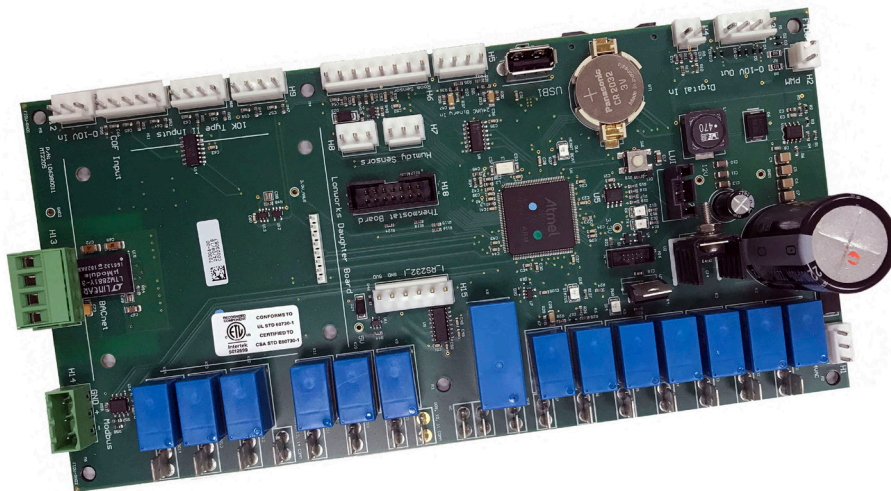# MICROTECH® UNIT VENTILATOR CONTROLLER

NETWORK INTEGRATION GUIDE

MicroTech® MT2205 Unit Controller Protocol Information
BACnet® MS/TP and LONWORKS® Networks
Models: Vertical Floor, Horizontal Ceiling, and Self-Contained

Member of
BACnet International

LonMark® 3.4

Introduction

Integration Guide Overview

This document describes how to integrate the MicroTech® Unit Ventilator (UV) application software used with the MT2205 UV controller into a Building Automation System (BAS). It describes all BACnet® and LONWORKS® parameters available to the network.

The MicroTech UV application software includes on-board BACnet capability so no additional hardware or software is required.

LONWORKS network integration requires the use of a separate communciation module attached to the UV controller.

It is assumed that the user is familiar with the basic principals of BACnet or LONWORKS network protocols.

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 MT2205 Unit Ventilator Controller, OM 1365 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.

Software Revision

This document supports all versions of the standard MicroTech unit ventilator (UV) application software used with the MT2205 UV unit controller and all subsequent revisions until otherwise indicated.The current revision of the application software is available from the local user interface (LUI) keypad display. The software version can also be read from the Application_Software_Version property of the BACnet Device Object or the LONWORKS Unit Application Identification NCI.

Hazard Identification

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

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

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

NOTICE
Notice indicates practices not related to physical injury.

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

Reference Documents

Number	Company	Title	Source
OM 732	Daikin Applied	ATS ServiceTools Software Operation Manual	www.DaikinApplied.com
OM 1365		MicroTech MT2205 Unit Ventilator Operation Manual	
ANSI/ASHRAE 135-2008	BACnet International	BACnet A Data Communication Protocol for Building Automation and Control Networks	www.ashrae.org
LonMark Interoperability Association	8500_20	LonMark Functional Profile: Space Comfort Controller, Version 2.0	www.lonmark.org
	078-0120-01G	LonMark® Layers 1-6 Interoperability Guidelines, Version 3.4	
	078-0120-01G	LonMark Application Layer Interoperability Guidelines, Version 3.4	
Echelon Corporation	078-0156-01G	LONWORKS FTT-10A Free Topology Transceiver Users Guide	www.echelon.com

BACnet Networks

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 UV 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 BACnet PICS.

BACnet Objects

The MicroTech UV 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, 3101120	BACnetObjectIdentifier
Object Name	MTUC_UV-3101120	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_UV	Character String
Firmware Revision	UV-BN v1.0.x (Variable)	Character String
Application Software Version	v3.00.xx (Variable)	Character String
Location	Location	Character String
Description	MTUC_UV	Character String
Protocol Version	1	Unsigned
Protocol Revision	14	Unsigned
Protocol Services Supported	SubscribeCOV ReadProperty ReadPropertyMultiple WriteProperty WritePropertyMultiple DeviceCommunicationControl ReinitializeDevice I-Am	BACnetServicesSupported
Protocol Object Types Supported	AI, AV, BV, Device, MSI, MSV	BACnetObjectTypesSupported
Object List	AI-1, AI-2, etc.	Sequence of BACnetObjectIdentifer
Max APDU Length Accepted	480	Unsigned 16
Segmentation Supported	3 = Not Supported	BACnetSegmentation
Local Time1	14 26:1300	Time
Local Date1	2021-08 30 Mon	Date
APDU Timeout	10000	Unsigned
Number of APDU Retries	0	Unsigned
Max Master	127	Unsigned
Max Info Frames (MS/TP only)	1	Unsigned
Device Address Binding	None	Sequence of BACnetAddressBinding
Database Revision	1	Unsigned
Active COV Subscriptions	<=16	BACnetLIST of COVSubscription

[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	0-127 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	20 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 Networks

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 communication module is LonMark 3.4 certified and is configured in accordance with the LonMark Space Comfort Control (SCC) Functional Profile, v2.0 (8500_20). The object type is 8505 SCC-Unit Ventilator. 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

XIF Device Files	Resource Files
MT_UV_FT6050.APB	McQuaySCC_UV.enu
MT_UV_FT6050.HEX	McQuaySCC_UV.fmt
MT_UV_FT6050.NEI	McQuaySCC_UV.fpt
MT_UV_FT6050.NME	McQuaySCC_UV.typ
MT_UV_FT6050.NMF	
MT_UV_FT6050.XFB	
MT_UV_FT6050.XFO	
MT_UV_FT6050.XIF	

LONWORKS Commissioning

Pressing the service pin on the LONWORKS communication module generates a service pin message, which contains the Neuron ID and 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.

When the network issues a Wink command, the unit controller performs a sequence of steps as described below.

NOTE: The Wink command is allowed during all operating modes.

Shutdown Sequence

1. The following occurs immediately:
   - The unit controller Status LED blinks rapidly during the Wink
   - The unit transitions to fan-only mode
   - Immediate shutdown of all running compressors
   - Electric heat shuts down
   - Auxiliary heat shuts down
   - Indoor fan turns off for 5 seconds. The unit controller then does the following:

2. Turns indoor fan on at 100% (unless the *ShutdownDIAarm* is Active) for 5 seconds

3. Turns indoor fan off for 5 seconds

4. Resumes normal activity (initially in fan-only mode)

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 on the 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.

Other Configuration Methods

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 unit 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 MT2205 UV Controller, OM 1365 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

• Downloaded version of latest ATS ServiceTools software (www.DaikinApplied.com).

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

• Laptop with Windows 10 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 Data Tables

BACnet Network Objects

The following section contains relevant information needed to integrate a MicroTech UV controller into the network via BACnet MS/TP communications. See Configurable Parameters for more information about network supported analog inputs and their interaction with locally configured parameters.

Some of the unit ventilator 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. AI and AV parameters are noted in Table 4 and Table 5.

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.

> ⚠ **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.

Table 4: Analog Inputs

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Local Space Temperature	AI:1	LocalSpaceTemp	-40 to 212ºF -40 to 100ºC Default: 32767[3]	R	No	The local space temperature sensor value, if installed and configured with a valid input. It is used to set the effective space temperature value (AV:22) if the network space temperature input (AV:18) is invalid. See Selected Configurable Parameters section for more information about the interaction of this input and the tenant override feature.
Leaving Water Temperature	AI:2	LWT	-40 to 212ºF -40 to 100ºC Default: 32767[3]	R	No	The value of the local leaving water temperature sensor, if installed and configured with a valid input.
Entering Water Temperature	AI:3	EWT	-40 to 212ºF -40 to 100ºC Default: 32767[3]	R	No	The value of the local entering water temperature sensor, if installed and configured with a valid input. It is used to set the effective entering water temperature value (AV:57) if the network entering water temperature input (AV:50) is invalid.
Discharge Air Temperature	AI:4	DischAirTemp	-40 to 212ºF -40 to 100ºC Default: 32767[3]	R	No	The value of the discharge air temperature sensor, if installed and configured with a valid input.
Local Setpoint Adjust Output	AI:5	LocalSetpt	55 to 95ºF 12.8 to 35ºC (ABS) Default: 32767[3]	R	No	The remote wall sensor setpoint adjustment input. It reflects the long-range sensor value. It can be used to determine the effective heating and cooling setpoints.
Indoor Coil Temperature	AI:6	Comp1SuctTemp	-40 to 212ºF -40 to 100ºC Default: 32767[3]	R	No	The value of the compressor suction line temperature sensor, if installed and configured with a valid input. Note that in heat pump applications, the compressor suction line temperature equals the indoor coil temperature.
Brownout Detection	AI:8	LineVoltage	0 to 4095 counts	R	No	Reflects the line voltage reading compared to the reference setpoint to determine if the brownout or overvoltage condition exists.[4]
Outdoor Air Temperature	AI:9	OutdoorTemp	-40 to 212ºF -40 to 100ºC Default: 32767[3]	R	No	The value of the outdoor air temperature sensor, if installed and configured with a valid input. It is used to set the effective outdoor air temperature value (AV:44).
Outdoor Relative Humidity	AI:10	OutdoorRH	-0.1 to 100.1% Default: 32767[3]	R	No	The value of the outdoor relative humidity sensor, if installed and configured with a valid input. It is used to set the effective outdoor humidity value (AV:47).
Indoor Relative Humidity	AI:11	IndoorRH	-0.1 to 100.1% Default: 32767[3]	R	No	The value of the indoor relative humidity sensor, if installed and configured with a valid input. It is used to set the effective indoor humidity value (AV:49).
Space CO_2[	AI:12	SpaceCO2	10 to 2000 ppm Default: 32767[3]	R	No	The value of the space CO_2 sensor, if installed and configured with a valid input. It is used to set the effective space CO_2 value (AV:51).[4]
Return Air Temperature	AI:13	ReturnAirTemp	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	The value of the room/return air temperature (RAT), if installed and configured with a valid input.

1. R = Read-only access.
2. 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.
3. The Null value 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.
4. Input values are rounded to the nearest integer.

Table 5: Analog Values

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Occupancy Temperature Setpoints (AV:1 to AV:6)						Defines the heating and cooling temperature setpoints for different occupancy modes. See Configurable Parameters and Temperature Setpoint Calculations.
Occupied Cooling Setpoint	AV:1	Occupied_ Cool_Setpt	61 to 86ºF 16.1 to 30ºC Default: 73ºF / 22.8ºC	W	Yes	The control temperature setpoint used for the occupied cooling mode.
Standby Cooling Setpoint	AV:2	Standby_ Cool_Setpt	61 to 86ºF 16.1 to 30ºC Default: 77ºF / 25ºC	W	Yes	The control temperature setpoint used for the standby cooling mode.
Unoccupied Cooling Setpoint	AV:3	Unoccupied_ Cool_Setpt	61 to 86ºF 16.1 to 30ºC Default: 82ºF / 27.8ºC	W	Yes	The control temperature setpoint used for the unoccupied cooling mode.
Occupied Heating Setpoint	AV:4	Occupied_ Heat_Setpt	50 to 82ºF 10 to 27.8ºC Default: 70ºF / 21.11ºC	W	Yes	The control temperature setpoint used for the occupied heating mode.
Standby Heating Setpoint	AV:5	Standby_ Heat_Setpt	50 to 82ºF 10 to 27.8ºC Default: 66ºF / 18.88ºC	W	Yes	The control temperature setpoint used for the standby heating mode.
Unoccupied Heating Setpoint	AV:6	Unoccupied_ Heat_Setpt	50 to 82ºF 10 to 27.8ºC Default: 61ºF / 16.1ºC	W	Yes	The control temperature setpoint used for the unoccupied heating mode.
Local Bypass Time Setpoint	AV:7	BypassTime	0 to 480 Minutes Default: 120 Minutes	W	Yes	Defines the amount of time that the unit can be in the bypass mode initiated by the timed override button. Pressing the timed override button 3-11 seconds sets the bypass timer to this parameter's value. The value of 0 disables this feature.[7]
Brownout Reference Setpoint	AV:9	BrownoutRef	25 to 4095 Counts Default: 0 Counts	W	Yes	Configures the brownout setpoint 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.[7] Only perform the calibration procedure if the unit controller 24 VAC voltage is within normal operating parameters.
Occupied Setpoint Differential	AV:10	OccDiff	1 to 10°F 0.56 to 5.56°C Default: 1ºF / 0.56ºC	W	Yes	Determines the cooling OFF and heating ON effective setpoints. Applies when the unit is in the occupied, bypass, or standby mode as follows:: ClgSetptOff = EffectSetpt (AV:23) - cpOccDiff (AV:10). HtgSetptOff = EffectSetpt (AV:23) + cpOccDiff (AV:10). Also see Temperature Setpoint Calculations.
Low Suction Line Temperature Protection Setpoint	AV:12	LowTempProt	0 to 50°F -17.8 to 10°C Default: 28ºF / -2.22ºC	W	Yes	The setpoint used to determine when the compressor low suction line temperature alarm becomes active, and when the unit enters and exits defrost. Applies to both water and glycol loop units.
Low Suction Temperature Protection Differential	AV:13	LowTmpProtDif	1 to 8°F 0.56 to 4.44°C Default: 4°F / 2.22°C	W	Yes	This value is added to the selected low suction line temperature protection setpoint (AV:12) to determine the setting at which the alarm clears.
Compressor Minimum Off Timer	AV:15	MinCompOffTmr	300 to 600 Seconds Default: 360 Seconds	W	Yes	Configures the minimum amount of time the compressor must remain off before it is allowed to turn on again.[7]
Compressor Minimum On Timer	AV:16	MinCompOnTmr	60 to 600 Seconds Default: 180 Seconds	W	Yes	Configures the minimum amount of time the compressor must remain on before it is allowed to turn off again.[7]

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Unoccupied Setpoint Differential	AV:17	UnoccDiff	1 to 10°F 0.56 to 5.56°C Default: 1°F / 0.57°C	W	Yes	This value represents the unoccupied mode setpoint hysteresis to determine the effective off setpoint. Applies only to occupied, bypass, and standby modes as follows: ClgSetptOff = EffectSetpt (AV:23) - cpUnoccDiff (AV:17). HtgSetptOff = EffectSetpt (AV:23) + cpUnoccDiff (AV:17). Also see Temperature Setpoint Calculations.
Network Space Temperature Input	AV:18	NetworkSpaceTemp	-14 to 122°F -25.6 to 50°C Default: 32767[3]	C	No	Provides a space temperature value from the network instead of using the local temperature sensor. It is used to set the effective space temperature value. The network override reverts back to its default value upon unit controller reset.
Network Temperature Setpoint Input	AV:19	NetworkSetpoint	-40 to 212°F -40 to 100°C Default: 32767[3]	C	No	Allows the network to set the reference setpoint in occupied, unoccupied, standby, and bypass modes. It determines the effective temperature setpoint (AV:23) when the network setpoint (AV:19) is valid. The network override reverts back to its default value upon unit controller reset. Also see Temperature Setpoint Calculations.
Effective Space Temperature	AV:22	EffectSpaceTemp	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	The space temperature value provided by a valid network input or local hard-wired sensor. It represents the network space temperature input value (AV:22), if available. Otherwise, it represents the local hard-wired sensor input provided by the space temperature (AI:1). Also see Temperature Setpoint Calculations.
Effective Setpoint	AV:23	EffectSetpt	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	The effective heating or cooling setpoint to which the unit controller is attempting to maintain is dependent upon the effective occupancy (MSV:6). The network override reverts back to its default value upon unit controller reset. Also see Temperature Setpoint Calculations.
Temperature Setpoint Shift	AV:24	SetptShift	-5 to 5°F -2.78 to - 2.78°C Default: 0°F	R	No	Represents the local hard-wired setpoint adjustment value from the room sensor potentiometer. It is valid when the remote setpoint adjustment type is set to "DIFF" from the LUI keypad display. Also see Temperature Setpoint Calculations.
Temperature Setpoint Offset	AV:35	SetptOffset	-3 to 3°F -1.67 to 1.67°C Default: 32767[3]	C	No	Determines the setpoint offset from the network value, if available. Also see Temperature Setpoint Calculations.
Control Temperature	AV:114	ControlTemp	-40 to 212°F -40 to 100°C	R	No	Sets the space temperature or return air temperature value used to determine the temperature at which the unit should heat or cool.
Fan Speed	AV:38	FanSpeed	0 to 100°%	R	No	Displays the current fan speed command. Units with EC motors display the variable fan speed output. For units with PSC motors, fan speed output has the following settings: 0% = Off 5% = Low Speed 75% = Medium Speed 95% = High Speed
Compressor Run Time	AV:40	CompRunHoursTenths	0 to 300,000 hours Default: 0	R	No	Displays the total compressor run time.
Network Space Dewpoint Setpoint	AV:41	SpaceDewpt	50 to 70°F 10 to 21°C Default: 32767[3] (Null)	W	No	Network-provided space dewpoint setpoint used for dehumidification. This point is supported in MicroTech UV application software v3.0 and newer.
Effective Outdoor Air Temperature	AV:44	EffectOutdoorTemp	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	The outdoor air temperature value provided by a valid network input or local hard-wired sensor. It represents the network outdoor air temperature input (AV:45), if available. Otherwise, it represents the local hard-wired sensor input provided by outdoor air temperature (AI:9).
Network Outdoor Air Temperature Input	AV:45	NetworkOutdoorTemp	-40 to 122°F -40 to 50°C Default: 32767[3]	W	No	Provides an outdoor air space temperature value from the network instead of using the local temperature sensor. The network override reverts back to its default value upon unit controller reset.
Fan Run Time	AV:46	FanRunHoursTenths	0 to 300,000 hours Default: 0	R	No	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.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Effective Outdoor Humidity	AV:47	EffectOutdoorRH	0 to 100% Default: 0	R	No	The outdoor humidity value provided by a valid network input or local hard-wired sensor. It represents the network outdoor relative humidity value (AV:48), if available. Otherwise, it represents the locally wired humidity sensor input provided by the outdoor relative humidity value (AI-10).
Network Outdoor Humidity Input	AV:48	NetworkOutdoorRH	0 to 100% Default: 0	W	No	Provides an outdoor humidity value from the network instead of using the local outdoor humidity sensor. The network override reverts back to its default value upon unit controller reset.
Effective Space Humidity	AV:49	EffectSpaceRH	0 to 100% Default: 0	R	No	The indoor humidity value provided by a valid network input or local sensor. It represents the network space relative humidity value (AV:50), if available. Otherwise, it represents the humidity sensor input provided by the indoor relative humidity value (AI-11).
Network Space Humidity Input	AV:50	NetworkSpaceRH	0 to 100% Default: 0	W	No	Provides an indoor humidity value from the network instead of using the local outdoor humidity sensor. The network override reverts back to its default value upon unit controller reset.
Effective Space CO_2	AV:51	EffectSpaceCO2	0 to 2000 ppm Default: 0	R	No	The space CO_2 value provided by a valid network input or local hard-wired sensor. It represents the network space CO_2 value (AV:52), if available. Otherwise, it represents the locally wired CO_2 sensor input provided by space CO_2 (AI-12).[7]
Network Space CO_2 Input	AV:52	NetworkSpaceCO2	0 to 2000 ppm Default: 32767[3]	W	No	Provides a space CO_2 value from the network instead of using the local space CO_2 sensor. The network override reverts back to its default value upon unit controller reset.
Discharge Air Temperature Setpoint	AV:53	DATSetpt	-40 to 212°F -40 to 100°C Default: 0	R	No	Setpoint that determines the effective discharge air temperature (DAT) target control temperature setpoint based on the current unit mode (heating, cooling or reheat.)
Discharge Air Temperature	AV:118	DischargeAirTemp	-40 to 212°F -40 to 100°C Default: 0	R	No	Reflects the DAT value. Also see the discharge air temperature input (AI:4).
Network Discharge Air Temperature Cooling Setpoint Input	AV:54	NetworkDATClgSetpt	-40 to 212°F -40 to 100°C Default: 32767[3]	W	No	Sets the DAT cooling setpoint. Applies when the DAT cooling reset parameter (DATRstClSel) is configured for Network control from the local LUI keypad display or ServiceTools software. Note that UV controller applications v1.5 and newer set the DAT cooling reset parameter to Network by default.
Discharge Air Temperature Cooling Setpoint	AV:119	DATClgSetpt	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	Reflects the DAT cooling setpoint value.
Network Discharge Air Temperature Heating Setpoint Input	AV:55	NetworkDATHtgSetpt	-40 to 212°F -40 to 100°C Default: 32767[3]	W	No	Sets the discharge air temperature (DAT) heating setpoint. Applies when the DAT heating reset parameter (DATRstHtSel) is configured for Network control from the local LUI keypad display or ServiceTools software. Note that UV controller applications v1.5 and newer set the DAT heating reset parameter to Network by default.
Discharge Air Temperature Heating Setpoint	AV:120	DATHtgSetpt	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	Reflects the DAT heating setpoint value.
Outdoor Air Damper Position	AV:56	OADamper	0 to 100% Default: 0	R	No	Reflects the current position of the outdoor air damper.
Entering Water Temperature Input	AV:113	NetworkEWT	-40 to 212°F -40 to 100°C Default: 32767[3]	W	No	Reflects the Network-provided entering water temperature value. The network override reverts back to its default value upon unit controller reset.
Effective Entering Water Temperature	AV:57	EffectEWT	-40 to 212°F -40 to 100°C Default: 0	R	No	The entering water temperature (EWT) value provided by the network EWT (AV:113). Otherwise, it reflects the local sensor value, if installed and configured with a valid input.
Face and Bypass Damper Position	AV:58	FBDamper	0 to 100% Default: 0	R	No	Reflects the current position of the face and bypass damper. This is the damper position signal being sent to the actuator. Applies when the face and bypass control is active. A value of 0% indicates full bypass of the heating/ cooling coils.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Modulating Hot Water Valve Position	AV:59	HotWater	0 to 100% Default: 0	R	No	Reflects the current position of the modulating hot water valve.
Modulating Cold Water Valve Position	AV:60	ColdWater	0 to 100% Default: 0	R	No	Reflects the current position of the modulating cold water valve.
OAD Minimum Position	AV:61	OAMinPos	0 to 100% Default: 20%	W	Yes	Minimum outdoor air damper (OAD) position when unit is configured for CO_2 control or when the space fan is set to run at high speed.
OAD Minimum Position Medium Speed	AV:62	OAMinPos MedSpeed	0 to 100% Default: 25%	W	Yes	Minimum OAD position when the space fan is set to run at medium speed.
OAD Minimum Position Low Speed	AV:63	OAMinPos LowSpeed	0 to 100% Default: 30%	W	Yes	Minimum OAD position when the space fan is set to run at low speed.
Space CO2 Limit	AV:64	SpaceCO2Lim	0 to 2000 ppm Default: 1200 ppm	W	Yes	Configures the space CO_2 setpoint from the network.[7]
Economizer Outdoor Air Differential Setpoint	AV:65	EconOADiffSetpt	0 to 70ºF -17.8 to 38.39ºC Default: 2ºF/-16.7ºC	W	Yes	Configures the economizer indoor/outdoor air setpoint temperature differential.[7] The control temperature input must be less than the effective outdoor temperature plus this setpoint for free cooling to be available.
Economizer Dry Bulb Temperature Differential	AV:66	EconDBDiff	1 to 10ºF 0.56 to - 5.56ºC Default: 2ºF/- 1.1ºC	W	Yes	Adjusts the economizer indoor/outdoor air temperature deadband differential.
Economizer Enthalpy Setpoint	AV:67	EconEnthSetpt	5 to 50 BTU/lb 11.63 to 116.3 kJ/kg Default: 27 BTU/lb 62.8 kJ/kg	W	Yes	Adjusts the economizer outdoor air enthalpy setpoint. The outdoor enthalpy value (AV:125) must be less than this setpoint for free cooling to be available.
Economizer IA/OA Enthalpy Differential	AV:68	EconEnthDiff	0 to 10 BTU/lb 0 to 23.3 kJ/kg Default: 1 BTU/lb 2.3 kJ/kg	W	Yes	Adjusts the economizer indoor/outdoor air enthalpy differential.
Space Humidity Setpoint	AV:69	SpaceRHSetpt	10 to 100% RH Default: 60% RH	W	Yes	Configures the space relative humidity setpoint value. This setpoint initiates dehumidification on units that are properly configured and have dehumidification enabled.
Network Minimum Outdoor Air Damper Position	AV:70	NetworkOAMinPos	0 to 100% Default: 32767[3]	W	No	Network-provided minimum outdoor air damper position. It overrides the minimum damper position set by the fan speed or the effective space CO_2 value.
Setpoint	AV:71	Setpoint	-40 to 212°F -40 to 100°C Default: 0	R	No	Reflects the effective network temperature setpoint input. Otherwise, it reflects the remote sensor setpoint input, if available and configured for absolute setpoint adjustment. Otherwise, it reflects the active heating or cooling setpoint as determined by current unit mode.
Network Fan Speed Input	AV:115	NetworkFanSpeed	0 to 100% Default: 32767[3]	W	No	Allows the network to set the fan speed. Otherwise, it reflects the invalid value. The network override reverts back to its default value upon unit controller reset. Also see fan speed (AV:38).
Auxiliary Heat On Differential	AV:116	AuxHeatOnDiff	1 to 10°F 0.56 to 5.6°C Default: 2.0°F/1.11°C	W	Yes	Enables auxiliary heat when standard heating is at 100% and when the control temperature is less than or equal to the effective heating setpoint minus this setpoint (AuxHeatOnDiff).
Auxiliary Heat Off Differential	AV:117	AuxHeatOffDiff	1 to 10°F 0.56 to 5.6°C Default: 1.0°F/0.56°C	W	Yes	Disables auxiliary heat when the control temperature rises above the effective heating setpoint minus the auxiliary heat on differential (AV:116) plus this setpoint (AuxHeatOffDiff).
Air Source Heat Pump Defrost Time	AV:121	ASHPDefrostTime	3 to 5 Minutes Default: 4 Minutes	W	Yes	Determines the amount of time the unit is in defrost. Applies only to air source heat pump (ASHP) units. Water source heat pump (WSHP) units use a fixed 60-second time limit.[7]
Leaving Water Temperature	AV:122	LWTemp	-40 to 212ºF -40 to 100ºC Default: 32767[3]	R	No	Reflects the leaving water temperature setpoint configured from the leaving water temperature input (AI:2).
Keypad Setpoint Offset	AV:123	LuiSetptOffset	-5 to 5ºF -20.6 to -15ºC Default: 0ºF/-17.8ºC	R	Yes	Reflects the setpoint offset value set locally via the LUI keypad display.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Outdoor Air Lockout Setpoint	AV:124	OALockoutSetpt	25 to 45ºF -3.9 to 7.2ºC Default: 36ºF/2.2ºC	W	Yes	Configures the low outdoor air temperature lockout setpoint for the outdoor air damper. If the low outdoor air temperature lockout is enabled, the outdoor air damper closes when the outdoor air temperature is below this setpoint.
Outdoor Enthalpy	AV:125	OutdoorEnthalpy	0 to 100 BTU	R	No	Reflects the outdoor enthalpy value. It is based on the effective outdoor air temperature and effective outdoor humidity values.
Indoor Enthalpy	AV:126	IndoorEnthalpy	0 to 100 BTU	R	No	Reflects the indoor enthalpy value. It is based on the effective indoor air temperature and effective indoor humidity values.
Economizer Outdoor Air Temperature Setpoint	AV:127	OATSP	-40 to 80ºF -40 to 26.7ºC Default: 68ºF/20ºC	W	Yes	Configures the economizer outdoor air temperature (OAT) lockout setpoint. When the OAT is above this setpoint, the economizer is not available.
Emergency Heating Setpoint	AV:128	EmergHtgSetpt	0 to 70ºF -17.8 to 21.1ºC Default: 54ºF/12.2ºC	W	Yes	Configures the emergency heating setpoint. The unit enters the Emergency Heat state if the control temperature is below this setpoint and emergency heat is enabled.
Network Occupied Cooling Setpoint Shift Input	AV:129	OccCoolSetptShift	-18 to 18ºF -27.8 to -7.8ºC Default: 32767[3]	W	No	Shifts the network effective cooling setpoint +/-3ºF.
Network Standby Cooling Setpoint Shift Input	AV:130	StandbyCoolSetptShift	-18 to 18ºF -27.8 to -7.8ºC Default: 32767[3]	W	No	Reflects the network input for the standby cooling setpoint shift value. Shifts the effective setpoint via the network.
Network Occupied Heating Setpoint Shift Input	AV:131	OccHeatSetptShift	-18 to 18ºF -27.8 to -7.8ºC Default:32767[3]	W	No	Shifts the network effective heating setpoint +/-3ºF.
Network Standby Heating Setpoint Shift Input	AV:132	StandbyHeatSetptShift	-18 to 18ºF -27.8 to -7.8ºC Default: 32767[3]	W	No	Reflects the network input for the standby heating setpoint shift value. Shifts the effective setpoint via the network.
Exhaust Fan Outdoor Air Damper Setpoint Position	AV:133	ExhStartPos	0 to 100% Default:12%	W	Yes	Energizes the exhaust fan and sets the outdoor air damper position.
Filter Change Hours	AV:134	FilterChangeHours	50 to 2000 Hours Default: 700 Hours	W	Yes	The amount of time the fan can run before a filter change is needed and a warning alarm is generated.[7]
Fan Changer Per Hour	AV:135	FanChgsPerHour	1 to 60 Default: 60	W	Yes	Configures the number of fan changes allowed per hour for a 3-speed fixed indoor fan. Setting this to a value of 10, for example, means the fan speed is allowed to change once every six minutes.[7]
Mechanical Cooling Discharge Air Temperature Low Limit	AV:136	DisAirMechLowLim	35 to 65ºF 1.7 to 18.3ºC Default: 45ºF/7.2ºC	W	Yes	Configures the discharge air temperature low limit setpoint for mechanical (compressor or chilled water) cooling.
Discharge Air Temperature High Limit	AV:137	DisAirHighLim	80 to 135ºF 26.7 to 57.2ºC Default: 125ºF/51.7ºC	W	Yes	Configures the discharge air temperature high limit setpoint.
Motorized Isolation Valve Time Delay	AV:138	ComprMtrValveTime	0 to 60 Seconds Default: 30 Seconds	W	Yes	Configures the amount of time allowed (in seconds) after the pump/motorized valve output energizes before the compressor can be energized.[7]
Space Fan Off Delay	AV:139	FanOffDelay	0 to 10 Seconds Default: 4 Seconds	W	Yes	Configures the amount of time allowed (in seconds) after the compressor de-energizes before the fan can shut off.[7]
Compressor Cooling Outdoor Air Temperature Lockout	AV:140	CompClgOAT LockoutSetpt	45 to 80ºF 7.2 to 26.7ºC Default: 63.5ºF/17.5ºC	W	Yes	Disables compressor cooling when the outdoor air temperature setpoint is below this value. Applies only to air source heat pump units.
Compressor Heating Outdoor Air Temperature Lockout	AV:141	ComprHtgOATLock	10 to 212°F -12.2 to 100°C Default: 35ºF/-1.7ºC	W	Yes	Disables compressor heating when the outdoor air temperature setpoint is below this value. Applies only to air source heat pumps.
Compressor Heating Entering Water Temperature Lockout	AV:142	CompHtgEWTLock	10 to 212°F -12.2 to 100°C Default: 30ºF/-1.1ºC	W	Yes	Disables compressor heating when the effective entering water temperature setpoint is below this value. Applies only to air source heat pumps.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Air Tempering Differential	AV:143	AirTemperingDiff	2 to 20ºF -16.7 to -6.7ºC Default: 5ºF/-15ºC	W	Yes	The unit controller compares the discharge air temperature (DAT) to the occupied heating setpoint to determine when to enter the air tempering mode. When the DAT is lower than the occupied heating setpoint (AV:4) minus this parameter, heating is enabled in order to satisfy the occupied heating setpoint and maintain the proper space temperature. Air tempering is activated under the following conditions: • Air tempering mode (MSV:35) is enabled • The space temperature is between the effective heating and effective cooling setpoints • The unit is in either occupied or bypass mode
Entering Water Temperature Differential	AV:144	SourceTempDiff	0 to 10ºF -17.8 to -12.2ºC Default: 5ºF/-15ºC	W	Yes	The minimum differential required between the control temperature and the effective entering water temperature that allows the unit to enter hydronic heating or cooling.
OAD Minimum Position - Exhaust Interlock	AV:145	OAMinPosExhaust	0 to 100% Default: 100%	W	Yes	The minimum outdoor air damper position when the exhaust interlock input is active. Even if the exhaust interlock is active, the outdoor air damper remains closed when the unit is in a fault, unoccupied, standby, or emergency mode.
End of Cycle Low Outdoor Air Setpoint	AV:146	EOCLowOASetpt	20 to 36ºF -6.7 to 2.2ºC Default: 34ºF/1.1ºC	W	Yes	The setpoint at which the end of cycle (EOC) valve opens in order to prevent the coils from freezing. The EOC opens, regardless of space temperature, when both of the following conditions are true: • The outdoor air temperature is below the EOC low outdoor air setpoint (AV:146) • The face and bypass damper is in the full bypass position
Indoor Air/DX Coil Temperature	AV:147	IACoilDXTemp	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	Reflects the indoor air/DX coil temperature.
Outdoor Air/DX Coil Temperature	AV:148	OACoilDXTemp	-40 to 212°F -40 to 100°C Default: 32767[3]	R	No	Reflects the outdoor air or water DX coil temperature.
Fan Speed Low Break Point	AV:149	BreakPointAutoLow	5% to 100% Default: 5%	W	Yes	Configures the transition point (percent speed) for a low-speed fan to fan off. The fan remains at low speed if configured for continuous operation.
Fan Speed Medium Break Point	AV:150	BreakPoint AutoMedium	5% to 100% Default: 75%	W	Yes	Configures the transition point (percent speed) for a medium-speed to low-speed fan.
Fan Speed High Break Point	AV:151	BreakpointAutoHigh	5% to 100% Default: 95%	W	Yes	Configures the transition point (percent speed) for a high-speed to medium-speed fan.
Fan Speed Break Point Differential	AV:152	BreakpointAutoDiff	2 to 20% Default: 2%	W	Yes	Configures the transition point differential as a percent speed. This differential is added to the appropriate fan speed break point value (low, medium, or high speed as configured from AV:149-AV:151 above). This is the calculation used when the fan transitions to a higher speed.
Discharge Air Temperature Cooling Setpoint	AV:153	DATCoolSetpt	-40 to 212°F -40 to 100°C Default: 60ºF/15.6ºC	W	Yes	Configures the discharge air temperature (DAT) cooling setpoint. Applies when the DAT cooling reset parameter is not configured (i.e. set to "None" from the local LUI keypad display or ServiceTools software).
Discharge Air Temperature Heating Setpoint	AV:154	DATHeatSetpt	-40 to 212°F -40 to 100°C Default: 90ºF/32.2ºC	W	Yes	Configures the discharge air temperature (DAT) heating setpoint. Applies when the DAT heating reset parameter is not configured (i.e. set to "None" from the local LUI keypad display or ServiceTools software).
PWM Fan Low Speed	AV:155	PWMLowFan	50 to 80% Default: 75%	W	Yes	The speed (in percent) for low-speed operation when the unit is configured for a PWM3Fix fan.[7]
PWM Fan Medium Speed	AV:156	PWMMediumFan	70 to 90% Default: 90%	W	Yes	The speed (in percent) for medium-speed operation when the unit is configured for a PWM3Fix fan.[7]
PWM Fan High Speed	AV:157	PWMHighFan	80 to 100% Default: 100%	W	Yes	The speed (in percent) for high-speed operation when the unit is configured for a PWM3Fix fan.[7]
Entering Water Flow Timer	AV:158	EwFlowTimer	0 to 600 Seconds Default: 120 Seconds	W	Yes	Configures the EWT timer setpoint that determines the amount of time that the entering water loop must flow before hydronic heat or hydronic cooling is available. Applies to two-pipe units.[7]

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Return Air Temperature Setpoint	AV:159	RAT	-40 to 212°F -40 to 100°C Default: 0	R	No	Reflects the current value of the room/return air temperature (RAT) sensor, if installed and configured with a valid value. This parameter incorporates any sensor calibration offsets. Also see the RAT input, AI:13.
Outdoor Coil Temperature	AV:160	OutdoorCoilTemp	-40 to 212°F -40 to 100°C Default: 32767[3]	R	Yes	Reflects the outdoor coil temperature input, if sensor is installed with configured with a valid value.
Cooling Stage Down	AV:161	cpCoolingStageDown	32 to 40°F 0 to 4.4°C Default: 38ºF/3.3ºC	W	Yes	Configures the cooling stage-down transition temperature setpoint.
Space Dewpoint Setpoint	AV:162	cpSpaceDewptSetpt	50 to 70°F 10 to 21°C Default: 60ºF/15.6ºC	W	No	Configures the space dewpoint setpoint used for dehumidification. Applies when relative humidity sensor is installed and input is valid. This point is supported in MicroTech UV application software v3.0 and newer.
Single Zone Variable Air Volume (VAV) PI Loop[4,5]						
Proportional Gain	AV:72	SZVavPropGain	0 to 255 Default: 0.10	W	Yes	The proportional gain (Kp) value of the loop algorithm used for temperature control function of single-zone VAV units.
Integral Gain	AV:73	SZVavIntegGain	0 to 255 Default: 0.01	W	Yes	The integral gain (Ki) value of the loop algorithm used for temperature control function of single-zone VAV units. The value of 0 disables this feature.
Minimum Fan Output	AV:74	SZVavMinFan	0 to 100% Default: 5%	W	Yes	Sets the minimum fan speed for single-zone VAV units.[7]
Maximum Fan Output	AV:75	SZVavMaxFan	0 to 100% Default: 100%	W	Yes	Sets the maximum fan speed for single-zone VAV units.[7]
Maximum Temperature Differential	AV:76	SZVavMax DeltaTemp	1 to 10ºF 0.56 to - 5.56°C Default: 5ºF/2.78ºC	W	Yes	Configures the value used to determine the maximum fan speed output (AV:75) for single-zone VAV units.
Fan Speed Output	AV:77	SZVavFanSpeedPI	0 to 100% Default: 0%	R	No	Reflects the fan speed output for single-zone VAV units.
Chilled Water Valve PI Loop[4,5]						
Proportional Gain	AV:78	ClgPropGain	0 to 255 Default: 0.5	W	Yes	The proportional gain (Kp) value of the loop algorithm used to control hydronic cooling water valve function.
Integral Gain	AV:79	ClgIntegGain	0 to 255 Default: 0.02	W	Yes	The integral gain (Ki) value of the loop algorithm used to control the hydronic cooling water valve function.
Minimum Cooling Position	AV:80	ClgMinPos	0 to 100% Default: 0%	W	Yes	The hydronic cooling water valve minimum position when the difference between the discharge air temperature and the discharge air cooling setpoint is zero.
Maximum Cooling Temperature Differential	AV:81	ClgMaxDeltaTemp	1 to 10ºF 0.56 to - 5.56°C Default: 5ºF/2.78ºC	W	Yes	The value used to determine the hydronic cooling water valve position of the loop. It reflects the difference between the discharge air temperature and discharge air setpoint that causes the valve to open 100%.
Maximum Cooling Position	AV:82	ClgMaxPos	10 to 100% Default: 100%	W	Yes	The chilled water valve maximum position.
Chilled Water Valve Position	AV:83	ColdWaterPI	0 to 100%	R	No	Reflects the hydronic cooling water valve commanded position.
Hot Water Valve PI Loop[4,5]						
Proportional Gain	AV:84	HtgPropGain	0 to 255 Default: 0.5	W	Yes	The proportional gain (Kp) value of the loop algorithm used to control hot water valve function.
Integral Gain	AV:85	HtgIntegGain	0 to 255 Default: 0.02	W	Yes	The integral gain (Ki) value of the loop algorithm used to control the hot water valve function.
Minimum Heating Position	AV:86	HtgMinPos	0 to 100% Default: 0%	W	Yes	The hot water valve minimum position.

Table 5: Analog Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Maximum Heating Temperature Differential	AV:87	HtgMaxDeltaTemp	1 to 10ºF 0.56 to - 5.56ºC Default: 5ºF/2.78ºC	W	Yes	The value used to determine the hot water valve position of the loop algorithm. It reflects the difference between the discharge air temperature and discharge air setpoint that causes the valve to open 100%.
Maximum Heating Position	AV:88	HtgMaxPos	10 to 100% Default: 100%	W	Yes	The hot water valve maximum position.
Hot Water Valve Position	AV:89	HotWaterPI	0 to 100%	R	No	Reflects the hydronic hot water valve commanded position.
Face and Bypass Damper PI Loop[4,5]						
Proportional Gain	AV:90	FBDamperPropGain	0 to 255 Default: 10	W	No	The proportional gain (Kp) value of the loop algorithm used to control the face and bypass damper function.
Integral Gain	AV:91	FBDamperIntegGain	0 to 255 Default: 1	W	No	The integral gain (Ki) value of the loop algorithm used to control the face and bypass damper function.
Face and Bypass Damper Position Output	AV:92	FBP_PIOut	0 to 100%	R	No	Reflects the face and bypass damper commanded position. The value of 0 indicates that the damper is in full bypass position, which diverts the airflow to bypass heating or cooling elements. A value of 100% indicates that the damper is in full face position, which directs airflow over heating or cooling elements.
Electric Heat PI Loop[4,5]						
Proportional Gain	AV:93	HtgElectPropGain	0 to 255 Default: 8	W	Yes	The proportional gain (Kp) value of the loop algorithm used to control electric heat function.
Integral Gain	AV:94	HtgElectIntegGain	0 to 255 Default: 0.5	W	Yes	The integral gain (Ki) value of the loop algorithm used to control electric heat function.
Electric Heat Discharge Air Temperature Low Limit Output	AV:95	ElectDatLLPIOut	0 to 100%	R	No	Reflects the electric heat discharge air temperature low limit output. Electric heat discharge air temperature low limit is used only when there are no other forms of heat available and the discharge air temperature is below the low limit setpoint. When enabled, the loop algorithm output is based on the discharge air temperature.
Electric Heat Dehumidification Output	AV:96	ElectDehumPIOut	0 to 100%	R	No	Reflects the electric heat output for dehumidification.
CO_2 Control PI Loop[4,5]						
Proportional Gain	AV:101	CO2PropGain	0 to 255 Default: 0.1	W	Yes	The proportional gain (Kp) value of the loop algorithm used to control the outside air damper for CO_2/demand control ventilation.
Integral Gain	AV:102	CO2IntegGain	0 to 255 Default: 0.01	W	Yes	The integral gain (Ki) value of the loop algorithm used to control the outside air damper for CO_2/demand control ventilation.
Network Minimum Discharge Air Temperature Setpoint Input	AV:112	NetworkMinDATSetpt	-40 to 212°F -40 to 100°C Default: 32767[3]	W	No	Configures the unit discharge air temperature minimum setpoint when it is in reheat/dehumidification mode.
Outdoor Air Damper Position	AV:103	OADPosCO2	0 to 100%	R	No	Reflects the outdoor air damper position as commanded by the CO_2/VOC setpoint for demand control ventilation. Applies under the following conditions: A CO_2/VOC sensor is installed The unit is in Occupied or Standby mode The unit is configured for CO2/VOC-DCV (SpaceCO2Enable is enabled)
Proportional Gain	AV:104	EconPropGain	0 to 255 Default: 1	W	Yes	The proportional gain (Kp) value of the loop algorithm used to control the outdoor damper position when the unit is in economizer mode and free cooling is available.
Economizer Position PI Loop[4,5]						
Integral Gain	AV:105	EconIntegTime	0 to 255 Default: 0.1	W	Yes	The integral gain (Ki) value of the loop algorithm used to control the outdoor damper position when the unit is in economizer mode and free cooling is available.
Outdoor Air Damper Position	AV:106	FreeCoolingPILoopOut	0 to 100%	R	No	Reflects the output for the outdoor air damper position. This value is generated when the unit is in economizer mode and free cooling is available.

Table 5: Analog Values, Continued

Point Name	Object Type/Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Low Limit Outdoor Air Damper Position PI Loop[4,5]							
Proportional Gain	AV:107	OADLLPropGain	0 to 255 Default: 2.0	W	Yes	The proportional gain (Kp) value of the loop algorithm used to control the low limit outdoor damper position when the unit is in low limit.
Integral Gain	AV:108	OADLLIntegGain	0 to 255 Default: 0.2	W	Yes	The integral offset (Ki) value of the loop algorithm used to control the control the low limit outdoor damper position when the unit is in low limit.
Outdoor Air Damper Low Limit Differential	AV:109	OADLLPiOut	0 to 100% Default: 0%	R	No	The outdoor air damper low limit loop output. When the economizer is in the low limit state, the outdoor air damper modulates up or down.
Maximum Outdoor Air Damper Position	AV:111	OAMaxPos	0 to 100% Default: 100%	W	Yes	Reflects the maximum outdoor air damper commanded position.
BACnet MAC Address	AV:411	MacAddress	0 to 127 Default: 120	W	Yes	BACnet MS/TP node address of the unit controller. This value is used in conjunction with the Minimum Instance Number (AV:412) to determine the final Device Instance Number (DEV:3). The MAC address can be set from the BAS, LUI keypad display or ServiceTools software.[7] See Other Configuration Methods.
BACnet Minimum Instance Number	AV:412	SystemMinInstance	0 to 4194302 Default: 3101000	W	Yes	Instance number or object-identifier assigned by the integrator. This value is added to the MAC Address (AV:411) to determine the final Device Instance Number (DEV:3). This value must be unique throughout the entire BACnet network. It can be set from the BAS, LUI keypad display or ServiceTools software.[7] See Other Configuration Methods.

[1] R = Read-only access, W = Write access, C = Commandable.

[2] 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.

[3] The display of value 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.

[4] The unit controller ships with default PI loop values configured for each application. Before changing any of the writable parameters, it is recommended that you contact the Daikin Applied Terminal Systems Technical Response at TechResponseATS@daikinapplied.com or (315) 282-6434 for assistance.

[5] See PI Loop Control section at the end of this document and the MicroTech UV Controller OM 1280 (www.DaikinApplied.com) for additional information.

[6] AV:412 has an Object Name of SystemMinInstance, the Present Value is writable, and it has a default value of 3101000. During the commissioning process, the present value of AV:412 is added to the MAC Address to determine the Device Instance Number. In order to change the value of AV:412 in the unconfigured state, the BAS must broadcast a new present value to AV:412 using the BACnet service (BIBB – BACnet Interface Building Block) called "Unconfirmed COV" with a ProcessID value of 1. This prevents unauthorized unconfirmed writes, or changes, to AV:412. Note that this change affects the AV:412 present value for every MicroTech UV controller (device) on the trunk.

[7] Input values are rounded to the nearest integer if a partial integer value is written to the object.

Table 6: Binary Values

Point Name	Object Type/Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Clear Alarm	BV:1	ClearAlarm	0 = None 1 = Clear Alarm Default: 0 (None)	W	No	Resets the current (active) alarm. See Alarms section for details.
Reset Filter	BV:3	ResetFilter	0 = None 1 = Clear Alarm Default: 0 (None)	W	No	Clears the change filter alarm.

[1] R = Read-only access, W = Write access, C = Commandable.

[2] 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.

Table 7: Multi-State Inputs

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Condensate Overflow Status	MSI:1	CondOverFlow	1 = Dry 2 = Wet 3 = Null Default: 3 (Null)	R	No	Monitors the Condensate Overflow sensor input. A Null value indicates that no sensor is present.
Humidistat	MSI:4	Humidistat	1 = Notdehumidify 2 = Dehumidify Default: 1 (Notdehumidify)	R	No	Input used to command dehumidification. Applies when a sensor is installed and dehumidification has been enabled via the network or LUI keypad display.

[1] R = Read-only access, W = Write access, C = Commandable.

[2] 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.

Table 8: Multi-State Values

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Compressor Enable	MSV:1	NetworkCompr Enable	1 = Disable 2 = Enable 3 = Null Default: 3 (Null)	W	No	Specifies if the compressor is allowed to operate, which can be based on proof of loop fluid flow. The loop pump must be running to provide adequate flow through the unit so the compressor can operate safely. A default value of Null allows the compressor to be enabled. The network override reverts back to its default value upon unit controller reset.
Current Alarm	MSV:2	CurrentAlarm	See Alarms	R	No	Displays the current highest priority active alarm. See Alarms section for all BACnet alarm enumerations, priorities, and respective alarm classes.
Effective Occupancy Output	MSV:6	EffectOccup	1 = Occ 2 = Unocc 3 = Bypass 4 = Standby 5 = Null Default: 5 (Null)	R	No	The actual occupancy mode being used by the unit controller. The mode depends on occupancy override, occupancy scheduler, an internal schedule, and/or an occupancy sensor. See Configurable Parameters section for details.
Occupancy Override Input	MSV:7	OccManCmd	1 = Occ 2 = Unocc 3 = Bypass 4 = Standby 5 = Null Default: 5 (Null)	W	No	Network command that overrides the other occupancy inputs. The network override reverts back to its default value upon unit controller reset. See Configurable Parameters section for details.
Occupancy Scheduler Input	MSV:8	OccSchedule	1 = Occ 2 = Unocc 3 = Standby 4 = Null Default: 4 (Null)	W	No	Network command that sets the unit into different occupancy modes. The network override reverts back to its default value upon unit controller reset. See Configurable Parameters section for details.
Occupancy Sensor Input	MSV:9	OccSensor	1 = Occ 2 = Unocc 3 = Null Default: 3 (Null)	W	No	Network command used to indicate the presence of occupants in the space (motion detection). The network override reverts back to its default value upon unit controller reset. See Configurable Parameters section for details.
Energy Hold Off Input	MSV:12	EnergyHoldOff	1 = Normal 2 = Energy Hold Off 3 = Null Default: 3 (Null)	W	No	Network command that enables the unit to enter the energy hold off mode. The network overrides the local input from the LUI keypad display or ServiceTools. Energy hold off prevents the unit from heating and cooling, thus allowing it to protect the space from temperature extremes. When energy hold off is enabled, heating is not provided unless the space temperature exceeds the emergency heat setpoint. With the exception of free cooling, it does not allow for cooling operation. Also refer to the energy hold off status (MSV:43). The network override reverts back to its default value upon unit controller reset.
Pump Request Output	MSV:13	PumpRequest	1 = Inactive 2 = Active Default: 1 (Inactive)	R	No	Reflects 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.
Units (English/Metric)	MSV:15	Units	1 = Imperial (English) 2 = SI (Metric) Default: 1 (Imperial)	W	Yes	Units of measure for temperature conversion. Switching the default of English to Metric changes the temperature values for all applicable properties in the BACnet portion of the unit controller application.
Dehumidification Enable	MSV:16	DehumidEnable	1 = Disable 2 = Enable 3 = Null Default: 3 (Null)	W	Yes	Network command that allows the unit to enter the dehumidification state.
Application Mode[3]	MSV:17	NetworkApplic Mode	1 = Auto 2 = Heat 3 = Cool 4 = Night_Purge 5 = Off 6 = Emerg_Heat 7 = Fan_Only 8 = Dehumid 9 = Null Default: 9 (Null)	W	No	Network command that sets the operating mode of the unit. Application Mode does not "force" the unit into any state. However, it does disable certain unit operations. Examples: 1) An application mode of Cool disables heating, 2) Heat disables cooling and dehumidification, and 3) Fan-only disables heating, cooling, and dehumidification. *If the unit is in the Night Purge mode and the NightPurgeTimer expires, then NetworkApplicMode reverts back to default value.

Table 8: Multi-State Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Effective Heat/Cool	MSV:20	EffectHeatCool	1 = Auto 2 = Heat 3 = Cool 4 = Night_Purge 5 = Off 6 = Emerg_Heat 7 = Fan_Only 8 = Dehumid 9 = Null Default: 9 (Null)	R	No	Indicates the actual heat/cool mode of the unit.
Emergency Override	MSV:21	EmergOverride	1 = Normal 2 = Pressurize 3 = Depressurize 4 = Purge 5 = Shutdown 6 = Fire 7 = Invalid Default: 7 (Invalid)	C	No	Commands the unit into an emergency (non-normal) mode from the network. Overrides the local emergency mode if configured from the LUI keypad display. The network override reverts back to its default value upon unit controller reset.
Economizer Enable	MSV:22	NetworkEcon Enable	1 = Disable 2 = Enable 3 = Null Default: 3 (Null)	C	No	Network command that enables or disables economizer operation. Overrides the local economizer enable if configured from the LUI keypad display. The network override reverts back to its default value upon unit controller reset.
Remote Sensor Adjustment	MSV:23	RemoteSetpoint AdjTyp	1 = DIFF 2 = ABS Default: 2 (ABS)	W	Yes	Defines the type of remote sensor setpoint adjustment. ABS (absolute): 55° to 95°F adjustment DIFF (differential): +/-5°F adjustment
Auxiliary Heat Enable	MSV:24	AuxiliaryHeat	1 = Disable 2 = Enable 3 = Null Default: 3 (Null)	C	No	Input that allows the network to enable auxiliary heat. The network override reverts back to its default value upon unit controller reset.
Auxiliary Heat Reverse	MSV:25	AuxHeatReverse	1 = Direct 2 = Reversed Default: 1 (Direct)	W	Yes	Output that allows the network to change auxiliary heat from direct to reverse-acting.
Outdoor Air Lockout Enable	MSV:26	OALockout Enable	1 = Disable 2 = Enable Default: 1 (Disable)	W	Yes	Enables the outdoor air lockout function, which causes the unit to close the outdoor air damper when the outdoor air temperature drops below the damper low OAT lockout setpoint (see AV:127). This parameter can also be configured from the LUI keypad display or ServiceTools software.
Room Sensor Mode Status	MSV:27	RSSystemMode Status	1 = Not_Present 2 = Cool 3 = Auto 4 = Heat Default: 1 (Not_Present)	R	No	Reflects the room (space) sensor mode of operation input. Applies if sensor is installed and the input is enabled.
Room Sensor Fan Speed	MSV:28	RSFanSpeedStatus	1 = Auto 2 = High 3 = Medium 4 = Low 5 = Off	R	No	Reflects the fan speed signal from the room sensor input. Applies if sensor is installed and the input is enabled.
Emergency Heating Enable	MSV:29	EmergHtgEnable	1 = Disable 2 = Enable Default: 2 (Enable)	W	Yes	Allows the unit controller to enter an emergency heat state where all available heating is enabled.
Filter Change Enable	MSV:30	FilterChange Enable	1 = Disable 2 = Enable Default:1 (Disable)	W	Yes	Enables or disables the filter change alarm function.

Table 8: Multi-State Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Air Tempering Mode	MSV:31	AirTemperingMode	1 = Inactive 2 = Active Default:1 (Inactive)	W	No	Reflects the current air tempering mode. Air tempering is activated under the following conditions: Air tempering mode (MSV:35) is enabled The space temperature is between the effective heating and effective cooling setpoints The unit is in either occupied or bypass mode (not unoccupied) The controller compares the discharge air temperature (DAT) to the occupied heating setpoint to determine when to enter the air tempering mode. When the DAT is lower than the occupied heating setpoint (AV:4) minus the air tempering differential (AV:143), it enables heating in order to reheat the discharge air to the occupied heating setpoint.
Fan Cycling	MSV:32	FanCycling	1 = Continuous 2 = Cycling Default: 1 (Continuous)	W	Yes	Determines if the space fan may run continuously without heating or cooling demand. Applies when the unit is not in unoccupied mode.
Fan Run Time Reset	MSV:33	FanTimeReset	1 = Dont_Reset 2 = Reset	W	No	Resets the total fan run time hours.
Compressor Run Time Reset	MSV:34	ComprTimeReset	1 = Dont_Reset 2 = Reset	W	No	Resets the total compressor run time hours.
Air Tempering Enable	MSV:35	AirTempering Enable	1 = Disable 2 = Enable Default:1 (Disable)	W	Yes	Enables air tempering mode functionality. Air tempering mode activates under the following conditions: Air tempering mode (MSV:35) is enabled The space temperature is between the effective heating and effective cooling setpoints The unit is in either occupied or bypass mode (not unoccupied) The unit controller compares the discharge air temperature (DAT) to the occupied heating setpoint to determine when to enter the air tempering mode. When the DAT is lower than the occupied heating setpoint (AV:4) minus the air tempering differential (AV:143), it enables heating in order to reheat the discharge air to the occupied heating setpoint.
Economizer Strategy	MSV:38	EconStategy	1 = None 2 = Diff_Temp 3 = Outdoor_Enth 4 = Enth_Compare Default: 2 (Diff_Temp)	W	Yes	Specifies the method for determining when free cooling is available. Applies when the appropriate temperature sensors and/or humidity sensors are installed and configured correctly. These methods are described as follows: 1 = None (No strategy defined) 2 = Diff_Temp (Compares the outdoor air temperature to the indoor space temperature) 3 = Outdoor_Enth (Compares outdoor enthalpy to the economizer enthalpy setpoint using both the outdoor air temperature and the outdoor relative humidity) 4 = Enth_Compare (Compares the outdoor enthalpy to the indoor enthalpy using outdoor air temperature outdoor humidity versus space temperature/indoor humidity)
Control Temperature Source	MSV:39	ControlTemp Source	1 = Space 2 = RAT 3 = AISR_Avg Default: 2 (RAT)	W	Yes	Selects the control temperature source from either a space, return air sensor, or the average temperature using both sensor inputs. This selection is used to set the control temperature (AV:114). The space temperature defaults to the hard-wired temperature sensor input unless it is overridden by the network.
Indoor Fan Control Select	MSV:40	FanControlSelect	1 = Single_DAT 2 = CO2 3 = AI_Input Default: 1 (Single_DAT)	W	Yes	Selects the indoor fan control strategy. 1 = Single_DAT (Single-zone DAT control) 2 = CO2 (Network or hard-wired CO_2 sensor control) 3 = AI_Input (The hard-wired reset input from the reset volts parameter)
Space CO_2 Enable	MSV:41	SpaceCO2Enable	1 = Disable 2 = Enable Default:1 (Disable)	W	Yes	Enables unit control strategies (i.e. demand controlled ventilation) based on space CO_2 levels when a sensor is installed and the appropriate analog input is configured for CO_2.

Table 8: Multi-State Values, Continued

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non-volatile Memory[2]	Description
Unit State	MSV:42	UnitState	1-36 See Description	R	No	Reflects the unit's current operating state. The unit state options (1-36) are described below: 1 = Powerup 2 = Off 3 = Fan_Only 4 = Off_Alarm 5 = Defrost 6 = Night_Purge 7 = Low_Limit 8 = Lvg_Elect_Heat 9 = Prep_To_Heat 10 = Comp_Heat_1 11 = Comp_Heat_2 12 = Elect_Heat_1 13 = Elect_Heat_2 14 = Elect_Heat_3 15 = Hydro_Heat 16 = Hyd_Heat_Elect_1 17 = Hyd_Heat_Elect_2 18 = Hyd_Heat_Elect_3 19 = Comp_Heat_2_Elect_Heat_1 20 = Comp_Heat_2_Elect_Heat_2 21 = Comp_Heat_2_Elect_Heat_3 22 = Prep_Dehumid 23 = Dehumid_Water 24 = Dehumid_Comp_1 25 = Dehumid_Comp_2 26 = Comp_Cool_1 27 = Comp_Cool_2 28 = Air_Econo 29 = Econo_Comp_1 30 = Econo_Comp_2 31 = Air_Econo_Water 32 = Water_Cool 33 = Prep_To_Cool 34 = Reheat 35 = Reheat_Low_Limit 36 = Emerg_Heat
Energy Hold Off Status	MSV:43	EnergyHoldOffStatus	1 = Allow 2 = Hold_Off Default: 1 (Allow)	R	No	Prevents the unit from either heating and cooling, except when needed. This protects the space from temperature extremes. When the unit is in energy hold off, heating is not provided unless the space temperature exceeds the emergency heat setpoint. With the exception of free cooling, it does not allow for cooling operation. Also see the energy hold off input (MSV:12).
Setpoint Method	MSV:44	SetptMethod	1 = Easy 2 = Advanced Default: 2 (Advanced)	W	Yes	Determines which control strategy is used to calculate the heating or cooling setpoints (effective setpoint) as described below: 1 = Easy (User defines the input for the occupied, standby, and unoccupied cooling and heating setpoints, which are used for determining the setpoint calculations). 2 = Advanced* (The unit controller application determines the occupied, standby, and unoccupied setpoint calculations). *The advanced method is recommended. If necessary, contact ATS Technical Response at TechResponseATS@daikinapplied.com or (315) 282-6434 for assistance with setting the control strategy.
Space Temperature Sensor Installed	MSV:45	SpaceTemp SensInst	1 = Not_Installed 2 = Installed Default: 1 (Not_Installed)	W	Yes	Configures the space temperature sensor for field installation or replacement.
Dehumidification Setpoint Select	MSV:46	cpDehumidSetptSel	1 = RH 2 = DEWPT (RH) Default: 1 (RH)	W	Yes	Configures the dehumidification setpoint measurement type for relative humidity or dewpoint. Applies when unit is in occupied mode. This point is supported in MicroTech UV application software v3.0 and newer.

[1] R = Read-only access, W = Write access, C = Commandable.

[2] 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.

[3] The display of value 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.

Table 9: Device Objects

Point Name	Object Type/ Instance	BACnet Object Name	Range/Default (in Units)	Access Type[1]	Non- volatile Memory[2]	Description
Application Version	Device	App_Software_ Version	V.RR.BB Default: 0.00.01	R	No	The software version of the unit controller. V=Version, RR=Revision, BB = Build
Location	Device	Location	32 Characters	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 Other Configuration Methods.
Device Instance Number	Device	Object_Identifier	0 to 4194303 Default: 3101000	W	Yes	Unique instance number or object-identifier assigned by integrator. The device instance number can be set from the BAS, ServiceTools software, or LUI keypad display. See BACnet MAC Address (AV:411) and BACnet Minimum Instance Number (AV:412) for the objects used to configure the Device Name. See Other Configuration Methods.
BACnet Device Name	Device	Object_Name	20 Characters	W	Yes	Text string used to define the BACnet device name. The device object name can be set from the BAS, ServiceTools software, or LUI keypad display. See Other Configuration Methods.
MS/TP Baud Rate	NA	NA	9600 19200 38400 76800 Default: 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 Other Configuration Methods.
MaxMasters	Device	Max_Master	2 to 127 Default: 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 BAS, ServiceTools software, or LUI keypad display. See Other Configuration Methods.

[1] R = Read-only access, W = Write access, C = Commandable.

[2] 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.

LonWorks Data Tables

This section includes the data that is available to the BAS via the LonWorks network.

LonWorks input variable types (.nvi or nci) are writable and can be configured from the network. The LonWorks output variable type (.nvo) is 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. The network overrides locally set values such as sensor inputs or parameters configured from the local 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 10: Network Variable Inputs (NVIs)

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Application Mode	nviApplicMode	SNVT_hvac_mode	See Description Default: -1 = HVAC_Nul	Yes	W	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. **Supported Modes** 1 = HVAC_Heat 3 = HVAC_Cool 4 = HVAC_Night_Purge[1] 6 = HVAC_Off 8 = HVAC_Emerg_Heat 9 = HVAC_Fan_Only[2] 14 = HVAC_Dehumid -1 = HVAC_Nul [1] If the unit is in the Night Purge mode and the NightPurgeTimer expires, then nviApplicMode reverts back to default value. [2] Disables heating, cooling, and dehumidification
Auxiliary Heat Enable	nviAuxHeatEnable	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null Default: 2 = Null	Yes	W	No	Network command to allow auxiliary heat to be enabled. Condition Value State 0 = Disable 0 0 1 = Enable 100 1 2 = Null 0 -1
Compressor Enable	nviComprEnable	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null Default: 2 = Null (Enable)	Yes	W	No	Network command that disables compressor heating and cooling operation. Condition Value State 0 = Disable 0 0 1 = Enable 100 1 2 = Null (Enable) 0 -1
Compressor Timer Reset	nviComprTimeRst	UNVTcomprTimeRst	0 = RST_Dont_Reset 1 = RST_Reset -1 = RST_Nul Default: -1 = RST_Nul	No	W	Yes	Resets the compressor total run time hours to zero. The default of -1 = RST_Nul disables compressor timer reset.
Network Discharge Air Cooling Setpoint Input	nviDATClgSetpt	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[2] (Null)	Yes	W	No	Sets the DAT cooling setpoint. Applies when the DAT cooling reset parameter (DATRstClSel) is configured for Network control from the local LUI keypad display or ServiceTools software. Note that UV controller applications v1.5 and newer set the DAT cooling reset parameter to Network by default.

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Table 10: Network Variable Inputs (NVIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Network Discharge Air Heating Setpoint Input	nviDATHtgSetpt	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[2] (Null)	Yes	W	No	Sets the DAT heating setpoint. Applies when the DAT heating reset parameter (DATRstHtSel) is configured for Network control from the local LUI keypad display or ServiceTools software. Note that UV controller applications v1.5 and newer set the DAT heating reset parameter to Network by default.
Network Discharge Air Temperature Reheat Setpoint Input	nviDATReheatSetpt	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[2] (Null)	No	W	No	Sets the unit discharge air temperature (DAT) reheat setpoint. Applies when the unit is in reheat/dehumidification mode and when the DAT reheat reset parameter is configured for Network from the local LUI keypad display or ServiceTools software.
Economizer Enable	nviEconEnable	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null Default: 2 = Null	Yes	W	No	Allows the network to disable economizer operation. Overrides the local economizer enable if configured from the LUI keypad display or ServiceTools software. Condition Value State 0 = Disable 0 0 1 = Enable 100 1 2 = Null 0 -1
Emergency Override	nviEmergOverride	SNVT_hvac_emerg (103)	See Description Default: -1 = EMERG_Null	No	W	No	Commands the unit into an emergency (non-normal) mode from the network. Overrides the local emergency mode if configured from the LUI keypad display. 0 = EMERG_Normal 1 = EMERG_Pressurize 2 = EMERG_Depressurize 3 = EMERG_Purge 4 = EMERG_Shutdown 5 = EMERG_Fire -1 = EMERG_Nul
Energy Hold Off	nviEnergyHoldOff	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null Default: 2 = Null	Yes	W	No	Prevents the unit from either heating and cooling under certain conditions in order to conserve energy. Condition Value State 0 = Normal 0 0 1 = Hold Off 100 1 2 = Null 0 -1
Network Entering Water Temperature Input	nviEWTTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	Yes	W	No	Network input for the local entering water temperature sensor, if installed and configured with a valid input. The network value reverts back to the default setting upon unit controller reset or when the heartbeat expires, if enabled.
Network Fan Speed Command	nviFanSpeedCmd	SNVT_switch (95)	0 to 100% Default: 163.835[3] (Null)	No	W	No	Network command that configures the fan speed override. Applies when the unit fan control is configured for Network.
Fan Timer Reset	nviFanTimeReset	UNVTfanTimeReset	See Description Default: -1 = RST_Nul	No	W	Yes	Network command that clears the accumulated fan run time hours.[2] 0 = RST_Dont_Reset 1 = RST_Reset -1 = RST_Nul
Outdoor Air Damper Minimum Position	nviOAMinPos	SNVT_lev_percent (81)	0 to 100% Default: 163.835[3] (Null)	No	W	No	Adjusts the current position of the minimum OA damper position from the network. It overrides the previous minimum OA damper position.
Occupancy Override Command	nviOccManCmd	SNVT_Occupancy (109)	See Description Default: -1 = OC_Nul	No	W	No	Network command that overrides the effective occupancy output.[2] See Configurable Parameters section for details. 0 = OC_Occupied 1 = OC_Unoccupied 2 = OC_Bypass 3 = OC_Standby -1 = OC_Nul

Table 10: Network Variable Inputs (NVIs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Occupancy Scheduler Input	nviOccSchedule	SNVT_tod_event (128)	See Description Default: -1 = OC_Nul	No	W	No	Network occupancy schedule input that commands the unit to the desired occupancy mode.[2,] See Configurable Parameters section for details. 0 = OC_Occupied 1 = OC_Unoccupied 3 = OC_Standby -1 = OC_Nul
Occupancy Sensor Input	nviOccSensor	SNVT_Occupancy (109)	See Description Default: -1 = OC_Nul	Yes	W	No	Network command that indicates the presence of occupants in the space (motion detection). The network override reverts back to its default value upon unit controller reset. See Configurable Parameters section for details. 0 = OC_Occupied 1 = OC_Unoccupied -1 = OC_Nul
Network Outdoor Relative Humidity Input	nviOutdoorRH	SNVT_lev_percent (81)	0 to 100% Default: 163.835[3] (Null)	Yes	W	No	Enables the network to configure the effective outdoor humidity value (EffectOutdoorRH).
Outdoor Air Network Temperature Input	nviOutdoorTemp	SNVT_temp_p (105)	-40 to 122ºF -10 to 50ºC Default: 621.806[3] (Null)	Yes	W	No	Network setpoint input that is used to control the effective outdoor temperature instead of having input from a single sensor.
Clear Alarm	nviResetAlarm	UNVT_Reset_Cmd (95)	See Description Default: -1 = RST_Nul	Yes	W	No	Network command that clears the current (active) alarm. The network override reverts back to its default value upon unit controller reset. See Alarms section for details. 0 = RST_Dont_Reset 1 = RST_Reset -1 = RST_Nul
Clear Filter	nviResetFilter	UNVT_Reset_Cmd (95)	See Description Default: -1 = RST_Nul	No	W	No	Network command that clears the change filter alarm. The network override reverts back to its default value upon unit controller reset. See Alarms section for details. 0 = RST_Dont_Reset 1 = RST_Reset -1 = RST_Nul
Temperature Setpoint Input	nviSetpoint	SNVT_temp_p (105)	50 to 95ºF 10 to 35ºC Default: 621.806[3] (Null)	No	W	No	Network setpoint for occupied, unoccupied, standby, and bypass modes. Determines the effective temperature setpoint output when the network setpoint is valid. The network override reverts back to its default value upon unit controller reset. See Temperature Setpoint Calculations.
Temperature Setpoint Offset	nviSetptOffset	SNVT_temp_p (105)	-3 to 3ºF -1.67 to 1.67ºC Default: 0ºF / -17.8ºC	Yes	W	No	Network temperature setpoint offset input. Shifts the occupied and standby effective setpoints via the network, when available. The unoccupied effective setpoints are not affected.
Temperature Setpoint Offset Occupied Cooling	nviSetptShift. occupied_cool	SNVT_temp_setpt (106)	-18 to 18ºF -27.8 to -7.8ºC Default: 0ºF / -17.8ºC	Yes	W	No	Network input for the occupied cooling setpoint shift value.
Temperature Setpoint Offset Standby Cooling	nviSetptShift. standby_cool	SNVT_temp_setpt (106)	-18 to 18ºF -27.8 to -7.8ºC Default: 0ºF/-17.8ºC	Yes	W	No	Network input for the standby cooling setpoint shift value.
Temperature Setpoint Offset Occupied Heating	nviSetptShift. occupied_heat	SNVT_temp_setpt (106)	-18 to 18ºF -27.8 to -7.8ºC Default: 0ºF / -17.8ºC	Yes	W	No	Network input for the occupied heating setpoint shift value.
Temperature Setpoint Offset Standby Heating	nviSetptShift. standby_heat	SNVT_temp_setpt (106)	-18 to 18ºF -27.8 to -7.8ºC Default: 0ºF / -17.8ºC	Yes	W	No	Network input for the standby heating setpoint shift value.

Table 10: Network Variable Inputs (NVIs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Network Space CO$_2$ Input	nviSpaceIAQ	SNVT_ppm (29)	0 to 2000 ppm Default: 32767 (Null)	Yes	W	No	Network input that sets the effective space CO$_2$ value. Applies when the value is not 32767 and is within the acceptable range (0 to 2000 ppm.) Otherwise, the local sensor input is used as the effective space CO$_2$ (EffectSpaceCO2).
Network Space Relative Humidity Input	nviSpaceRH	SNVT_lev_percent (81)	0 to 100% Default: 163.835[3] (Null)	Yes	W	No	Network input that sets the effective indoor space humidity value. Applies when the value is not 32767 and is within the acceptable range.
Network Space Temperature Input	nviSpaceTemp	SNVT_temp_p (105)	14 to 122ºF -10 to 50ºC Default: 621.806[3] (Null)	Yes	W	No	Network space temperature input. It is used to set the effective space temperature value. Applies when the local sensor is installed with a valid input (including any calibration offsets). The network override reverts back to its default value upon unit controller reset.

[1] R = Read-only access, W = Write access.

[2] 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.

[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.

Table 11: Network Variable Outputs (NVOs)

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Entering Water Temperature	nvoAiEWT	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC Default: 621.806[3] (Null)	No	R	No	The entering water temperature input provided by the local sensor, if installed and configured with a valid value. Applies when analog input (ai10 or ai12) is configured for EWT.5 See Configurable Parameters for details.
Leaving Water Temperature	nvoaiLWT	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC Default: 621.806[3] (Null)	No	R	No	The leaving water temperature value provided by the local sensor.
Air Tempering Mode	nvoAirTemperMode	UNVT_AIR_Temper_Mode	0 = AI_Inactive 1 = AI_Active Default: 0 = AI_Inactive	No	R	No	Reflects the current air tempering mode. Air tempering is activated under the following conditions: Air tempering mode is enabled The space temperature is between the effective heating and effective cooling setpoints The unit is in either occupied or bypass mode (not unoccupied) The unit controller compares the discharge air temperature (DAT) to the occupied heating setpoint to determine when to enter the air tempering mode. When the DAT is lower than the occupied heating setpoint minus the air tempering differential, it enables heating in order to satisfy the occupied heating setpoint and maintain the proper space temperature.
Cold Water Valve Position	nvoColdWater	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the current cooling water modulating valve position.
Cold Water Valve Position PI Loop Output	nvoColdWaterPI	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the hydronic cooling water valve position from the PI loop output value.
Compressor Run Time	nvoComprRunTime	SNVT_time_hour_p (198)	0 to 300,000 Hours Default: 0	No	R	No	Displays the total compressor run time. To clear, set nviComprTimeRst to RST_RESET. This returns the compressor run time hours to zero.
Suction Refrigerant Temperature	nvoComp1 SuctTemp	SNVT_temp_p (105)	-40 to 212ºF -40 to 100ºC Default: 621.806[3] (Null)	No	R	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.
Condensate Overflow Status	nvoCondOvrflow	UNVT_Cont_Ovrflow	0 = OFS_Dry 1 = OFS_Wet 2 = OFS_Nul Default: -1 = OFS_Nul	No	R	No	The condensate overflow status. Applies when the local sensor is installed and configured with valid input.[3]
Control Temperature	nvoControlTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	The effective space temperature or return air temperature value set from the control temperature source input (nciCntrlTempSrc). It is used to determine the temperature at which the unit should heat or cool.
Discharge Air Temperature Cooling Setpoint	nvoDatClgSetpt	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	The effective discharge air temperature (DAT) cooling setpoint. Applies when the DAT cooling reset parameter is configured for Network from the local LUI keypad display or ServiceTools software.
Discharge Air Temperature Heating Setpoint	nvoDatHtgSetpt	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	The effective discharge air temperature (DAT) heating setpoint. Applies when the DAT heating reset parameter is configured for Network from the local LUI keypad display or ServiceTools software.
Discharge Air Temperature Setpoint	nvoDATSetpt	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	Reflects the discharge air temperature (DAT) setpoint. It displays the DAT heating, DAT cooling, or DAT reheat setpoint value depending on current unit mode.
Discharge Air Temperature	nvoDischAirTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	Yes	R	No	Reflects the discharge air temperature (DAT) input value set from aiDAT (AI-7). See Other Configuration Methods for details.

Table 11: Network Variable Outputs (NVOs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Effective Entering Water Temperature	nvoEffectEWT	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 32767[3] (Null)	No	R	No	The entering water temperature (EWT) value provided by the network EWT input (AV:113). Otherwise, it reflects the local sensor, if installed and configured with a valid input.
Effective Occupancy	nvoEffectOccup	SNVT_Occupancy (109)	See Description Default: -1 = OC_Nul	Yes	R	No	The actual occupancy mode being used by the unit controller. The mode depends on Occupancy Override, Occupancy Scheduler, an internal schedule, and/or an occupancy sensor. See Configurable Parameters for details. -1 = OC_Nul 0 = OC_Occupied 1 = OC_Unoccupied 2 = OC_Bypass 3 = OC_Standby
Effective Temperature Setpoint	nvoEffectSetpt	SNVT_temp_p (105)	50 to 95°F 10 to 35°C Default: 32767[3] (Null)	Yes	R	No	Reflects the effective heating or cooling setpoint the unit controller is attempting to maintain. This setpoint depends upon whether the unit is in an occupied or unoccupied state as well as the unit's current heating/cooling mode. It is set to the network setpoint (nviSetpoint) value, if available. Otherwise, it displays the effective setpoint calculated value.
Electric Heat Discharge Air Temperature Low Limit PI Loop Output	nvoElectDatLLPI	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the electric heat discharge air temperature low limit output. Electric heat discharge air temperature low limit is used only when there are no other forms of heat available and the discharge air temperature is below the setpoint. When enabled, the loop algorithm output is based on the discharge air temperature.
Electric Heat Dehumidification PI Loop Output	nvoElectDehumPI	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the electric heat dehumidification output. Applies when humidistat is installed and configured correctly.
Energy Hold Off	nvoEnergyHoldOff	SNVT_switch (95)	0 = Allow 1 = Hold_Off Default: 0 = Allow	No	R	No	Reflects the network or local command (nviEnergyHoldOff) that enables the unit to enter the energy hold off mode. The network overrides the local input from the LUI keypad display or ServiceTools.5 Energy hold off prevents the unit from either heating and cooling, thus allowing it to protect the space from temperature extremes When energy hold off is enabled, heating is not provided unless the space temperature exceeds the emergency heat setpoint. With the exception of free cooling, it does not allow for cooling operation. **Condition Value State** 0 = Allow 0 0 1 = Hold_Off 100 1
Fan Run Time	nvoFanRunTime	SNVT_time_hour_p (198)	0 to 300,000 Hours Default: 0	No	R	No	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.
Fan Speed	nvoFanSpeed	SNVT_switch (95)	0 to 100% Default: 0	Yes	R	No	Displays the current fan speed command. **Condition Value State** 0 = Fan Off 0 0 1 = Fan On 0.5-100 1 Units with EC motors display the variable fan speed output. For units with PSC motors, fan speed output has the following settings: 7% = Low Speed 77% = Medium Speed 97% = High Speed
Face and Bypass Damper Position	nvoFBDamper	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the current position of the face and bypass damper. This is the damper position signal being sent to the actuator. Applies when the face and bypass control is active. A value of 0% indicates full bypass of the heating/cooling coils.

Table 11: Network Variable Outputs (NVOs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Face and Bypass Damper Position PI Loop Output	nvoFBPIOut	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the face and bypass damper PI loop output signal. Applies when face and bypass damper control is active. The PI loop modulates the damper in order to maintain the control temperature when it goes above the heating setpoint or below the cooling setpoint.
Outdoor Air Damper Free Cooling PI Loop Output	nvoFreeClgPIOut	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the outdoor air damper free cooling PI loop output. This value is used for calculating the outdoor air damper position.
Effective Heat/Cool	nvoHeatCool	SNVT_hvac_mode	See Description Default: -1 = HVAC_Nul	Yes	R	No	Reflects the actual heating or cooling mode of the unit. **Supported Modes** 0 = HVAC_Auto 1 = HVAC_Heat 3 = HVAC_Cool 4 = HVAC_Night_Purge[1] 6 = HVAC_Off 8 = HVAC_Emerg_Heat 9 = HVAC_Fan_Only[2] 14 = HVAC_Dehumid -1 = HVAC_Nul [1]If the unit is in the Night Purge mode and the NightPurgeTimer expires, then nviApplicMode reverts back to default value. [2]Disables heating, cooling, and dehumidification.
Hot Water Modulating Valve Position	nvoHotWater	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the current position of the hot water modulating valve.
Hot Water Valve Position PI Loop Output	nvoHotWaterPI	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the hydronic heating water valve position determined from the PI loop output value.
Humidistat	nvoHumidistat	UNVT_Humidistat	0 = HUM_Not_Dehumidify 1 = HUM_Dehumidify Default: 0 = HUM_Not_Dehumidify	No	R	No	Reflects the input used to command dehumidification. Applies when a sensor is installed and dehumidification has been enabled via the network or LUI keypad display.
Indoor Air Coil Temperature	nvoIACoilDXTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	Reflects the indoor refrigerant coil temperature (ICT) value provided by the local sensor (aiIndoorCoilTemp).
Indoor Enthalpy	nvoIndoorEnth	SNVT_enthalpy_d	0 to 100 BTU Default: 140.873[3] (Null)	No	R	No	Reflects the indoor enthalpy value. It is based on the indoor space temperature and indoor humidity inputs.
Indoor Relative Humidity	nvoIndoorRH	SNVT_lev_percent (81)	0 to 100% Default: 163.835[3] (Null)	No	R	No	Reflects the indoor humidity sensor value. Sets the effective space relative humidity value.
Local Setpoint Adjust	nvoLocalSetpt	SNVT_temp_p (105)	55 to 95°F 12.8 to 35°C (ABS) Default: 621.806[3] (Null)	No	R	No	The remote wall sensor setpoint adjustment input. It reflects the long-range sensor value. It can be used to determine the effective heating and cooling setpoints.[3]
Local Setpoint Offset	nvoLuiSetptOffst	SNVT_temp_diff_p	-5 to 5°F -20.6 to -15°C Default: 0	No	R	No	Reflects the setpoint offset value set locally via the LUI keypad display.
Leaving Water Temperature Output	nvoLWT	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	Reflects the leaving water temperature (LWT) value provided by the local sensor.
Outdoor Air Coil Temperature Output	nvoOACoilDXTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	Reflects the outdoor air DX coil temperature value provided by the local sensor.

Table 11: Network Variable Outputs (NVOs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Outdoor Air Damper Position	nvoOutCoilTemp	SNVT_lev_percent (81)	0 to 100% Default: 163.835[3] (Null)	Yes	R	No	Reflects the current position of the outdoor air damper. 100% indicates full outdoor air.
Outdoor Air Damper Low Limit PI Loop Output	nvoOADLLPiOut	SNVT_lev_percent (81)	0 to 100% Default: Default: 0	No	R	No	Reflects the outdoor air damper low limit PI loop output. 100% indicates full outdoor air.
Outdoor Coil Temperature	nvoOutCoilTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	Reflects the outdoor coil temperature input, if sensor is installed with configured with a valid value.
Outdoor Enthalpy	nvoOutdoorEnth	SNVT_enthalpy_d	0 to 100 BTU Default: 140.873[3] (Null)	No	R	No	Reflects the outdoor enthalpy value. It is based on the outdoor air temperature and outdoor humidity inputs.
Effective Outdoor Humidity	nvoOutdoorRH	SNVT_lev_percent (81)	0 to 100% Default: 163.835[3]	Yes	R	No	The effective 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).
Effective Outdoor Air Temperature	nvoOutdoorTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	Yes	R	No	The effective 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).
Pump Request	nvoPumpRequest	UNVT_Pump_Request	0 = AI_Inactive 1 = AI_Active Default: 0 = AI_Inactive	No	R	No	Reflects the pump command as on or off depending on the unit mode (heating, cooling, dehumidification). 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.
Return Air Temperature	nvoRAT	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.806[3] (Null)	No	R	No	Reflects the current value of the room/return air temperature (RAT) sensor, including any calibration offsets.
Room Sensor Fan Speed	nvoRSFanSpdStat	UNVT_Fan_Speed_Stat	0 = FSS_Auto 1 = FSS_High 2 = FSS_Medium 3 = FSS_Low 4 = FSS_Off Default: -1 (FSS_Nul)	No	R	No	Reflects the fan speed input from the room sensor, if installed and configured correctly. Note that the entire unit shuts down when 4 = FSS_Off is selected.
Room Sensor Mode Status	nvoRSSysModeStat	UNVT_Sys_Mode_Stat	0 = SMS_Not_Avail 1 = SMS_Cool 2 = SMS_Auto 3 = SMS_Heat Default: -1 (SMS_Nul)	No	R	No	Reflects the room (space) sensor mode of operation input. Applies if sensor is installed and configured correctly.
Network Setpoint	nvoSetpoint	SNVT_temp_p (105)	50 to 95ºF 10 to 35ºC Default: 621.806[3] (Null)	Yes	R	No	Reflects the effective network setpoint (nviSetpoint) input. Otherwise, it reflects the remote sensor setpoint input, if available and configured for absolute setpoint adjustment. Otherwise, it reflects the active heating or cooling setpoint as determined by current unit mode.
Setpoint Shift	nvoSetptShift	SNVT_tempSetpt (106)	-5 to 5ºF -1.67 to 2.78ºC Default: 621.806[3] (Null)	Yes	R	No	Reflects the short-range setpoint adjustment for occupied and standby heating/cooling modes. Applies when a remote sensor is installed and configured for differential setpoint adjustment. The unoccupied heating and cooling values always default to zero. Note that LONWORKS applies a 32ºF (0ºC) offset to this value.

Table 11: Network Variable Outputs (NVOs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Effective Space CO2	nvoSpaceCO2	SNVT_ppm (29)	0 to 2000 ppm Default: 327673 (Null)	Yes	R	No	The effective indoor space CO_2 value. It reflects the network indoor space CO_2 input (nviSpaceIAQ), if available. Otherwise, it reflects the local sensor input if installed and configured with a valid input.
Effective Space Humidity	nvoSpaceRH	SNVT_lev_percent (81)	0 to 100% Default: 163.8353	Yes	R	No	The indoor relative humidity input value. It reflects the network input (nviSpaceRH), if available. Otherwise, it reflects the local sensor input (including any calibration offsets).
Effective Space Temperature	nvoSpaceTemp	SNVT_temp_p (105)	-40 to 212°F -40 to 100°C Default: 621.8063	Yes	R	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) if installed and configured with a valid input.
Single Zone VAV Fan Speed PI Loop Output	nvoSZVavFanSpdPI	SNVT_lev_percent (81)	0 to 100% Default: 0	No	R	No	Reflects the fan speed PI loop output for single-zone VAV units.
Unit State	nvoUnitState	UNVT_Unit_State	0 - 35 See Description	Yes	R	No	Reflects the current unit operating state as described below: 0 = MSM_Power_Up 1 = MSM_Off 2 = MSM_Fan_Only 3 = MSM_Off_Alarm 4 = MSM_Defrost 5 = MSM_Night_Purge 6 = MSM_Low_Limit 7 = MSM_Lvg_El_Heat 8 = MSM_Prep_Heat 9 = MSM_Comp_Heat_1 10 = MSM_Comp_Heat_2 11 = MSM_Elct_Heat_1 12 = MSM_Elct_Heat_2 13 = MSM_Elct_Heat_3 14 = MSM_Hydr_Heat 15 = MSM_Hydr_Ht_Eh_1 16 = MSM_Hydr_Ht_Eh_2 17 = MSM_Hydr_Ht_Eh_3 18 = MSM_Cmp_Ht_2_Eh_1 19 = MSM_Cmp_Ht_2_Eh_2 20 = MSM_Cmp_Ht_2_Eh_3 21 = MSM_Prep_Dehum 22 = MSM_Dehum_Watr 23 = MSM_Dehum_Cmp_1 24 = MSM_Dehum_Cmp_2 25 = MSM_Comp_Cool_1 26 = MSM_Comp_Cool_2 27 = MSM_Air_Econo 28 = MSM_Econ_Cmp_1 39 = MSM_Econ_Cmp_2 30 = MSM_Econ_Water 31 = MSM_Water_Cool 32 = MSM_Prep_Cool 33 = MSM_Reheat 34 = MSM_Reht_Low_Lmt 35 = MSM_Emerg_Heat
Unit Status - In Alarm	nvoUnitStatus. in_alarm	SNVT_hvac_status	0-31 Default: 0 = NoAlm	Yes	R	No	The status of the current alarm state. See Alarms section for complete description of each alarm state and the corresponding index number (1-31).

Table 11: Network Variable Outputs (NVOs), Continued

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)[3]	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description
Unit Status Mode	nvoUnitStatus.Mode	SNVT_hvac_status	See Description Default: 6 = HVAC_Off	Yes	R	No	Reflects the current unit mode as follows: 1 = HVAC_Heat 3 = HVAC_Cool 4 = HVAC_Night_Purge[1] 6 = HVAC_Off 8 = HVAC_Emerg_Heat 9 = HVAC_Fan_Only[2] 10 = HVAC_Free_Cool 14 = HVAC_Dehumid [1]If the unit is in the Night Purge mode and the NightPurgeTimer expires, then nviApplicMode reverts back to default value [2]Disables heating, cooling and dehumidification
Unit Status - Cooling Output	nvoUnitStatus.cool_output	SNVT_hvac_status	0 to 100% Default: 0	Yes	R	No	Reflects the cold water (compressor cooling) output.
Unit Status - Economizer Output	nvoUnitStatus.econ_output	SNVT_hvac_status	0 to 100% Default: 0	Yes	R	No	Reflects the economizer free cooling (outdoor air damper position) output.
Unit Status - Fan Output	nvoUnitStatus.fan_Output	SNVT_hvac_status	0 to 100% Default: 0	Yes	R	No	Reflects the indoor fan speed output.
Unit Status - Primary Heating Output	nvoUnitStatus.heat_output_primary	SNVT_hvac_status	0 to 100% Default: 0	Yes	R	No	Reflects the hot water (hydronic heating valve or compressor heating) output.
Unit Status - Secondary Heating Output	nvoUnitStatus.heat_output_secondary	SNVT_hvac_status	0 to 100% Default: 0	Yes	R	No	Reflects the electric heating output.

[1] R = Read-only access, W = Write access.

[2] 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.

[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 ATS ServiceTools software.

[4] 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.

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

Table 12: Network Configuration Properties Inputs (NCIs)

Point Name	LonWorks Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Air Tempering Differential	AirTemperDiff	UCPTairTemperDiff	2 to 20ºF -16.7 to -6.7ºC Default: 5ºF/-15ºC	No	W	Yes	The unit controller compares the discharge air temperature (DAT) to the occupied heating setpoint to determine when to enter the air tempering mode. When the DAT is lower than the occupied heating setpoint minus this parameter, heating is enabled in order to satisfy the occupied heating setpoint and maintain the proper space temperature. Air tempering is activated under the following conditions: Air tempering mode is enabled The unit state is fan-only The unit is in either occupied or bypass mode
Air Tempering Enable	AirTemperEnbl	UCPTairTemper Enbl	See Description Default: 0 = Disable	No	W	Yes	Enables air tempering functionality. **Condition Value State** 0 = Disable 0 0 1 = Enable 100 1 -1 = Null 60 -1 Note that -1 = Null sets this input to the default and disables air tempering.
ASHP Compressor Defrost Timer	ASHPComp DefTm	UCPTashpComp DefTm	3 to 5 Minutes Default: 4 Minutes	No	W	Yes	Determines the amount of time the unit is in defrost. Applies only to air source heat pumps. Water source heat pumps use a fixed 60-second time limit.
Auxiliary Heat Off Differential	AuxHeat OffDif	UCPTAuxHeat OffDiff	1 to 10ºF 0.56 to - 5.56ºC Default: 1.0°F/0.56°C	No	W	Yes	Disables auxiliary heat when the control temperature rises above the effective heating setpoint minus the auxiliary heat on differential plus this setpoint (AuxHeatOffDif).
Auxiliary Heat On Differential	AuxHeat OnDif	UCPTAuxHeat OnDiff	1 to 10ºF 0.56 to - 5.56ºC Default: 2.0°F/1.11°C	No	W	Yes	Enables auxiliary heat when standard heating is at 100% and when the control temperature is less than or equal to the effective heating setpoint minus this setpoint (AuxHeatOnDif).
Auxiliary Heat Reverse	AuxHeatRev	UNVT_Aux_Heat_ Reverse	0 = AHR_Direct 1 = AHR_ Reverse Default: 0 = AHR_Direct	No	W	Yes	Commands the auxiliary heat output from direct to reverse-acting. Note that -1 (Nul) sets this input to the default of 0 = AHR_Direct.
Break Point High Speed Fan	BrkPtAutoHigh	UCPTbrkPtAuto High	5 to 100% Default: 95%	No	W	Yes	Sets the transition point (percent speed) for a high-speed fan.
Break Point Low Speed Fan	BrkPtAutoLow	UCPTbrkPtAutoLow	5 to 100% Default: 5%	No	W	Yes	Sets the transition point (percent speed) for a low-speed fan.
Break Point Medium Speed Fan	BrkPtAutoMed	UCPTbrkPtAuto Med	5 to 100% Default: 75%	No	W	Yes	Sets the transition point (percent speed) for a medium-speed fan.
Break Point Fan Speed Differential	BrkPtAutoDiff	UCPTbrkPtAutoDiff	2 to 20% Default: 2%	No	W	Yes	Sets the transition point differential as a percent speed. This differential is added to the appropriate fan speed break point value (low, medium, or high speed as configured from the parameters directly above). This is the calculation used when the fan transitions to a higher speed.
Brownout Reference Setpoint	BrownoutRef	UNVT_ADC_COUNTS	0 to 4095 Default: 0	No	W	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	BypassTime	SCPTbypassTime (34)	0 to 480 Minutes Default: 120 Minutes	No	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.
Cooling PI Loop Integral Gain	ClgIntegGain	UNVT_PID_GAIN	0 to 255 Default: 0.02	No	W	Yes	The integral offset (Ki) value of the PI loop algorithm used to control the hydronic cooling water valve function.

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Cooling Maximum Temperature Differential	ClgMax DeltTmp	UCPTclgMx DeltaTmp	1 to 10ºF 0.56 to - 5.56ºC Default: 5ºF / 2.78ºC	No	W	Yes	The value that determines the hydronic cooling water valve position of the PI loop. It reflects the difference between the discharge air temperature and discharge air setpoint that causes the valve to open 100%.
Cooling Maximum Position	ClgMaxPos	UCPTclgMaxPos	10 to 100% Default: 100%	No	W	Yes	The chilled water valve maximum position.
Cooling Minimum Position	ClgMinPos	UCPTclgMinPos	0 to 100% Default: 0%	No	W	Yes	The chilled water valve minimum position when the difference between the discharge air temperature and the discharge air cooling setpoint is zero.
Cooling PI Loop Proportional Gain	ClgPropGain	UNVT_PID_GAIN	0 to 255 Default: 0.5	No	W	Yes	The proportional gain (Kp) value of the PI loop algorithm used to control hydronic cooling water valve function.
Compressor Heating Disable - WSHPs	CmpHtgEWTLock	UCPTComprHtg EWTLock	10 to 212°F -12.2 to 100°C Default*: 55°F/-12.8°C	No	W	Yes	Disables compressorized heating when the effective entering water temperature is below this setpoint. Applies only to water source heat pump units. *The default value applies to unit controller v1.5 and LonWorks v1.2. Previous versions default to 30°F.
Compressor Heating Disable - ASHPs	CmpHtg OATLock	UCPTComprHtg OATLock	10 to 212°F -12.2 to 100°C Default: 30°F/-1.1°C	No	W	Yes	Disables compressorized heating when the effective outdoor air temperature is below this setpoint. Applies only to air source heat pump units.
Control Temperature Source	CntrlTempSrc	UNVT_Cntrl_Temp_ Src	0 = CTC_Space 1 = CTC_RAT 2 = CTC_ Average -1 = CTC_Nul Default: 1 = CTC_RAT	No	W	Yes	Sets the control temperature from either a space sensor, return air sensor, or the average of both sensor inputs. The space temperature defaults to the local temperature sensor input unless it is overridden by the network. Note that -1 = CTC_Nul sets this input to the default value.
CO$_2$ PI Loop Integral Gain	CO2IntegGain	UNVT_PID_GAIN	0 to 255 Default: 0.01	No	W	Yes	The integral offset (Ki) value of the PI loop algorithm used to control the outside air damper for CO2 /demand control ventilation.
CO$_2$ PI Loop Proportional Gain	CO2PropGain	UNVT_PID_GAIN	0 to 255 Default: 0.01	No	W	Yes	The proportional gain (Kp) value of the PI loop algorithm used to control the outside air damper for CO2 /demand control ventilation.
Compressor OFF Timer	ComprMinOffTm	UCPTcompr MinOffTm	300 to 600 Seconds Default: 360 Seconds	No	W	Yes	Configures the minimum amount of time the compressor must remain off before it is allowed to turn on again.
Compressor ON Timer	ComprMinOnTm	UCPTcompr MinOnTm	60 to 600 Seconds Default: 180 Seconds	No	W	Yes	Configures the minimum amount of time the compressor must remain on before it is allowed to turn off again.
Compressor Valve Timer Delay	ComprMtrVlvTm	UCPTcompr MtrVlvTm	0 to 60 Seconds Default: 45 Seconds*	No	W	Yes	Configures the amount of time allowed after the compressor motorized valve de-energizes before the fan can shut off. *The default value applies to unit controller v1.5 and LonWorks v1.2. Previous versions default to 30 seconds.
Compressor Cooling Lockout	CoolLockout	UCPTcoolLockout	45 to 80ºF 7.2 to 26.7ºC Default: 63.5ºF / 17.5ºC	No	W	Yes	Prevents compressor cooling when the outdoor air temperature is below this setpoint. Applies only to air source heat pump units.
Discharge Air Temperature Economizer Low Limit Setpoint	DAEconLowLim	UCPTdaEcon LowLim	45 to 65ºF 7.2 to 18.3ºC Default: 50ºF / 10ºC	No	W	Yes	Configures the airside economizer DAT cooling low limit setpoint.
Discharge Air Temperature Mechanical Low Limit Setpoint	DAMechLowLim	UCPTdaMech LowLim	35 to 65ºF 1.7 to 18.3ºC Default: 45ºF/7.2ºC	No	W	Yes	Configures the DAT mechanical cooling low limit setpoint. Used in conjunction with airside economizer cooling.
Discharge Air Temperature Cooling Setpoint	DATCoolSetpt	UCPTDatCoolSetpt	-40 to 212°F -40 to 100°C Default: 60°F/15.6°C	No	W	Yes	Sets the discharge air temperature cooling setpoint. Applies when the DAT cooling reset temperature parameter is not configured (i.e. set to "None" from the local LUI keypad display or ServiceTools software).

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Dehumidification Enable	DehumEnable	SNVT_switch (95)	0 = Disable 1 = Enable 2 = Null (Enable) Default: 2 = Null	Yes	W	Yes	Enables the unit to enter the dehumidification state. **Condition Value State** 0 = Disable 0 0 1 = Enable 100 1 2 = Null/Enable* 0 -1 Note that 2 = Null sets to the default. This allows automatic mode determination and enables dehumidification.
Discharge Air Temperature Heating Setpoint	DATHeatSetpt	UCPTdatHeat Setpt	-40 to 212°F -40 to 100°C Default: 90°F/32.2°C	No	W	Yes	Sets the discharge air temperature heating setpoint. Applies when the DAT heating reset temperature parameter is not configured (i.e. set to "None" from the local LUI keypad display or ServiceTools software). Note: Default value = 85°F on unit controller software versions prior to 1.4.
Device Software Identification (Major Version)	DevMajVer	SCPTdevMajVer (165)	0 to 99 Default: 1	No	R	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).
Device Software Identification (Minor Version)	DevMinVer	SCPTdevMinVer (166)	0 to 9 Default: 2	No	R	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).
Discharge Air Temperature Economizer High Limit Setpoint	DisAirHighLim	UCPTdisAirHighLim	80 to 135°F 26.7 to 57.2°C Default: 125°F / 51.7°C	No	W	Yes	Configures the airside economizer DAT heating high limit setpoint.
Economizer Indoor/Outdoor Air Deadband Differential	EconDBDiff	UCPTeconDbDiff	1 to 10°F 0.56 to - 5.56°C Default: 2°F/ -1.1°C	No	W	Yes	Adjusts the economizer indoor/outdoor air (IA/OA) temperature deadband differential.
Economizer Indoor/Outdoor Air Enthalpy Differential	EconEnthDiff	UCPTeconEnthDiff	0 to 10 BTU/lb 0 to 23.3 kJ/kg Default: 1 BTU/lb 2.3 kJ/kg	No	W	Yes	Adjusts the economizer indoor/outdoor air (IA/OA) enthalpy differential.
Economizer Enthalpy Setpoint	EconEnthSetpt	UCPTecon EnthSetpt	5 to 50 BTU/lb 11.63 to 116.3 kJ/kg Default*: 27 BTU/lb 62.8 kJ kg	No	W	Yes	Adjusts the economizer outdoor air enthalpy setpoint. The outdoor enthalpy input must be less than this setpoint for free cooling to be available. *The default value applies to unit controller v1.5 and LONWORKS v1.2. Previous versions default to 29 BTU/lb.
Economizer PI Loop Integral Gain	EconIntegGain	UNVT_PID_GAIN	0 to 255 Default: 0.1	No	W	Yes	The integral offset (Ki) value of the PI loop algorithm used to control the outdoor damper position when the unit is in economizer mode and free cooling is available.
Economizer Outdoor Air Differential Setpoint	EconOADiffSpt	UCPTeconOASetpt	0 to 70°F 0 to 21.12°C Default: 2°F/-16.7°C	No	W	Yes	Adjusts the economizer indoor/outdoor air (IA/OA) temperature differential. The control temperature input must be less than the effective outdoor temperature plus this setpoint for free cooling to be available.
Economizer PI Loop Proportional Gan	EconPropGain	UNVT_PID_GAIN	0 to 255 Default: 1	No	W	Yes	The proportional gain (Kp) value of the PI loop algorithm used to control the outdoor damper position when the unit is in economizer mode and free cooling is available.
Economizer Strategy	EconStrategy	UCPTeconStrategy	0 = ES_None 1 = ES_Diff_ Temp 2 = ES_Outdoor_ Enth 3 = ES_Enth_ Compare -1 = ES_Nul Default: 1 = ES_Diff_ Temp	No	W	Yes	Specifies the control strategy to determine when free cooling is available as described here: • Diff_Temp: Compares outdoor air temperature to space temperature. • Outdoor_Enth: Compares outdoor air temperature to outside humidity. • Enth_Compare: Compares outdoor enthalpy to indoor enthalpy. Note that -1 = ES_Nul sets this input to the default.

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Emergency Heating Setpoint	EmergHtgSetpt	UCPTemerg HtgSetpt	0 to 70ºF -17.8 to 21.1ºC Default: 54ºF/12.2ºC	No	W	Yes	Configures the emergency heating setpoint. The unit enters the emergency heat state if the control temperature is below this setpoint and emergency heat is enabled.
Emergency Heating Enable	EmergHtgEnbl	UCPTemerg HtgEnbl	0 = Disable 1 = Enable Default: 1 = Enable	Yes	W	Yes	Enables the unit to enter the dehumidification state. **Condition** **Value** **State** 0 = Disable 0 0 1 = Enable 100 1 2 = Null/Enable* 0 -1 Note that -1 = Null sets to the default. This allows automatic mode determination and enables emergency heating.
End of Cycle (EOC) Valve Low Limit Temperature Setpoint	EOCLowOASetpt	UCPTeocLow OASetpt	20 to 36ºF -6.7 to 2.2ºC Default: 34ºF/1.1ºC	No	W	Yes	The setpoint at which the end of cycle (EOC) valve opens in order to prevetnt the coils from freezing. The EOC opens, regardless of space temperature, under these conditions: • The outdoor air temperature is below the EOC low outdoor air setpoint • The face and bypass damper is in the full bypass position
Entering Water Flow Timer	EwFlowTmr	UCPTewFloTmr	0 to 600 Seconds Default: 120 Seconds	No	W	Yes	Determines the amount of time that the entering water loop must flow before hydronic heat or hydronic cooling is available. Applies to two-pipe units.
Exhaust Fan Start Position	ExhStartPos	SCPTexhaust EnablePostiton	0 to 100% Default: 12%	No	W	Yes	Energizes the exhaust fan and sets the outdoor air damper position.
Fan Changes Per Hour	FanChgPerHr	UCPTfanChg PerHr	1 to 60 Times/Hour Default: 10 Times/Hour	No	W	Yes	Configures the number of fan speed changes allowed each hour. Applies to 3-speed indoor fans.
Fan Control Select	FanControlSel	UCPTfan ConttrolSel	0 = FCS_Single_DAT 1 = FCS_CO2 2 = FCS_AI_Input Default: 0 = FCS_Single_DAT	No	W	Yes	Determines the indoor fan control strategy. • Single_DAT: Fan control based on the single zone discharge air temperature • CO_2: Fan control based on the space CO_2 from the network or local CO_2 sensor, if available • AI_Input: Fan control using the locally configured analog input. See Configurable Parameters for more information. Note that -1 =FCS_Nul sets the input to the default, FCS_Single_DAT.
Fan Cycling	FanCycling	UCPTfanCycling	0 = FC_Continuous 1 = FC_Cycling Default: 0 = FC_Continuous	No	W	Yes	Configures if the space fan should run continuously without heating or cooling demand. Only applies when the unit is operating in a non-occupied mode. Note that -1 =FC_Nul sets this input to the default, allowing the fan to cycle continuously.
Fan Off Time Delay	FanOffDelay	UCPTfanOffDelay	0 to 10 Seconds Default: 4 Seconds	No	W	Yes	The amount of time the fan is allowed to run after the unit has been shut down. Applies when the unit is configured for fan cycling.
Face and Bypass Damper PI Loop Integral Gain	FBDIntegGain	UNVT_PID_GAIN	0 to 255 Default: 1	No	W	Yes	The integral offset (Ki) value of the loop algorithm used to control the face and bypass damper function.
Face and Bypass Damper PI Loop Proportional Gain	FBDPropGain	UNVT_PID_GAIN	0 to 255 Default: 10	No	W	Yes	The proportional gain (Kp) value of the loop algorithm used to control the face and bypass damper function.
Filter Change Alarm Enable	FltrChgEnable	UCPTfltrChgEnable	0 = Disable 1 = Enable -1 = Null Default: 0 = Disable*	No	W	Yes	Enables the change filter alarm. It is used along with Filter Change Hours (nvoFltrChgHours.) **Condition** **Value** **State** 0 = Disable 0 0 1 = Enable 100 1 2 = Null/Enable 0 -1 Note that -1 = Nul sets the input to the default and disables the change filter alarm.

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Filter Change Hours	FltrChgHours	UCPTfltrChgHours	50 to 2000 Hours Default: 700 Hours	No	W	Yes	The amount of time the fan can run before a filter change is needed and a warning alarm is generated. The alarm is cleared using the clear filter input (nviResetFilter).
Heating Water Valve PI Loop Integral Gain	HtgIntegGain	UNVT_PID_GAIN	0 to 255 Default: 0.02	No	W	Yes	The integral offset (Ki) value of the PI loop algorithm used to control the heating water valve function.
Heating Maximum Temperature Differential	HtgMax DeltTmp	UCPThtgMx DeltaTmp	1 to 10ºF 0.56 to - 5.56ºC Default: 5ºF / 2.78ºC	No	W	Yes	The value used to determine the hot water valve position of the loop algorithm. It reflects the difference between the discharge air temperature and discharge air setpoint that causes the valve to open 100%.
Hot Water Maximum Position	HtgMaxPos	UCPThtgMaxPos	10 to 100% Default: 100%	No	W	Yes	The hot water valve maximum position.
Hot Water Minimum Position	HtgMinPos	UCPThtgMinPos	0 to 100% Default: 0%	No	W	Yes	The hot water valve minimum position.
Heating Water Valve PI Loop Proportional Gain	HtgPropGain	UNVT_PID_GAIN	0 to 255 Default: 0.5	No	W	Yes	The proportional gain (Kp) value of the PI loop algorithm used to control heating water valve function.
Electric Heat PI Loop Integral Gain	HtgSecIntgtGn	UNVT_PID_GAIN	0 to 255 Default: 0.5	No	W	Yes	The integral offset (Ki) value of the PI loop algorithm used to control the electric heating function.
Electric Heat PI Loop Proportional Gain	HtgSecPropGn	UNVT_PID_GAIN	0 to 255 Default: 8	No	W	Yes	The proportional gain (Kp) value of the PI loop algorithm used to control the electric heating function.
Location	Location	SCPTlocation (17)	31 Characters Default: Blank	No	W	Yes	Text string used to describe the physical location of the unit.
LONWORKS Software Part Number	LonSoftNum	UCPTLonSoftNum	10 Character Text String Default: 2507450011	No	R	Yes	The LONWORKS communication module (device) software part number. This text string is written to the unit controller and read-only from the network. It is defined as follows: NNNNNNNVVR N = Base part number V = Version number R = Revision number
Low Suction Line Temperature Protection Setpoint	LowTempProt	UCPTlowTempProt	0 to 50°F -17.8 to 10°C Default: 28ºF / -2.22ºC	No	W	Yes	The setpoint used to determine when the compressor low suction line temperature alarm becomes active, and when the unit enters and exits defrost. Applies to both water and glycol loop units. See Alarms section for more information.
Low Suction Temperature Protection Differential	LowTmpProtDif	UCPTlowTmp ProtDif	1 to 8°F 0.56 to 4.44°C Default: 4°F / 2.22°C	No	W	Yes	This value is added to the selected low suction line temperature protection setpoint (nciLowTempProt) to determine the setting at which the alarm becomes inactive. See Alarms section for more information.
Minimum Send Time	MinOutTm	SCPTminSendTime (24)	0 to 3276 Seconds Default: 0 Seconds	No	W	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 Low Limit PI Loop Integral Gain	OADLLIntgGain	UNVT_PID_GAIN	0 to 255 Default: 0.2	No	W	Yes	The integral offset (Ki) value of the PI loop algorithm used to control the control the low limit outdoor damper position when the unit is in low limit.
Outdoor Air Damper Low Limit PI Loop Proportional Gain	OADLLPropGain	UNVT_PID_GAIN	0 to 255 Default: 2.0	No	W	Yes	The proportional gain (Kp) value of the PI loop algorithm used to control the low limit outdoor damper position when the unit is in low limit.

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Outdoor Air Damper Lockout Enable	OALockoutEnbl	UCPToaLockout Enbl	0 = Disable 1 = Enable -1 = Null Default: 0 = Disable	No	W	Yes	Enables the outdoor air lockout function, which causes the unit to close the outdoor air damper when the outdoor air temperature drops below the damper low OAT lockout setpoint (OALockoutSetp). 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 Damper Lockout Setpoint	OALockoutSetp	UCPToaLockout Setpt	25 to 45°F -3.9 to 7.2°C Default: 36°F / 2.2°C	No	W	Yes	Prevents the outdoor air damper from opening when the outdoor air temperature drops below this setpoint.
Outdoor Air Damper Maximum Position	OAMaxPos	SCPTmaxRnge (20)	0 to 100% Default: 100%	No	W	Yes	Sets the outdoor air damper maximum position when unit is configured for CO_2 control or space fan running at high speed.
Outdoor Air Damper Minimum Position	OAMinPos	SCPTminRnge (23)	0 to 100% Default: 20%	No	W	Yes	Sets the outdoor air damper minimum position when unit is configured for CO_2 control or space fan running at high speed.
Outdoor Air Damper Minimum Exhaust Interlock Position	OAMinPosExh	UCPToaMinPosExh	0 to 100% Default: 100%	No	W	Yes	Sets the minimum outdoor air damper position when the exhaust interlock is active.
Outdoor Air Damper Minimum Position Low Speed	OAMinPosLowSp	UCPToaMinPos LowSpeed	0 to 100% Default: 30%	No	W	Yes	Sets the outdoor air damper minimum position setpoint when the space fan is running at low speed.
Outdoor Air Damper Minimum Position Medium Speed	OAMinPosMedSp	UCPToaMinPos MedSpeed	0 to 100% Default: 25%	No	W	Yes	Sets the outdoor air damper minimum position setpoint when the space fan is running at medium speed.
Economizer Outdoor Air Temperature Setpoint	OATSetpt	SCPToutdoorAir TempSetpoint	-40 to 80°F -40 to 26.7°C Default: 68°F / 20°C	No	W	Yes	Configures the economizer outdoor air temperature (OAT) lockout setpoint. When the OAT is above this setpoint, the economizer is not available.
Occupied Setpoint Differential	OccDiff	UCPToccDiff	1 to 10°F -17.2 to -12.2°C Default: 1°F / 0.56°C	No	W	Yes	Determines the cooling OFF and heating ON effective setpoints. Applies when the unit is in the occupied, bypass, or standby mode as follows: ClgSetptOff = EffectSetpt - cpOccDiff HtgSetptOff = EffectSetpt + cpOccDiff
PWM Fan High Speed	PWMHighFan	UCPTpwmHighFan	80 to 100% Default: 100%	No	W	Yes	The speed (in percent) for a PWM high fixed-speed fan.
PWM Fan Low Speed	PWMLowFan	UCPTpwmLowFan	50 to 80% Default: 75%	No	W	Yes	The speed (in percent) for a PWM low fixed-speed fan.
PWM Fan Medium Speed	PWMMedFan	UCPTpwmMedFan	70 to 90% Default: 90%	No	W	Yes	The speed (in percent) for a PWM medium fixed-speed fan.
Receive Heartbeat	RcvHrtBt	SCPTmaxRcvTime (48)	0 to 3276 Seconds Default: 0 Seconds (Disabled)	No	W	Yes	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.

Remote Sensor Adjustment	RemSetptAdjTy	UNVTSetptAdjType	0 = SAT_DIFF
			1 = SAT_ABS
			-1 = SAT_Nul
			Default:
			1 = SAT_ABS
				No	W	Yes	Defines the type of remote wall sensor setpoint adjustment method.
							  SAT_ABS (absolute): 55° to 95°F adjustment
							  SAT_DIFF(differential): +/-3°F adjustment
							Note that -1 = Nul sets this input to the default of 1 = SAT_ABS.

Occupied Cooling Setpoint	Setpoints.occupied_cool	SCPTsetPnts (60)	61 to 86°F 16.1 to 30°C Default: 73°F / 22.8°C	No	W	Yes	The control temperature setpoint used for the occupied cooling mode.
Standby Cooling Setpoint	Setpoints.standby_cool	SCPTsetPnts (60)	61 to 86°F 16.1 to 30°C Default: 77°F / 25°C	No	W	Yes	The control temperature setpoint used for the standby cooling mode.

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Unoccupied Cooling Setpoint	Setpoints. unoccupied_cool	SCPTsetPnts (60)	61 to 86ºF 16.1 to 30ºC Default: 82ºF / 27.8ºC	No	W	Yes	The control temperature setpoint used for the unoccupied cooling mode.
Occupied Heating Setpoint	Setpoints. occupied_heat	SCPTsetPnts (60)	50 to 82ºF 10 to 27.8ºC Default: 70ºF / 21.11ºC	No	W	Yes	The control temperature setpoint used for the occupied heating mode.
Standby Heating Setpoint	Setpoints.standby_ heat	SCPTsetPnts (60)	50 to 82ºF 10 to 27.8ºC Default: 66ºF / 18.88ºC	No	W	Yes	The control temperature setpoint used for the standby heating mode.
Unoccupied Heating Setpoint	Setpoints. unoccupied_heat	SCPTsetPnts (60)	50 to 82ºF 10 to 27.8ºC Default: 61ºF / 16.1ºC	No	W	Yes	The control temperature setpoint used for the unoccupied heating mode.
Setpoint Method	SetptMethod	UNVTSetptMethod	0 = EA_Easy 1 = EA_Advanced Default: 1 = EA_Advanced	No	W	Yes	Determines which control strategy is used to calculate the heating or cooling setpoints (effective setpoint) as described below: 0 = EA_Easy: User defines the input for the occupied, standby, and unoccupied cooling and heating setpoints, which are used for determining the setpoint calculations). 1 = EA_Advanced*: The unit controller application determines the occupied, standby, and unoccupied setpoint calculations. Note that -1 = EA_Nul sets this input to the default, EA_Advanced. *The advanced method is recommended for setting the control strategy. Contact ATS Technical Response at TechResponseATS@ daikinapplied.com or (315) 282-6434 for assistance.
Send Heartbeat	SndHrtBt	SCPTmaxSendTime (22)	0 to 3276 Seconds Default: 0 Seconds (Disabled)	No	W	Yes	If the network has not sent a network variable output (nvo) within this amount of time, then the network value is manually transmitted. The value of 0 disables this feature.
Source (Entering Water Temperature) Setpoint Differential	SourceTmpDiff	UCPTsource TempDiff	0 to 10°F -17.8 to -12.2°C Default: 5°F / -15ºC	No	W	Yes	Defines the minimum differential between the effective entering water temperature setpoint and the space temperature setpoint (nviSpaceTemp). Enables hydronic heating or cooling, depending on the relative space and water temperature values. This differential applies to two-pipe change-over applications. Heating is enabled when Effective EWT - ControlTemp > nciSourceTempDiff Cooling is enabled when the ControlTemp - Effective EWT > nciSourceTempDiff
Space CO_2 Enable	SpaceCO2Enbl	UCPTspace CO2Enbl	0 = Disable 1 = Enable Default: 0 = Disable	No	W	Yes	Enables unit demand control ventilation strategy based on space CO_2 levels when a sensor is installed and configured for CO_2. Condition　　Value　　State 0 = Disable　　　0　　　0 1 = Enable　　100　　　1 -1 = Null　　　60　　　-1 Note that -1 = Nul sets this input to the default and disables demand control ventilation based on space CO_2.
Space CO_2 Limit	SpaceCO2Lim	SCPTlimitCO2 (42)	0 to 2000 ppm Default: 1200 ppm	No	W	Yes	Configures the indoor space CO_2 sensor setpoint from the network. Applies when installed and configured with a valid sensor value.
Space Relative Humidity Setpoint	SpaceRHSetpt	SCPThumSetpt (36)	10 to 100% Default: 60%	No	W	Yes	Configures the indoor space relative humidity sensor setpoint from the network. Applies when installed and configured with a valid sensor value.

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Space Temperature Sensor Installed	SpcTmpSnsInst	UNVT_Installed_t	0 = INS_Not_ Installed 1 = INS_Installed Default: 0 = INS_Not_ Installed	No	W	Yes	Configures the space temperature sensor for field installation or replacement. Note that -1 = INS_Nul sets this input to the default (0 = INS_Not_Installed).
Single Zone VAV Fan PI Loop Integral Gain	SZVavIntgGain	UNVT_PID_GAIN	0 to 255 Default: 0.01	Yes	W	Yes	The integral offset (Ki) value of the PI loop algorithm used for temperature control function of single-zone VAV units. The value of 0 disables this feature.
Single Zone VAV Fan Maximum Output	SZVavMaxFan	UCPTszVavMaxFan	0 to 100% Default: 100%	Yes	W	Yes	Sets the maximum fan speed for single-zone VAV units.
Single Zone VAV Fan Minimum Output	SZVavMinFan	UCPTszVavMinFan	0 to 100% Default: 5%	Yes	W	Yes	Sets the minimum fan speed for single-zone VAV units.
Single Zone VAV Fan Maximum Temperature Differential	SZVavMxDeltaT	UCPTszVAV MxDeltaT	1 to 10ºF 0.56 to - 5.56ºC Default: 5ºF / 2.78ºC	Yes	W	Yes	Configures the value used to determine the maximum fan speed output for single-zone VAV units.
Single Zone VAV Fan PI Loop Proportional Gain	SZVavPropGain	UNVT_PID_GAIN	0 to 255 Default: 0.1	Yes	W	Yes	The proportional gain (Kp) value of the PI loop algorithm used for temperature control function of single-zone VAV units.
Year	TimeStamp.year	SNVT_time_stamp	2020 to 2100 Default: 2020	No	W	No	Sets the current year. Default format displayed in LONWORKS is 1/1/2020 00:00:00.
Month	TimeStamp.month	SNVT_time_stamp	1 to 12 Default: 1	No	W	No	Sets the current month used in the default format. See nciTimeStamp.year directly above. 1 = Jan 2 = Feb 3 = Mar 4 = Apr 5 = May 6 = Jun 7 = Jul 8 = Aug 9 = Sep 10 = Oct 11 = Nov 12 = Dec
Date	TimeStamp.day	SNVT_time_stamp	1 to 31* Default: 1	No	W	No	Sets the current day of the month used in the default format. See nciTimeStamp.year above. *Note the maximum day value depends on the month and year values.
Hour	TimeStamp.hour	SNVT_time_stamp	0 to 23 Default: 0	No	W	No	Sets the current hour of the day used in the default format. See nciTimeStamp.year above.
Minute	TimeStamp.minute	SNVT_time_stamp	0 to 59 Default: 0	No	W	No	Sets the current minute of the hour used in the default format. See nciTimeStamp.year above.
Unit Application Identification (Major Version)	UnitAppMajVer	UCPTunitAppMajVer	0 to 99 (Text String)	No	R	Yes	The major version of the unit controller software. It reflects the "VV" portion of the full text string (VV.R) where VV = Version and R = Revision.
Unit Application Identification (Minor Version)	UnitAppMinVer	UCPTunitAppMinVer	0 to 99 (Text String)	No	R	Yes	The minor version of the unit controller software. It reflects the "R" portion of the full text string (VV.R) where VV = Version and R = Revision.
Unit Application Software Number	UnitSoftNum	UCPTUnitSoftNum	10 Characters (Text String) Default: 2507402013	No	R	Yes	The software number of the unit controller application. This text string gets passed to the LONWORKS communication module (device). The text string is defined as follows: NNNNNNNVVR N = Base part number V = Version number R = Revision number

Table 12: Network Configurable Inputs (NCIs), Continued

Point Name	LONWORKS Parameter Name	SNVT/UNVT (SNVT/UNVT Index)	Range/Default (in Units)	Receive Heart-beat	Access Type[1]	Non-volatile Memory[2]	Description[3]
Unoccupied Mode Temperature Setpoint Differential	UnoccDiff	UCPTunOccDiff	1 to 10ºF 0.56 to - 5.56ºC Default: 1°F / 0.56°C	No	W	Yes	This value is used in setpoint calculation to determine the effective OFF setpoint. Applies only to the unoccupied mode as follows: Cooling OFF setpoint = EffectSetpt - UnoccDiff Heating OFF setpoint = EffectSetpt + UnoccDiff

[1] R = Read-only access, W = Write access.

[2] 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.

[3] All nci parameters are network-configurable. They can also be changed locally from the LUI keypad display or ServiceTools software.

Configurable Parameters

Configurable Analog Inputs

Table 13 describes a special set of configurable analog inputs not covered in the previous data tables.

Analog Inputs AI10, AI12, and AI14 support more than one configuration parameter (sensor) input. They are available to the BACnet or LONWORKS network when the respective input has been configured and is active or enabled.

These parameters, and any applicable offsets, are set 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 input must be re-configured from the LUI keypad display or ServiceTools software before network access is possible. Analog inputs are read-only.

Refer to MicroTech UV Controller OM 1280 for a description of all unit controller I/O parameters and how to use 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 13: Configurable Analog Inputs

Analog Input		Configurable Parameters[2]	BACnet Objects	LONWORKS Variables	Description[1]
AI10	Entering Water Temp	aiEWT (Default)	EWT (AI:3)	nvoEffectEWT	Factory-wired and configured for 10k Type II sensor input
		aiOutdoorCoilTemp	NA	NA	
		aiIndoorCoilTemp	CompSuctionTemp (AI:6)	nvoCompSuctionTemp	
		None			
AI12	Indoor Coil Temp	aiIndoorCoilTemp (Default)	CompSuctionTemp (AI:6)	nvoCompSuctionTemp	Factory-wired and configured for 10k Type II sensor input
		aiEWT	EWT (AI:3)	nvoEffectEWT	
		aiOutdoorCoilTemp			
		None			
AI14	CO2	aiCO2 (Default)	SpaceCO2 (AI:12)	nvoSpaceCO2	Factory-wired and configured for 0-10 VDC sensor input
		aiResetVolts			
		None			

[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.

Alarms

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 14 displays all alarms supported by the unit controller for both BACnet and LONWORKS networks.

Alarm Class and Priority

Alarms are organized by Fault, Problem, or Warning alarm class.

Table 14 lists all alarms sorted by index number. The alarm (index) number is mapped to the BACnet or LONWORKS network. For BACnet, no alarm = 1. 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 14 and Table 15.

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 will clear automatically when conditions return to normal.

Alarm Monitoring

BACnet

Alarms are monitored using the *CurrentAlarm* (MSV:2) 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 the network variable *nvoUnitStatus.in_alarm*. Only the highest priority active alarm is displayed when there are multiple active alarms and *nvoUnitStatus.in_alarm* is active. When no alarms are active, *nvoUnitStatus.in_alarm* = 0.

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.

Other Clear Alarm Options

Intelligent Alarm Reset

The 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.

Modbus Client/Server

A single UV controller (client) can supervise multiple server devices. Servers can be UVs and/or room sensors. Client and servers must be configured from the LUI keypad display or ServiceTools software in order to enable this feature and alarm notifications. Alarms can then be viewed and cleared from the BACnet BAS.

NOTE: Modbus client/server alarms are only supported in UV applications v1.5 and newer.

Once configured, the client can:

1. Coordinate communication from 1-9 server UVs
2. Coordinate communication with 1-4 room sensor servers

Both the UV controller client and affected server(s) use *ModbusAlarm* to indicate a loss of communication, incorrect or duplicate device addressing, or software incompatibility. When one or more servers lose communication to the client, the affected server(s) parameters become invalid and revert to their default values. The unaffected servers continue to communicate as expected. Once the server is communicating, the alarm clears the next time it is pinged by the client. The server parameter settings are then restored.

Each server has its own fault, problem, and warning alarms. *ModbusAlarm* does not automatically activate when one of these server alarms has been generated. See Alarm Tables in the next section for a complete description of *ModbusAlarm* and individual server alarms.

NOTE: When a new server device is added or replaced, the UV controller client must be configured for manual discovery. This cannot be done from the BAS. It must be done at the LUI keypad display or ServiceTools software. If the client discovers an unexpected server device while performing routine network polling, a "comm" error is displays from *ModbusAlarm* (BACnet alarm 32) until the server is discovered.

For more information, see MicroTech MT2205 Unit Controller OM 1365 and ATS ServiceTools OM 732, www.DaikinApplied.com.

Alarm Tables

Table 14 describes all BACnet and LᴏɴWᴏʀᴋs alarm enumerations according to index number. The index number displays the highest priority active alarm. Table 15 - Table 17 describe the alarms by Fault, Problem, and Warning classes.

Alarms are read-only but can be monitored and cleared as described in the previous section.

Refer to the MicroTech MT2205 Unit Controller OM 1365 for additional descriptions about alarm generation (www.DaikinApplied.com).

Table 14: Alarms by Alarm Number

Alarm Index Number - BACnet	Alarm Index Number - LᴏɴWᴏʀᴋs	Description	Type	Priority	Clear
1	0	NoAlarm	-	-	-
2	1	ShutdownDIAlarm	Fault	4	Auto
3	2	SpaceTempSensorAlarm	Problem	12	Auto
4	3	HighDxPressureAlarm[1,2]	Problem	13	Auto
5	4	DATLLDxAlarm	Problem	14	Auto
6	5	CondensateOverflowAlarm	Problem	15	Auto
7	6	IndoorAirCoilDxTempSensorAlarm[2]	Problem	16	Auto
8	7	OATSensorAlarm	Problem	17	Auto
9	8	DATSensorAlarm	Fault	5	Auto
10	9	OutdoorAirCoilDxTempSensorAlarm[2]	Problem	18	Auto
11	10	WaterCoilDxTempSensorAlarm[2]	Problem	19	Auto
12	11	WaterOutTempSensorAlarm	Problem	20	Auto
13	12	WaterInTempSensorAlarm	Problem	21	Auto
14	13	SpaceHumiditySensorAlarm	Problem	22	Auto
15	14	OutdoorHumiditySensorAlarm	Problem	23	Auto
16	15	SpaceCO2SensorAlarm	Problem	24	Auto
17	16	WaterInTempInadequateAlarm	Problem	25	Auto
18	17	WaterCoilFreezeFaultAlarm	Fault	8	Auto
19	18	LowSuctionLineTempAlarm[1,2]	Problem	26	Auto
20	19	CantCoolAlarm	Problem	27	Auto
21	20	CantHeatAlarm	Problem	28	Auto
22	21	DATLLAlarm	Problem	29	Auto
23	22	BrownoutAlarm[2]	Problem	30	Auto
24	23	HighVoltageAlarm[2]	Problem	31	Auto
25	24	ChangeFilterAlarm	Warning	36	Manual
26	25	LowOACoilTempAlarm	Problem	32	Auto
27	26	ReturnTempSensorAlarm	Problem	33	Auto
28	27	FactoryConfigStringAlarm	Fault	6	Manual
29	28	ControlTempAlarm[2]	Fault	7	Manual
30	29	ConfigurationAlarm	Warning	37	Auto
31	30	ControlBoardAlarm	Fault	2	Auto
32	-	ModbusAlarm[3]	Problem	34	Auto
33	-	ServerFaultAlarm[4]	Problem	11	Auto
34	-	ServerProblemAlarm	Problem	35	Auto
35	-	ServerWarningAlarm	Warning	38	Auto
36	-	A2lLeakAlarm	Fault	3	Manual
37	-	A2lSensorAlarm	Problem	9	Auto
38	-	A2lCommunicationAlarm	Problem	10	Auto

[1] After seven days, alarm reverts from Auto to Manual reset.

[2] Multi-compressor alarm.

[3] Each server has its own fault, problem, and warning alarms. See BACnet alarms 33-35 in the following tables. ModbusAlarm does not automatically activate when there is an individual server alarm. It activates due to an addressing error, software incompatibility, or loss of communication with at least one of the server devices. When this happens, the affected server parameters revert to invalid (default) values until communication is restored. The other servers maintain control by the server and continue to communicate as expected.

[4] Indicates a fault has occurred in at least one of the server devices. This generates a problem alarm in the client. This prevents the client from shutting down due to a fault.

Table 15: Fault Alarms

Alarm Index Number - BACnet	Alarm Index Number- LONWORKS	Alarm Name	Priority	Clear	Description
31	30	ControlBoardAlarm	2	Auto	The control board alarm indicates the unit controller hardware has failed or is not reliable.
29	28	ControlTempAlarm[2]	6	Manual	The control temperature alarm indicates neither a space temperature or return air temperature is available.[2]
9	8	DATSensorAlarm	5	Auto	The discharge air temperature (DAT) sensor alarm indicates that the DAT sensor is either shorted or open-circuited, or the discharge air temperature is out of range.
28	27	FactoryConfigStringAlarm	6	Manual	The factory configuration alarm indicates there is an error detected in the factory-loaded unit configuration string.
2	1	ShutdownDIAlarm	4	Auto	The shutdown DI alarm indicates an emergency stop condition and that the shutdown discrete binary input is active.
18	17	WaterCoilFreezeFaultAlarm	8	Auto	The water coil freeze alarm indicates the hydronic water coil freeze stat setpoint is low.
36	-	A2lLeakAlarm	3	Manual	The MT6210 (A2L) refrigerant detection board has detected a refrigerant concentration level above the desired threshold.

[1] After seven days, alarm reverts from Auto to Manual reset.
[2] Multi-compressor alarm.

Table 16: Problem Alarms

Alarm Index Number - BACnet	Alarm Index Number- LONWORKS	Alarm Name	Priority	Clear	Description
23	22	BrownoutAlarm	30	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.[2]
20	19	CantCoolAlarm	27	Auto	The can't cool alarm indicates that conditions are preventing the unit from entering cooling mode. The effective entering water temperature ($EffEWT$) is higher than the acceptable range, and no other form of cooling is available.
21	20	CantHeatAlarm	28	Auto	The can't heat alarm indicates that conditions are preventing the unit from entering heating mode. The effective entering water temperature ($EffEWT$) is lower than the acceptable range, and no other form of heating is available.
6	5	CondensateOverflowAlarm	15	Auto	The condensate overflow alarm indicates that the sensor is installed and that the drain pan is full of condensate.
22	21	DATLLAlarm	29	Auto	The discharge air temperature (DAT) low limit alarm indicates that the DAT is below the minimum $DisAirEconLowLim$ setpoint. Applies when the unit is not in compressorized cooling.
5	4	DATLLDxAlarm	14	Auto	The DAT low limit Dx alarm indicates that the DAT is below the minimum $DisAirMechLowLim$ setpoint. Applies when the unit is in compressorized cooling.
4	3	HighDxPressureAlarm	13	Auto[1]	The high DX pressure alarm is active due to a fault (switch open).[2]
24	23	HighVoltageAlarm	31	Auto	The high voltage alarm indicates that the line voltage exceeds the maximum limit.[2]
7	6	IndoorAirCoilDxTempSensorAlarm	16	Auto	The indoor air coil DX temperature alarm indicates that the sensor is installed but either shorted or open-circuited, or the indoor air DX coil temperature is out of range.[2]
8	7	OATSensorAlarm	17	Auto	The outdoor air temperature (OAT) sensor alarm indicates that the sensor is either shorted or open-circuited, or the outdoor air temperature is out of range.
26	25	LowOACoilTempAlarm	32	Auto	The low outdoor air (OA) coil temperature alarm indicates the OA coil temperature is below the minimum setpoint.
19	18	LowSuctionLineTempAlarm	26	Auto[1]	The low suction line temperature sensor alarm indicates that the suction line temperature is below the setpoint.[2]
10	9	OutdoorAirCoilDxTempSensorAlarm	18	Auto	The outdoor air coil DX temperature alarm indicates that the sensor is installed but is either shorted or open-circuited, or the outdoor air DX coil temperature input is out of range.[2]
15	14	OutdoorHumiditySensorAlarm	23	Auto	The outdoor humidity alarm indicates that the sensor is either shorted or open-circuited, or the outside humidity level is out of range.
27	26	ReturnTempSensorAlarm	33	Auto	The return air temperature sensor alarm indicates that the sensor is either shorted or open-circuited, or the return air temperature input is out of range.

Table 16: Problem Alarms, Continued

Alarm Index Number - BACnet	Alarm Index Number- LONWORKS	Alarm Name	Priority	Clear	Description
16	15	SpaceCO2SensorAlarm	24	Auto	The space CO_2 sensor alarm indicates that the sensor is installed but is either shorted or open-circuited, or the space CO_2 level is out of range.
14	13	SpaceHumiditySensorAlarm	22	Auto	The space humidity alarm indicates that the sensor is installed but is either shorted or open-circuited, or the indoor humidity is out of range.
3	2	SpaceTempSensorAlarm	12	Auto	The space temperature alarm indicates that the sensor is installed but is either shorted or open-circuited, or the space temperature analog input is out of range.
11	10	WaterCoilDxTempSensorAlarm	19	Auto	The water coil DX temperature sensor alarm indicates that the sensor is installed but the sensor is not reliable or the outdoor coil temperature is out of range.[2]
17	16	WaterInTempInadequateAlarm	25	Auto	The water temperature inadequate alarm indicates that the water temperature is not acceptable for the current unit mode.
13	12	WaterInTempSensorAlarm	21	Auto	The water in temperature alarm indicates that the DX coil temperature sensor is installed but is either shorted or open-circuited, or the entering water temperature is out of range.
12	11	WaterOutTempSensorAlarm	20	Auto	The water out temperature alarm indicates that the water DX coil temperature sensor is installed but is either shorted or open-circuited, or the leaving water temperature is out of range.
32	-	ModbusAlarm	34	Auto	Indicates an error or loss of communication, incorrect or duplicate device addressing, or software incompatibility. When this happens, the affected server(s) parameters become invalid and revert to their default values. The unaffected servers continue to communicate as expected. Once the server is communicating, the alarm clears the next time it is pinged by the server. The server parameter settings are then restored. The following descriptions reflect the alarm text that appears in the LUI keypad display or ServiceTools software. Also see Table 17. 1. Config: NA - used only for internal purposes. 2. Comm: No communication from the server to a server, or from a server to the server. 3. Version: Indicates a discrepancy between the server version number and a server version number. 4. SRange: The UV server is assigned an invalid address (other than 1) 5. CRange: At least one of the UV servers has an invalid address. Valid addresses are 2-10. 6. RSRange: One of the Modbus room sensors has been assigned an invalid address. Valid addresses are 11-14. 7. Dup: There is a duplicate device configuration. This could mean that there are two server UVs with the same address, two room sensors with the same address, or two server configurations.
33	-	ServerFaultAlarm	11	Auto	Indicates that at least one of the Modbus server devices is in a fault condition. When this happens, a problem alarm is generated in the server, which prevents the server from shutting down. Applies only to devices configured for client/server networks.
34	-	ServerProblemAlarm	35	Auto	Indicates that at least one of the Modbus server devices has generated a problem alarm. Applies only to devices configured for client/server networks.
37	-	A2lSensorAlarm	9	Auto	An A2L sensor alarm indicates there is a communication error with one or more of the refrigerant sensors.
38	-	A2lCommunicationAlarm	10	Auto	There is a communication error between the MicroTech UV controller and the MT6210 (A2L) refrigerant detection board

[1] After seven days, alarm reverts from Auto to Manual reset.
[2] Multi-compressor alarm.

Table 17: Warning Alarms

Alarm Index Number - BACnet	Alarm Index Number- LONWORKS	Alarm Name	Priority	Clear	Description
25	24	ChangeFilterAlarm	36	Manual	The change filter alarm indicates that the filter needs to be replaced based on fan runtime hours.
30	29	ConfigurationAlarm	37	Auto	The configuration alarm indicates that there is an error with one or more of the unit controller I/O configuration parameters.
35	-	ServerWarningAlarm	38	Auto	Alarm indicates that at least one of the Modbus server devices has generated a warning alarm. Applies only to devices configured for client/server networks.

Effective Occupancy Modes

Effective Occupancy

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

The unit operates in one of four different occupancy modes as described in Table 18 below.

Table 18: Occupancy Modes

Mode	Description
Occupied	Space is occupied
Unoccupied	Space is unoccupied
Standby	Unit is using setpoints that are in between the values defined by Occupied and Unoccupied states
Bypass	Space is considered occupied for the duration of the bypass timer

The unit 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 19 describes the parameters used to calculate effective occupancy (MSV:6-MSV:9). Table 20 describes the relationship among those network occupancy inputs and the respective configuration parameters.

Table 19: Parameter Descriptions

Parameter	Description
EffectOccup	Indicates the actual occupancy mode of the unit (Occupied, Unoccupied, Bypass, Standby)
niOccManCmd	Network occupancy override input
biUnoccupied	Physical input for the Unoccupied mode
niOccSensor	Network occupancy sensor
TenantOverride	Determined by space temperature sensor input (aiSpaceTemp), if sensor is installed and has a tenant override button. Sets the unit to Occupied/Bypass mode
BypassTime	Allows the unit to enter Bypass mode when the timer is active and BypassTime has been set
cpLuiOccManCmd	LUI keypad display occupancy override input

Table 20: Occupancy Mode Interactions

Occupancy Override Input (niOccManCmd) MSV:7	LUI OccManCmd (cpLuiOccManCmd)	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)
5 (Null)	Standby	NA	NA	NA	NA	NA	4 (Standby)

Table 20: Occupancy Mode Interactions, Continued

Occupancy Override Input (niOccManCmd) MSV:7	LUI OccManCmd (cpLuiOccManCmd)	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)	Null	Inactive	1 (Occ)	NA	1 (Occ)	NA	1 (Occ)
			1 (Occ)	NA	2 (Unoc)	NA	4 (Standby)
			1 (Occ)	NA	3 (Null)	NoBI[1]	1 (Occ)
			1 (Occ)	NA	3 (Null)	Occ[2]	1 (Occ)
			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)
			4 (Null)	Occ	2 (Unoc)	NA	4 (Standby)
			4 (Null)	Occ	3 (Null)	NoBI[1]	1 (Occ)
			4 (Null)	Occ	3 (Null)	Occ[2]	1 (Occ)
			4 (Null)	Occ	3 (Null)	Unoc[3]	4 (Standby)
			4 (Null)	Unoc	1 (Occ)	NA	1 (Occ)
			4 (Null)	Unoc	2 (Unoc)	NA	2 (Unoc)
			4 (Null)	Unoc	3 (Null)	NoBI[1]	2 (Unoc)
			4 (Null)	Unoc	3 (Null)	Occ[2]	1 (Occ)
			4 (Null)	Unoc	3 (Null)	Unoc[3]	2 (Unoc)
5 (Null)	Null	Active	1 (Occ)	NA	1 (Occ)	NA	1 (Occ)
			1 (Occ)	NA	2 (Unoc)	NA	3 (Bypass)
			1 (Occ)	NA	3 (Null)	NoBI[1]	1 (Occ)
			1 (Occ)	NA	3 (Null)	Occ[2]	1 (Occ)
			1 (Occ)	NA	3 (Null)	Unoc[3]	3 (Bypass)
			2 (Unoc)	NA	NA	NA	2 (Bypass)
			3 (Standby)	NA	NA	NA	3 (Bypass)
			4 (Null)	Occ	1 (Occ)	NA	1 (Occ)
			4 (Null)	Occ	2 (Unoc)	NA	3 (Bypass)
			4 (Null)	Occ	3 (Null)	NoBI[1]	1 (Occ)
			4 (Null)	Occ	3 (Null)	Occ[2]	1 (Occ)
			4 (Null)	Occ	3 (Null)	Unoc[3]	3 (Bypass)
			4 (Null)	Unoc	1 (Occ)	NA	1 (Occ)
			4 (Null)	Unoc	2 (Unoc)	NA	3 (Bypass)
			4 (Null)	Unoc	3 (Null)	NoBI[1]	3 (Bypass)
			4 (Null)	Unoc	3 (Null)	Occ[2]	3 (Bypass)
			4 (Null)	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 BypassTime, 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.

Space Temp Setpoint Methods

Temperature Setpoint Calculations

This section details the calculations used for setting space temperature setpoints. The calculations depend on unit status (if it is occupied, unoccupied, standby, or bypass mode) and whether a local or long range setpoint adjust is enabled. A space temperature setpoint operation diagram illustrates the relationship among the inputs and their default values ( ). The last section includes examples of common applications using default values.

Table 21 is the set of default values for each parameter.

Table 21: Temperature Setpoint Defaults

AV:1 (cpOccupied_Cool_Setpt) = 73°F
AV:2 (cpStandby_Cool_Setpt) = 77°F
AV:3 (cpUnoccupied_Cool_Setpt) = 82°F
AV:4 (cpOccupied_Heat_Setpt) = 70°F
AV:5 (cpStandby_Heat_Setpt) = 66°F
AV:6 (cpUnoccupied_Heat_Setpt) = 61°F
AV:10 (cpOccDiff) = 1°F
AV:17 (cpUnoccDiff) = 1°F
AV:19 (niSetpoint)1 = Invalid2
AV:24 (SetpointShift)3 = 0°F
AV:35 (niSetptOffset)4 = Invalid2

[1]Network-supplied input value for occupied, unoccupied, standby, and bypass modes. It determines the effective temperature setpoint (AV:23).
[2]The default (invalid) value 32767 indicates that the network input is not used.
[3] Network-supplied input value that shifts the occupied heating or cooling setpoint +/- 5ºF.
[4]Network-supplied input value that sets the SetptOffset +/- 3ºF.

Setpoint Methods with BACnet

1. **The unit is operating in Unoccupied mode.**

   - EffCoolOnSP = AV:3
   - EffCoolOffSP = (EffCoolOnSP – AV:17)
   - EffHeatOnSP = AV:6
   - EffHeatOffSP = (EffHeatOnSP + AV:17)

2. **The unit is operating in Occupied or Standby mode and the Local Setpoint Adjust is not connected or is invalid.**

This calculation then depends on whether or not there is a valid Network Temperature Setpoint Input (AV:19) value. The absolute offset used in this calculation is shown for both Occupied and Standby modes (and applies to both a valid and invalid AV:19 value):

   Occupied
   absOffset = Setpoint – 0.5 (OccCoolSetpt + OccHeatSetpt)

   Standby
   absOffset = Setpoint – 0.5 (StandbyCoolSetpt - StandyHeatSetpt)

   With valid AV:19 value:
   - ReferenceSP = (AV:19 + AV:35)
     - EffCoolOnSP = (ReferenceSP + absOffset)

   - EffCoolOffSP = (EffCoolOnSP – AV:10)
   - EffHeatOnSP = (ReferenceSP – absOffset)
   - EffHeatOffSP = (EffHeatOnSP + AV:10)

   With invalid AV:19 value (Analog Null):

   The Reference setpoint used in this calculation is shown for both Occupied and Standby modes:

   Occupied
   - ReferenceSP = (AV:1 – absOffset + AV:35)
     - EffCoolOnSP = (AV:1 + AV:35)
     - EffCoolOffSP = (EffCoolOnSP – AV:10)
     - EffHeatOnSP = (AV:4 + AV:35)
     - EffHeatOffSP = (EffHeatOnSP + AV:10)

   Standby
   - ReferenceSP = (AV:2 – absOffset + AV:35)
     - EffCoolOnSP = (AV:2 + AV:35)
     - EffCoolOffSP = (EffCoolOnSP – AV:10)
     - EffHeatOnSP = (AV:5 + AV:35)
     - EffHeatOffSP = (EffHeatOnSP + AV:10)

3. **The unit is operating In Occupied or Standby mode with Long Range Local Setpoint Adjust selected.**
   The absolute offset used in this calculation is shown for both Occupied and Standby modes.

   Occupied
   absOffset = Setpoint – 0.5 (OccCoolSetpt + OccHeatSetpt)

   Standby
   absOffset = Setpoint – 0.5 (StandbyCoolSetpt - StandyHeatSetpt)

   - ReferenceSP = A:I5
     - EffCoolOnSP = (ReferenceSP + absOffset)
     - EffCoolOffSP = (EffCoolOnSP – AV:10)
     - EffHeatOnSP = (ReferenceSP – absOffset)
     - EffHeatOffSP = (EffHeatOnSP + AV:10)

4. **The unit is operating in Occupied mode with Short Range Local Setpoint Adjust selected and MSV:14=2.**

   - EffCoolOnSP = (AV:1 + AV:24 + AV:35)
   - EffCoolOffSP = (EffCoolOnSP – AV:10)
   - EffHeatOnSP = (AV:5 + AV:24 + AV:35)
   - EffHeatOffSP = (EffHeatOnSP + AV:10)

5. **The unit is operating in Standby mode with Short Range Local Setpoint Adjust selected.**

   - EffCoolOnSP = (AV:2 + AV:24 + AV:35)
   - EffCoolOffSP = (EffCoolOnSP – AV:10)
   - EffHeatOnSP = (AV:5 + AV:24 + AV:35)
   - EffHeatOffSP = (EffHeatOnSP + AV:10)

See MicroTech UV Controller OM 1280 (www.DaikinApplied.com) for parameter calculations referenced above.

Figure 1: Space Temperature Setpoint Operation
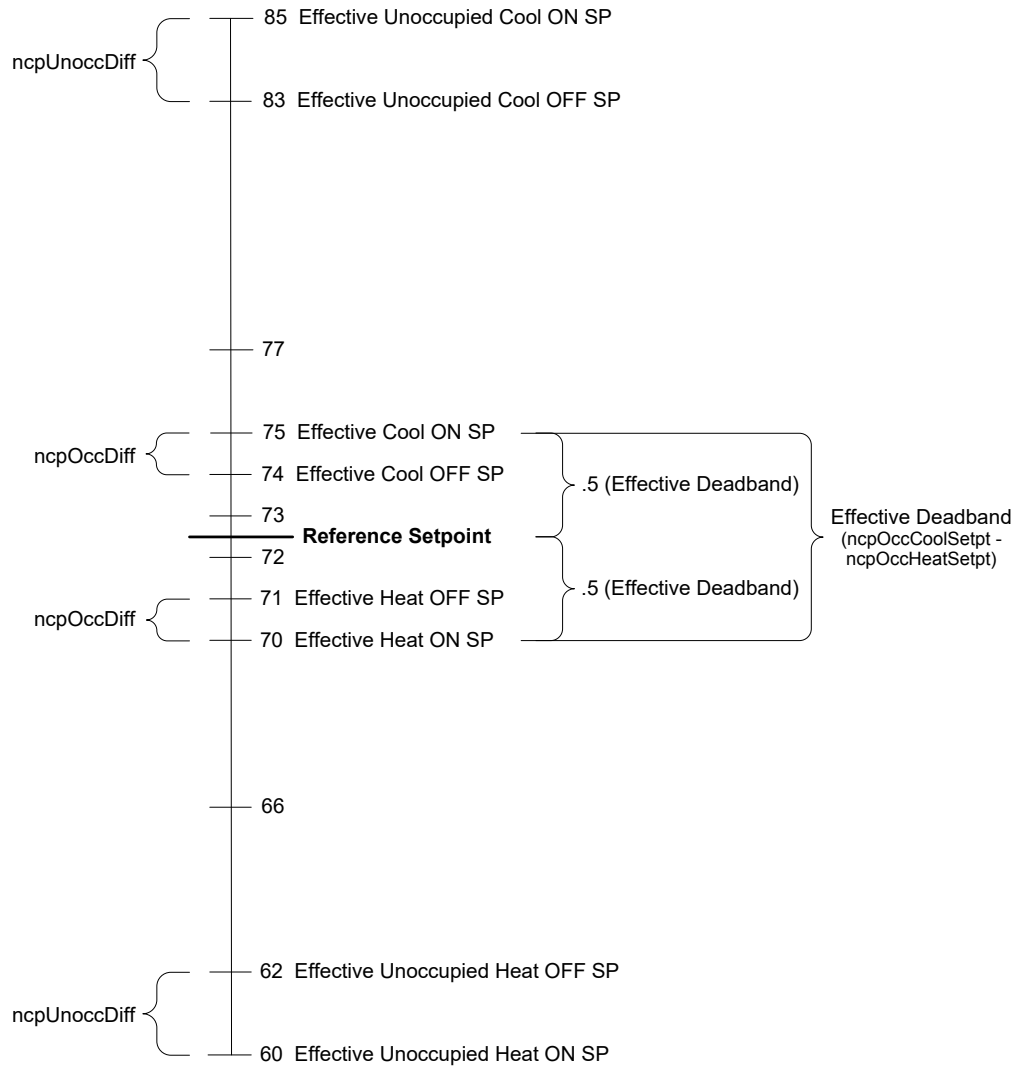
PI Loop Control

PI Control Algorithm

Two adjustable parameters are associated with each Proportional-Integral (PI) control loop: Proportional Gain (Kp) and Integral Time (Ki). When the unit is properly sized for the space, the default settings for these parameters provide the best control action for all the various operating conditions. The following section describes the terminology and calculations used to determine these parameters.

In the event of a field issue, these parameters must be set back to the original default settings.

The PI control algorithm calculates the desired actuator output, and ranges from 0 to 100%.

Output Formula

Output % = (Kp * Error) + (Sum of Error * Ki)

Unit Ventilator PI Control Blocks

PI Loop		Setpoint	Feedback (Controlled Variable)	Output
PI-1	Single Zone VAV Fan	Effective Heating or Cooling Temperature Setpoint	Control Temperature	Fan Speed
PI-2	Economizer / Free Cooling	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Position the OA Damper
PI-3	Modulating Cooling Valve	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Modulating Cooling Valve Position
PI-4	Modulating Hot Water Valve	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Modulating Hot Water Valve Position
PI-5	Face and Bypass Damper	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Face and Bypass Damper Position
PI-6	CO_2 / Demand Control Ventilation	Effective Space CO_2 Setpoint	Space CO_2	Position the OA Damper
PI-7	DAT Low Limit	Effective Reheat Discharge Air Temperature Setpoint	Discharge Air Temperature	Position the OA Damper
PI-8	Electric Heat	Effective Discharge Air Temperature Setpoint	Discharge Air Temperature	Electric Heat Stage

Definitions

- **Process Variable (PV)**: Measured analog input reading.
- **Setpoint (SP)**: Desired target value.
- **Error**: Value is calculated one of two ways depending on the PI blocks fixed action type.
- **Direct Acting PI (Cooling)**: Error = PV – SP
- **Reverse Acting PI (Heating)**: Error = SP – PV
- **Sample Time (ST)**: Scan rate of the PI control blocks, which is an internally fixed value of five seconds.
- **Sum of Errors:** Summation of all past errors. To prevent integral wind-up, the integral error summation is suspended when PI output reaches 100%.
- **Integral Gain (Ki)**: Or integral action, accumulates the error amounts and causes the controlled output to approach the setpoint over time in an attempt to eliminate any system offset. The higher the integral (Ki) setting, the more the integral effects the process under control. When the Ki setting is too high, the process variable (PV) oscillates around the setpoint. When the Ki setting is too low, the process variable does not reach the setpoint.

- **Proportional Gain (Kp)**: Or proportional action, causes the controlled output to change in proportion to the magnitude of the present error amount. Error is the difference between the sensors present value and the setpoint. When the Kp setting is too low, the process variable (PV) response will change too slowly. When the Kp setting is too high, the process variable response will excessively overshoot and possibly oscillate around the setpoint (SP). If faster system response is desired, increase the Kp setting. Make small, incremental adjustments to the proportional gain setting to avoid system instability.

Device Management

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 daugher 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 Unit Ventilator Controller

This section contains the Protocol Implementation Conformance Statement (PICS) for the MicroTech UV 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	Feb 4, 2025
Vendor Name	Daikin Applied
Product Name	MTUC_UV
Product Model Number	UV
Application Software Version	3.00.00
Bootloader Revision	01.00.01
BACnet Protocol Version	Version 1
BACnet Protocol Revision	Revision 4

Product Description

The MicroTech UV controller application software with on-board BACnet MS/TP is designed to operate the unit ventilator and integrate it into a BACnet building automation system.

BACnet Standardized Device Profile

The MicroTech UV 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	Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable
Analog Input	☐	☐	Description Min_Pres_Value Max_Pres_Value	COV_Increment[1]
Analog Value	☐	☐	Description Priority_Array[2]	Present_Value COV_Increment[1] Relinquish_Default
Binary Value	☐	☐	Description Active_Text Inactive_Text Priority_Array[2]	Present_Value COV_Increment[1]
Multi-state Input	☐	☐	Description State_Text	
Multi-state Value	☐	☐	Description State_Text Priority_Array[2]	Present_Value
Device	☐	☐	Description Location Max_Master Active_COV_Subscription (<=16) Local_Time Local_Date Max_Info_Frames (MS/TP only)	Description Location (Max 20 Characters) Max_Master Local_Time Local_Date Object_Name

1. After changing COV_Increment, wait at least 20 minutes before cycling power. Otherwise, this change is not saved.

2. The MicroTech UV 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 priority 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.

Revision History

Revision	Date	Changes
ED 19110-1	Feb 2019	Initial release.
ED 19110-2	May 2019	Updated PI Loop Control Block table and Effective Occupancy Mode table. Added the following parameters: MSV-23, Remote Setpoint Adjust Type AV-115, Network Fan Speed AV-116, Auxiliary Heat On Diff AV-117, Auxiliary Heat Off Diff MSV-24, Auxiliary Heat MSV-25, Auxiliary Heat Reverse
ED 19110-3	Sep 2019	Revised description for AV:110. Added Invalid option and default to Emergency Override, MSV:23. Added note to MSV:17 for Night Purge mode. Changed MSV:17, MSV:21, MSV:22, MSV:24 to commandable. Corrected MSV enumerations from " 0"-x to "1"-x. Fixed AI:6 (Indoor Coil Temp) object name and default value AI:12 Space CO2 min to 10. Added Fault Alarm 32-Water Coil Freeze. Changed BV range from 1-2 to 0-1.
ED 19110-4	Sep 2020	Added LONWORKS network variables (all new), BACnet points AV:118-AV:160, MSV:26-MSV:45, changed AV:64 and AV:78 object names, updated operating ranges for AI:10, AI:11, AV:45, AV:80, AV:86, and AV:117, added references to new version of ServiceTools. Removed nciUVAppVersion and added LONWORKS Device Software and Unit Application ncis. Changed alarm 11 to waterfreezeprotection.
ED 19110-5	Jun 2021	Changed LONWORKS reset functionality in LONWORKS Data Tables introduction and DATHeatSetpt default from 85 to 90°F for both BACnet and LONWORKS. Updated UV app version to 1.03 in PICS. Added table notes for BACnet AI/AVs that do not support floats. Revised LONWORKS Network Configuration section and added tables for supported device files. LONWORKS data table updates, moved TimeStamp from nvi to nci. Added new Selected Configurable Parameters section.
ED 19110-6	Mar 2022	Corrected Table 6 - BV1 and BV3 clear alarm values. Removed UTC Offset from Table 1 (not supported). PICS: Added Min/Max PV as optional properties supported by Analog Inputs. Removed DATLLHotWaterPI in BACnet and LONWORKS tables. Other BACnet Device and Object chages to support BACnet/ASHRAE 2014 Standard. Added Modbus Client/Server section to Alarms section. New alarms to Tables 13, 15, and 16 for Modbus client/server functionality. Changed EconEnthSetpt default from 29 to 27 BTU/lb - BACnet AV:67 and LonWorks nciEconEnthSetpt. Revised BACnet and LONWORKS table descriptions for DATClgSetp/DATHtgSetpt to reflect that in pre v1.5 UV apps, DATRstClSel must be set to Network from LUI or ServiceTools before the DAT setpoints can be commanded from the BAS. Added Object_Name to PICS Device writeable properties. Changed defaults for CmpHtgEWTLock, nciComprMtrVlvTm, and nciEconEnthSetpt supported by v1.5 UV code and newer.
ED 19110-7	Feb 2024	Added new AV:161 for cpCoolingStageDown, changed defaults for AV:135 FanChgsPerHour and AV:141 ComprHtgOATLock
ED 19110-8	Feb 2025	Added A2L mitigation board alarms 36-38 introduced with v3.0 application. Added new BACnet points MSV:46 (Dehumidification Setpoint Select, AV:162 (Dewpoint Setpoint Select) and AV:41 (Network Space Dewpoint). Updated alarm priorities.

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