DAIKIN

Network Integration Guide

ED 19118

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MicroTech® DOAS WSHP
Unit Controller Protocol Information

BACnet® MS/TP Networks
LonWorks® Networks

Model: SmartSource® DOAS Water Source Heat Pump

Member of BACnet International

LonMark® 3.4

Revision History

ED 19118 June 2021 Initial release.

Notice

Daikin Applied reserves the right to change any information contained herein without prior notice. The user is responsible for determining whether this product is appropriate for the application.

Hazardous Information Messages

⚠ CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

⚠ WARNING

Improper grounding may result in injury, death, and property damage if not avoided.

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

⚠ DANGER

Dangers indicate a hazardous electrical situation which will result in death or serious injury if not avoided.

Reference Documents

Number	Company	Title	Source
OM 732	Daikin Applied	ATS ServiceTools Software Operation Manual	www.DaikinApplied.com
OM 1308		MicroTech Controls for Daikin SmartSource DOAS Water Source Heat Pump	
ANSI/ASHRAE 135-2008	BACnet International	BACnet A Data Communication Protocol for Building Automation and Control Networks	www.ashrae.org
078-0014-01G	LonMark® Interoperability Association	LonMark® Layers 1-6 Interoperability Guidelines, Version 3.4	www.lonmark.org
078-0120-01G		LonMark Application Layer Interoperability Guidelines, Version 3.4	
8610		SFPT Discharge Air Controller	

Software Revision

This edition documents all versions of the standard MicroTech DOAS WSHP controller software and all subsequent revisions until otherwise indicated. You can determine the revision of the application software from the local user interface (LUI) keypad display or ServiceTools software interface. The software version can also be read from the Application_Software_ Version property of the Device Object.

Limited Warranty

Consult your local Daikin Applied representative for warranty details. To find your local Daikin Applied representative, go to www.DaikinApplied.com.

Integration Guide Overview

This document provides the information you need to integrate a Daikin Applied SmartSource® DOAS WSHP with MicroTech® unit controller into a building automation system (BAS). It describes all BACnet® and LonWorks® parameters available to the network.

The controller application includes on-board BACnet capability so no additional hardware or software is required for BACnet integration. However, a separate LonWorks communication module must be attached to the unit controller so that it can be configured for network integration. It is assumed that the user is familiar with the basic principals of network integration. The main areas of this guide cover:

- BACnet Networks: Describes how the MicroTech controller implements the BACnet standard network profile and required minimum addressing parameters (Table 2)
- BACnet Data Tables: Data tables with descriptions of BACnet network-supported objects
- LonWorks Networks: Describes how the MicroTech controller implements the LonMark standard profile and commissioning process
- LonWorks Data Tables: Data tables with descriptions of LonWorks network variables and configuration properties
- Additional Configuration Methods: Describes local user interface (LUI) keypad display and ServiceTools software used in conjunction with the BAS to set and display certain network parameters
- Selected I/O Parameters: Describes the characteristics and BAS interaction with a particular set of dedicated and configurable I/O parameters
- Alarms: Alarm descriptions and alarm handling specific to each protocol
- Effective Occupancy Modes: Describes the interaction among the various inputs that ultimately determine the effective occupancy mode of the unit
- Temperature Setpoints: Describes the temperature setpoint mode calculations, defaults, and diagram of operation
- Appendix A: Protocol Implementation Conformance Statement (PICS)

Unit Controller Data Points

Some data points are read-only while others can be configured from the network. Network points may also be read-only or configurable from the local user interface (LUI keypad display) and/or ATS ServiceTools software. Each interface has different levels of access depending on user credentials. See Additional Configuration Methods for more information about using the LUI and ServiceTools software. The parameters that are configurable from the LUI keypad display or ATS ServiceTools are noted where applicable in the point tables.

Also see the MicroTech Controls for Daikin SmartSource DOAS Water Source Heat Pump, OM 1308 for details (www.DaikinApplied.com).

Contact the Daikin Applied Controls Customer Support group at 866-462-7829 or Controls@daikinapplied.com for additional assistance, if necessary.

BACnet Network Configuration

BACnet Protocol

BACnet is a standard communication protocol for Building Automation and Control Networks developed by the American National Standards Institute (ANSI) and American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) specified in ANSI/ASHRAE standard 135-2008 (www.ashrae.org). It addresses all aspects of the various systems that are applied to building control systems. BACnet provides the communication infrastructure needed to integrate products manufactured by different vendors and to integrate building services that are now independent.

BACnet Network Compatibility

The MicroTech DOAS WSHP 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 are found in Appendix A: Protocol Implementation Conformance Statement (PICS).

BACnet Objects

The MicroTech DOAS WSHP controller supports 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 type and instance index. Some properties can be adjusted (read/write properties, e.g., setpoints) from the network and others can only be interrogated (read-only properties, e.g., status information).

Each data point accessible from a BACnet network is described with a detailed table that gives the Object Name, Instance Number, min/max values, and other relevant descriptive information.

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

⚠ CAUTION

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

Device Object Properties

The Device Object properties as shown in Table 1.

Table 1: Unit Controller Device Object Properties

Property	Default/Valid Values	Data Type
Object Identifier	Device	BACnetObjectIdentifier
Object Name	MTUC_DOAS WSHP	Character String
Object Type	8 (Device)	BACnetObjectType
System Status	0 (Operational)	BACnetDeviceStatus
Vendor Name	Daikin Applied	Character String
Vendor Identifier	3	Unsigned 16
Model Name	MTUC_DOAS WSHP	Character String
Firmware Revision	Variable	Character String
Application Software Version	Variable	Character String
Location	Location	Character String
Description		Character String
Protocol Version	1	Unsigned
Protocol Revision	4	Unsigned
Protocol Services Supported	SubscribeCOV UnconfirmedCOVNotification ReadProperty ReadPropertyMultiple WriteProperty WritePropertyMultiple DeviceCommunicationControl TimeSynchronization Relinquish_Default Who-Has I-Have Who-Is I-Am	BACnetServices Supported
Protocol Object Types Supported	AI, AV, BI, BO, BV, Device, MSI, MSV	BACnetObjectTypes Supported
Object List		Sequence of BACnetObjectIdentifer
Max APDU Length Accepted	480	Unsigned 16
Segmentation Supported	None	BACnetSegmentation
Max Segments Accepted	16	Unsigned
Device Address Binding		Sequence of BACnetAddressBinding
Database Revision	1	Unsigned
Active COV Subscriptions	15	List of BACnetCOV Subscriptions
Local Time[1]	Variable	Time
Local Date[1]	Variable	Date
UTC Offset	0 /Unsupported	Integer
Daylight Savings Status	0 / Variable	Boolean
APDU Segment Timeout	Unsupported	Unsigned
APDU Timeout	10000 / Unsupported	Unsigned
Number of APDU Retries	0 / Unsupported	Unsigned

[1] The unit controller has its own time clock. This could differ if the time is changed via the LUI keypad display. The time clock re-synchronizes once a second and after every unit controller reset.

The BACnet addressing parameters shown in Table 2 are necessary in order to establish communication between the unit controller and BACnet network.

Table 2: Important BACnet Configuration Parameters

Parameter	BACnet Object Name	Range/Default	Description/Notes
Baud Rate[1]	NA	9600,19200,38400,76800 Default: 38400	Data transfer speed (bps) of the BACnet MS/TP network.
Device Instance[1]	Object_Identifier	1-4194303 Default: 3101120	This value must be unique throughout the entire BACnet network.
MS/TP (MAC) Address[1]	MacAddress	0-127 Default: 120	MS/TP Address of the device (i.e. unit controller). Each device on the BACnet network must have a unique MAC Address.
Max Masters	Max_Master	2-127 Default: 127	Specifies the highest possible address for the network master. Nodes must be less than or equal to 127.
Device (Object) Name	Object_Name	Up to 20 characters Default: DevName	The Device Object Name must be unique throughout the entire network.
Location	Location	32 Characters Default: Location	Text string used to describe the physical location of the unit.
Units (English/Metric)	Units	Imperial (English), SI (Metric) Default: English	English: Use English units of measure (Deg F, PSI, GPM) Metric: Use metric units of measure (Deg C, kPa, liter/sec).

[1] Parameter is required for minimum network configuration.

LONWORKS Network Configuration

LonTalk® Protocol

LonTalk is the network communication specification developed and owned by the Echelon Corporation®. It describes how information should be transmitted among devices on a control network. The LonTalk protocol requires that devices conform to the interface requirements of the LonMark® interoperability standards.

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.

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. 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.

LonMark Standard Network Variables and Configuration Properties

The 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). See Table 3 for a list of all supported device files.

User-Specified Network Variables and Configuration Properties

The communication module software supports User Network Variable Types (UNVTs) and User Configurable Property Types (UCPTs) in addition to the standard LonMark files.

Resource Files

Resource files contain definitions of the user-defined functional profiles, network variables types, configuration property types, and enumerations. Resource files are required for displaying these user-specific variables (UNVTs) and configuration properties (UCPTs) that are not included in the standard device profile. See Table 3 for a list of all supported resource files.

The device XIF and resource files must be downloaded and mapped for network configuration. A LONWORKS application such as Echelon CT (Commissioning Tool) is recommended, but not necessarily required. Refer to www.echelon.com for more information. Echelon CT requires a 32-bit version of Visio software and also .NET v4.8 Windows framework. It is also recommended that .NET v3.5 remain installed in order to support other PC applications not related to the Echelon CT Tool.

Table 3: Device and Resource Files

Device Files	Resource Files
MT_DOAS_WSHP_FT6050.APB	McQuayDAC_DOAS.enu
MT_DOAS_WSHP_FT6050.HEX	McQuayDAC_DOAS.fmt
MT_DOAS_WSHP_FT6050.NEI	McQuayDAC_DOAS.fpt
MT_DOAS_WSHP_FT6050.NME	McQuayDAC_DOAS.typ
MT_DOAS_WSHP_FT6050.NMF	
MT_DOAS_WSHP_FT6050.XFB	
MT_DOAS_WSHP_FT6050.XFO	
MT_DOAS_WSHP_FT6050.XIF	

LONWORKS Commissioning

Pressing the service pin on the LONWORKS communication module generates a service pin message, which contains the Neuron ID and tand the Standard Program Identification code (SPID) of the device. 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 (see above) maps the 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.

Verifying Network Addressing (Wink)

The MicroTech unit controller supports the LONWORKS Wink functionality. 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 below.

Shutdown Sequence

The unit controller immediately initiates a normal shutdown of all running compressors. This takes approximately 5 minutes. The unit controller then does the following:

1. Turns fan off for 5 seconds
2. Turns fan on for 5 seconds
3. Turns fan off for 5 seconds
4. Resumes normal activity

Configuring the Communication Module

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.

Network Data Tables

Detailed descriptions of all LonWorks network integration parameters are described in the LONWORKS Data Tables section.

Unit Controller Configuration Tools

The MicroTech controller local user interface (LUI) keypad display and ServiceTools software can be used in conjunction with the BAS front end (as described in the BACnet Networks and LONWORKS Networks sections) to access and configure the controller for BACnet or LONWORKS communication.

Local User Interface (LUI) Keypad Display

The LUI is an optional unit-mounted interface that indicates the current unit operating state. It can be used to set the DOAS WSHP operating parameters (operating mode, temperature setpoints, fan speed and occupancy mode) and network addressing values. The LUI has three levels of password protection. In addition to the operating mode states and fan functions, the interface displays:

- The current unit operating mode
- The current supply air temperature setpoint
- Active alarms and unit fault conditions

See MicroTech Controls for Daikin SmartSource DOAS Water Source Heat Pump, OM 1308 (www.DaikinApplied.com) for the complete list of configurable parameters available via the LUI keypad display.

ATS ServiceTools Software

Daikin Applied's ATS ServiceTools software is a free, multi-purpose desktop application used for unit startup and configuration, network addressing and diagnostics. The service interface supports the ability to:

- Configure and address unit for BAS network communication
- Download and update unit controller software
- Configure the software for specific unit hardware options
- Adjust operational parameters and setpoints
- View real-time operation, alarms, and unit status
- Adjust operational parameters

Requirements

- Download of latest ATS ServiceTools software and ATS ServiceTools User Manual, OM 732 (www.DaikinApplied.com)

NOTE: Proper user level access is required to configure network addressing parameters

- Laptop with Windows 7 or newer operating system
- .NET Framework v4.6.1 or newer
- USB v2.0 Type A Male to Type A Male direct connect cable (not a cross-over cable)

Contact the Daikin Applied Controls Customer Support group at 866-462-7829 or Controls@daikinapplied.com for assistance, if necessary.

BACnet Network Objects

This section includes the data that is available from the unit controller to the BAS via BACnet MS/TP. See Additional Configuration Methods for more information about network-supported analog and binary inputs and their interaction with locally configured parameters.

Some of the unit controller analog inputs (AI) and analog values (AV) pass integer values instead of floating points. Setting these parameters to a fractional value rounds the value to the nearest integer. These AI and AV parameters are noted in Table 4 and Table 5.

Refer to Effective Occupancy Modes, and Operational Temperature Setpoints for configuration and temperature setpoint operation details. The BACnet PICS is provided in Appendix A: Protocol Implementation Conformance Statement (PICS).

⚠ CAUTION

Please note that anytime a command is written to a configuration property, 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 BACnet objects linked to configuration properties must be limited to avoid damage to the hardware. Non-volatile parameters are saved every 20 minutes.

NOTE: Upon unit controller power-up or reset, network values default to the Invalid value of 32767.

The network overrides locally set values such as sensor inputs or parameters configured from the LUI keypad display or ServiceTools software. Local values take precedent when a network value is not provided.

Table 4: Analog Inputs

Point Name[1]	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default[2]	Read/ Write	Non-volatile Memory[3]	Description
Local Space Temperature	AI:1	LocalSpaceTemp	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The local space temperature sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] See Selected I/O Parameters section for additional information about the interaction of this input and the tenant override feature.
Leaving Water Temperature	AI:2	LWT	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The local leaving water temperature sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2]
Entering Water Temperature	AI:3	LocalEWT	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The local entering water temperature sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] Also see Effective Entering Water Temperature (AV:57).
Discharge Air Temperature	AI:4	DAT	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The effective discharge air temperature sensor value, if installed and configured with a valid input.[2]
Local Setpoint Adjust	AI:5	LocalSetptAdj	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The room sensor setpoint input value used to determine the effective heating and cooling setpoints. This point is currently not used.
Suction Refrigerant Temperature	AI:6	SuctRefTemp	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The compressor suction line temperature sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] For heat pump applications, the compressor suction line temperature is equal to the indoor coil temperature.
Leaving Coil Temperature	AI:7	LCT	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The effective leaving coil air temperature sensor value, if installed and configured with a valid input.[2]
Brownout Detection	AI:8	Brownout	0 to 4095 counts	32767 (Null)	R	No	Provides a value from the unit controller for the incoming line voltage. This value is used to determine if a brownout or overvoltage condition exists.[4]
Outdoor Air Temperature	AI:9	OutdoorTemp	-40 to 212ºF -40 to 100ºC	32767 (Null)	R	No	The outdoor air temperature sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] Also see Effective Outdoor Air Temperature (AV:44).
Outdoor Relative Humidity	AI:10	LocalOutdoorRH	0 to 100%	32767 (Null)	R	No	The outdoor relative humidity sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] Also see Effective Outdoor Relative Humidity (AV:47).
Indoor Relative Humidity	AI:11	LocalIndoorRH	0 to 100%	32767 (Null)	R	No	The indoor relative humidity sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] Also see Effective Space Relative Humidity (AV:49).
Space CO_2	AI:12	LocaSpaceCO2	0 to 5000 ppm	32767 (Null)	R	No	The local space CO_2 sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2,4]
Building Static Pressure	AI:20	BldgStatPress	-0.25 to 0.25 in -62.3 to 62.3 Pa	32767 (Null)	R	No	The effective building static pressure sensor (BSP) value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] Applies only to units configured for BSP fan control.

Table 4: Analog Inputs, Continued

Point Name[1]	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default[2]	Read/ Write	Non-volatile Memory[3]	Description
Discharge Refrigerant Temperature	AI:22	DischRefTemp	-40 to 300ºF -40 to 149ºC	NA	R	No	The discharge refrigerant temperature sensor value, if installed and configured with a valid input.[2]
Suction Refrigerant Pressure	AI:25	RefSuctionP	0 to 300 psi 0 to 689.5 kPa	NA	R	No	The suction refrigerant pressure sensor value, if installed and configured with valid input.[2]
Discharge Refrigerant Pressure	AI:26	RefDischP	0 to 750 psi 0 to 5171 kPa	NA	R	No	The effective discharge refrigerant pressure sensor value, if installed and configured with valid input.[2]
Analog Input Reset	AI:28	LocalAIReset	0 to 10 Volts	NA	R	No	The value of the configurable Analog Input (ai14) when it has been set locally for AIReset. Otherwise, it displays as Null.[2] See Additional Configuration Methods.

[1] All analog input parameters support trending.

[2] The Null value of 32767 indicates that a sensor is not installed, the sensor is unreliable, or when the unit controller is not using a value within the acceptable range.

[3] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Y, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = N, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

[4] Input values are rounded to the nearest integer.

Table 5: Analog Values

Point Name	Object Type/ Instance	BACnet Object Name	Range (In Units)	Default[2]	Read/ Write[1]	Non-volatile Memory[3]	Description
Outdoor Air Temperature Cooling Setpoint	AV:2	OATClgSetpt	65 to 80ºF 18.3 to 27ºC	80ºF 27ºC	W	Yes	The outdoor air temperature (OAT) cooling change-over setpoint. The unit enters cooling mode when the OAT is above this value.
Leaving Coil Temperature Cooling Setpoint	AV:4	LCTClgSetpt	45 to 75ºF 7.2 to 24ºC	65ºF 18.3ºC	W	Yes	The leaving coil temperature (LCT) setpoint. This value is used when the unit is in cooling mode.
Discharge Air Temperature Heating Setpoint	AV:5	cpDAHtgSetpt	55 to 80ºF 12.8 to 27ºC	70ºF 21ºC	W	Yes	The heating discharge air temperature (DAT) setpoint. This value is used when the unit is in heating mode.
Duct Static Pressure	AV:6	DuctStatPress	0 to 3 Inches	32767 (Null)	R	No	The effective duct static pressure (DSP) sensor value, if installed and configured with a valid input. Otherwise, it displays as Null.[2] See Selected I/O Parameters for details.
Duct Static Pressure Setpoint	AV:7	cpDuctStaticSP	0 to 3 Inches	1 Inch	W	Yes	The duct static pressure (DSP) sensor setpoint. Applies when the unit fan control is configured for DSP.[4] It is also used for compressor staging in the dehumidification mode.
Network Duct Static Pressure Setpoint	AV:160	niDuctStaticP	0 to 3 Inches	32767 (Null)	W	No	The network-provided DSP sensor setpoint. Applies when the sensor is installed with a valid value and configured for DSP. Otherwise, it displays as Null.[2] See Selected I/O Parameters for details.
Building Static Pressure Setpoint	AV:8	BldgStaticSP	-0.25 to 0.25 Inches	0.1 Inches	W	Yes	The building static pressure (BSP) sensor setpoint. Applies when the unit fan control is configured for BSP.
Network Buildng Static Pressure Setpoint	AV:159	niBldgStatP	-0.25 to 0.25 Inches	32767 (Null)	R	No	The network-provided BSP sensor setpoint. Applies when the sensor is installed with a valid value and configured for BSP. Otherwise, it displays as Null.[2]
Brownout Reference Setpoint	AV:9	cpBrownoutRef	0 to 4095 Counts	2775 Counts	W	Yes	Used for factory-calibration of the unit controller line voltage. The controller detects a brownout condition when the line voltage is less than 80% of the factory calibrated reference setpoint. An alarm is generated in the event of a brownout condition.[4] *Only perform the calibration procedure if the unit controller 24 VAC voltage is within normal operating parameters.*
Outdoor Air Temperature Heating Setpoint	AV:10	OATHtgSetpt	55 to 70ºF 12.8 to 21ºC	55ºF 12.8ºC	W	Yes	The outdoor air temperature (OAT) heating change-over setpoint. The unit enters heating mode when the OAT is below this value.
Suction Refrigerant Temperature Low Limit Setpoint	AV:12	cpLowTempProt	0 to 50ºF -17.8 to 10ºC	28ºF -2.2ºC	W	Yes	The suction refrigerant temperature (SRT) low limit setpoint value. An alarm is generated when the SRT is below this setpoint. Applies when the water loop type is configured for water.
Suction Refrigerant Temperature Low Limit-Glycol	AV:13	cpLowTempProtGL	0 to 50ºF -17.8 to 10ºC	6.5ºF -14.2ºC	W	Yes	The suction refrigerant temperature low limit setpoint value. An alarm is generated when the SRT is below this setpoint. Applies when the water loop type is configured for glycol.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default[2]	Read/ Write[1]	Non-volatile Memory[3]	Description
Suction Refrigerant Temperature Low Limit Differential	AV:151	nciLowTempProtDiff	2 to 15ºF -16.7 to -9.4ºC	8ºF -13.3ºC	W	Yes	The temperature differential value that generates an alarm when either: 1. The unit is configured for a water loop and the suction refrigerant temperature (SRT) is below the low SRT setpoint (28°F) OR 2. The unit is configured for glycol and the SRT is below the low SRT setpoint (6.5°F) This indicates that a potential freeze condition can occur. The alarm clears automatically when the suction refrigerant temperature exceeds the setpoint by 4°F. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset.
Compressor Minimum Off Time	AV:15	cpMinCompOffTmr	300 to 600 Seconds	300 Seconds	W	Yes	The minimum amount of time the compressor must be off before it can be started again.[4]
Compressor Minimum On Time	AV:16	cpMinCompOnTmr	60 to 600 Seconds	180 Seconds	W	Yes	The minimum amount of time the compressor must run before it can be turned off.[4]
Network Space Temperature Input	AV:18	NetworkSpaceTemp	-40 to 212°F -40 to 100°C	32767 (Null)	C	No	Network-provided space temperature input. It is used to set the effective space temperature value (AV:22). The network override reverts to its default value upon unit controller reset.
Dewpoint	AV:20	Dewpoint	0 to 100°F -17.8 to 37.8°C	NA	R	No	The calculated dewpoint value. It is used to determine if dehumidification is necessary. The dewpoint is based on the calculated inputs for effective outdoor air temperature, effective outdoor relative humidity, and elevation.
Effective Space Temperature Input	AV:22	EffectSpaceTemp	-40 to 212°F -40 to 100°C	32767 (Null)	R	No	The space temperature value provided by a valid network input or local sensor. It represents the NetworkSpaceTemp (AV:18) input, if available. Otherwise, it reflects the local space temperature sensor input (including any calibration offsets). Displays as Null if a valid input is not available.[2]
Entering Water Temperature Heating Lockout - Glycol	AV:30	LowEWTSptGly	0 to 70°F -17.8 to 21.1°C	15°F -9.4°C	W	Yes	Disables heating when the entering water temperature drops below this setpoint. Applies when the water loop type is configured for glycol.
Entering Water Temperature Heating Lockout - Water	AV:31	LowEWTSptWtr	10 to 212°F -12.2 to 100°C	30°F -1.1°C	W	Yes	Disables heating when the entering water temperature drops below this setpoint. Applies when the water loop type is configured for water.
Local Bypass Time	AV:39	cpBypassTime	0 to 480 Minutes	120 Minutes	W	Yes	The amount of time the unit is allowed to continue operating when the tenant override button is pressed during an unoccupied period. Applies to units with an optional wall-mounted room temperature sensor with timed override button.
Compressor 1 Run Time	AV:40	Comp1RunHours	0 to 300000 Hours	0 Hours	W	Yes	Compressor 1 or 2 run time. It can be configured to reset the run time back to zero hours after a new compressor(s) has been added or replaced.
Compressor 2 Run Time	AV:41	Comp2RunHours					
Outdoor Airflow	AV:42	OAFlow	0 to 4095 CFM	32767 (Null)	R	No	The outdoor airflow sensor value, if installed and configured with valid input. Otherwise, it displays as Null.[2, 4]
Effective Outdoor Air Temperature	AV:44	EffectOutdoor Temp	-40 to 212°F -40 to 100°C	0°F -17.8°C	R	No	The outdoor air temperature value provided by a valid network input or local sensor. It represents the NetworkOutdoorTemp (AV:45) value, if available. Otherwise, it reflects the local outdoor temperature sensor input (including any calibration offsets).
Network Outdoor Air Temperature Input	AV:45	NetworkOutdoor Temp	-40 to 212°F -40 to 100°C	32767 (Null)	W	No	Network-provided outdoor temperature input. It is used to set the effective outdoor temperature value (AV:44). The network input reverts to its default value upon unit controller reset.
Fan Run Time	AV:46	FanRunHoursTenths	0 to 300,000 Hours	NA	W	Yes	Configures the total fan run time. It is used to reset the current run time hours back to zero (0) after a new fan has been installed or replaced.
Effective Outdoor Humidity	AV:47	EffectOutdoorRH	0 to 100%	NA	R	No	The outdoor humidity value provided by a valid network input or local sensor. It represents the NetworkOutdoorRH (AV:48) value, if available. Otherwise, it reflects the local outdoor humidity sensor input (including any calibration offsets).
Network Outdoor Humidity Input	AV:48	NetworkOutdoorRH	0 to 100%	32767 (Null)	W	No	Network-provided outdoor humidity input. It is used to set the effective outdoor humidity value (AV:47). The network input reverts to its default value upon unit controller reset.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default[2]	Read/ Write[1]	Non-volatile Memory[3]	Description
Effective Space Humidity	AV:49	EffectSpaceRH	0 to 100%	NA	R	No	The space humidity value provided by a valid network input or local sensor. It represents the NetworkSpaceRH (AV:50) value, if available. Otherwise, it reflects the local space humidity sensor input (including any calibration offsets.)
Network Space Humidity	AV:50	NetworkSpaceRH	0 to 100%	32767 (Null)	W	No	Network-provided space humidity input. It is used to set the effective space humidity value (AV:49). The network input reverts to its default value upon unit controller reset.
Effective Space CO_2	AV:51	EffectSpaceCO2	0 to 5000 ppm	NA	R	No	The space CO_2 value provided by a valid network input or local sensor. It represents the NetworkSpaceCO2 (AV:52) value, if available. Otherwise, it reflects the local space CO_2 sensor input (including any calibration offsets.)[4]
Network Space CO_2 Input	AV:52	NetworkSpaceCO2	0 to 5000 ppm	32767 (Null)	W	No	Network-provided space CO_2 input. It is used to set the effective space CO_2 value (AV:51.)[4] The network input reverts to default value upon unit controller reset.
Effective Discharge Air Temperature Setpoint	AV:53	DATSetpt	50 to 80°F 10 to 26.7°C	70°F 21°C	R	No	The effective discharge air temperature (DAT) setpoint value provided by the local sensor (including any calibration offsets) based on the current unit mode.[2] See Selected I/O Parameters for details.
Effective Entering Water Temperature	AV:57	EffectEWT	-40 to 212°F -40 to 100°C	32767 (Null)	R	No	The entering water temperature value provided by a valid network input or local sensor. It represents the NetworkEWT (AV:113) value, if available. Otherwise, it reflects the local entering water temperature sensor input (including any calibration offsets). Displays as Null if a valid input is not available.[2]
Effective Leaving Coil Temperature Setpoint	AV:58	EffLCTSetpt	28 to 80°F -2.2 to 26.7°C	70°F 21°C	R	No	The effective leaving coil air temperature control setpoint. Used for economy and precision cooling and dehumidification mode determination.
Leaving Coil Temperature Low Limit	AV:110	LCTLowLim	30 to 40°F -1.1 to 4.4°C	32°F 0°C	W	No	The leaving coil temperature (LCT) minimum value. The compressors shut off when the unit reaches the LCT low limit setpoint.
Discharge Air Temperature High Limit	AV:111	DATHighLim	80 to 135°F 26.7 to 57.2°C	110°F 43.3°C	W	No	The discharge air temperature (DAT) maximum value. The compressors shut off when the unit reaches the DAT high limit setpoint.
Network Entering Water Temperature Input	AV:113	NetworkEWT	-40 to 212°F -40 to 100°C	32767 (Null)	W	No	Network-provided entering water temperature (EWT) value, if provided. Reverts to Null upon unit controller reset.
Network Fan Speed Command	AV:115	NetworkFanSpeed Cmd	0 to 100%	32767 (Null)	W	No	Network-provided fan speed override. Reverts to Null upon unit controller reset.[2,4]
Fan On Delay Timer	AV:116	cpFanOnDelayTmr	1 to 300 Seconds	10 Seconds	W	No	The amount of time allowed for the outdoor air damper to open prior to turning on the fans. The amount of time needed before the outdoor air damper opens prior to turning on the fans. The delay timer allows for fan stabilization upon initial unit start-up.[4]
Minimum Fan On Time	AV:117	MinFanOnTime	0 to 60 Seconds	60 Seconds	W	Yes	The amount of time the fan must remain at partial speed before the unit leaves the Start mode. This allows the outdoor air damper sensor enough time to capture an accurate reading.[4]
Elevation	AV:125	Elevation	0 to 21,499 Feet	32767 (Null)	W	No	The elevation (in feet above sea level) of the unit's physical location. The elevation is used to calculate barometric pressure.
Outdoor Air Temperature High Lockout Setpoint	AV:126	OATHiLkSetpt	80 to 120°F 26.7 to 48.9°C	115°F 46.1°C	W	Yes	The outdoor air temperature (OAT) high limit setpoint. Disables the unit when the outdoor air temperature exceeds this setpoint and when the lockout functionality is enabled.
Outdoor Air Temperature Low Lockout Setpoint	AV:127	OATLoLkSetpt	-20 to 20°F -28.9 to -6.7°C	-20°F -28.9°C	W	Yes	The outdoor air temperature (OAT) low limit setpoint. Disables the unit when the outdoor air temperature drops below this setpoint and when the lockout functionality is enabled.
Saturated Suction Refrigerant Temperature (Teg)	AV:128	SuctSatTemp	-40 to 212°F -40 to 100°C	0°F -17.8°C	R	No	The saturated suction refrigerant temperature (Teg) value. This input is used to maintain the superheat setpoint. An alarm is generated when the Teg value is outside of the acceptable range for longer than expected. See Alarms.
Filter Change Hours Setpoint	AV:129	FilterChgHrsSP	50 to 2,000 Hours	700 Hours	W	Yes	The setpoint that determines the maximum amount of time the fan should run before generating a dirty filter alarm.[4] See AV:130 and also Alarms.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default[2]	Read/ Write[1]	Non-volatile Memory[3]	Description
Filter Change Hours Timer	AV:130	FilterChgHrs	0 to 300,000 Hours	0 Hours	W	Yes	The number of fan run hours since the previous filter change. A dirty filter alarm is generated when the timer exceeds the filter change hours setpoint (AV:129). See Alarms.
Saturated Discharge Refrigerant Temperature (Tc)	AV:134	DischSatTemp	-40 to 212°F -40 to 100°C	0°F -17.8°C	R	No	Reflects the saturated discharge refrigerant temperature (Tc) is used in the condenser temperature setpoint calculation. A fault alarm is generated when the Tc value is outside of the acceptable range. See Alarms.
PWM Constant Speed Fan	AV:135	cpACFM	0 to 5,000 CFM 0 to 142 m^3/min	1,000 CFM 28 m^3/min	W	Yes	The cubic feet per minute setpoint used to determine the PWM (pulse width modulating) fan output. Applies only to constant fans.[4] Actual cubic feet per minute (ACFM) is a unit of volumetric flow. It is the actual volume of air delivery relative to the current PWM fan inlet conditions.
Discharge Air Temperature Reheat Setpoint	AV:145	ReheatDATSP	40 to 80°F 4.4 to 26.7°C	70°F 21.1°C	W	Yes	The discharge air temperature reheat setpoint. This value is used when the unit is in the dehumidification mode.
Dewpoint Setpoint	AV:146	DewpointSetpt	45 to 60°F 7.2 to 15.6°C	55°F 12.8°C	W	Yes	The outdoor dewpoint temperature setpoint. The unit enters dehumidification mode when the calculated outdoor dewpoint is above this value.
Discharge Air Temperature Reset	AV:158	LocalAiDatReset	0 to 10 Volts	0 Volts	R	No	Discharge air temperature (DAT) reset value. Applies when the unit DAT reset is configured for Analog Input (ai16) and the sensor is installed.[2,4] See Selected I/O Parameters for details.
Network Discharge Air Temperature Reset Input	AV: 148	NetworkDATReset	40 to 90°F 4.4 to 32.3°C	32767 (Null)	W	No	Network-provided discharge air temperature reset value. Reverts to Null upon unit controller reset.[2]
Minimum Cooling Discharge Air Temperature Reset Setpoint	AV:149	ClgMinDATRst	50 to 60°F 10 to 15.6°C	60°F 15.6°C	W	Yes	The minimum cooling discharge air temperature (DAT) reset setpoint.
Maximum Heating Discharge Air Temperature Reset Setpoint	AV:150	HtgMaxDATRst	70 to 90°F 21.1 to 32.2°C	70°F 26.6°C	W	Yes	The maximum heating discharge air temperature (DAT) reset setpoint.
Unit Status - Primary Heating Output	AV:152	UnitStatusPriHeat	0 to 100%	0%	R	No	Reflects the heating output capacity by compressor stage. The percentage of heating capacity for each stage is as follows: Stage 1: 27% Stage 2: 40% Stage 3: 51% Stage 4: 59% Stage 5: 67% Stage 6: 80% Stage 7: 87% Stage 8: 100%
Unit Status - Cooling Output	AV:153	UnitStatusCool	0 to 100%	0%	R	No	Reflects the cooling output capacity by compressor stage. Cooling uses the same % output by stage as heating.[4]
Unit Status - Fan Output	AV:154	UnitStatusFan	0 to 100%	0%	R	No	Reflects the indoor fan speed output.[4]
Unit Status - Secondary Heating Output	AV:155	UnitStatusSecHeat	0 to 100%	0%	R	No	Reflects the electric/hot water preheat output capacity by compressor stage. It is either 0% = Off or 100% = On.[4]
Compressor 1 Starts	AV:156	Comp1Starts	0 to 300,000	0	R	No	The total number of compressor 1 starts.
Compressor 2 Starts	AV:157	Comp2Starts	0 to 300,000	0	R	No	The total number of compressor 2 starts.
BACnet MS/TP MAC Address	AV:411	MacAddress	1 to 127	120	W	Yes	The MAC address is used in conjunction with the instance number to set the unique network (node) address for the unit controller. It can be set from the BAS, LUI keypad display or ServiceTools software.[4] See Additional Configuration Methods.
Device Instance Number	AV:412	SystemMinInstance	0 to 4194303	3101000	W	Yes	The instance number is added to the MAC Address to determine the final BACnet Device Name and Device Instance Number. This value must be unique throughout the entire BACnet network. It can be set from the BAS, ServiceTools software, or LUI keypad display.[4] See Additional Configuration Methods.

[1] Only the highest priority value (lowest number) of the priority array command is written to the Present Value. For writeable objects, the value is written to the Present Value. Range checking is performed before the write occurs or an error is returned.
[2] The Null value of 32767 indicates that a sensor is not installed, the sensor is unreliable, or when the unit controller is not using a value within the acceptable range.
[3] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Y, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = N, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.
[4] Input values are rounded to the nearest integer.

Binary Inputs and Outputs

The unit controller has a special set of dedicated and configurable I/O that are available to the BACnet network (Table 6 and Table 7). Refer to the Selected I/O Parameters section for more information about these and other field-configurable options.

Table 6: Binary Inputs

BACnet Object	Input Designation	Description	Input Type
BI:1	BI-1	High Pressure	24 VAC
BI:2	BI-2	Freeze Stat	24 VAC
BI:3	BI-3	Low Pressure/Phase Monitor	24 VAC
BI:4	BI-4	None	24 VAC
BI:5	BI-5	Dirty Filter	Dry Contact
BI:6	BI-6	Energy Recovery Feedback	Dry Contact
BI:7	BI-7	Unoccupied	24 VAC
BI:8	BI-8	Shutdown	Dry Contact

Table 7: Binary Outputs

BACnet Object	Output Designation	Description	Output Type
BO:1	DO-1	Fan Enable	24 VAC
BO:2	DO-2	Crank Case Heater	24 VAC
BO:3	DO-3	None[1] (Default)	24 VAC
BO:4	DO-4	Reversing Valve[1]	24 VAC
BO:5	DO-5	Fault Output	24 VAC
BO:6	DO-6	Energy Recovery Enable	24 VAC
BO:7	DO-7	Outside Air Damper	24 VAC
BO:8	DO-8	Water Loop Pump Request / Isolation Valve	Normally open or normally closed
BO:9	DO-9	Compressor 1 Low	Dry contact
BO:10	DO-10	Compressor 1 High	Dry contact
BO:11	DO-11	Compressor 2 Low	Dry contact
BO:12	DO-12	Compressor 2 High	Dry contact
BO:13	DO-13	Preheat	Dry contact
BO:14	DO-14	None[1] (Default)	Dry contact

[1] Additional configurations are available with proper access from the LUI keyppad/display or ServiceTools: Fan Out, Crank Case Heater, Reversing Valve, Fault Output, Energy Recovery Enable, Outside Air Damper, Pump Request/Isolation Valve, Comp 1 Low, Comp 1 High, Comp 2 Low, Comp 2 High, PreHeat

Table 8: Binary Values

Point Name	Object Type/ Instance	BACnet Object Name	Range (In Units)	Default	Read/ Write[1]	Non-volatile Memory[2]	Description
Clear Alarm	BV:1	ClearAlarm	0 = None 1 = Clear	0 (None)	W	No	The current (active) alarms. This point should not be written to continuously and frequently under any circumstances. The purpose of writing to BV:1 is to intentionally clear an active alarm. See Alarms for details.
Reset Filter	BV:3	ResetFilter	0 = None 1 = Clear	0 (None)	W	No	Clears the change filter alarm. This value can be set from the network or via ServiceTools software. See Alarms for details.

[1] Only the highest priority value (lowest number) of the priority array command is written to the Present Value. For writeable objects, the value is written to the Present Value. Range checking is performed before the write occurs or an error is returned.
[2] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Y, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = N, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

Table 9: Multi-State Inputs

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default	Read/ Write	Non-volatile Memory[1]	Description
Condensate Overflow Status	MSI:1	CondOverFlow	1 = Dry 2 = Wet 3 = Null	3 (Null)	R	No	The condensate overflow status. Applies when a sensor is installed and configured with valid input. A Null value indicates that no sensor is present.

[1] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Y, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = N, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

Table 10: Multi-State Values

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default	Read/ Write[1]	Non-volatile Memory[2]	Description
Compressor Enable	MSV:1	NetComprEnable	1 = Disable 2 = Enable 3 = Null	3 (Null)	W	No	Disables compressor heating and cooling from the network. A Null value indicates the compressors are enabled.
Run Timer Reset	MSV:3	NetTimeRst	0 = None 1 = RstCmp1 2 = RstCmp2 3 = RstFan 4 = All	0 (None)	W	No	Network command that clears the accumulated run time hours for compressor #1, compressor #2, supply fan, or for all simultaneously. It is intended to be used when replacing a fan or compressor(s).
Unit Status Mode	MSV:4	UnitStatusMode	0 = Heat 1 = Cool 2 = PreCool 3 = Off 4 = FanOnly 5 = Dehum 6 = Calibrate 7 = Auto	0 = Heat	R	No	Displays the current unit mode.
Previous Alarm	MSV:5	Previous Alarm	1- 45 See Alarms	1 (No Alarm)	R	No	Displays the last active alarm. See Alarms section for complete list of alarms, priorities, and descriptions.
Effective Occupancy	MSV:6	EffectOccup	1 = Occ 2 = Unocc 3 = Bypass 4 = Standby 5 = Null	5 (Null)	R	No	The current unit occupancy mode. The effective occupancy is determined based on inputs from occupancy override, occupancy scheduler, an internal schedule, and/or an occupancy sensor. See Effective Occupancy Modes section for details.
Network Occupancy Override Input	MSV:7	OccManCmd	1 = Occ 2 = Unocc 3 = Bypass 4 = Standby 5 = Null	5 (Null)	W	No	Network-provided input used to override the existing unit occupancy mode (MSV:6). The network override reverts to its default value upon unit controller reset. See Effective Occupancy Modes section for details.
Network Occupancy Schedule Input	MSV:8	OccSchedule	1 = Occ 2 = Unocc 3 = Standby 4 = Null	4 (Null)	W	No	Network-provided occupancy schedule input. Commands the unit to the desired occupancy mode. The network override reverts to its default value upon unit controller reset. See Effective Occupancy Modes section for details.
Occupancy Sensor	MSV:9	OccSensor	1 = Occ 2 = Unocc 3 = Null	3 (Null)	R	No	Network-provided input used to indicate the presence of occupants in the space (motion detection.) The network override reverts to its default value upon unit controller reset. See Effective Occupancy Modes section for details.
Unit State	MSV:10	UnitState	1 - 18 See Unit State descriptions	1 (Powerup)	R	No	The current unit state as described below. Unit operation and temperature control conditions dictate how and when the unit transitions from one state to the next. **Unit State Descriptions** 1 = Powerup (Unit controller is energizing) 2 = Initialize =(Unit controller software initialization process) 3 = Calibration (Valve calibration process that follows unit initialization) 4 = Off (After initialization, unit remains in an Off state until space is occupied) 5 = Start (Start timer delay is active, allowing fan stabilization) 6 = FanOnly (Unit is in fan-only mode) 7 = Prepare_Cool (Unit is preparing to enter cooling mode) 8 = Cooling (Unit is in either economy or precision cooling mode) 9 = Prepare_Dehum (Unit is preparing to enter dehumidification mode) 10 = Dehum (Unit is in dehumidification mode (via modulating gas reheat control)) 11 = Prepare_Heat (Unit is preparing to enter heating mode) 12 = Heating (Unit is in heating mode) 13 = Defrost (Unit is in defrost mode) 14 = Alarm (Unit is in active alarm state) 15 = AlarmOff =(Alarms are turned off to disable unit for safety purposes) 16 = Comp_Shutdown (Unit is in the normal compressor shut-down process) 17 = Immediate_Shutdown (Unit is in an immediate (forced) shut down) 18 = Vacuum (Modulates the EEV and HGR valves into 50% position in order to allow a vacuum to pulled during system recharge)

Table 10: Multi-State Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default	Read/ Write[1]	Non-volatile Memory[2]	Description
Current Alarm	MSV:11	CurrentAlarm	1-45 See Alarms	1 (No Alarm)	R	No	Displays the highest priority active alarm. See Alarms section for complete list of alarms, priorities, and descriptions.
Pump Request Output	MSV:13	PumpRequest	1 = Inactive 2 = Active	1 (Inactive)	R	No	The pump command as either on or off depending on the unit mode (heating, cooling, dehumidification). The pump command indicates when the unit is requesting flow from the main water loop. The loop pump must be running to provide adequate flow through the unit so the compressor(s) can operate safely.
Dehumidification Enable	MSV:16	ncpDehumEnable	1 = Disabled 2 = Enabled 3 = Null	3 (Null)	R	No	Network-provided command that allows the unit to enter the dehumidification state. 1 = Disabled (Never allow dehumidification) 2 = Enabled (Always allow humidification) 3 = Null (Allow automatic mode determination)
Application Mode	MSV:17	NetApplicMode	1 = Auto 2 = Off 3 = FanOnly 4 = Heat 5 = Cool 6 = Null	6 (Null)	R	No	Network-provided command that The operating mode of the unit. The application mode does not “force” the unit into any state. However, it does disable certain unit operations. Applies when the local LUI keypad display is configured for Auto or is invalid. Reverts to the default of Null upon unit controller reset. 1 = Auto (Unit allowed to operate in any mode) 2 = Off (Unit operation not enabled by the network) 3 = FanOnly (Disables heating, cooling, and dehumidification) 4 = Heat (Disables cooling and dehumidification) 5 = Cool (Disables heating) 6 = HtCl (Heat/Cool) 7 = Null (No network value has been supplied)
Cooling Setpoint Method	MSV:19	SetpointMethod	1 = Economy 2 = Precision 3 = Dehum	1 (Economy)	W	No	The cooling strategy when the unit enters cooling mode. 1 = Economy (Cooling is controlled through compressor staging only, allowing for a wider discharge air temperature deadband) 2 =Precision (Cooling is controlled using compressor staging and modulating hot gas reheat valve (MHGR) to achieve a more precise DAT setpoint) 3 = Dehum (Dehumidification is always enabled when cooling is required; staging compressors based on the dewpoint setpoint and using the modulating hot gas reheat valve (MHGR) to control to the DAT setpoint)
Effective Heat/Cool	MSV:20	EffectHeatCool	1 = Auto 2 = Off 3 = FanOnly 4 = Heat 5 = Cool 6 = Dehum 7 = Invalid	1 (Auto)	R	No	Indicates the current heating/cooling mode of the unit.
Outdoor Air Lockout Enable	MSV:21	OALockoutEn	1 = Disable 2 = Enable	1 (Disable)	W	No	Enables the outdoor air lockout function. When enabled, the unit forces the outdoor air damper closed when the outdoor air temperature drops below the outdoor air lockout setpoint (see AV:126 and AV:127).
Filter Change Hours Enable	MSV:22	FilterChgHrsEn	1 = Disable 2 = Enable	1 (Disable)	W	Yes	Enables the change filter alarm. It is used in conjunction with Filter Change Hours (AV:130).
Fan Control Type	MSV:23	FanCtrlMethod	1 = Const 2 = DSP 3 = BSP 4 = CO2 5 = AI_Reset 6 = Network	1 (Const)	W	Yes	Sets fan speed control strategy to one of the following methods: 1 = Const (Constant air volume fan) 2 = DSP (Duct static pressure) 3 = BSP (Building static pressure) 4 = CO2 (CO_2) 5 = AI_Reset (External analog input voltage) 6 = Network (BACnet BAS)
Unit Status - In Alarm	MSV:24	UnitStatusAlarm	1-45 See Alarms	1 (No Alarm)	R	No	The status of the current alarm state. See Alarms section for complete list of alarms, priorities, and descriptions.

Table 10: Multi-State Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default	Read/ Write[1]	Non-volatile Memory[2]	Non-volatile Memory[2]
Trend Rate	MSV:25	TrendRate	1 = None 2 = OccChange 3 = 1Minute 4 = 10Min 5 = Hourly 6 = Daily	1 (None)	W	Yes	Defines how frequent trending-supported parameters are recorded. Data is captured in a .csv file type and saved to an external SD card. See the SmartSource DOAS WSHP Unit Controller OM 1308 for more information about trending. 1 = None (No trend data recorded) 2 = OccChange (Trend data recorded when unit transitions from an occupied to unoccupied mode, or vice versa) 3 = 1Minute (Trend data recorded once every 60 seconds) 4 = 10Min (Trend data recorded once every ten minutes) 5 = Hourly (Trend data recorded once per hour) 6 = Daily (Trend data recorded once every 24 hours)

[1] Only the highest priority value (lowest number) of the priority array command is written to the Present Value. For writeable objects, the value is written to the Present Value. Range checking is performed before the write occurs or an error is returned.

[2] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Y, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = N, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

Table 11: Device Objects

Point Name	Object Type/ Instance	BACnet Object Name	Range (in Units)	Default	Read/ Write	Non-volatile Memory[1]	Description
Application Version	Device	App_Software_ Version	VV.RR.BB	00.00.01	R	No	The software version of the unit controller. VV=Version, RR=Revision, BB = Build
Location	Device	Location	32 Characters	Text String	W	Yes	Describes the physical location of the unit. The user-defined description can be up to 32-characters long. It may be set through the network, ServiceTools software, or local LUI keypad display. See Additional Configuration Methods.
Device Instance Number	Device	Object_Identifier	0 to 4194303	3101120	W	Yes	The instance number (object-identifier) of the unit controller. The device ID must be unique throughout the network. It can be set from the network, ServiceTools software, or local LUI keypad display. See Additional Configuration Methods.
Device Name	Device	Object_Name	20 Characters	Text String	W	Yes	Text string used to define the BACnet object device name. The device name must be unique throughout the network. It can be set from the network, ServiceTools software, or local LUI keypad display. See Additional Configuration Methods.
MS/TP Baud Rate	NA	NA	9600 19200 38400 76800	38400	NA	Yes	Set the baud rate to match the speed of the BACnet network. Speeds above 38400 should be avoided unless the network wiring has been tested and verified to meet the required speed. The baud rate must be set from the ServiceTools software or LUI keypad display. See Additional Configuration Methods.
MaxMasters	Device	Max_Master	2 to 127	127	W	Yes	MaxMasters should be set to the highest address of a MS/TP master on the network segment. The default value is 127 for maximum compatibility. Setting this to the highest address of the MS/TP master device on the network reduces the MS/TP token traffic and decreases the response time of the unit controller. MaxMasters can be set from the network, ServiceTools software, or LUI keypad display. See Additional Configuration Methods.

[1] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Y, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = N, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

LonWorks Network Variables

This section includes the data that is available from the unit controller to the BAS via LonWorks.

LonWorks network variable inputs (.nvi or .nci) are writeable and can be configured from the network. The LonWorks network variable outputs (.nvo) are read-only and can only be viewed from the network.

NOTE: Upon unit controller power-up or reset, .nvi network values are set to default upon unit controller power-up. The network overrides locally set values such as sensor inputs or parameters configured from the unit controller's LUI keypad display or ServiceTools software. Local values take precedent when a network value is not provided or is invalid.

Exceptions are noted where applicable.

⚠ 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 12: Network Variable Outputs (NVIs)

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default	Receive Heart-beat	Non-volatile Memory[1]	Description
Application Mode	nviApplicMode	SNVT_hvac_mode (108)	0 = HVAC_Auto 1 = HVAC_Heat 3 = HVAC_Cool 6 = HVAC_Off 9 = HVAC_Fan_Only -1 = HVAC_Nul	-1 = HVAC_Nul	No	No	Network command that is used in the determination of the Control Mode and eventually the System Status Command. This occurs only when the LUI keypad display is configured for Auto or Null and the Application Mode is set to Off, Fan Only, Heat or Cool. Application Mode is initialized to Null during unit controller power-up.
Building Static Pressure	nviBldgStaticSP	SNVT_press_p (113)	-0.25 to 0.25 Inches	131.779[2] (Null)	No	No	Network BSP setpoint input. Applies when the local sensor is installed with a valid input and the unit fan control is configured for BSP. See Selected I/O Parameters for details.
Compressor Enable	nviComprEnable	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null (Enable)	2 = Null (Enable)	No	No	Network command that disables compressor heating and cooling operation.[3] **Condition / Value / State** 0 = Disable / 0 / 0 1 = Enable / 1 / 1 2 = Null/Enable / 0 / -1
Network Discharge Air Temperature Reset	nviDATReset	SNVT_temp_p (105)	40 to 90ºF 4.4 to 32.2ºC	621.806[2] (Null)	No	No	Network DAT reset setpoint input. Applies when the cooling reset select and heating reset select setpoint values are configured for network control.[3] See Selected I/O Parameters for details.
Duct Static Pressure Setpoint	nviDuctStaticSP	SNVT_press_p (113)	0 to 3 Inches	131.779[2] (Null)	No	No	Network DSP setpoint input. Applies when the local sensor is installed with a valid input and the unit fan control is configured for DSP.[3] See Selected I/O Parameters for details.
Occupancy Override Command	nviOccManCmd	SNVT_Occupancy (109)	0 = OC_Occupied 1 = OC_Unoccupied 2 = OC_Bypass 3 = OC_Standby -1 = OC_Nul	-1 = OC_Nul	No	No	Network command that overrides the existing unit occupancy mode.[2,3] See Selected I/O Parameters for details.
Occupancy Schedule Input	nviOccSchedule	SNVT_tod_event (128)	0 = OC_Occupied 1 = OC_Unoccupied 3 = OC_Standby -1 = OC_Nul	-1 = OC_Nul	No	No	Network occupancy schedule input that commands the unit to the desired occupancy mode.[2,3] See Selected I/O Parameters for details.
Occupancy Sensor Input	nviOccSensor	SNVT_Occupancy (109)	0 = OC_Occupied 1 = OC_Unoccupied -1 = OC_Nul	-1 = OC_Nul	Yes	No	Network command that indicates the presence of occupants in the space (motion detection.[2,3]) See Selected I/O Parameters for details. Note: Configuring this input to Null commands the unit controller to the default value, which sets the occupancy mode to the last selected value.
Network Outdoor Humidity Input	nviOutdoorRH	SNVT_lev_percent (81)	0 to 100%	163.835[2] (Null)	Yes	No	Enables the network to configure the effective outdoor humidity value.[3]

Table 12. Network Variable Inputs (NVIs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default[2]	Receive Heart-beat	Non-volatile Memory[1]	Description
Network Outdoor Air Temperature Input	nviOutdoorTemp	SNVT_temp_p (105)	-40 to 122°F -40 to 50°C	621.806[2] (Null)	Yes	No	Network setpoint input that is used to control the effective outdoor temperature instead of having input from a single sensor.[3]
Clear Alarm	nviResetAlarm	UNVT_Reset_Cmd	0 = RST_Dont_Reset 1 = RST_Reset -1 -RST_Nul	0 = RST_Dont_Reset	No	No	Network command that clears the current (active) alarm. Entering -1 = RST_NUL sends the default value to the unit controller. Aso see Alarms section.
Reset Filter	nviResetFilter	UNVT_Reset_Cmd (95)	0 = RST_Dont_Reset 1 = RST_Reset -1 -RST_Nul	0 = RST_Dont_Reset	No	No	Network command that clears the change filter alarm. Entering -1 = RST_NUL sends the default value to the unit controller. Aso see Alarms section.
Network Entering Water Temperature Input	nviSourceTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C	621.806[2] (Null)	Yes	No	Network-provided entering water temperature (EWT) input. It is used to set the effective EWT value. Applies when the value is valid and within the acceptable range. Otherwise, it reflects the local sensor with valid input.[3] See Selected I/O Parameters for details.
Network Space CO_2 Input	nviSpaceCO2	SNVT_ppm (29)	0 to 5000 ppm	32767 (Null)	Yes	No	Network-provided space CO_2 input. It is used to set the effective space CO_2 value. Applies when the value is valid and within the acceptable range. Otherwise, it reflects the local sensor with valid input.[3] See Selected I/O Parameters for details.
Network Space Humidity Input	nviSpaceRH	SNVT_lev_pct (81)	0 to 100%	163.835[2] (Null)	Yes	No	Network-provided space humidity input. It is used to set the effective indoor space humidity value. Applies when the value is valid and within the acceptable range. Otherwise, it reflects the local sensor with valid input.[3] See Selected I/O Parameters for details.
Network Space Temperature Input	nviSpaceTemp	SNVT_temp_p (105)	14 to 122°F -10 to 252°C	621.806[2] (Null)	Yes	No	Network-provided space temperature input. It is used to set the effective space temperature value. Applies when the unit fan control is configured for Network.[3] See Selected I/O Parameters for details.
Network Fan Speed Command	nviSupFanCap	SNVT_lev_percent (81)	0 to 100%	163.835[2] (Null)	Yes	No	Network command that configures the fan speed override. Applies when the unit fan control is configured for Network.[3] See Selected I/O Parameters for details.
Run Timer Reset	nviTimerReset	UNVT_Timer_Reset	0 = TMR_RST_None 1 = TMR_RST_Cmp1 2 = TMR_RST_Cmp2 3 = TMR_RST__Fan 4 = TMR_RST__All -1 = TMR_RST__Nul	0 = TMR_RST_None	No	No	Network command that clears the accumulated run time hours for compressor #1, compressor #2, supply fan, or for all simultaneously. It is intended to be used when replacing a fan or compressor(s).

[1] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Yes, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = No, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

[2] The Null value indicates that a sensor is not installed, the sensor is unreliable, or when the unit controller is not using a value within the acceptable range. The Null values provided in this table are displayed when using a LonWorks BAS or programming tool. The Null value of 32767 appears when using the Daikin ATS ServiceTools software.

[3] The network override reverts back to its default value (Null/Invalid) upon unit controller reset.

Table 13: Network Variable Outputs (NVOs)

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default	Receive Heart-beat	Non-volatile Memory[1]	Description
Discharge Air Temperature Reset	nvoAIDatReset	SNVT_volt (44)	0 to 10 Volts	3276.7[2] (Null)	No	No	Discharge air temperature (DAT) reset value. Applies when the unit DAT reset is configured for Analog Input (ai14) and the sensor is installed.[2,4] See Selected I/O Parameters for details.
Building Static Pressure	nvoBldgStatPress	SNVT_press_p (113)	-0.25 to 0.25 Inches -62.3 to 62.3 Pa	131.779[2] (Null)	Yes	No	The effective building static pressure (BSP) value. It reflects the local sensor input (including any calibration offsets). Otherwise, it reflects the network setpoint (nviBldgStaticSP). Applies when analog input (ai14) is configured for this sensor and when the unit is configured for BSP fan control.[2,4] See Selected I/O Parameters for details.
Brownout Detection	nvoBrownout	SNVT_count (8)	0 to 4095	0	No	No	Input value (in ADC counts) from the unit controller for the incoming line voltage. This value is used to determine if a brownout condition exists.
Compressor 1 Run Time	nvoComp1RunTime	SNVT_time_hour_p (-198)	0 to 300,000 Hours	0	No	Yes	Compressor 1 run hours (in tenths). It can be used to reset the run time after a new compressor has been added or replaced.
Compressor 2 Run Time	nvoComp2RunTime	SNVT_time_hour_p (-198)	0 to 300,000 Hours	0	No	Yes	Compressor 2 run hours (in tenths). It can be configured to reset the run time hours after a new compressor has been added or replaced.
Compressor 1 Starts	nvoComp1Starts	SNVT_count_32 (183)	0 to 300,000	0	No	Yes	The total number of compressor 1 starts.
Compressor 2 Starts	nvoComp2Starts	SNVT_count_32 (183)	0 to 300,000	0	No	Yes	The total number of compressor 2 starts.
Condensate Overflow Status	nvoCondOverflow	UNVT_Cond_Overflow	0 = COF_Dry 1 = COF_Wet -1 = COF_Nul	-1 = COF_Nul	No	No	The condensate overflow status. Applies when the local sensor is installed and configured with valid input.[2]

Table 13. Network Variable Outputs (NVOs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default	Receive Heart-beat	Non-volatile Memory[1]	Description
Current Alarm	nvoCurrentAlarm	UNVT_Alarms	0-44 See Description	0 = AL_ NoAlm	No	No	Displays the highest priority active alarm from the following alarm options: 0 = AL_NoAlm 1 = AL_HighP 2 = AL_LowP 3 = AL_LoSucLnT 4 = AL_FrzFlt 5 = AL_Shutdown 6 = AL_ChangeFlt 7 = AL_HiDSP 8 = AL_CondOvFlow 9= AL_LowEWT 10 = AL_Brownout 11 = AL_LoLCTTmp 12 = AL_HighDAT 13 = AL_HighSSH 14 = AL_LowSSH 15 = AL_HighDRT 16 = AL_HiCondSatTmp 17 = AL_LoCondSatTmp 18 = AL_HiEvpSatT 19 = AL_LoEvpSatT 20 = AL_HiCondSatT2 21 = AL_LoCondSatT1 22 = AL_Preheat 23 = AL_SpcLwtSens 24 = AL_DRTSens 25 = AL_FanSens 26 = AL_SuctTSens 27 = AL_PTSSens 28 = AL_PTDSens 29 = AL_IAHOAFlwSens 30 = AL_OutHumSens 31 = AL_LCTSens 32 = AL_OATSens 33 = AL_OilPurge 34 = AL_FactCfg 35 = AL_FanCfg 26 = AL_EWTSens 37 = AL_PhaseMon 38 = AL_OALock 39 = AL_DATSens 40 = AL_Defrost 41 = AL_ERecW 42 = AL_ERecF 43 = AL_CtrlB 44 = AL_LowDAT See Alarms section for complete list of alarms, priorities, and descriptions.
Discharge Air Temperature	nvoDischAirTemp	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	Yes	No	The discharge air temperature value provided by the local sensor (including any calibration offsets). Displays a Null value if no sensor is installed or is not functioning properly.[4]
Discharge Refrigerant Temperature	nvoDischRefTemp	SNVT_temp_p (105)	-40 to 260ºF -40 to 127ºC	621.806[2] (Null)	No	No	The discharge refrigerant coil temperature (DRT) value provided by the local sensor. Displays a Null value if no sensor is installed or is not functioning properly.[4]
Saturated Discharge Refrigerant Temperature (Tc)	nvoDischSatTemp	SNVT_temp_p (105)	-60 to 161ºF -51 to 71.2ºC	621.806[2] (Null)	No	No	The saturated discharge refrigerant temperature (Tc) used in the condenser temperature setpoint calculation. A fault alarm is generated when the Tc value is outside of the acceptable range. See Alarms section for details.
Duct Static Pressure	nvoDuctStatPress	SNVT_press_p (113)	0 to 3 Inches 0 to 745.8 pa	131.779[2] (Null)	No	No	The effective duct static pressure (DSP) input. It reflects the local sensor input. Otherwise, it reflects the network setpoint (nviDuctStaticSP), if available. Applies when analog input (ai14) is configured for this sensor and when the unit is configured for DSP fan control.[4] See Selected I/O Parameters for details.

Table 13. Network Variable Outputs (NVOs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default	Receive Heart-beat	Non-volatile Memory[1]	Description
Dewpoint	nvoDewpoint	SNVT_temp_p (105)	0 to 100°F -17.8 to 37.8°C	621.806[2] (Null)	No	No	The effective dewpoint value. It is used to determine proper unit mode. The effective dewpoint is calculated using the inputs for effective outdoor air temperature, relative humidity, and elevation.
Effective Occupancy	nvoEffectOccup	SNVT_Occupancy (109)	0 = OC_Occupied 1 = OC_Unoccupied 2 = OC_Bypass 3 = OC_Standby -1 - OC_Nul	-1 = OC_Nul	Yes	No	The effective occupancy unit mode. It is determined based on inputs from occupancy override, occupancy scheduler, an internal schedule, and/or an occupancy sensor. See Selected I/O Parameters section for details.
Effective Discharge Air Temperature Setpoint	nvoEffectSP	SNVT_temp_p (105)	50 to 80°F 10 to 26.7°C	621.806[2] (Null)	Yes	No	The effective discharge air temperature (DAT) setpoint value provided by the local sensor (including any calibration offsets) based on the current unit mode.[2,4] See Selected I/O Parameters for details.
Fan Reset	nvoFanReset	SNVT_volt (44)	0 to 10 Volts	32767[2] (Null)	No	No	The voltage used to determine the indoor fan control strategy. Applies when the unit is configured for Fan Reset (ai14) and sensor is installed.[2,4] See Selected I/O Parameters for details.
Fan Run Time	nvoFanRunTime	SNVT_time_hour_p (198)	0 to 300,000 Hours	0	No	Yes	The total fan run time in tenths of hours. The current fan run time reverts back to zero (0) hours after a new fan has been installed or replaced.
Filter Change Hours	nvoFltrChgHours	UCPTfiltrChgHours	0 to 300,000 Hours	0	No	Yes	Indicates how many hours the fan can run before a filter change is needed. A warning alarm is generated when the run time has exceeded this setpoint. The alarm is cleared using the clear filter input (nviResetFilter). See Alarms section for details.
Effective Heat/Cool	nvoHeatCool	SNVT_hvac_mode	0 = HVAC_Auto 1 = HVAC_Heat 3 = HVAC_Cool 6 = HVAC_Off 9 = HVAC_Fan_Only 14 = HVAC_Dehumid -1 = HVAC_Nul	-1 = HVAC_Nul	Yes	No	Reflects the unit mode of operation set from the room sensor. Applies if sensor is installed and configured correctly.
Leaving Coil Temperature Setpoint	nvoLCTSP	SNVT_temp_p (105)	28 to 80°F -2.2 to 26.7°C	621.806[2] (Null)	No	No	The leaving coil air temperature control setpoint. Used for economy and precision cooling and dehumidification mode determination.
Leaving Coil Temperature	nvoLCT	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	Yes	No	The leaving coil temperature value provided by the local sensor (including any calibration offsets). Applies when fan control method is set to BSP.[4]
Leaving Water Temperature	nvoLWT	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	No	No	The leaving water temperature value provided by the local sensor. Applies when analog input (ai4) is configured for LWT.[4] See Selected I/O Parameters for details.
Entering Water Temperature	nvoLocalEWT	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	No	No	The entering water temperature input provided by the local sensor (including any calibration offsets), if installed and configured with a valid value.[4]
Outdoor Relative Humidity	nvoLocalOARH	SNVT_lev_percent (81)	0 - 100%	163.835[2] (Null)	No	No	The outdoor relative humidity input provided by the local sensor (including any calibration offsets), if installed and configured with a valid value.[4]
Outdoor Air Temperature	nvoLocalOATemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C	621.806[2] (Null)	Yes	No	The outdoor air temperature sensor input (including any calibration offsets). It is used to set the effective outdoor air temperature value if the network outdoor air temperature input is valid.[4]

Table 13. Network Variable Outputs (NVOs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default	Receive Heart-beat	Non-volatile Memory[1]	Description
Setpoint Adjust	nvoLocalSetptAdj	SNVT_temp_p (105)	55 to 95ºF 12.8 to 35ºC	621.806[2] (Null)	No	No	The remote wall sensor setpoint adjustment input. This value is used to determine the effective heating and cooling setpoints. This point is currently not used.
Space CO_2	nvoLocalSpace CO2	SNVT_ppm (29)	0 to 5,000 ppm	32767[2] (Null)	No	No	The space CO_2 sensor input. It is used to set the effective space CO_2 value. Applies when analog input (ai14) is configured for this sensor.[4] See Selected I/O Parameters for details.
Space Relative Humidity	nvoLocalSpaceRH	SNVT_lev_percent (81)	0 to 100%	163.835[2] (Null)	No	No	The indoor relative humidity sensor input value. It reflects the network input (nviSpaceRH), if available. Otherwise, it reflects the local sensor input (including any calibration offsets). Applies when analog input (ai16) is configured for this sensor.[4] See Selected I/O Parameters for details.
Space Temperature	nvoLocalSpace Tmp	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	No	No	The effective space temperature value. It reflects the network space temperature input (nviSpaceTemp), if available. Otherwise, it reflects the local sensor input (including any calibration offsets). Applies when analog input (ai4) is configured for this sensor.[3,4] See Selected I/O Parameters for details.
Effective Outdoor Air Flow	nvoOAFlow	SNVT_flow (15)	0 to 5,000 CFM	32767[2]	Yes	No	The outdoor airflow value provided by the local sensor (including any calibration offsets). Applies when analog input (ai16) is configured for this sensor. See Selected I/O Parameters for details.
Effective Outdoor Humidity	nvoOutdoorRH	SNVT_lev_percent (81)	0 to 100%	163.835[2] (Null)	Yes	No	The outdoor relative humidity value. It reflects the network outdoor relative humidity input (nviOutdoorRH), if available. Otherwise, it reflects the local sensor input (including any calibration offsets). Applies when analog input (ai15) is configured for this sensor.[3,4] See Selected I/O Parameters for details.
Effective Outdoor Air Temperature	nvoOutdoorTemp	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	No	No	The outdoor air temperature value. It reflects the network outdoor air temperature input (nviOutdoorTemp) if available. Otherwise, it reflects the local sensor input (including any calibration offsets). Applies when analog input (ai9) is configured for this sensor.[3,4] See Selected I/O Parameters for details.

Table 13. Network Variable Outputs (NVOs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default[2]	Receive Heart-beat	Non-volatile Memory[1]	Description
Previous Alarm	nvoPreviousAlarm	UNVT_Alarms	0-44 See Description for list of all alarm enumerations	0 = AL_NoAlm	No	No	Displays the last active alarm from the following alarm options: 0 = AL_NoAlm 1 = AL_HighP 2 = AL_LowP 3 = AL_LoSucLnT 4 = AL_FrzFlt 5 = AL_Shutdown 6 = AL_ChangeFlt 7 = AL_HiDSP 8 = AL_CondOvFlow 9= AL_LowEWT 10 = AL_Brownout 11 = AL_LoLCTTmp 12 = AL_HighDAT 13 = AL_HighSSH 14 = AL_LowSSH 15 = AL_HighDRT 16 = AL_HiCondSatTmp 17 = AL_LoCondSatTmp 18 = AL_HiEvpSatT 19 = AL_LoEvpSatT 20 = AL_HiCondSatT2 21 = AL_LoCondSatT1 22 = AL_Preheat 23 = AL_SpcLwtSens 24 = AL_DRTSens 25 = AL_FanSens 26 = AL_SuctTSens 27 = AL_PTSSens 28 = AL_PTDSens 29 = AL_IAHOAFlwSens 30 = AL_OutHumSens 31 = AL_LCTSens 32 = AL_OATSens 33 = AL_OilPurge 34 = AL_FactCfg 35 = AL_FanCfg 26 = AL_EWTSens 37 = AL_PhaseMon 38 = AL_OALock 39 = AL_DATSens 40 = AL_Defrost 41 = AL_ERecW 42 = AL_ERecF 43 = AL_CtrlB 44 = AL_LowDAT See Alarms section for complete list of alarms, priorities, and descriptions.
Effective Discharge Refrigerant Pressure	nvoRefDischP	UNVT_Pressure	0 to 700 psi 0 to 4826 kPa	4752.53[2] (Null)	No	No	The discharge refrigerant pressure value provided by the local sensor.
Effective Suction Refrigerant Pressure	nvoRefSuctionP	UNVT_Pressure	0 to 300 psi 0 to 2068 kPa	4752.53[2] (Null)	No	No	The discharge suction pressure value provided by the local sensor.
Effective Space CO_2	nvoSpaceCO2	SNVT_ppm (29)	0 to 5,000 ppm	32767[2] (Null)	No	No	The indoor space CO_2 value. It reflects the network input (nviSpaceCO2), if available. Otherwise, it reflects the local sensor input (including any calibration offsets). Applies when analog input (ai14) is configured for this sensor.[4] See Selected I/O Parameters for details.
Effective Space Humidity	nvoSpaceRH	SNVT_lev_percent (81)	0 to 100%	163.835[2] (Null)	Yes	No	The indoor relative humidity value. It reflects the network space relative humidity input (nviSpaceRH), if available. Otherwise, it reflects the local sensor input. Applies when analog input (ai16) is configured for this sensor.[2,4] See Selected I/O Parameters for details.
Effective Entering Water Temperature	nvoSourceTemp	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	No	No	The entering water temperature (EWT) value. It reflects the network EWT input (nviSourceTemp), if available. Otherwise, it reflects the local sensor input.[2,4]

Table 13. Network Variable Outputs (NVOs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default	Receive Heart-beat	Non-volatile Memory[1]	Description
Effective Space Temperature Output	nvoSpaceTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C	621.806[2] (Null)	Yes	No	The space temperature value. It represents the network space temperature input (nviSpaceTemp), if available. Otherwise, it reflects the local sensor input (including any calibration offsets). Applies when analog input (ai4) is configured for this sensor.[2,4] See Selected I/O Parameters for details.
Pump Request	nvoPumpRequest	UNVT_Pump_ Request	0 = PR_Inactive 1 = PR_Active	0 = PR_ Inactive	No	No	The status of the pump/motorized valve output. Indicates when the unit is requesting flow from the main water loop. The loop pump must be running to provide adequate flow through the unit so the compressor(s) can operate safely.
Suction Saturated Temperature	nvoSuctSatTemp	SNVT_temp_p (105)	-40 to 107ºF -40 to 41.2ºC	621.806[2] (Null)	No	No	The compressor saturated suction line temperature value. This value is used in conjunction with compressor staging to set the superheat setpoint.
Suction Refrigerant Temperature	nvoSuctRefTemp1	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC	621.806[2] (Null)	No	No	The compressor suction refrigerant line temperature value provided by the local sensor. For heat pump applications, the compressor suction line temperature is equal to the indoor coil temperature.
Unit State	nvoUnitState	UNVT_Unit_State	0-17 See Description for list of possible unit state conditions	0 = US_ Power_Up	No	No	Reflects the current unit operating state from the following options: 0 = US_Power_Up 1 = US_US_Initialize 2 = US_Calibration 3 = US_Off 4 = US_Start 5 = US_Fan_Only 6 = US_Prepare_Clg 7 = US_Cooling 8 = US_Prepare_Dehum 9 = US_Dehumidification 10 = US_Prepare_Htg 11 = US_Heating 12 = US_Defrost 13 = US_Alarm 14 = US_Alarm_Off 15 = US_Comp_Shutdown 16 = US_Imm_Shutdown 17 = US_Vacuum_Mode
Unit Status Mode	nvoUnitStatus. mode	SNVT_hvac_status (112)	0 = HVAC_Auto 1 = HVAC_Heat 3 = HVAC_Cool 5 = HVAC_Pre_Cool 6 = HVAC_Off 9 = HVAC_Fan_Only 14 = HVAC_Dehum 15 = HVAC_ Calibrate	0 = HVAC_ Auto	Yes	No	Reflects the current unit mode.
Unit Status - Cooling Output	nvoUnitStatus.cool _output	SNVT_hvac_status (112)	0 to 100%	0	Yes	No	Reflects the cooling output capacity by compressor stage. Cooling uses the same % output by stage as heating. See nvo.UnitStatus.heat_ output_primary below for reference.
Unit Status - Fan Output	nvoUnitStatus.Fan_ Output	SNVT_hvac_status (112)	0 to 100%	0	Yes	No	Reflects the indoor fan speed output.
Unit Status - Primary Heating Output	nvoUnitStatus.heat_ output_primary	SNVT_hvac_status (112)	0 to 100%	0	Yes	No	Reflects the heating output capacity by compressor stage. The percentage of heating capacity for each stage is as follows: Stage 1: 27% Stage 2: 40% Stage 3: 51% Stage 4: 59% Stage 5: 67% Stage 6: 80% Stage 7: 87% Stage 8: 100%

Table 13. Network Variable Outputs (NVOs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default	Receive Heart-beat	Non-volatile Memory[1]	Description
Unit Status - Secondary Heating Output	nvoUnitStatus.heat_output_secondary	SNVT_hvac_status (112)	0 to 100%	0%	Yes	No	Reflects the electric/hot water preheat output capacity by compressor stage. It is either 0% = Off or 100% = On.
Unit Status - In Alarm	nvoUnitStatus.in_alarm	SNVT_hvac_status (112)	0-44 See Description	0 = NoAlm	Yes	No	The status of the current alarm state. See nvoCurrentAlarm and also Alarms section for complete list of alarms, priorities, and descriptions.

[1] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Y, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = N, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

[2] The Null value indicates that a sensor is not installed, the sensor is unreliable, or when the unit controller is not using a value within the acceptable range. The Null values provided in this table are displayed when using a LonWorks BAS or programming tool. The Null value of 32767 appears when using the Daikin ATS ServiceTools software.

[3] The space temperature sensor includes a tenant override button. When the tenant override button is pressed and not active, the parameter *aiSpaceTemp* is used for control. When the unit is not in tenant override, space temperature control defaults to *hardwareSpaceTemp*, which must maintain its previous value for up to 30 seconds.

[4] The network override reverts back to its default value (Null/Invalid) upon unit controller reset.

Configurable Network Variable Outputs (nvos)

The unit controller has a special set of dedicated and configurable I/O that are available to the LonWorks network as nvo variable types (Table 14 and Table 15). Refer to the Selected I/O Parameters section for more information about these and other field-configurable options.

Table 14: Configurable Binary Inputs

LonWorks NVO Variable	Input Designation	Description	Input Type
nvoBI1	BI-1	High Pressure	24 VAC
nvoBI2	BI-2	Freeze Stat	24 VAC
nvoBI3	BI-3	Low Pressure/Phase Monitor	24 VAC
nvoBI4	BI-4	None	24 VAC
nvoBI5	BI-5	Dirty Filter	Dry Contact
nvoBI6	BI-6	Energy Recovery Feedback	Dry Contact
nvoBI7	BI-7	Unoccupied	24 VAC
nvoBI8	BI-8	Shutdown	Dry Contact

Table 15: Configurable Binary Outputs

LonWorks NVO Variable	Output Designation	Description	Output Type
nvoBO1	DO-1	Fan Enable	24 VAC
nvoBO2	DO-2	Crank Case Heater	24 VAC
nvoBO3	DO-3	Not Used	24 VAC
nvoBO4	DO-4	Reversing Valve[1]	24 VAC
nvoBO5	DO-5	Fault Output	24 VAC
nvoBO6	DO-6	Energy Recovery Enable	24 VAC
nvoBO7	DO-7	Outside Air Damper	24 VAC
nvoBO8	DO-8	Water Loop Pump Request / Isolation Valve	Nornally open or normally closed
nvoBO9	DO-9	Compressor 1 Low	Dry contact
nvoBO10	DO-10	Compressor 1 High	Dry contact
nvoBO11	DO-11	Compressor 2 Low	Dry contact
nvoBO12	DO-12	Compressor 2 High	Dry contact
nvoBO13	DO-13	Preheat Enable	Dry contact
nvoBO14	DO-14	None[1] (Default)	Dry contact

[1] Additional configurations are available with proper access from the LUI keyppad/display or ServiceTools: Fan Out, Crank Case Heater, Reversing Valve, Fault Output, Energy Recovery Enable, Outside Air Damper, Pump Request/Isolation Valve, Comp 1 Low, Comp 1 High, Comp 2 Low, Comp 2 High, PreHeat

Table 16: Network Configuration Inputs (NCIs)

Point Name	LonWorks Parameter Name	UCPT/SCPT	Range (in Units)	Default[3]	Receive Heart-beat	Non-volatile Memory[1]	Description[2]
Airflow Setpoint	nciACFM	UCPTaCFM	0 to 5000 CFM	1000 CFM	No	Yes	The outdoor airflow sensor setpoint. This value is used to determine the PWM (pulse width modulating) fan output. Applies only to constant fans.[4] Note: Actual cubic feet per minute (ACFM) is a unit of volumetric flow. It is the actual volume of air delivery relative to the current PWM fan inlet conditions.
Building Static Pressure Setpoint	nciBldgStaticSP	SCPTbuildingStatic PressureSetpoint	-0.25 to 0.25 Inches	0.1 Inch	No	Yes	The building static pressure (BSP) sensor setpoint. Applies when the unit is configured for BSP fan control.
Brownout Reference Setpoint	nciBrownoutRef	UCPTbrownOutRef	0 to 4095	2775	No	Yes	The reference setpoint (in ADC counts) from the unit controller for the incoming line voltage. This value determines if a brownout or overvoltage condition exists. An alarm is generated when the line voltage is less than 80% of this setpoint. Contact Daikin ATS Technical Response for assistance with calibration. Also verify that the unit controller 24 VAC voltage is within normal operating parameters.
Bypass Time	nciBypassTime	SCPTbypassTime (34)	0 to 480 Minutes	120 Minutes	No	Yes	The amount of time the unit is allowed to continue operating when the tenant override button is pressed during an unoccupied period. Applies to units with an optional wall-mounted room temperature sensor with timed override button.
Minimum Cooling Discharge Air Temperature Reset Setpoint	nciClgMinDATRst	UCPTclgMinDATRst	50 to 60°F 10 to 15.5°C	60°F 15.5°C	No	Yes	The minimum cooling discharge air temperature (DAT) reset setpoint value.[3] Applies when the cooling reset select and heating reset select setpoint values are within the valid range.
Leaving Coil Temperature Cooling Setpoint	nciDAClSP	SCPTdischargeAir CoolingSetpoint	45 to 75ºF 7.2 to 24ºC	65ºF 18.3ºC	No	Yes	The leaving coil temperature (LCT) setpoint. This value controls compressor staging when the unit is in cooling mode.
Discharge Air Temperature Heating Setpoint	nciDAHtSP	SCPTdischargAir HeatingSetpoint	55 to 80ºF 12.8 to 27ºC	70ºF 21ºC	No	Yes	The heating discharge air temperature (DAT) setpoint. This value is used when the unit is in heating mode.
Discharge Air Temperature High Limit Setpoint	nciDATHighLimit	UCPTdatHighLimit	80 to 135°F 26.7 to 57.2°C	110°F 43.3°C	No	Yes	The discharge air temperature (DAT) maximum value. The compressors shut off when the unit reaches the DAT low limit setpoint.
Dehumidification Enable	nciDehumEnable	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null (Enable)	2 = Null (Enable)	No	No	(Future) Enables the unit to enter the dehumidification state. Not currently used. **Condition / Value / State** 0 = Disable 0 0 1 = Enable 100 1 2 = Null/Enable* 0 -1 *2 = Null allows automatic mode determination and enables dehumidification. Reverts to Null after unit controller reset.
Device Software Identification (Major Version)	nciDevMajVer	SCPTdevMajVer (165)	0 to 99	NA	No	Yes	The software version number of the LonWorks communication module (device) firmware. It reflects the “VV” portion of the full LonWorks software text string (see nciLonSoftNum). Read-only.
Device Software Identification (Minor Version)	nciDevMinVer	SCPTdevMinVer (166)	0 to 9	NA	No	Yes	The software revision number of the LonWorks communication module (device) firmware. It reflects the “R” portion of the full LonWorks software text string (see nciLonSoftNum). Read-only.

Table 14. Network Configuration Inputs (NCIs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default[3]	Receive Heart-beat	Non-volatile Memory[1]	Description[2]
Dewpoint Setpoint	nciDewpointSP	UCPTdewpointSP	45 to 60°F 7.2 to 15.6°C	55°F 12.8°C	No	Yes	The dewpoint temperature setpoint. The unit enters dehumidification mode when the calculated outdoor dewpoint is above this value.
Duct Static Pressure Setpoint	nciDuctStatSP	SCPTductStatic PressureSetpoint	0 to 3 Inches	1 Inch	No	Yes	The duct static pressure (DSP) setpoint value. Applies when the unit fan control is configured for DSP. It is also used for compressor staging in the dehumidification mode.
Elevation	nciElevation	UCPTelevation	0 to 21,499 Feet	21501 (Null)[3]	No	No	The elevation (in feet above sea level) of the unit's physical location. The elevation is used to calculate dewpoint and fan output.
Fan Control Type	nciFanCtrlMethod	UCPTfanCtrlMethod	0 = FCM_Const 1 = FCM_DSP 2 = FCM_BSP 3 = FCM_CO2 4 = FCM_AI_Reset 5 = FCM_Network -1 = FCM_Nul*	0 = FCM_ Const	No	Yes	Sets fan speed control strategy to one of the following methods. *Entering a Null value (-1 = FCM_ Nul) resets the unit to the default.
Fan On Delay Timer	nciFanOnDelayTm	UCPTfanOnDelayTm	1 to 300 Seconds	10 Seconds	No	Yes	The amount of time needed before the outdoor air damper opens prior to turning on the fans. The delay timer allows for fan stabilization upon initial unit start-up.
Filter Change Hours Enable	nciFltrChgEnable	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null (Enable)	0 = Disable	No	No	Enables the change filter alarm. It is used in conjunction with Filter Change Hours (nvoFltrChgHours.) **Condition / Value / State** 0 = Disable 0 0 1 = Enable 100 1 2 = Null/Enable 100 -1
Filter Change Hours Setpoint	nciFltrChgHours	UCPTFltrChgHrs	50 to 2,000 Hours	700 Hours	No	Yes	The setpoint that determines the maximum amount of time the fan should run before generating a dirty filter alarm.[4] See Alarms section for details.
Maximum Heating Discharge Air Temperature Reset Setpoint	nciHtgMaxDATRst	UCPThtgMaxDATRst	70 to 90°F 21.1 to 32.2°C	70°F 21.1°C	No	Yes	The maximum heating discharge air temperature (DAT) reset setpoint.
Leaving Coil Temperature Low Limit	nciLCTLowLimit	UCPTlctLowLimit	30 to 40°F -1.1 to 4.4°C	32°F 0°C	No	Yes	The leaving coil temperature (LCT) minimum value. The compressors shut off when the unit reaches the LCT low limit setpoint.
Location	nciLocation	SCPTlocation (17)	30 Characters	Text String	No	No	Describes the physical location of the unit. The user-defined description can be set through the network, ServiceTools software, or local LUI keypad display.
LonWorks Software Part Number	nciLonSoftNum	UCPTlonSoftNum	10 Characters	2507461010 (Text String)	No	Yes	The LonWorks communication module (device) software part number. This text string is sent to the unit controller and is read-only from the network. It is defined as follows: NNNNNNNVVR N = Base part number V = Version number R = Revision number
Entering Water Temperature Heating Lockout - Glycol	nciLowEwtSptGly	UCPTlowEWTSptGly	0 to 70°F -17.8 to 21.1°C	15°F -9.4°C	No	Yes	Disables heating when the entering water temperature drops below this setpoint. Applies when the water loop type is configured for glycol.
Entering Water Temperature Heating Lockout - Water	nciLowEwtSptWtr	UCPTlowEwtSptWtr	10 to 212°F -12.2 to 100°C	30°F -1.1°C	No	Yes	Disables heating when the entering water temperature drops below this setpoint. Applies when the water loop type is configured for water.

Table 14. Network Configuration Inputs (NCIs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default[3]	Receive Heart-beat	Non-volatile Memory[1]	Description[2]
Suction Refrigerant Temperature Low Limit- Water	nciLowTempProt	UCPTloTempProtGL	0 to 35ºF -17.8 to 10ºC	28ºF -2.2ºC	No	Yes	The suction refrigerant temperature (SRT) low limit setpoint value. An alarm is generated when the SRT is below this setpoint. Applies when the unit is configured for a water loop. *This setpoint should only be adjusted by a qualified technician after consulting Daikin ATS Technical Response.*
Suction Refrigerant Temperature Low Limit- Glycol	nciLoTempProtGL	UCPTloTempProtGL	0 to 35ºF -17.8 to 10ºC	6.5ºF -14.2ºC	No	Yes	The suction refrigerant temperature (SRT) low limit setpoint. An alarm is generated when the SRT is below this setpoint. Applies when the water loop is configured for glycol. *This setpoint should only be adjusted by a qualified technician after consulting Daikin ATS Technical Response.*
Suction Refrigerant Temperature Low Differential	nciLowTmpProtDif	UCPTlowTmpProtDif	2 to 15ºF -16.7 to -9.4ºC	8ºF -13.3ºC	No	Yes	The temperature differential value that generates an alarm when either: 1. The unit is configured for a water loop and the suction refrigerant temperature (SRT) is below the low SRT setpoint (28˚F) 2. The unit is configured for glycol and the SRT is below the low SRT setpoint (6.5˚F) This indicates that a potential freeze condition can occur. The alarm clears automatically when the suction refrigerant temperature exceeds the setpoint by 4˚F. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset.
Compressor Minimum Off Time	nciMinCompOffTmr	UCPTminCompOffTmr	300 to 600 Seconds	300 Seconds	No	Yes	The minimum amount of time the compressor must be off before it can be started again.
Compressor Minimum On Time	nciMinCompOnTmr	UCPTminCompOnTmr	60 to 600 Seconds	180 Seconds	No	Yes	The minimum amount of time the compressor must run before it can be turned off.
Minimum Fan On Time	nciMinFanOnTm	UCPTMinFanOnTm	0 to 60 Seconds	60 Seconds	No	Yes	The amount of time the fan must remain at partial speed before the unit leaves the Start mode. This allows the outdoor air damper sensor enough time to capture an accurate reading.
Minimum Send Time	nciMinOutTm	SCPTminSendTime (24)	0 to 6553 Seconds	0 Seconds	No	Yes	Defines the minimum amount of time that must pass before a LonWorks network variable output (nvo) can be sent. It limits network traffic when output network variables are frequently changing. The value of 0 disables the timer.
Outdoor Air Damper Lockout Enable	nciOALockoutEn	UCPToaLockout Enbl	0 = Disable 1 = Enable	0 = Disable	No	Yes	Enables the outdoor air damper to close on lockout when the outdoor air temperature is below the OA lockout setpoint (nciOALockoutSetp). **Condition / Value / State** 0 = Disable / 0 / 0 1 = Enable / 100 / 1 -1 = Null / 0 / -1 Note that -1 = Nul sets the input to the default and disables the outdoor air damper from closing on lockout.
Outdoor Air Temperature Cooling Setpoint	nciOATClgSP	UCPToatClgSp	65 to 80ºF 18.3 to 27ºC	80ºF 27ºC	No	Yes	The outside air temperature (OAT) cooling change-over setpoint. The unit enters cooling mode when the OAT is above this value.

Table 14. Network Configuration Inputs (NCIs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default[3]	Receive Heart-beat	Non-volatile Memory[1]	Description[2]
Outdoor Air Temperature High Lockout Setpoint	nciOATHiLkSP	UCPToatHiLkSP	80 to 120°F 26.7 to 48.9°C	115°F 46.1°C	No	Yes	The outdoor air high lockout setpoint. When OA lockout has been enabled, the unit is disabled when the OAT rises above this setpoint. The unit is not allowed to resume normal operation until the OAT drops below this setpoint plus a 1°F differential.
Outdoor Air Temperature Heating Setpoint	nciOATHtgSP	UCPTOATHtgSP	55 to 70ºF 12.8 to 21ºC	55ºF 12.8ºC	No	Yes	The outdoor air temperature (OAT) heating change-over setpoint. The unit enters heating mode when the OAT is below this value. When in heating mode, compressor staging is based on the discharge air temperature (DAT).
Outdoor Air Temperature Low Lockout Setpoint	nciOATLoLkSP	UCPToatLoLkSP	-20 to 20°F -28.9 to -6.7°C	0°F -17.8°C	No	Yes	Prevents the outdoor air damper from opening when the outdoor air temperature drops below this setpoint. The unit is not allowed to resume normal operation until the OAT rises above this setpoint plus a 1°F differential.
Receive Heartbeat	nciRcvHrtBt	SCPTmaxRcvTime (48)	0 to 6553 Seconds	0 Seconds (Disabled)	No	Yes	The Receive Heartbeat timer. If a network variable input (nvi) value has not been received within this amount of time, the present value reverts back to the network default. The value of 0 disables this feature.
Discharge Air Temperature Reheat Setpoint	nciReheatDATSP	SNVT_temp_p (105)	40 to 80°F 4.4 to 26.7°C	70°F 21.1°C	No	Yes	The discharge air temperature reheat setpoint. This value is used when the unit is in the dehumidification mode.
Cooling Method	nciSetpMeth	UCPTsetpointMethod	0 = SPM_Economy 1 = SPM_Precision 2 = SPM_Dehum -1 = SPM_Nul	0 = SPM_ Economy	No	Yes	Configures the unit for economy cooling, precision cooling, or dehumidification. 0 = SPM_Economy (Cooling is controlled to meet DAT using the leaving coil temperature (LCT) setpoint) 1 = SPM_Precision (Cooling is controlled using the modulating hot gas reheat valve (MHGR) to control to the DAT setpoint) 2 = SPM_Dehum (The unit is always in dehumidification mode when cooling is required) -1 = SPM_Nul (Returns the unit to the default of Economy Cooling)
Send Heartbeat	nciSndHrtBt	SCPTmaxSendT (22)	0 to 6553 Seconds	0 Seconds (Disabled)	No	Yes	The Send Heartbeat timer. If a network variable output (nvo) has not been sent within this amount of time, then the network value is manually transmitted. The value of 0 disables this feature.
Trend Rate	nciTrendRate	UCPTtrendRate	0 = TR_None 1 = TR_Occ_Chg 2 = TR_1_Min 3 = TR_10_Min 4 = TR_Hourly 5 = TR_Daily -1 = TR_Nul	0 = TR_None	No	Yes	Defines how frequent trending-supported parameters are recorded. Data is captured in a .csv file type and saved to an external SD card. See the SmartSource DOAS WSHP Unit Controller OM 1308 for more information about trending. 0 = None (No trend data recorded) 1 = OccChange (Trend data recorded when unit transitions from an occupied to unoccupied mode, or vice versa) 2 = 1Minute (Trend data recorded once every 60 seconds) 3 = 10Min (Trend data recorded once every ten minutes) 4 = Hourly (Trend data recorded once per hour) 5 = Daily (Trend data recorded once every 24 hours) -1 = Null (Saves the trend rate back to the default)

Table 14. Network Configuration Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range (in Units)	Default[3]	Receive Heart-beat	Non-volatile Memory[1]	Description[2]
Unit Application Identification (Major Version)	nciUnitAppVer.major	SNVTUnitAppVer. major	0 to 100 (Text String)	1	No	Yes	The major version of the unit controller software. It reflects the "VV" portion of the full text string (VV.R.B). Read-only from the network.
Unit Application Identification (Minor Version)	nciUnitAppVer.minor	SNVTUnitAppVer. minor	0 to 99 (Text String)	1	No	Yes	The minor version of the unit controller software. It reflects the "R" portion of the full text string (VV.R.B). Read-only from the network.
Unit Application Identification (Build Version)	nciUnitAppVer.build	SNVTUnitAppVer. minor	0 to 255 (Text String)	0	No	Yes	The build version of the unit controller software. It reflects the "B" portion of the full text string (VV.R.B). Read-only from the network.
Unit Application Software Number	nciUnitSoftNum	UCPTUnitSoftNum	10 Characters (Text String)	2507460011	No	Yes	The software number of the unit controller application. This text string gets passed to the LONWORKS communication module (device). Read-only from the network. The text string is defined as follows: NNNNNNNVVR N = Base part number V = Version number R = Revision number

[1] Parameter is stored in FLASH/EEPROM (non-volatile memory) in either the communication module or in the unit controller. If Non-volatile Memory = Yes, then the value is saved through a power cycle. Writes to this parameter must be limited. If Non-volatile Memory = No, the value is not saved through a power cycle. Non-volatile parameters are saved every 20 minutes.

[2] Other than those noted, nci parameters are network-configurable. They can also be changed locally from the LUI keypad display or ServiceTools software.

[3] The Null value indicates that a sensor is not installed, the sensor is unreliable, or when the unit controller is not using a value within the acceptable range. The Null values provided in this table are displayed when using a LonWorks BAS or programming tool. The Null value of 32767 appears when using the Daikin ATS ServiceTools software.

Additional Analog and Binary I/O

The unit controller has a special set of discrete and configurable I/O parameters not covered elsewhere in this guide. These parameters are supported by both the BACnet and Lonworks BAS but have different configuration options as described in this section.

- **Configurable Analog Inputs AI4, AI14, and AI16** support more than one configuration parameter input (i.e. sensor). Available when the respective input has been configured and is active or enabled - Table 17
- **Discrete (Dedicated) Binary Inputs BI1-BI8** are active when the parameter dedicated to that input has been configured - Table 18
- **Discrete (Dedicated) Binary Outputs DO1-DO8** are available when the configurable parameter dedicated to that BI is active or enabled - Table 19
- **Configurable Binary Outputs DO3 and DO14** support more than one configuration parameter output. Available when the respective binary input has been configured and is active or enabled - Table 19

These parameters, and any applicable offsets, are accessed from the LUI keypad display and ServiceTools software with valid user level access.

The appropriate sensor must be installed. If a sensor is replaced, changed, or if the unit controller is replaced in the field, the parameter must be re-configured from the LUI keypad display or ServiceTools software before network access is possible.

Refer to MicroTech DOAS WSHP, OM 1308 for more information about unit controller configuration from the LUI keypad display. Also refer to Refer to ServiceTools User Manual, OM 732 (www.DaikinApplied.com).

NOTE: The following I/Os parameters are read-only from the BAS.

Table 17: Configurable Analog Inputs

Analog Input		Configurable Parameters[2]	BACnet Objects	LonWorks Variables	Description[1]
AI4	Space Temp	SpaceTemp (Default)	LocalSpaceTemp (AI:1)	nvoLocalSpaceTmp	Factory-wired and configured for 10k Type II sensor input
		LWT (Leaving Water Temp)	LWT (AI:2)	nvoLWT	
		None			
AI14	None	None (Default)			Factory-wired and configured for 10k Type II sensor input
		aiDSP (Duct Static Pressure)	DuctStatPress (AV:6)	nvoDuctStatPress	
		aiBSP (Building Static Pressure)	BldgStatPress (AI:20)	nvoBldgStatPress	
		aiCO2	LocalCO2 (AI:12)	nvoLocalSpaceCO2	
		aiReset (Fan Reset)	LocalAIReset (AI:28)	nvoFanReset	
		aiDATReset (DAT Reset)	LocalAiDatReset (AV:158)	nvoDATReset	
AI16	None	None (Default)			Factory-wired and configured for 0-10 VDC sensor input
		HumIn (Indoor Humidity)	LocalIndoorRH (AI:11)	nvoLocalSpaceRH	
		OAFlow (Outdoor Air Flow)	OAFlow (AV:42)	nvoOAFlow	
		aiDATReset (DAT Reset)	LocalAiDatReset (AV:158)	nvoDATReset	

[1]If an analog parameter is not configured for a sensor input, then it defaults to an invalid value of 32767.
[2]Parameter can be configured for multiple sensor types. These parameters are changed using the LUI keypad/display or ServiceTools software using the applicable physical input, which can then be accessed via the BAS.

Table 18: Discrete Binary Inputs

Binary Input		Configurable Parameters[2]	BACnet Object	LonWorks Variable	Description
BI-1	High Pressure[1]	biHighPressure	BI:1	nvoBI1	24 VAC sensor input
BI-2	Freeze Stat	biFreezeStat	BI:2	nvoBI2	24 VAC sensor input
BI-3	Phase Monitoring/ Low Pressure[4]	biLoPress-PM	BI:3	nvoBI3	24 VAC sensor input
BI-4	None (Not Used)	NA	BI:4	nvoBI4	24 VAC sensor input
BI-5	Dirty Filter	biDirtyFilter	BI:5	nvoBI5	Dry contact discrete input provided by field-installed dirty filter differential pressure switch
BI-6	Energy Recovery	biERFbk	BI:6	nvoBI6	Dry contact discrete input provided by field-installed energy recovery feedback switch
BI-7	Unoccupied[3]	biUnoccupied	BI:7	nvoBI7	24 VAC discrete input provided by field-installed room sensor occupancy switch
BI-8	Shutdown	biShutdown	BI:8	nvoBI8	Dry contact discrete input provided by field-installed emergency stop switch

[1] High pressure and low pressure/phase monitor safety inputs are interlocked with compressor outputs.
[2] This column refers to parameter inputs that can be configured for multiple input types. These parameters are changed using the LUI keypad/display or ServiceTools software using the applicable physical input, which can then be accessed via the BAS.
[3] When adjusting the controller's internal schedule, it is generally recommended that binary inputs are not set to Unoccupied as this may cause a conflict.
[4] Shared input for phase monitoring and low pressure switch.

Table 19: Discrete and Configurable Binary Outputs

Binary Output		Configurable Parameters	BACnet Object	LONWORKS Variable	Description[1]
DO1	Fan Enable	boFanOutput	BO:1	nvoBO1	Discrete (dedicated) 24 VAC fan output
DO2	Crank Case Heater	boCCHeat1	BO:2	nvoBO2	24 VAC output is enabled if both compressors are off
DO3[1]	bo3	None (Default)	BO:3	nvoBO3	24 VAC reversing valve output
	Fan Output	boFanOutput			
	Crank Case Heater	boC1Heater			
	Reversing Valve	boReversingValve			
	Fault Output	boFaultOut			
	Energy Recovery Enable	boEREnable			
	Outside Air Damper	boOADamper			
	Pump Request / Isolation Valve	boPump			
	Compressor 1 Low	boC1Low			
	Compressor 1 High	boC1high			
	Compressor 2 Low	boC2Low			
	Compressor 2 High	boC2High			
	PreHeat	boPreHeat			
DO4	Not Used	boReversingValve	BO:4	nvoBO4	24 VAC reversing valve output
DO5	Fault Output	boFaultOut	BO:5	nvoBO5	24 VAC output can be configured for Fault or Fault/Problem
DO6	Energy Recovery Enable	boEREnable	BO:6	nvoBO6	24 VAC energy recovery enable output
DO7	Outside Air Damper	boOADamper	BO:7	nvoBO7	24 VAC outside air damper output
DO8	Water Loop Pump Request / Isolation Valve	boPump	BO:8	nvoBO8	NC or NO output for water loop pump request or isolation valve
DO9	Compressor 1 Low	boC1Low	BO:9	nvoBO9	Dry contact (D09-D11) common output for compressors
DO10	Compressor 1 High	boC1High	BO:10	nvoBO10	
DO11	Compressor 2 Low	boC2Low	BO:11	nvoBO11	
DO12	Compressor 2 High	boC2High	BO:12	nvoBO12	Dry contact (DO12-DO14) common output
DO13[1]	Preheat	boPreheat (Default)	BO:13	nvoBO13	
		None			
DO14[1]	bo14_Virtual	None (Default)	BO:14	nvoBO14	24 VAC reversing valve output
	Fan Output	boFanOutput			
	Crank Case Heater	boC1Heater			
	Reversing Valve	boReversingValve			
	Fault Output	boFaultOut			
	Energy Recovery Enable	boEREnable			
	Outside Air Damper	boOADamper			
	Pump Request / Isolation Valve	boPump			
	Compressor 1 Low	boC1Low			
	Compressor 1 High	boC1high			
	Compressor 2 Low	boC2Low			
	Compressor 2 High	boC2High			
	PreHeat	boPreHeat			

[1]Binary output can be configured for multiple sensor types. The parameter input/output can be changed using the LUI keypad/display or ServiceTools software using the applicable physical input, which can then be accessed via the BAS.

Alarm Management

The MicroTech unit controller has various ways of monitoring, acknowledging, and clearing alarms. Alarms can be managed from the LUI keypad display, ServiceTools software, and the BAS network. Table 17 displays all alarms supported by the unit controller for both BACnet and LonWorks networks.

Alarm Class and Priority

Alarms in the MicroTech controller are organized by Fault, Problem, or Warning alarm class. See Table 18 - Table 20.

Table 17 lists all alarms sorted by index number. The alarm (index) number is mapped to the network. For BACnet, no alarm = 1 and for LonWorks, no alarm = 0. If more than one alarm is currently active, the alarm number indicates the highest active alarm.

Fault Alarms

Fault alarms have the highest priority. Faults are conditions that are serious enough to completely shut down the unit. In this case, the Unit State parameter indicates *OffAlm.* The alarm condition must be corrected and the alarm cleared before unit operation can resume. When the alarm binary output (*cpAlarmBOut)* is configured and Fault conditions occur, an alarm is activated.

Some fault alarms must be cleared manually while others must be cleared manually after a third occurrence in 7 days. There are others that clear automatically when conditions return to normal. These conditions are noted next to each fault alarm in both Table 17 and Table 18.

Problem Alarms

Problem alarms have the next highest priority. Problem alarms do not cause unit shutdown but do limit operation of the unit in some way. When the configuration parameter *cfgAlmBOut* is set to *FltProb* and a Problem occurs, the Fault binary output is activated. Some of these alarms must be cleared manually, others clear automatically when conditions return to normal.

Warning Alarms

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

Alarm Monitoring

BACnet

Alarms are monitored using the *CurrentAlarm* (MSV:11) object. When an alarm becomes active, it is added to the list according to its priority, and when an alarm becomes inactive, it is removed from the list.

LonWorks

Alarm status is displayed through two network variables: *nvoUnitStatus.in_alarm* and *nvoCurrentAlarm*. Only the highest priority active alarm is displayed when there are multiple active alarms. Both *nvoUnitStatus.in_alarm* and *nvoCurrentAlarm* = 0 when no alarms are active.

Alarm History

The last 32 alarms are recorded in the alarm history with the date, the time the alarm became active and inactive, and alarm description. When an alarm is cleared, it is removed and no longer appears in the alarm history. Alarm records are accessible from the LUI keypad display and ServiceTools software.

Clearing Alarms

BACnet

Alarms can be cleared by using one of several methods:

- The *ClearAlarm* (BV:1) BACnet network object.

NOTE: When the BAS indicates an alarm, it is best to investigate what has triggered the alarm and determine root cause. The purpose of writing to BV:1 is to intentionally clear an active alarm.

- The LUI keypad display parameter *LuiResetAlarm*.
- The tenant override button on the room sensor, if available.

LonWorks

Some alarms can be cleared by using *nviClearAlarm*. Once all alarms have been cleared, the In Alarm attribute of *nvoUnitStatus.in_alarm* displays a 0.

Intelligent Alarm Reset

The MicroTech unit controller supports the intelligent alarm reset feature by automatically clearing the alarm the first two times it occurs within a 7-day period. The alarm must then be manually cleared if it occurs a third time within seven days. The alarms that support this feature show “Auto/Manual” in the Clear column of the alarm tables.

Remote Sensor with Tenant Override

The tenant override is a set of dry contacts placed in parallel with the space temperature sensor. When the contacts are closed momentarily, the bypass timer becomes active and is set to *cpBypassTime*. The unit then enters the bypass mode and changes the setpoints. The tenant override function is active until the timer expires.

The tenant override feature is a way to reset and clear alarms from the space temperature sensor. Once the cause of the alarm has been addressed, apply a ground signal to the tenant override input for 11 or more seconds but less than 29 seconds. Doing so forces the unit controller to clear the alarm.

- BACnet uses the *LocalSpaceTemp* (AI:1) input
- LonWorks uses the *nvoLocalSpaceTmp* input

NOTE: Grounding the tenant override generates an “I Am” Service Request for BACnet or a Service Pin message for LonWorks.

Alarm Tables

Table 20 lists all alarms provided to the BAS by the MicroTech unit controller, sorted by alarm index number. Table 21 - Table 23 describe alarms according to Fault, Problem, and Warning alarm types. Alarms are read-only but can be monitored and cleared as described in the Alarm Management section. The unit controller supports intelligent alarm reset by clearing re-settable faults (indicated as “Auto/Manual” in the following tables) the first two times they occur within a 7-day period. It then triggers a lock-out on third fault that must be cleared manually.

Table 20: Alarms by Alarm Index Number

BACnet Alarm Index Number	LonWorks Alarm Index Number	Alarm Name	Description	Priority	Type	Clear
1	0	NoAlm	No Alarm	0		
2	1	HighDxPressureAlarm	High Pressure Switch Fault	4	Fault	Auto/Manual[2]
3	2	LowDxPressureAlarm	Low Pressure Switch Fault	5	Fault	Auto/Manual[2]
4	3	LowSuctionLineTempAlarm	Low Suction Temp Protection	12	Fault	Auto/Manual[2]
5	4	HydronicCoilFreezeAlarm	Hydronic Coil Freeze Protection	19	Fault	Auto
6	5	ShutdownDIAlarm	Emergency Shutdown	1	Fault	Auto
7	6	ChangeFilterAlarm	Change Dirty Filter	44	Warning	Manual
8	7	HighDuctStaticPrsAlarm	High Duct Static Pressure	10	Fault	Manual
9	8	CondensateOverflowAlarm	Condensate Overflow	20	Fault	Auto
10	9	LowEnteringWaterTempAlarm	Low Entering Water Temp	34	Problem	Auto
11	10	BrownoutAlarm	Voltage Brownout	3	Fault	Auto
12	11	LowLeavingCoilTempAlarm	Leaving Coil Temp Low Limit	21	Fault	Auto
13	12	HighDischargeAirTempAlarm	High Discharge Air Temp	23	Fault	Auto
14	13	HiSuctionSuperHeatAlarm	High Suction Superheat	37	Warning	Auto
15	14	LoSuctionSuperHeatAlarm	Low Suction Superheat	18	Fault	Auto/Manual[2]
16	15	HighDRTAlarm	High Discharge Refrigeration Temp	15	Fault	Manual
17	16	HighCondSatTempAlarm	High Condenser Saturation Temp	38	Warning	Auto
18	17	LowCondSatTempAlarm	Low Condenser Saturation Temp	24	Fault	Auto
19	18	HighEvapSatTempAlarm	High Air to Refrigerant Coil Saturated Temp	39	Warning	Auto
20	19	LowEvapSatTempAlarm	Low Air to Refrigerant Coil Saturated Temp	25	Fault	Auto
21	20	HighCondSatTemp2Alarm	High Condenser Saturation Temp 2	31	Fault	Auto
22	21	LowCondSatTemp2Alarm	Low Condenser Saturation Temp 2	32	Warning	Auto
23	22	HydronicHeatAlarm	Hydronic PreHeat	40	Warning	Auto
24	23	SpcTLwtSensorAlarm	Space Temperature/Leaving Water Temperature Sensor	35	Problem	Auto
25	24	DRTSensorAlarm	Discharge Refrigeration Temperature Sensor	14	Fault	Auto
26	25	FanSensorAlarm	Fan Control Sensor	41	Warning	Auto
27	26	SuctionTempSensorAlarm	Suction Temperature Sensor	11	Fault	Auto
28	27	SuctionPressSensorAlarm	Suction Pressure Sensor	13	Fault	Auto
29	28	DischargePressSensorAlarm	Discharge Pressure Sensor	16	Fault	Auto
30	29	InHumOAFlwSensorAlarm	Indoor Humidity/Outdoor Air Flow Sensor	42	Warning	Auto
31	30	OutdoorHumSensorAlarm	Outdoor Humidity Sensor	8	Fault	Auto
32	31	LCTSensorAlarm	Leaving Coil Temperature Sensor	9	Fault	Auto
33	32	OATSensorAlarm	Outdoor Air Temperature Sensor	7	Fault	Auto
34	33	OilPurgeAlarm	Pressure Differential	43	Warning	Auto
35	34	ConfigErrorAlarm	Factory Config String	26	Fault	Auto
36	35	FanConfigAlarm	Fan Config Fault	27	Fault	Auto
37	36	EWTSensorAlarm	Entering Water Temperature Sensor	36	Warning	Auto
38	37	PhaseMonitorAlarm	Phase Monitor Fault	6	Fault	Auto/Manual[2]
39	38	LockoutEnableAlarm	Outdoor Air Temperature Low/High Lockout	28	Fault	Auto
40	39	DATSensorAlarm	Discharge Air Temperature Sensor	17	Fault	Auto
41	40	DefrostAlarm	Defrost Alarm	30	Fault or Warning[1]	Auto/Manual[2]
42	41	EnergyRecoveryAlarmP	Energy Recovery Problem	33	Problem	Auto
43	42	EnergyRecoveryAlarmF	Energy Recovery Fault	29	Fault	Auto
44	43	ControlBoardAlarm	Control Board Alarm	2	Fault	Auto
45	44	LowDATAlarm	Low Discharge Air Temperature Alarm	22	Fault	Auto/Manual[2]

[1] See alarm description in either Fault or Warning table for details.
[2] After seven days, alarm reverts from Auto to Manual reset with the Intelligent Reset feature.

Table 21: Fault Alarms

Alarm Index Number - BACnet	Alarm Index Number- LonWorks	Description	Alarm Name	Priority	Clear	Details
2	1	High Dx Pressure Fault	HighDxPressureAlarm	3	Auto/ Manual[1]	Alarm occurs when the high pressure safety switch opens and signals that the unit has entered a high pressure fault condition. The unit controller immediately shuts down. The alarm clears automatically when the high pressure condition no longer exists. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset of the alarm via the network or the LUI keypad display.
3	2	Low Dx Pressure Fault	LowDxPressureAlarm	4	Auto/ Manual[1]	Alarm occurs under these three conditions: 1. The normally closed low pressure switch (BI:3) opens 2. The normally closed high pressure switch (BI:1) opens 3. The suction pressure is less than 8 psi These conditions signal that the unit has entered a low pressure fault condition. The unit controller immediately shuts down. The alarm clears automatically when the low pressure condition no longer exists. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset of the alarm via the network or the LUI keypad display.
4	3	Low Suction Refrigerant Temperature	LowSuctLineTempAlarm	12	Auto/ Manual[1]	Alarm occurs under one of these two conditions: 1. The unit is configured for a water loop and the suction refrigerant temperature (SRT) is below the low SRT setpoint (28°F) OR 2. The unit is configured for glycol and the SRT is below the low SRT setpoint (6.5°F) This indicates that a potential freeze condition can occur. The alarm clears automatically when the suction refrigerant temperature exceeds the setpoint by 4°F. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset of the alarm via the network or the LUI keypad display.
5	4	Hydronic Coil Freeze Protection	HydronicCoilFreezeAlarm	19	Auto	Alarm occurs when the optional freezestat sensor is installed and indicates a freeze condition. This causes the unit to eventually enter an OffAlarm state. Alarm automatically clears when the condition no longer exists.
6	5	Emergency Shutdown	ShutdownDIAlarm	1	Auto	Alarm occurs when the Shutdown binary input is detected. The unit controller immediately shuts down the unit. The emergency shutdown is the highest priority alarm. This alarm automatically clears when the condition no longer exists.
8	7	High Duct Static Pressure	HighDuctStaticPrsAlarm	10	Manual	Alarm occurs when the normally closed high duct static pressure binary input switch is in the open position and forces the unit into a normal shutdown. This alarm requires a manual reset of the alarm via the network or the LUI keypad display. Applies to VAV units only.
9	8	Condensate Overflow	CondensateOverflowAlarm	20	Auto	Alarm indicates that the condensate overflow sensor has detected a high water level condition for 60 consecutive seconds and the drain pan is full of condensate. Applies only when the unit is in cooling or dehumidification mode. Alarm initiates a normal shutdown if the compressors are running. It automatically clears when the condensate pan has dried out sufficiently.
11	10	Brownout	BrownoutAlarm	3	Auto	Alarm indicates that the 24-volt power input supplied to the unit controller is less than 80% of the reference voltage (the amount of power required to safely run the unit controller). The alarm forces the unit into normal shutdown in order to protect from low line voltage conditions. The alarm automatically clears once the power input meets the minimum voltage threshold.
12	11	Low Leaving Coil Temperature	LowLeavingCoilTempAlarm	21	Auto	Alarm indicates that the leaving coil temperature is below the setpoint limit for more than three minutes. When the unit is in compressor stage 1 and in cooling or dehumidification, the unit stages down automatically. Otherwise, this alarm initiates a normal shutdown of the unit. It automatically clears when the leaving coil temperature rises 10°F above the limit.

Table 18: Fault Alarms, Continued

Alarm Index Number - BACnet	Alarm Index Number- LonWorks	Description	Alarm Name	Priority	Clear	Details
13	12	Discharge Air Termperature High Limit	HighDischargeAirTempAlarm	23	Auto	Alarm indicates that the high discharge air temperature is greater than the high discharge air temperature limit for 12 consecutive minutes. The alarm initiates a normal shutdown of the unit. It automatically clears when the discharge air temperature drops 10°F below the limit.
15	14	Low Suction SuperHeat	LoSuctionSuperHeatAlarm	18	Auto	Alarm indicates a low suction superheat condition when the suction refrigerant temperature (SRT) - evaporator temperature (Teg) < low superheat setpoint for three minutes. The alarm initiates a normal compressor shutdown. It automatically clears when the SRT - Teg reaches 2°F above the setpoint value. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset via the network or the LUI keypad display.
16	15	High Discharge Refrigerant Temperature	HighDRTAlarm	15	Manual	Alarm indicates that the effective discharge refrigerant temperature (DRT) is above the DRT setpoint high limit for longer than 10 minutes or when the DRT is above 250°F. The alarm initiates a normal compressor shutdown. It requires a manual reset via the network or the LUI keypad display.
18	17	Low Condenser Saturated Temperature	LowCondSatTempAlarm	24	Auto	Alarm occurs when the condenser saturation temperature (Tc) is lower than setpoint for 10 minutes. Alarm initiates a normal shutdown of the unit. It automatically clears when the condenser saturated temperature is 5°F above the setpoint.
20	19	Low Evaporator Saturated Temperature	LowEvapSatTempAlarm	25	Auto	Alarm occurs when the evaporator saturated temperature (Teg) is lower than the setpoint for more than one minute. Alarm initiates a normal shutdown of the unit. It automatically clears when the evaporator saturated temperature is 5°F above the setpoint.
21	20	High Condenser Saturated Temperature 2	HighCondSatTemp2Alarm	31	Auto	Alarm is used as an additional safety feature in conjunction with a second condenser saturated temperature calculation and pressure differential check for a period of one minute. Alarm initiates a normal shutdown of the unit. It automatically clears when a calculated condenser temperature is 10°F below the setpoint.
25	24	Discharge Refrigerant Temperature Sensor Fail	DRTSensorAlarm	14	Auto	Alarm occurs if the discharge refrigerant temperature (DRT) sensor is providing an invalid value. This is a required sensor. Alarm initiates a normal shutdown of the unit. It is cleared when a valid DRT value is received.
27	26	Suction Temperature Sensor Fail	SuctionTempSensorAlarm	11	Auto	Alarm occurs if the suction temperature sensor is providing an invalid value. This is a required sensor. Alarm initiates a normal shutdown of the unit. It is cleared when a valid value is received.
28	27	Suction Pressure Sensor Fail	SuctionPressSensorAlarm	13	Auto	Alarm occurs if the suction pressure sensor is providing an invalid value. This is a required sensor. Alarm initiates a normal shutdown of the unit. It is cleared when a valid value is received.
29	28	Discharge Pressure Sensor Fail	DischargePressSensorAlarm	16	Auto	Alarm occurs if the discharge temperature sensor is providing an invalid value. This is a required sensor. Alarm initiates a normal shutdown of the unit. It is cleared when a valid value is received.
31	30	Outdoor Humidity Sensor Fail	OutdoorHumSensorAlarm	8	Auto	Alarm occurs if the outdoor humidity sensor is providing an invalid value. This is a required sensor. Alarm initiates a normal shutdown of the unit. It is cleared when a valid value is received.
32	31	Leaving Coil Temperature Sensor Fail	LCTSensorAlarm	9	Auto	Alarm occurs if the leaving coil temperature sensor is providing an invalid value. This is a required sensor. Alarm initiates a normal shutdown of the unit. It is cleared when a valid value is received.
33	32	Outdoor Air Temperature Sensor Fail	OATSensorAlarm	7	Auto	Alarm occurs if the outdoor air temperature sensor is installed but providing an invalid value. This is a required sensor. It initiates a normal shutdown of the unit. Alarm is cleared when a valid OAT value is received.

Table 18: Fault Alarms, Continued

Alarm Index Number - BACnet	Alarm Index Number- LonWorks	Description	Alarm Name	Priority	Clear	Details
35	34	Factory Configuration String Error	ConfigErrorAlarm	26	Auto	Alarm occurs when one or more of the required sensors is not installed or there is an error in the unit configuration code string. Any of the following can trigger this alarm: • A factory configuration string error is detected • A blower configuration error is detected • The DRT sensor is not installed • The SRT sensor is not installed • The PTS sensor is not installed • The PTD sensor is not installed • The Outdoor Humidity sensor is not installed • The LCT sensor is not installed • The OAT sensor is not installed • The DAT sensor is not installed • A DAT reset configuration error • An occupancy schedule overlap has occurred • The ACFM is outside the acceptable range as determined by the unit type Alarm initiates a normal shutdown of the unit. It is cleared automatically once the configuration error is corrected.
36	35	Fan Configuration Error	FanConfigAlarm	27	Auto	Alarm occurs when one of the following fan control methods has been selected, but the AI:14 input is not configured for the unit: • DSP • BSP • CO2 • Ai Reset Alarm initiates a normal shutdown of the unit. It is cleared once the AI:14 input is configured for the appropriate fan control method.
38	37	Phase Monitor	PhaseMonitorAlarm	6	Auto/ Manual[1]	The phase monitor alarm reflects the status of the high pressure input, the low pressure/phase monitor input, and the suction pressure transducer value. The following conditions generate an alarm and cause the unit controller to immediately shut down: • The normally closed low pressure switch (BI:3) opens • The normally closed high pressure switch (BI:1) opens • The suction pressure is above than 8 psi Alarm clears automatically when the phase condition no longer exists. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset via the network or the LUI keypad display.
39	38	High/Low Ambient Lockout	LockoutEnableAlarm	28	Auto	Alarm occurs when the outside air temperature is not within the acceptable range (-20-115°F) for the unit to effectively condition the space. Alarm initiates an immediate shutdown of the unit. After the alarm occurs, the unit waits for 30 minutes before can attempt to operate again. Both the high and low OAT lockout status network configuration parameters must be enabled in order for this alarm to be generated.
40	39	Discharge Air Temperature Sensor Fail	DATSensorAlarm	17	Auto	Alarm occurs when the discharge air temperature (DAT) sensor is providing an invalid value. This is a required sensor. Alarm initiates a normal shutdown of the unit. It is cleared automatically when a valid DAT value is received.
41	40	Defrost	DefrostAlarm	30	Auto/ Manual[1]	Alarm indicates a potential freeze condition when the unit is in heating mode and the suction refrigerant temperature (SRT) drops below the allowable setpoint* for one minute. The first two times this occurs within a 7-day period, a warning alarm is generated. It automatically clears when the unit is no longer in defrost mode. The third time this condition occurs within a 7-day period, a fault alarm is generated. The fault alarm requires a manual reset via the network or the LUI keypad display. *The allowable setpoint differs depending on whether the unit is configured for water or glycol.

Table 18: Fault Alarms, Continued

Alarm Index Number - BACnet	Alarm Index Number- LonWorks	Description	Alarm Name	Priority	Clear	Details
43	42	Energy Recovery	EnergyRecoveryAlarmF	29	Auto	Alarm occurs when energy recovery ventilation functionality has been enabled but is not functioning as expected. Energy recovery can be configured as either a fault or problem alarm. When configured for a fault alarm, it disables energy recovery and forces the unit to shut down normally.
44	43	Control Board	ControlBoardAlarm	2	Auto	Alarm indicates the unit controller hardware or internal communication is not functioning as expected. It is recommended that the unit controller is replaced in the event this alarm occurs. Contact the Daikin Applied Controls Customer Support group at 866-462-7829 or Controls@daikinapplied.com for assistance.
45	44	Low Discharge Air Temperature Alarm	LowDATAlarm	22	Auto/ Manual[1]	Alarm occurs when the discharge air temperature is below the low DAT setpoint (40˚F) for one minute after the fan has been on for at least 12 minutes. Alarm clears automatically when the low DAT condition no longer exists. The alarm can occur up to three times within a 7-day period. The third time requires a manual reset via the network or the LUI keypad display.

[1] After seven days, alarm reverts from Auto to Manual reset with the Intelligent Reset feature.

Table 22: Problem Alarms

Alarm Index Number - BACnet	Alarm Index Number- LonWorks	Description	Alarm Name	Priority	Clear	Details
10	9	Low Entering Water Temperature	LowEnteringWater TempAlarm	34	Auto	Alarm occurs if an entering water temperature (EWT) sensor is installed and when: • The unit is configured for a water loop and the EWT drops below the EWT heating setpoint (30°F) OR • The unit is configured for a glycol loop and the EWT drops below the EWT heating setpoint (15°F) The unit enters heating mode and the alarm automatically clears once the EWT is within the acceptable range. Note that heating is not available when alarm is active.
24	23	Space Temperature/ Leaving Water Temperature Sensor	SpcTLwtSensorAlarm	35	Auto	Alarm occurs under the following conditions: • The unit is configured for either a space temperature sensor or leaving water temperature sensor • The respective sensor is not installed or is receiving invalid data Alarm clears when a valid value is received. Both sensors are optional.
42	41	Energy Recovery	EnergyRecovery AlarmP	33	Auto	Alarm occurs when energy recovery ventilation functionality has been enabled but is not functioning as expected. Energy recovery can be configured as either a problem or fault alarm. When configured for a problem alarm, it disables energy recovery but does not shut down the unit.

Table 23: Warning Alarms

Alarm Index Number - BACnet	Alarm Index Number- LonWorks	Description	Alarm Name	Priority	Clear	Details
7	6	Change Dirty Filter	ChangeFilterAlarm	44	Manual	Alarm indicates the filter needs to be changed based on fan runtime hours or as indicated by an optional differential pressure switch.
14	13	High Suction SuperHeat	HiSuctionSuperHeatAlarm	37	Auto	Alarm indicates that a high suction super heat condition has occurred. This happens when the suction refrigerant temperature (SRT) - evaporator temperature (Teg) is greater than the high superheat setpoint for three minutes. Alarm automatically clears when the SRT - Teg is 10°F below the setpoint value. This alarm protects the compressor from overheating.

Table 20: Warning Alarms, Continued

Alarm Index Number - BACnet	Alarm Index Number- LonWorks	Description	Alarm Name	Priority	Clear	Details
17	16	High Condenser Saturated Temperature	HighCondSatTempAlarm	38	Auto	Alarm occurs when the condenser saturation temperature (Tc) is higher than the setpoint for more than one minute. The alarm automatically clears when the condenser saturated temperature is 10°F below the setpoint.
19	18	High Evaporator Saturated Temperature	HighEvapSatTempAlarm	39	Auto	Alarm is generated after the evaporator saturated temperature (Teg) is higher than the setpoint for at least five minutes. If the unit is in compressor stage 1 when this occurs, the alarm forces the unit into compressor stage 2. Alarm automatically clears when the evaporator temperature is below the setpoint.
22	21	Low Condenser Saturated Temperature 2	LowCondSatTemp2Alarm	32	Auto	Alarm is used as an additional safety feature in conjunction with a second saturated temperature calculation for three minutes. Alarm automatically clears when the calculated condenser temperature is 6°F above the setpoint.
23	22	Hydronic PreHeat	HydronicHeatAlarm	40	Auto	Alarm is generated when all of the following conditions apply: 1. Unit is in heating mode 2. Preheat option is other than NONE 3. Unit is in stage 8 4. Stage timers are expired 5. Preheat output is 100% 6. The effective discharge air setpoint is greater than the effective discharge air temperature Alarm automatically clears when any of the above conditions no longer exist.
26	25	Fan Control Sensor	FanSensorAlarm	41	Auto	Alarm occurs when one or more of the optional fan sensors (CO_2, discharge static pressure (DSP), building static pressure (BSP), or Ai Reset) is installed but is receiving an invalid value. Alarm automatically clears when a valid value is received.
30	29	Indoor Humidity/Outdoor Air Flow Sensor	InHumOAFlwSensorAlarm	42	Auto	Alarm occurs under one of these two sets of conditions: 1. An indoor space humidity sensor is installed and the analog input (AI-16) is configured for this sensor. However, it is providing an invalid value. 2. An outdoor air (OA) flow sensor is installed and the analog input (AI-16) is configured for this sensor. However, it is providing an invalid value. In either case, the alarm clears when a valid value is received. These are optional sensors.
34	33	Pressure Differential	OilPurgeAlarm	43	Auto	Alarm occurs when the pressure differential is less than the setpoint for 10 minutes while the compressors are running. Alarm clears when the pressure differential is above the setpoint.
37	36	Entering Water Temperature Sensor	EWTSensorAlarm	36	Auto	Alarm occurs if the entering water temperature sensor is installed but providing an invalid value. Alarm clears when a valid value is received. This is an optional sensor.
41	40	Defrost	DefrostAlarm	30	Auto/ Manual[1]	Alarm indicates a potential freeze condition when the unit is in heating mode and the suction refrigerant temperature (SRT) drops below the allowable setpoint* for one minute. The first two times this occurs within a 7-day period, a warning alarm is generated. It automatically clears when the unit is no longer in defrost mode. The third time this condition occurs within a 7-day period, a fault alarm is generated. The fault alarm requires a manual reset via the network or the LUI keypad display. *The allowable setpoint differs depending on whether the unit is configured for water or glycol.

[1] After seven days, alarm reverts from Auto to Manual reset with the Intelligent Reset feature.

Effective Occupancy

Occupancy is a critical parameter when determining the mode of operation. When in the occupied mode, the unit is enabled and when not in occupied mode, the unit is off.

The unit operates in one of four different occupancy modes as described in Table 24 below.

Table 24: Occupancy Modes

Mode	Description
Occupied	Space is occupied
Unoccupied	Space is unoccupied
Standby	Unit is using setpoints that are in between the occupied and unoccupied states and should not run
Bypass	Space is considered occupied for the duration of the bypass timer

The MicroTech DOAS WSHP controller calculates the proper occupancy state based on several physical and network variables. This section describes the parameters and how Effective Occupancy (EffectOccup) is determined.

Table 25 and Table 26 describe the various parameters, their relationship among the network occupancy inputs, and impact on respective unit modes.

Table 25: Parameter Descriptions

Parameter	Description
EffectOccup	Indicates the actual occupancy mode of the unit (Occupied, Unoccupied, Bypass, Standby)
OccManCmd	Network occupancy override input
OccSchedule	Allows network to set occupancy schedule for the unit
OccSensor	Network-provided occupancy sensor input
Unoccupied	Physical input for the Unoccupied mode
KeyOccManCmd	LUI keypad/display occupancy override input
Tenant Override	Set of dry contacts on the space temperature sensor that enables tenant override. Determined by space temperature sensor input (aiSpaceTemp), if sensor is installed and has a tenant override button. The unit to Occupied/Bypass mode. When contacts are closed, the unit enters tenant override until timer expires
IntSchedule	Internal occupancy schedule output that is used to determine effective occupancy, EffectOccup (MSV:6)
LocalBypassTm	Allows the unit to enter bypass mode when BypassTime (AV:39) has been set and the timer is active

Table 26: Occupancy Mode Determination

Occupancy Override Input (niOccManCmd) MSV:7	Local Occupancy Command (KeyOcc ManCmd)	Tenant Override Active/ Inactive	Occupancy Scheduler Input (niOccSchedule) MSV:8	Internal Schedule (IntSched)	Occupancy Sensor Input (niOccSensor) MSV:9	Hard-wired Sensor Input (biUnoccupied)	Effective Occupancy Output (EffectOccup) MSV:6
1 (Occ)	NA	NA	NA	NA	NA	NA	1 (Occ)
2 (Unoc)	NA	NA	NA	NA	NA	NA	2 (Unoc)
3 (Bypass)	NA	NA	1 (Occ)	NA	NA	NA	1 (Occ)
			2 (Unoc)	NA	NA	NA	3 (Bypass)
			3 (Standby)	NA	NA	NA	3 (Bypass)
			4 (Null)	Occ	NA	NA	1 (Occ)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	3 (Bypass)
				Unoc	3 (Null)	NoBI[1]	3 (Bypass)
				Unoc	3 (Null)	Occ[2]	1 (Occ)
				Unoc	3 (Null)	Unoc[3]	3 (Bypass)
4 (Standby)	NA	NA	NA	NA	NA	NA	4 (Standby)
5 (Null)	Occ	NA	NA	NA	NA	NA	1 (Occ)
5 (Null)	Unoc	NA	NA	NA	NA	NA	2 (Unoc)
5 (Null)	Bypass	NA	1 (Occ)	NA	NA	NA	1 (Occ)
			2 (Unoc)	NA	NA	NA	3 (Bypass)
			3 (Standby)	NA	NA	NA	3 (Bypass)
			4 (Null)	Occ	NA	NA	1 (Occ)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	3 (Bypass)
				Unoc	3 (Null)	NoBI[1]	3 (Bypass)
				Unoc	3 (Null)	Occ[2]	1 (Occ)
				Unoc	3 (Null)	Unoc[3]	3 (Bypass)

Table 22: Occupancy Mode Determination, Continued

Occupancy Override Input (niOccManCmd) MSV:7	Local Occupancy Command (KeyOcc ManCmd)	Active/ Inactive	Occupancy Scheduler Input (niOccSchedule) MSV:8	Internal Schedule (IntSched)	Occupancy Sensor Input (niOccSensor) MSV:9	Hard-wired Sensor Input (biUnoccupied)	Effective Occupancy Output (EffectOccup) MSV:6
5 (Null)	Standby	NA	NA	NA	NA	NA	4 (Standby)
5 (Null)	Null	Inactive	1 (Occ)	NA	1 (Occ)	NA	1 (Occ)
				NA	2 (Unoc)	NA	4 (Standby)
				NA	3 (Null)	NoBI[1]	1 (Occ)
				NA	3 (Null)	Occ[2]	1 (Occ)
				NA	3 (Null)	Unoc[3]	4 (Standby)
			2 (Unoc)	NA	NA	NA	2 (Unoc)
			3 (Standby)	NA	NA	NA	4 (Standby)
			4 (Null)	Occ	1 (Occ)	NA	1 (Occ)
				Occ	2 (Unoc)	NA	4 (Standby)
				Occ	3 (Null)	NoBI[1]	1 (Occ)
				Occ	3 (Null)	Occ[2]	1 (Occ)
				Occ	3 (Null)	Unoc[3]	4 (Standby)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	2 (Unoc)
				Unoc	3 (Null)	NoBI[1]	2 (Unoc)
				Unoc	3 (Null)	Occ[2]	1 (Occ)
				Unoc	3 (Null)	Unoc[3]	2 (Unoc)
5 (Null)	Null	Active	1 (Occ)	NA	1 (Occ)	NA	1 (Occ)
				NA	2 (Unoc)	NA	3 (Bypass)
				NA	3 (Null)	NoBI[1]	1 (Occ)
				NA	3 (Null)	Occ[2]	1 (Occ)
				NA	3 (Null)	Unoc[3]	3 (Bypass)
			2 (Unoc)	NA	NA	NA	2 (Unoc)
			3 (Standby)	NA	NA	NA	3 (Bypass)
			4 (Null)	Occ	1 (Occ)	NA	1 (Occ)
				Occ	2 (Unoc)	NA	3 (Bypass)
				Occ	3 (Null)	NoBI[1]	1 (Occ)
				Occ	3 (Null)	Occ[2]	1 (Occ)
				Occ	3 (Null)	Unoc[3]	3 (Bypass)
				Unoc	1 (Occ)	NA	1 (Occ)
				Unoc	2 (Unoc)	NA	3 (Bypass)
				Unoc	3 (Null)	NoBI[1]	3 (Bypass)
				Unoc	3 (Null)	Occ[2]	3 (Bypass)
				Unoc	3 (Null)	Unoc[3]	3 (Bypass)

NOTE: The tenant override is a set of dry contacts placed in parallel with the space temperature sensor (aiSetpointAdjust). When the contacts are closed momentarily, the bypass timer becomes active and is set to ncpBypassTime, and the unit enters the Bypass mode. The tenant override function is active until the timer expires.

[1] No binary inputs are configured for an Unoccupied input.
[2] A binary input is configured for an Unoccupied input and that input indicates occupied.
[3] A binary input is configured for an Unoccupied input and that input indicates unoccupied.

Temperature Setpoints

This section highlights the specific BACnet and LONWORKS network parameters used for configuring the temperature setpoints. The setpoints depend on unit status (if it is occupied or unoccupied along with the unit mode). Table 27 is the set of default values for each parameter.

See MicroTech DOAS WSHP Controller OM 1280 (www.DaikinApplied.com) for parameter calculations referenced here.

Table 27: Temperature Setpoint Defaults

BACnet Object	BACnet Analog Value	LONWORKS Network Configuration Input	Default Value
OATClgSetpt	AV:2	nciOATClgSP	80°F
LCTClgSetpt	AV:4	nciDACISP	65°F
ReheatDATSP	AV:145	nciReheatDATSP	70°F
DewpointSetpt	AV:146	nciDewpointSP	55°F
OATHtgSetpt	AV:10	nciOATHtgSP	55°F
DATHighLimit	AV:111	nciDATHighLimit	110F
cpDAHtgSetpt	AV:5	nciDAHtSP	70°F

BACnet Device Management

Several parameters are used only for maintenance and testing. A network management tool such as VTS is typically used to issue the network commands. This section describes the use of these network parameters that apply to the unit controller:

- DeviceCommunicationControl – Disable
- DeviceCommunicationControl - Enable
- ReinitializeDevice - Reset

DeviceCommunicationControl - Disable

The purpose of this command is to reduce network traffic for diagnostic testing of the MS/TP network. When the unit controller receives a network command to disable communication, it stops communicating unit information to the network. An optional time may be specified for how long to suspend communications. The unit continues to operate during the Disabled state.

DeviceCommunicationControl - Enable

When the unit controller receives a network command to enable, BACnet network communication is restored.

ReinitializeDevice - Reset

When the unit controller receives a network ReinitializeDevice command, it performs the following:

1. Sends a command to the unit controller to perform a warm reset, maintaining non-volatile memory.
2. Resets the unit controller.

LonWorks Device Management

The following functions are specific to the LonWorks device via the LonWorks daughter board (referred to here as the communication module). These functions are used for maintenance and testing. A network management tool such as Echelon® CT (Commissioning Tool), available at www.echelon.com, is typically used to issue the network commands.

- Note that Echelon CT requires a 32-bit version of Visio software and also .NET v4.8 Windows framework. It is also recommended that .NET v3.5 remain installed in order to support other PC applications not related to the Echelon CT Tool.

Offline

When the LonWorks communication module receives a network command to go Offline, the unit controller continues to operate but LonWorks communication is suspended except for network management messages.

Online

When the LonWorks communication module receives a network command to go Online, LonWorks network messaging is restored.

Reset

When the LonWorks network sends a command to the LonWorks communication module, it causes both the unit controller and LonWorks communication module to reset.

When the LonWorks communication module receives a network command Reset command, it performs the following:

1. Send a command to the unit controller to perform a warm reset, maintaining non-volatile memory.
2. Reset the Neuron processor.

BACnet PICS - MicroTech DOAS WSHP Controller

This section contains the Protocol Implementation Conformance Statement (PICS) for the MicroTech DOAS WSHP controller as required by ANSI/ASHRAE Standard 135-2008, BACnet; A Data Communication Protocol for Building Automation and Control Networks.

Protocol Implementation Conformance Statement

Date:	March 2021
Vendor Name:	Daikin Applied
Product Name:	MTUC_DOAS
Product Model Number:	DOAS WSHP
Application Software Version:	v01.01.00
Bootloader Revision:	v01.00.01
BACnet Protocol Revision:	Version 1 Revision 4

Product Description

The MicroTech DOAS WSHP controller application with on-board BACnet communication capability is a microprocessor designed to operate the DOAS WSHP and integrate it into a BACnet building automation system.

BACnet Standardized Device Profile

The MicroTech DOAS WSHP controller supports the BACnet Interoperability Building Blocks (BIBBS) included in the BACnet Advanced Application Controller (B-AAC) profile. The following section provides a complete listing of BIBBS.

- ☐ **BACnet Standardized Device Profile**
- ☐ **BACnet Operator Workstation (B-OWS)**
- ☐ **BACnet Building Controller (B-BC)**
- ☐ **BACnet Advanced Application Specific Controller (B-AAC)**
- ☒ **BACnet Application Specific Controller (B-ASC)**
- ☐ **BACnet Smart Sensor (B-SS)**
- ☐ **BACnet Smart Actuator (B-SA)**

BACnet Interoperability Building Blocks (BIBBS) Supported

BIBB Name	Designation
Data Sharing – Read Property – B	DS-RP-B
Data Sharing – Read Property Multiple – B	DS-RPM-B
Data Sharing – Write Property – B	DS-WP-B
Data Sharing – Write Property Multiple – B	DS-WPM-B
Data Sharing – COV – B (15 Maximum Objects Supported)	DS-COV-B
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 – Reinitialize Device – B	DM-RD-B

Standard Object Types Supported

Object-Type	Creatable	Deletable	Optional	Writeable
Analog Input	☐	☐		COV_Increment[1]
Analog Value	☐	☐	Priority_Array[2]	Present_Value COV_Increment[1] Relinquish_Default
Binary Input	☐	☐	Description	COV_Increment[1]
Binary Output	☐	☐	Description	COV_Increment[1]
Binary Value	☐	☐	Description Priority_Array[2]	Present_Value COV_Increment[1]
Multi-state Input	☐	☐	State_Text	COV_Increment[1]
Multi-state Value	☐	☐	State_Text Priority_Array[2]	Present_Value COV_Increment[1]
Device	☐	☐	Description Location Max_Master	Description Location (Max 20 Characters) Max_Master

1. After changing COV_Increment, wait at least 20 minutes before cycling power. Otherwise, this change is not saved.
2. The MicroTech DOAS WSHP controller enables the command priority to be set by the device that is commanding the Present Value of the object. Only the highest priority command takes effect. When the higher priority command is relinquished, the next lower command then takes effect as defined by the Priority Array property type.

Data Link Layer Options

- ☐ BACnet IP, (Annex J)
- ☐ BACnet IP, (Annex J), Foreign Device
- ☒ MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400 & 76800
- ☐ MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400 & 76800

Segmentation Capability

- ☐ Segmented requests supported Window Size: 1
- ☐ Segmented responses supported Window Size: 1

Device Address Binding

- ☐ Yes Static Device Binding
- ☒ No

Character Sets Supported

- ☒ ANSI X3.4
- ☐ IBM®/Microsoft® DBCS
- ☐ ISO 8859-1
- ☐ ISO 10646 (UCS-2)
- ☐ ISO 10646 (UCS-4)
- ☐ JIS C 6226

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

Daikin Applied Training and Development

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