit 3	BI:350	C3LDPSBEvnt	Automatic	The circuit compressor state is forced into Standby because of low differential pressure protection unloading control.
Low Pressure Standby Event Circuit 1	BI:154	C1LPSBEvnt	Automatic	The circuit compressor state is forced into Standby because of low pressure unloading control.
Low Pressure Standby Event Circuit 2	BI:254	C2LPSBEvnt		
Low Pressure Standby Event Circuit 3	BI:354	C3LPSBEvnt		
Outdoor Air Fan Standby Event Circuit 1	BI:156	C1OAFSBEvnt	Automatic	The circuit compressor state is forced into Standby because of a fault detected by the outdoor air fan VFD.
Outdoor Air Fan Standby Event Circuit 2	BI:256	C2OAFSBEvnt		
Outdoor Air Fan Standby Event Circuit 3	BI:356	C3OAFSBEvnt		
Variable Compressor Problem Standby Event Circuit 1	BI:158	C1VCmpPrbSBEvnt	Automatic	The circuit compressor state is forced into Standby because of a fault detected by the variable compressor.
Variable Compressor Problem Standby Event Circuit 2	BI:258	C2VCmpPrbSBEvnt		
Variable Compressor Problem Standby Event Circuit 3	BI:358	C3VCmpPrbSBEvnt		
Variable Compressor Request Standby Event Circuit 1	BI:159	C1VCmpReqSBEvnt	Automatic	The circuit compressor state is forced into Standby because of a request from the variable compressor.
Variable Compressor Request Standby Event Circuit 2	BI:259	C2VCmpReqSBEvnt		
Variable Compressor Request Standby Event Circuit 3	BI:359	C3VCmpReqSBEvnt		
Outdoor Air Fan Request for Standby Event Circuit 1	BI:178	C1OAFReqSB_Evnt	Automatic	The circuit state is forced to standby due to a fan control board request.
Outdoor Air Fan Request for Standby Event Circuit 2	BI:278	C2OAFReqSB_Evnt		
Outdoor Air Fan Request for Standby Event Circuit 3	BI:378	C3OAFReqSB_Evnt		

[1] Standby events apply to variable compressors and are supported by intrinsic reporting (NC-4) of the BACnet Event Notification requirements.

BACnet PICs

MicroTech Packaged Rooftop Unit Controller

This section contains the Protocol Implementation Conformance Statement (PICS) for the MicroTech unit controller as required by ANSI/ASHRAE Standard 135-2014, BACnet: A Data Communication Protocol for Building Automation and Control Networks.

Date	August 2025
Vendor Name	Daikin Applied
Product Name	MT4 Rebel Applied
Product Model Number	MT4 AHU
Application Software Version	2506036302
Firmware Revision	11.58
BACnet Protocol Version	1
BACnet Protocol Revision	14

Product Description

The MicroTech unit controller with BACnet (IP or MS/TP) comunication module is designed to operate the Rebel Applied Packaged Rooftop unit and integrate it into a BACnet building automation system.

The unit controller provides normal temperature, static pressure and ventilation control and alarm monitoring with alarm-specific component shutdown in critical system conditions. Access to temperatures, pressures, operating states, alarm messages, control parameters and schedules is available through the unit controller menu display (HMI) and the BACnet control network.

BACnet Standardized Device Profile (Annex L)

☐	BACnet Advanced Workstation	(B-AWS)
☐	BACnet Operator Workstation	(B-OWS)
☐	BACnet Operator Display	(B-OD)
☒	BACnet Building Controller	(B-BC)
☐	BACnet Advanced Application Controller	(B-AAC)
☐	BACnet Application Specific Controller	(B-ASC)
☐	BACnet Smart Sensor	(B-SS)
☐	BACnet Smart Actuator	(B-SA)

BACnet Interoperability Building Blocks Supported

Data Sharing

☒	Data Sharing – Read Property-A	DS-RP-A
☒	Data Sharing – Read Property-B	DS-RP-B
☒	Data Sharing – Read Property Multiple-A	DS-RPM-A
☒	Data Sharing – Read Property Multiple-B	DS-RPM-B
☒	Data Sharing – Write Property-A	DS-WP-A
☒	Data Sharing – Write Property-B	DS-WP-B
☒	Data Sharing – Write Property Multiple-B	DS-WPM-B
☒	Data Sharing – Change of Value -A	DS-COV-A
☒	Data Sharing – Change of Value -B	DS-COV-B

Alarm and Event Management

☒	Alarm and Event – Notification Internal-B	AE-N-I-B
☒	Alarm and Event – ACK-B	AE-ACK-B
☒	Alarm and Event – Alarm Summary-B	AE-ASUM-B
☒	Alarm and Event – Enrollment Summary-B	AE-ESUM-B
☒	Alarm and Event – Information-B	AE-INFO-B

Device management

☒	Device Management – Dynamic Device Binding-A	DM-DDB-A
☒	Device Management – Dynamic Device Binding-B	DM-DDB-B
☒	Device Management – Dynamic Object Binding-B	DM-DOB-B
☒	Device Management – Device Communication Control-B	DM-DCC-B
☒	Device Management – Time Synchronization-B	DM-TS-B
☒	Device Management – UTC Time Synchronization-B	DM-UTC-B
☒	Device Management – Reinitialize Device-B	DM-RD-B
☒	Device Management – Backup and Restore-B	DM-BR-B
☒	Device Management – Object Creation and Deletion-B	DM-OCD-B

Scheduling

Scheduling – Internal-B	SCHED-I-B
Scheduling – External-B	SCHED-E-B

Trending

Trending – Viewing and Modifying Internal-B	T-VMT-I-B
Trending – Automated Trend Retrieval-B	T-ATR-B

Segmentation Capability

☒	Able to transmit segmented messages	Window size	4 for IP and 1 for MS/TP
☒	Able to receive segmented messages	Window size	4 for IP and 1 for MS/TP

Data Link Layer Options

☒	BACnet IP, (Annex J)	-
☒	BACnet IP, (Annex J), Foreign Device	-
☐	ISO 8802-3, Ethernet (Clause 7)	-
☐	ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)	-
☐	ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s)	-
☒	MS/TP master (Clause 9), baud rate(s)	9600 19200 38400 57600 76800 115200
☐	MS/TP slave (Clause 9), baud rate(s)	9600 19200 38400 57600 76800 115200
☐	Point-To-Point, EIA 232 (Clause 10), baud rate(s)	38400
☐	Point-To-Point, modem, (Clause 10), baud rate(s)	38400
☐	LonTalk, (Clause 11), medium	TP/FT-10
☐	Other	-

Device Address Binding

Is static device binding supported?	☐ Yes	☒ No

Networking Options

□	Router, Clause 6 (remote management functionality/BACnet PTP)		
□	Annex H, BACnet Tunneling Router over IP		
□	BACnet/IP Broadcast Management Device (BBMD) Number of BDT entries: 10 Number of FDT entries: 10		
-	Does the BBMD support registrations by foreign devices?	oo Yes	□ No

Character Sets Supported

NOTE: Support for multiple character sets does not imply they can be supported simultaneously.

☒ UTF-8	☐ IBM / Microsoft DBCS	☒ ISO 8859-1
☒ ISO 10646 (UCS-2)	☐ ISO 10646 (UCS-4)	☐ JIS C 6226

Standard Object Types Supported

Analog Inputs

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	R[1]	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-
Units	R	-
Min_Pres_Value	R	-
Max_Pres_Value	R	-
COV_Increment	W[2]	-
Time_Delay	R	-
Notification_Class	R	-
High_Limit	R	-
Low_Limit	R	-
Deadband	R	-
Limit_Enable	W[3]	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

[1] Present_Value is not commandable or writeable.
[2] Changes to this property do not take effect until the power is cycled on the unit controller.
[3] This property is writeable via BACnet. However, it reverts to the unit controller value if the object is setup for Intrinsic Reporting. This is a safety feature so the network cannot disable alarms from occurring.

Analog Outputs

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	W	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-
Units	R	-
Min_Pres_Value	R	-
Max_Pres_Value	R	-
Priority_Array	R	-
Relinquish_Default	W	-
COV_Increment	W[1]	-
Time_Delay	R	-
Notification_Class	R	-
High_Limit	R	-
Low_Limit	R	-

Analog Outputs, Continued

Properties	Readable / Writable	Range restrictions
Deadband	R	-
Limit_Enable	W	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

[1] Changes to this property do not take effect until the power is cycled on the unit controller.

Analog Values

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	W[1,3]	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-
Units	R	-
Priority_Array	R	-
Relinquish_Default	W	-
COV_Increment	W[2]	-
Time_Delay	R	-
Notification_Class	R	-
High_Limit	R	-
Low_Limit	R	-
Deadband	R	-
Limit_Enable	W	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

[1] Present_Value is not commandable or writeable.
[2] Changes to this property do not take effect until the power is cycled on the unit controller.
[3] Priority 1 is reserved for the commandable objects application. BACnet writes at priority 1 will fail.

Binary Inputs

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	R[1]	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-

Binary Inputs, Continued

Properties	Readable / Writable	Range restrictions
Polarity	R	-
Inactive_Text	R	-
Active_Text	R	-
Elapsed_Active_Time	W	Only 0
Time_Of_Active_Time_Reset	R	-
Time_Delay	R	-
Notification_Class	R	-
Alarm_Value	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

Binary Outputs

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	W	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R[1]	-
Out_Of_Service	W	-
Polarity	W	-
Inactive_Text	R	-
Active_Text	R	-
Elapsed_Active_Time	W	Only 0
Time_Of_Active_Time_Reset	R	-
Priority_Array	R	-
Relinquish_Default	W	-
Time_Delay	R	-
Notification_Class	R	-
Feedback_Value	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

Binary Values

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	W[1,2]	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-
Inactive_Text	R	-
Active_Text	R	-
Elapsed_Active_Time	W	Only 0
Time_Of_Active_Time_Reset	R	-
Priority_Array	R	-
Relinquish_Default	W	-
Notification_Class	R	-
Alarm_Value	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

[1] Present_Value is not commandable or writeable.
[2] Priority 5 is reserved for the commandable objects application. BACnet writes at priority 5 will fail.

Multistate Inputs

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	R	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-
Number_Of_States	R	-
State_Text	R	-
Time_Delay	R	-
Notification_Class	R	-
Alarm_Values	R	-
Fault_Values	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

Multistate Outputs

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	W	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-
Number_Of_States	R	-
State_Text	R	-
Priority_Array	R	-
Relinquish_Default	W	-
Time_Delay	R	-
Notification_Class	R	-
Feedback_Value	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-

Multistate Values

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Present_Value	W[1]	-
Description	R	-
Status_Flags	R	-
Event_State	R	-
Reliability	R	-
Out_Of_Service	R	-
Number_Of_States	R	-
State_Text	R	-
Priority_Array	R	-
Relinquish_Default	W	-
Time_Delay	R	-
Notification_Class	R	-
Alarm_Values	R	-
Fault_Values	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-
Event_State	R	-
Out_Of_Service	R	-
Number_Of_States	R	-
State_Text	R	-
Property_List	R	-

[1] Present_Value is not commandable or writeable.

Device

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
System_Status	R	-
Vendor_Name	R	-
Vendor_Identifier	R	-
Model_Name	R	-
Firmware_Revision	R	-
Application_Software_Version	R	-
Location	W	-
Description	W	-
Protocol_Version	R	1
Protocol_Revision	R	14
Protocol_Services_Supported	R	-
Protocol_Object_Types_ Supported	R	-
Object_List	R	-
Max_APDU_Length_Accepted	W	50..1476, 50..480
Segmentation_Supported	W	-
Max_Segments_Accepted	W	2..16
Local_Time	R	-
Local_Date	R	-
UTC_Offset	W	-
Daylight_Savings_Status	R	-
APDU_Segment_Timeout	W	500..65535
APDU_Timeout	W	1000..65535
Number_Of_APDU_Retries	W	-
Max_Master (MS/TP only)	W	1-127
Max_Info_Frames (MS/TP only)	W	1-32
Device_Address_Binding	R	-
Database_Revision	R	-
Configuration_Files	R	-
Last_Restore_Time	R	-
Backup_Failure_Timeout	W	-
Active_COV_Subscriptions	R	-
Last_Restart_Reason	R	-
Time_Of_Device_Restart	R	-
Restart_Notification_Recipients	W	-
Property_List	R	-

Event Enrollment

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	W	-
Object_Type	R	-
Event_Type	R	-
Notify_Type	W	-
Event_Parameters	W	Change-Of-State, Change-Of-Value, Out-Of-Range only
Object_Property_Reference	W	-
Event_State	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notification_Class	W	-
Event_Time_Stamps	R	-
Property_List	R	-
Event_Detection_Enable	R	-
Status_Flags	R	-
Reliability	R	-

File

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Description	R	-
File_Type	R	-
File_Size	R	-
Modification_Date	R	-
Archive	W	-
Read_Only	R	-
File_Access_Method	R	-
Property_List	R	-

Notification Class

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Description	R	-
Notification_Class	R	-
Priority	W	-
Ack_Required	W	-
Recipient_List	W	Max. 20
Property_List	R	-

Trend Log

Properties	Readable / Writable	Range restrictions
Object_Identifier	R	-
Object_Name	R	-
Object_Type	R	-
Description	R	-
Enable	W	-
Start_Time	W	-
Stop_Time	W	-
Log_DeviceObjectProperty	W	-
Log_Interval	W	-
Client_COV_Increment	W	-
Stop_When_Full	W	-
Buffer_Size	R	-
Log_Buffer	R	-
Record_Count	W	-
Total_Record_Count	R	-
Notification_Threshold	W	-
Records_Since_Notification	R	-
Last_Notify_Record	R	-
Event_State	R	-
Notification_Class	R	-
Event_Enable	W	-
Acked_Transitions	R	-
Notify_Type	R	-
Event_Time_Stamps	R	-
Logging_Type	W	-
Status_Flags	R	-
Property_List	R	-
Event_Detection_Enable	R	-

Revision History

Revision	Date	Changes
ED 19117	Jan 2020	Initial release
ED 19117-1	Apr 2022	Added 8 new configurable I/O points to Table 17. Revised alarm enumerations for Warning, Problem and Fault alarm class ranges. Removed references to Filter Pressure 1-3 (AI:21-23) in Table 32. Added OffSnrCfg to Unit Status and CfgErr to Cooling Status. Fixed supply fan enumerations (MSV:11). Major revsions to Alarm Management section, clarified notification class and other descriptions (p.38), added BACnet objects /events to support R32 and refrigerant mgmt package. Added BACnet and LONWORKS points to support ECM fans and variable speed compressor units.
ED 19117-2	Jun 2022	Fixed range order and enumeration for MSV:11, which did not match what the controller sends. Also changed related points AV:7, AV:8, and AV:24 descriptions to match.
ED 19117-3	Nov 2022	Add UV Light Hours, BACnet AV:122. Also added new enumerations for MonitorPkgs, BACnet MSV:114 (RefSys,Pwr, Ref&Pwr, IAQ...) and MSV:108 mods, also updated controller app version in PICS. Updated Table 21 BACnet Unit Configuration options to match options supported in app version referenced in PICS.
ED 19117-4	Apr 2024	Corrected BACnet OA Max Damper Position description (AV:55) and changed to read-only. Removed energy monitoring BACnet Table 17 and alarms 1-3. Formatting updates.
ED 19117-5	Aug 2024	Added MT4 Rebel DPS with R32. Added A2L board configuration parameters MSV:120 and AV:155. Also added BI:19, BI:20 and alarm objects 133 and 134 for A2L. Added OffEvac option to DaikinStatus, MSV:1. Modified SAFType, MSV:104 for supply fan with VFD Modbus option, MSV:110 (SAFlowInput) has been updated to remove unsupported options and MSV:111 (RFEFFlowInput) added option 4.
ED 19117-6	Sept 2025	Added Supply Air Fan OA Flow Setpoint, AV:58. Added HPHtgStatus (MSV:4), C1-C3 HDTULA Events (BI:144, BI:244, and BI:344), and changed their Device Object names. Added BI:44 HIRiseLimiting Event and also Events BI:340-BI:376. Added a second BACnet object, BI:244 for fixed compressor C2HDLT2ULEvnt (Table 35). Added BI:213 - MHGRhtVlv2Prb, RAFDSPSpt - AV:59, and EFFPSPSpt - AV:60. Updated cover page with "DSPA with R-410A or R-32 Refrigerant and DPS with R-32 Refrigerant." Added circuit 3 BACnet objects to Tables 5, 9, 13 and 15. Updated MSV:110 and added RFEFFlowInput, MSV:11.

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