DAIKIN

Network Integration Guide

ED 15125-7

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Maverick I® Packaged Rooftop Systems Unit Controller Protocol Information

BACnet® MS/TP, IP Networks
LonWorks® Networks

Model: MPS

LONMARK® 3.4

Member of BACnet International

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Introduction

This document provides the information needed to integrate the Maverick I® Packaged Rooftop (MPS) unit controller from Daikin Applied into a building automation system (BAS). It describes all BACnet® and LONWORKS® points available to the network.

The Maverick I Rooftop unit controller must have the corresponding network communication module installed. There are two communication modules: one for BACnet and one for LonWorks. The BACnet module supports BACnet IP, BACnet Ethernet, and BACnet MS/TP communications.

It is assumed that the user is familiar with network integration. Contact the Daikin Applied Controls Customer Support group at 866-462-7829 or Controls@daikinapplied.com for additional assistance, if necessary.

Reference Documents

Title	Number	Company	Source
Unit Controller Operation Manual Maverick I Rooftop Systems	OM 1077	Daikin Applied	www.DaikinApplied.com
Maverick I Rooftop Systems LONWORKS Communication Module Installation Manual	IM 999		
Maverick I Rooftop Systems BACnet Communication Module Installation Manual	IM 1000		
BACnet A Data Communication Protocol for Building Automation and Control Networks	ANSI/ASHRAE 135-2004	American Society of Heating, Refrigeration, and Air-Conditioning Engineers	www.ashrae.org
LonMark® Layers 1-6 Interoperability Guidelines, Version 3.4	078-0120-01G	LonMark Interoperability Association	www.lonmark.org
LonMark Application Layer Interoperability Guidelines, Version 3.4	078-0120-01G		
LonMark Functional Profile: Space Comfort Controller, Version 1.0	8500_10		
LonMark Functional Profile: Discharge Air Controller, Version 1,0	8600_10		

Software Revision

This edition documents all versions of the standard Maverick I Packaged Rooftop unit controller application software and all subsequent revisions until otherwise indicated. The application version can be found via the unit controller HMI and can also be read from the Application_Software_Version property of the BACnet Device Object.

Hazard Identification

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

Notice indicates practices not related to physical injury.

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

BACnet Compatibility

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 135-2004. It addresses all aspects of the various systems that are applied to building control systems.

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

LONWORKS Compatibility

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 Maverick I unit controller is LonMark 3.4 certified in accordance with the SCC functional profile v1.0. Refer to www.lonmark.org for details.

Network Communication Parameters

Table 1 describes the network parameters that should be configured so that the unit controller communicates properly with the BAS. The controller supports BACnet IP/Ethernet, BACnet MS/TP or LonWorks protocols. Parameters are set differently depending on which communication module is ordered and shipped with the unit.

The BACnet Communication Module (BCM) configuration tool, a web-based user interface, can be used to set up and address the BACnet parameters shown in Table 1. Also see BACnet Communication Module Installation Manual, IM 1000.

Table 1: Communication Parameter Settings

Parameter Name	BACnet IP/ Ethernet	BACnet MS/TP	LonWorks
IP Address	172.16.5.8	NA	NA
IP Subnet Mask	255.255.0.0	NA	NA
UDP Port Number	47808	NA	NA
IP Router Address (Gateway)	0.0.0.0	NA	NA
MSTP MAC Address	NA	0	NA
MSTP Baud Rate	NA	19200	NA
Type	BACnet IP or BACnet Ethernet	BACnet MS/TP	LonWorks
Device Instance Number[2]	47065	3002	NA
Max Master	NA	1	NA
Max Info Frames	NA	127	NA
Max APDU Length	BACnet IP:1472	480	NA
Device Object Name[1]	RTU_ CXXXXXXXXX	RTU_ CXXXXXXXXX	NA

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

[2]The default Device Instance Number for BACnet MS/TP is 3002 plus the MAC address.

Unit Controller Sequence of Operation

The sequence of operation for a Maverick I Rooftop Unit Controller depends on the control type. Refer to the Maverick I Unit Controller OM 1077 for sequence of operation details.

BACnet Network Integration

Access to Properties

Object properties are accessible from the network by specifying the device object identifier, object identifier, and the property identifier

Unit Controller Device Object

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

Each data point accessible from a BACnet network is described in the BACnet Data Points section.

⚠ CAUTION

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

Device Object Identifier

The Maverick I Rooftop Unit Controller Object Identifier uniquely specifies the unit within the network. The device object type for all devices is fixed by ASHRAE at 8. Therefore the device object instance number must be unique. The initial Device Object identifier is set at the factory. The device object identifier can be read from the Maverick I Rooftop Unit Controller (Table 2).

Device Object Name

Each device has a unique Object_Name by default. The Maverick I Rooftop Unit Controller Object_Name is RTU_C#########, where ######### represents the Device Instance. If the Device Instance changes, and the “RTU_C_” portion of the Object_Name is retained, the Device Name is updated as well.

The RTU_C portion of the device name can only be changed via the BCM configuration interface (see BACnet Communication Module Installation Manual, IM 1000 for details).

Device Object Properties

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

Table 2: Maverick I Unit Controller Device Object Properties

Property	Identifier	Default Value	Data Type
Object Identifier	75	device	BACnetObjectIdentifier
Object Name	77	RTU_ C#########[1] (variable)	Character String
Object Type	79	8	BACnetObjectType
System Status	112		BACnetDeviceStatus
Vendor Name	121	Daikin Applied	Character String
Vendor Identifier	120	3	Unsigned 16
Model Name	70	RTU_C	Character String
Firmware Revision	44	variable	Character String
Application Software Version	12	variable	Character String
Location	58		Character String
Protocol Version	98	1	Unsigned
Protocol Revision	139	4	Unsigned
Protocol Services Supported	97		BACnetServices Supported
Protocol Object Types Supported	96	AI, AV, BV, Device, MSV	BACnetObjectTypes Supported
Object List	76		Sequence of BACnet ObjectIdentifer
Max APDU Length Accepted	62	1472 (IP) 480 (MS/TP)	Unsigned 16
Max Segments Accepted	167	16	Unsigned
Segmentation_ Supported	107	No-Segmentation	Unsigned
APDU_Timeout	11	Variable	Unsigned
Number_Of_ APDU_Retries	73	Variable	Unsigned
Device_Address_ Binding	30		List of BACnetAddress Binding
Database_ Revision	155	1	Unsigned

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

BACnet IP Configuration

The Maverick I Rooftop Unit Controller can be incorporated into a BACnet/IP network dedicated to BACnet devices. The BACnet/IP address consists of the four-octet Internet Protocol address followed by the two-octet UDP (User Datagram Protocol) Port Number. The BACnet/IP address is a six-octet value analogous to a MAC (Media Access Control) address. The IP address portion of the BACnet/IP address must be unique in the BACnet/IP network segment.

Maverick I Rooftop Unit Controller defaults are:

- UDP Port Number: 47808 (BAC0 in hexadecimal)
- Internet Protocol Subnet Mask: 255.255.0.0
- IP Address: 172.16.5.8.
- The BACnet Communication Module supports DHCP (Dynamic Host Configuration Protocol) IP addressing. By default, this feature is disabled. To configure the BACnet Communication Module to use the DHCP feature, write 0.0.0.0 as the IP address.

Shared Ethernet Networks (LAN) Configuration

The Maverick I Rooftop Unit Controller can be incorporated into a an Ethernet network shared with BACnet devices and other devices. Integrating the Maverick I Rooftop Unit Controller into a shared Ethernet LAN requires close cooperation with the network administrator of the shared Ethernet network. The steps are as follows:

- Obtain the IP Subnet Mask of the shared network from the network administrator.
- Obtain the static IP Addresses for all Maverick I Rooftop Unit Controllers you are integrating into the shared network. Obtain the address of an IP Router or Gateway to use for sending IP messages to and from the BACnet IP subnets.
- Refer to Setting Maverick I Rooftop Unit Controller Communication Parameters section of this document.
- The communication type variable must be set to BACnet Ethernet for BACnet communication to take place. The default value for this property is BACnet IP.

BACnet MS/TP Configuration

A number of network configurations in the Maverick I Rooftop Unit Controller in a BACnet MS/TP Local Area Network (LAN) are set via the BACnet Communication Module (BCM) configuration tool, a web-based user interface (See BACnet Communication Module Installation Manual, IM 1000. Please refer to Setting Maverick I Rooftop Unit Controller Communication Parameters in the previous section Configurations include:

- The BACnet MS/TP device address (Media Access Control [MAC] address). The default MAC Address is 0. This address must be unique and is determined during installation. After you set the MAC address you must cycle power (turn the controller off and then on again) to the controller in order for the new address to take effect.
  - The default data transmission rate is set to 19200 bps (baud). If necessary, change the baud rate to 9600, 19200, 38400, or 76800
  - The communication type variable must be set to BACnet MS/TP. The default value for this property is BACnet IP.

BACnet Communication LEDs

The TX LED appears green when the communication module is transmitting data to the BACnet network. The RX LED appears green when the communication module is receiving data from the BACnet network. If both LEDs are on simulatenously, then communication is not established. Table 3 describes the LED activity (See IM 1000 for physical location of LEDs on the BACnet communication module.)

Table 3: LED Description of BACnet Activity

LED	LED Color	Description
Modbus TX	Green	LED flashes when data is being transmitted from the BACnet Communication Module to the unit controller
Modbus RX	Yellow	LED flashes when data is being sent to the BACnet Communication from the unit controller
MS/TP TX	Green	LED flashes when data is being transmitted via the MS/TP network
MS/TP RX	Yellow	LED flashes when data is received via the MS/TP network
Power	Green	This LED remains on when power is applied to the BACnet Communication Module
D7	Green	Ethernet activity LED

The unit controller is ready to operate with the default values of the various parameters. Default values may be changed with the local HMI or via the network (See Maverick I Unit Controller OM 1077 for default values and keypad operating instructions.)

Use the BACnet reset button to reset the BACnet addressing and configuration parameters back to factory defaults. Press and hold the reset button for five seconds to perform this function.

Receive Heartbeat

The integrity of some data depends on a valid network connection to maintain current values. The following data points require valid network updates within the Receive Heartbeat time (if not 0 seconds). If these parameters are not updated within the receive heartbeat time, the unit controller reverts to the default values from the network or attached sensor input. Table 4 defines the effect on BACnet network variables if the Receive Heartbeat timer should expire without having been updated.

Table 4: Receive Heartbeat Variables – BACnet

BACnet Object Name	Description	Effect of Heartbeat Timer Expiring Without Update
OccState	Occupancy Scheduler Input	Powerup (3)
ApplicCmd	Application Mode	Auto (5)
SupFanCapInput	Remote Discharge Fan Capacity Setpoint	Invalid (0x7FFF)
SpaceTempInput	Remote Space Temperature	Invalid (0x7FFF)
EconEnable	Economizer Enable	Auto (0xFF)
SpaceIAQInput	Space Indoor Air Quality (IAQ)	Invalid (0x7FFF)

LonWorks Network Integration

The unit controller supports LonWorks protocol standards to access unit data points. The unit controller uses both standard variables and user-defined variables as described in this section.

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.

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).

The .XIF file is available so that any network tool can design and configure it prior to installation. XIF files are available on www.DaikinApplied.com and www.lonmark.org.

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. Resource files are available on www.DaikinApplied.com and www.lonmark.org.

LonWorks Communication LEDs

Table 5 describes the various LEDs available on the LonWorks communication module as well as a description of their function. See IM 999 for physical location of LEDs.

Table 5: LED Description of LonWorks Activity

LED	LED Color	Description
SRVC	Yellow	This LED flashes approximately once a second when device is not commissioned. This LED activates when the Service pin is pressed. Otherwise, this LED is off when the device is commissioned but the Service pin has not been pressed.
WINK	Green	Winking is used to identify control on the network. The Wink LED will flash 2 times/second for 5 seconds when control is winking. When not winking, the WINK LED flashes off for 0.1 second every five seconds. This indicates that the application is functioning properly.
STAT	Green	The Status LED flashes when the unit controller transmits a request. When communicating properly with the unit controller, it flashes 6 times/second or faster. If communication between the unit controller and communication module is not responding properly, it flashes slower (approximately once per second) and the error LED will flash.
ERR	Red	The Error LED flashes when there is a mis-communication between the unit controller and communication module.
PWR	Green	The LED remains steady on when power is applied to the controller.

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 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.

Receive Heartbeat

Receive Heartbeat variables require a valid network connection if bound. If these variables do not change after a given time, the unit controller reverts to local control, and the variables will revert to their default values. The heartbeat time is set via the local unit controller HMI or via the network. The heartbeat time can be overridden by setting the Receive Heartbeat time = 0. However, in doing so, the corresponding controller variable remains at the last valid value upon loss of communication. See Table 6 for Receive Heartbeat variables.

Table 6: Receive Heartbeat Variables – LonWorks

LonMark Variable	Description	Effect of Heartbeat Timer Expiring Without Update
nviOccSchedule. current_state	Occupancy Scheduler Input	Powerup (3)
nviApplicMode	Application Mode	Auto (5)
nviSpaceTemp	Remote Discharge Fan Capacity Setpoint	Invalid (0x7FFF)
nviOutdoorTemp	Remote Space Temperature	Invalid (0x7FFF)
nviEconEnable	Economizer Enable	Auto (0xFF)
nviSpaceIAQ	Space Indoor Air Quality (IAQ)	Invalid (0x7FFF)

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

BACnet Data Points

The following table contains the unit controller data points available to the BAS via BACnet (MS/TP, IP, and Ethernet). Parameters that appear in multiple locations on the keypad are only listed in the location they first appear on the keypad.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Only the items applicable to the specific unit configuration appear on the keypad menu display. Descriptions are provided in the Network Parameter Details section.

Table 7: Maverick I BACnet Points

Point Name	Object Type	Object Instance	Read/ Write Access	Description
Unit Status				
Unit State[1]	MSV	15	R	1=Off, 2=Start, 4=FanOnly, 6=Htg, 7=Econo, 8=Clg
BACnet Unit Support[2]	MSV	16	R/W	BACnet network values provided in English or metric units
Cooling Capacity	AV	1	R	Compressor cooling capacity (%)
Heating Capacity Primary	AV	2	R	Capacity of the unit primary heating source (%)
Heating Capacity Secondary	AV	44	R	Capacity of the unit secondary heating source (%)
Economizer Capacity	AV	15	R	Capacity of economizer feedback value (%)
Effective Supply Fan Capacity	AI	8	R	Capacity of supply fan motor drive input (%)
Return/Exhaust Fan Capacity	AI	10	R	Capacity of return or exhaust fan (%)
Application Mode	MSV	5	R/W	1=Off, 2=HeatOnly, 3=CoolOnly, 4=FanOnly, 5=Auto
Emergency Override	MSV	10	R/W	1=Normal, 2=Shutdown
Indoor Fan Occupancy[2]	MSV	49	R/W	1 = Continous Mode 2 = Cycle On in Heating/Cooling 3 = Continous in Occupied and Cycle in Unoccupied
Occupancy				
Effective Occupancy	MSV	6	R	1=Occ, 2=Unocc, 3=TntOvrd
Occupancy Schedule	MSV	8	R/W	1=Occ, 2=Unocc, 3=NUL (Powerup)
Occupancy Mode	MSV	7	R/W	1=Occ, 2=Unocc, 3=TntOvrd, 4=NUL(Auto)
Occupancy Schedule Override Setpoint[2]	AV	3	R/W	Sets the amount of time that the unit operates in bypass mode. Applies when Occupancy Mode is set to Standby.
Temperature				
Effective Space Temperature	AI	3	R	Reflects the effective space temperature value provided by either a local sensor or network input.
Local Space Temperature	AV	4	R	Reflects the input value of the local indoor space temperature sensor
Network Space Temperature	AV	28	R/W	The network space temperature input value. If an input is not available from the network or is unreliable, the temperature reverts to the local sensor value.
Effective Outdoor Air Temperature	AI	4	R	Reflects the effective outdoor air temperature value provided by either a local sensor or network input
Local OA Temperature	AV	5	R	Reflects the local outdoor air temperature sensor input value
Network Outdoor Air Temperature	AV	29	R/W	The outdoor air temperature input provided by the network. If an input is not available from the network or the value is unreliable, the temperature reverts to the local sensor value
Discharge Air Temperature	AI	1	R	The current reading of the local discharge air temperature sensor
Return Air Temperature	AI	2	R	The current reading of the local return air temperature sensor
Space Temperature Setpoints				
Effective Setpoint	AV	50	R	Reflects the active controlling space setpoint from either the network or a local sensor. The value varies depending on the current unit operating state (cooling or heating)
Local Space Temperature Setpoint	AV	51	R	Current reading of the local space sensor
Room Sensor Setpoint Enable[2]	BV	65	R/W	Enables the use of the local hard-wired setpoint adjustment

Table 7: Maverick I BACnet, Continued

Point Name	Object Type	Object Instance	Read/ Write Access	Description
Remote Space Temperature Spt Adjust	AV	56	R/W	Enables occupied setpoints from a remote space temperature sensor. When the value is valid and Room Sensor Setpoint Enable is set to Disabled (Network), it is used to determine the Effective Setpoint output. Otherwise, the Effective Setpoint does not depend on this value
Occupied Cooling Setpoint²	AV	9	R/W	Sets the occupied cooling setpoint when it is not controlled by another function
Occupied Heating Setpoint²	AV	11	R/W	Sets the occupied heating setpoint value when it is not controlled by another function
Unoccupied Cooling Setpoint²	AV	10	R/W	Sets the temperature above which the unit starts and provides cooling during unoccupied periods. An optional space temperature sensor is required for unoccupied cooling operation
Unoccupied Heating Setpoint²	AV	12	R/W	Sets the temperature below which the unit starts and provides heating during unoccupied periods. An optional space temperature sensor is required for unoccupied heating operation
Economizer				
Economizer Enable	MSV	32	R/W	Enables or disables economizer functionality for both free cooling and for indoor air quality (IAQ) ventilation 1 = Disable Free Cooling, Enable Ventilation 2 = Enable Free Cooling, Enable Ventilation 3 = Auto (unit control decides) 4 = Disable All Economizer Functionality
Demand Control Ventilation Limit²	AV	53	R/W	Sets the minimum position setpoint when CO_2 override control is enabled
Ventilation Limit²	AV	54	R/W	Sets the maximum position setpoint when CO_2 override control is enabled
Local Space CO2	AI	13	R	Reflects the CO_2 level the space (ppm) level from an optional space CO_2 sensor (0-2000 ppm)
Remote Space IAQ	AV	31	R/W	Network input used to set the minimum OA damper control (0-2000 ppm)
Space CO2 High Limit Setpoint²	AV	48	R/W	Sets the space CO_2 high limit setpoint level (0, 500-2000 ppm.) A value of 0 disables the CO_2 limit function
Exhaust On/Off Setpoint²	AV	55	R/W	Configures the economizer to turn the exhaust fan off and on depending on the position of the damper (0-100%)
Dehumidification				
Space RH Configuration Setpoint²	AV	65	R/W	Configures the space relative humidity setpoint from the network (35 -100%)
RH Setpoint	AV	66	R/W	Configures the space relative humidity setpoint from the network. A value of 0 disables dehumidification (35 -100%)
Variable Air Volume (VAV)				
VAV Pressure	AI	14	R	Allows network to display the VAV system pressure (0-5 inches water column)
VAV Supply Temp	AV	67	R/W	Determines the supply air temperature setpoint that the VAV system is attempting to maintain (50-60°F)
VAV Supply Pressure	AV	68	R/W	Determines the supply pressure setpoint that the VAV system is attempting to maintain (0-4.4 inches water column)
VAV Max Pressure	AV	69	R/W	Determines the VAV maximum pressure setpoint (0-4.9 inches water column)
Field Inputs				
Field Input 1	AV	61	R	Reflects the value from the unit controller Field Input 1. This input must be supplied with a temperature value
Field Input 2	AV	62	R	Reflects the value from the unit controller Field Input 2. This input can be configured for percent, flow, temperature, ppm, or pressure values. Used in conjunction with AV:63 and AV:64
Configurable Input 2 Type²	AV	63	R/W	Configures the low and high voltage range for the unit controller Field Input 2. Used in conjunction with AV:62
	AV	64		
Alarm Objects				
Current Alarm	AV	27	R	Displays the highest priority active alarm. See Alarms section
Clear All Alarms	BV	66	R/W	Clears all active alarms. This parameter reverts back to 0 when the conditions allow for alarms to clear. 0=No Alarms, 1=Clear Alarms. See Alarms section
Clear One Alarm	AV	57	R/W	Clears an individual alarm by its alarm number. This parameter reverts back to 0 when the alarm has been cleared. See Alarms section for enumerations
Device Management				
Receive Heartbeat²	AV	43	R/W	Configures the maximum amount of time that can elapse (in seconds) before the Receive Heartbeat variable returns to its default. A value of 0 seconds (default) disables Receive Heartbeat functionality
Integrated Furnace Controller Software Version	AV	45	R	The application software version and revision that has been installed in the integrated furnace controller

Table 7: Maverick I BACnet, Continued

Point Name	Object Type	Object Instance	Read/ Write Access	Description
Communication Module Software Version	Device	8	R	The application version and revision of the BACnet communication module
Application Version	Device	8	R	The application software version of the unit controller
Honeywell Economizer Software Version	AV	46	R	The Honeywell Economizer application software version and revision
Location[2]	Device	8	R/W	Sets descriptive physical location information

[1]When the keypad display menu item “Unit State” is in Standby mode, the corresponding BACnet property “Unit Property” displays “Off” from the BAS.
[2]Parameter is stored in EEPROM/FLASH in either the communication module or in the unit controller. Writes to this parameter must be limited.

LonWorks Data Points

The following table contains the data points available to the BAS from the unit controller. Parameters that appear in multiple locations on the keypad are only listed in the location they first appear on the keypad. Only the items applicable to the specific unit configuration appear on the keypad menu display.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Further descriptions are provided in the Network Parameter Details section.

Network variables (.nvi, .nci, or .cpi) are writeable from the network. The output variable (.nvo) is read-only. Default values do not apply to nvos.

Table 8: Maverick I LonWorks

Point Name	LonWorks Variable Name	SNVT/ SCPT Index	Read/ Write Access	Description
Unit Status				
Unit State[1]	nvoUnitStatus	112	R	1=HEAT, 3=COOL, 6=OFF, 9=FAN_ONLY, 10=ECONMY, 14=DEHU-MID, 0xFF=NUL
Cooling Capacity	nvoUnitStatus	112	R	nvoUnitStatus.cool_output (%)
Heating Capacity Primary	nvoUnitStatus	112	R	nvoUnitStatus.heat_output_primary (%)
Heating Capacity Secondary	nvoUnitStatus	112	R	nvoUnitStatus.heat_output_secondary (%)
Economizer Capacity	nvoUnitStatus	112	R	nvoUnitStatus.econ_output (%)
Effective Supply Fan Capacity	nvoUnitStatus	112	R	nvoUnitStatus.fan_output (%)
Return/Exhaust Fan Capacity	nvoExhFanStatus	95	R	nvoExhFanStatus.value (%)
Application Mode	nviApplicMode	108	R/W	0=AUTO, 1=HEAT, 3=COOL, 6=OFF, 9=FAN_ONLY, 0xFF=NUL
Emergency Override	nviEmergOverride	103	R/W	0=NORMAL, 4=SHUTDOWN (other states not used)
Indoor Fan Occupancy[2]	nviIndoorFanOcc	NA	R/W	1 = Continous Mode 2 = Cycle On in Heating/Cooling 3 = Continous in Occupied and Cycle in Unoccupied
Occupancy				
Effective Occupancy	nvoEffectOccup	109	R	0=OCCUPIED, 1=UNOCCUPIED, 2=BYPASS, 3=STANDBY, 0xFF=NUL
Occupancy Schedule	nviOccSchedule	128	R/W	nviOccSchedule.current_state 0=OCCUPIED, 1=UNOCCUPIED, 0xFF=NUL (Powerup)
Occupancy Mode	nviOccManCmd	109	R/W	0=OCCUPIED, 1=UNOCCUPIED, 2= BYPASS, 0xFF=NUL (AUTO)
Occupancy Schedule Override Setpoint[2]	nciBypassTime	123/34	R/W	Determines the amount of time that the unit operates in bypass mode when nviOccManCmd is set to Standby
Temperature				
Effective Space Temperature	nvoSpaceTemp	105	R	Reflects the effective space temperature value provided by either a local sensor or network input
Local Space Temperature	nvoLocalSpaceTmp	105	R	Reflects the input value of the local indoor space temperature sensor
Network Space Temperature	nviSpaceTemp	105	R/W	The space temperature input value provided by the network. If an input is not available from the network or the value is unreliable, the temperature reverts to the local sensor value
Effective Outdoor Air Temperature	nvoOutdoorTemp	105	R	Reflects the effective outdoor air temperature value provided by either a local sensor or network input
Local OA Temperature	nvoLocalOATemp	105	R	Reflects the local outdoor air temperature sensor input value
Network Outdoor Air Temperature	nviOutdoorTemp	105	R/W	The outdoor air temperature input provided by the network. If an input is not available from the network or the value is unreliable, the temperature reverts to the local sensor value
Discharge Air Temperature	nvoDischAirTemp	105	R	The current reading of the local discharge air temperature sensor
Return Air Temperature	nvoRATemp	105	R	The current reading of the local return air temperature sensor

Table 8: Maverick I LONWORKS, Continued

Point Name	LONWORKS Variable Name	SNVT/ SCPT Index	Read/ Write Access	Description
Space Temperature Setpoints				
Effective Setpoint	nvoEffectSetpt	105	R	Reflects the active controlling space setpoint from either the network or a local sensor. The value varies depending on the current unit operating state (i.e. cooling or heating
Local Space Temperature Setpoint	nvoSetpoint	105	R	Current reading of the local space sensor
Room Sensor Setpoint Enable[2]	UCPTlocalSptEnable	NA	R/W	Enables the use of the local hard-wired setpoint adjustment
Remote Space Temperature Spt Adjust	nviSetpoint	105	R/W	Enables occupied setpoints from a remote space temperature sensor. When the value is valid and Room Sensor Setpoint Enable is set to Disabled (Network), then it is used to determine the the Effective Setpoint output Effective Heat SP = nviSetpoint – 0.5 (Occupied_Cool – Occupied_ Heat) Effective Cool SP = nviSetpoint + 0.5 (Occupied_Cool – Occupied_ Heat)
Occupied Cooling Setpoint[2]	nciSetpoints SCPTsetPnts	106/60	R/W	Sets the occupied cooling setpoint value when it is not controlled by another function
Occupied Heating Setpoint[2]	nciSetpoints SCPTsetPnts	106/60	R/W	Sets the occupied heating setpoint value when it is not controlled by another function
Unoccupied Cooling Setpoint[2]	nciSetpoints SCPTsetPnts	106/60	R/W	Sets the temperature above which the unit starts and provides cooling during unoccupied periods. An optional space temperature sensor is required for unoccupied cooling operation
Unoccupied Heating Setpoint[2]	nciSetpoints SCPTsetPnts	106/60	R/W	Sets the temperature below which the unit starts and provides heating during unoccupied periods. An optional space temperature sensor is required for unoccupied heating operation
Economizer				
Economizer Enable	nviEconEnable	95	R/W	Enables or disables economizer functionality for both free cooling and for indoor air quality (IAQ) ventilation [0, 200] = Disable All Economizer Functionality [0, 0 - 199] = Disable Free Cooling, Enable Ventilation [1, NA] = Enable Free Cooling, Enable Ventilation [-1,NA] =Auto (unit control decides)
Demand Control Ventilation Limit[2]	nviMinVentLim	81	R/W	Sets the minimum position setpoint when CO_2 override control is enabled
Ventilation Limit[2]	nviMaxVentLim	81	R/W	Sets the maximum position setpoint when CO_2 override control is enabled
Local Space CO2	nvoSpaceCO2	29	R	Reflects the CO_2 level the space (ppm) level from an optional space CO_2 sensor (0-2000 ppm)
Remote Space IAQ	nviSpaceIAQ	29	R/W	Network input used to set the minimum OA damper control (0-2000 ppm)
Space CO2 High Limit Setpoint[2]	nciSpaceCO2Lim	29	R/W	Sets the space CO_2 high limit setpoint level (0, 500-2000 ppm.) A value of 0 disables the CO_2 limit function
Exhaust On/Off Setpoint[2]	nciExhaustSpt	81	R/W	Configures the economizer to turn the exhaust fan off and on depending on the position of the damper (0-100%)
Dehumidification				
Space RH Configuration Setpoint[2]	nviSpaceRHSpt	81	R/W	Configures the space relative humidity setpoint from the network (35 -100%)
Field Inputs				
Field Input 1	nvoFieldInput1	105	R	Reflects the value from the unit controller Field Input 1. This input must be supplied with a temperature value
Field Input 2	nvoFieldInput2	81	R	Reflects the value from the unit controller Field Input 2. This input can be configured for percent, flow, temperature, ppm, or pressure values. The SNVT type is configurable using nciField2
Configurable Input 2 Type[2]	UCPTfieldInput	NA	R/W	Configures the high and low voltage range for nvoFieldInput2
Alarm Objects				
Current Alarm	nvoUnitStatus	112	R	Displays the highest priority active alarm. See Alarms section
Clear All Alarms	nviClearAllAlarm	8	R/W	Clears all active alarms. This parameter reverts back to 0 when the conditions allow for alarms to clear. 0=No Alarms, 1=Clear Alarms. See Alarms section
Clear One Alarm	nviClear1Alarm	8	R/W	Clears an individual alarm by its alarm number. This parameter reverts back to 0 when the alarm has been cleared. See Alarms section

Table 8: Maverick I LonWorks, Continued

Point Name	LonWorks Variable Name	SNVT/ SCPT Index	Read/ Write Access	Description
Device Management				
Receive Heartbeat²	nciRcvHrtBt SCPTmaxRcvTime	107/48	R/W	Configures the maximum amount of time that can elapse (in seconds) before the Receive Heartbeat variable returns to its default. A value of 0 seconds (default) disables Receive Heartbeat functionality
Send Heartbeat²	nciSndHrtBt SCPTmaxSendTime	107/49	R/W	Defines the maximum period of time that expires before the specified network variable output is automatically updated
Minimum Send Time²	nciMinOutTm SCPTminSendTime	107/52	R/W	Defines the minimum period of time between automatic network variable output transmissions. It is used to reduce traffic on the network.
Communication Module Software Version	UCPTcommDevMajVer UCPTcommDevMinVer	165/166	R	The application software version and revision that have been installed in the BACnet communication module
Application Version	UCPTunitDevMajVer UCPTunitDevMinVer	165/166	R	The application software version of the unit controller
Integrated Furnace Controller Software Version	UCPTifcDevMajVer UCPTifcDevMinVer	165/166	R	The application software version and revision that have been installed in the integrated furnace controller
Honeywell Economizer Software Version	UCPTeconDevMajVer UCPTeconDevMinVer	165/166	R	The application software version and revision that have been installed in the Honeywell Economizer
Location²	nciLocation	36/17	R/W	Sets descriptive physical location information for the associated functional block or device
Object Status	nvoStatus	93	R	This variable is part of the Node Object and reports the status of the requested functional block in the device.
Object Request	nviRequest	92	R/W	This variable is part of the Node Object and requests a particular mode for a particular functional block in the device. Only t RQ_NORMAL, RP_UPDATE_STATUS AND RQ_REPORT_MASK are used

¹When the keypad display menu item “Unit State” is in Standby mode, the corresponding BACnet property “Unit Property” displays “Off” from the BAS.
²Parameter is stored in EEPROM/FLASH in either the communication module or in the unit controller. Writes to this parameter must be limited.

Detailed Data Point Information

This section descrbes the network paramaters available from the unit controller to the BAS. Table 9 describes the differences among the communication module software versions and compatibility with the unit controller.

Table 9: Unit Controller Software Compatibility Matrix

BACnet Point	BACnet Software Version	LonWorks Point	LonWorks Software Version	Compatible Controller Software Version	Description (Function)
MSV:49	2	nviIndoorFanOcc	2	1.5+	Added a network point to allow the network to command the indoor fan to either 1) run in continuous mode, 2) cycle on only when in heating or cooling or 3) run continuously when in occupied and cycle when unoccupied.
AV:61	2	nvoFieldInput1	2	1.5+	Added a network point that reports a value from the unit controls field input 1. This point is always a temperature value.
AV:62	2	nvoFieldInput2	2	1.5+	Added a network point that reports a value from the unit controls field input 2. The unit type is configurable.
AV:63	2	-	-	1.5+	Added a network point that configures the low range for nvoFieldInput2.
AV:64	2	-	-	1.5+	Added a network point that configures the high range for nvoFieldInput2.
-	-	UCPTfieldInput	2	1.5+	Added a network point that configures the low range and high range for nvoFieldInput2.
MSV:32	2	nviEconEnable	2	2.1+	Added an enumeration to the network point that disable all economizer functionality. The unit control now supports Disabled Free Cooling, Enabled Free Cooling or Disable all Economizer Functionality
AV:65	2	nviSpaceRHSpt	2	2.36+	Added a network point that can set the Space Relative Humidity Configuration Setpoint.
AV:67	2.06	-	-	2.36+	Added BACnet network points for VAV control systems. These points are not currently supported in LonWorks.
AV:68	2.06	-	-		

Application Mode

Keypad Menu Path Effective Occupancy /Occupied Mode

This read/write attribute sets the unit in an application mode. Writing Off to Application Mode shuts down the unit. In the unit controller, this setting has priority over any other setting or source of occupancy. Writing Auto to Application Mode allows the controller to determine its mode of operation based on input conditions. When operating in a communicating environment, Application Mode must be set to Auto, Fan Only, Heat Only or Cool Only. Additionally, the keypad can set the Application Mode to Control By Thermostat. In this mode the network occupancy parameters are ignored. Unsupported BACnet and LonWorks enumerations (not described here) revert to Auto.

Measurement	Units	Data Type	Valid Range	Default Value
Mode	NA	Unsigned	Enumerated	Auto

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	19	5	Present_Value	85
Full Reference				
RTU_C#########.ApplicCmd.Present_Value				

Enumeration
1 = Off
2 = Heat
3 = Cool
4 = Fan Only
5 = Auto

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nviApplicMode	DAC, SCC	Yes	SNVT_hvac_mode	108

LONWORKS Enumeration		
Value	**Identifier**	**Description**
0	HVAC_AUTO	Controller automatically changes between application modes
1	HVAC_HEAT	Heating only 0
2	HVAC_MRNG_WRMUP	Not supported – reverts to HVAC_AUTO
3	HVAC_COOL	Cooling only
4	HVAC_NIGHT_PURGE	Not supported – reverts to HVAC_AUTO
5	HVAC_PRE_COOL	Not supported – reverts to HVAC_AUTO
6	HVAC_OFF	Controller not controlling outputs
7	HVAC_TEST	Not supported – reverts to HVAC_AUTO
8	HVAC_EMERG_HEAT	Not supported – reverts to HVAC_AUTO
9	HVAC_FAN_ONLY	Air not conditioned, fan turned on
10	HVAC_FREE_COOL	Not supported – reverts to HVAC_AUTO
11	HVAC_ICE	Not supported – reverts to HVAC_AUTO
12	HVAC_MAX_HEAT	Not supported – reverts to HVAC_AUTO
13	HVAC_ECONOMY	Not supported – reverts to HVAC_AUTO
14	HVAC_DEHUMID	Not supported – reverts to HVAC_AUTO
15	HVAC_CALIBRATE	Not supported – reverts to HVAC_AUTO
16	HVAC_EMERG_COOL	Not supported – reverts to HVAC_AUTO
17	HVAC_EMERG_STEAM	Not supported – reverts to HVAC_AUTO
0xFF	HVAC_NUL	Not supported – reverts to HVAC_AUTO

Cooling Capacity

Keypad Menu Path Unit Status/Capacity Cooling

This read-only property indicates the current percentage of unit maximum cooling capacityFor LONWORKS, this variable is supported under the Unit Status network parameter. Unit Status reflects the current operating state, or mode, of the unit. It includes additional variables that display multiple unit sub-states. See Unit State for details.

Measurement	Units	Data Type	Valid Range	Default Value
Percent	%	Real LonWorks: Structure	0-100%	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	1	Present_Value	85
Full Reference				
RTU_C#########. CoolOutput.Present_Value				

LONWORKS

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nvoUnitStatus.cool_output	SCC	Yes	SNVT_hvac_status	112

Discharge Air Temperature

Keypad Menu Path Temperature/Disch Air Temp

This read-only property indicates the current reading of the unit discharge air temperature sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F / °C	Real	-40.0°C - 80.0°C -40.0°F - 176.0°F	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	0	1	Present_Value	85
Full Reference				
RTU_C#########.DischAirTemp.Present_Value				

LonWorks

Variable Name	Profile	Uses Hearbeat	SNVT Type	SNVT Index Number
nvoDischAirTemp	DAC, SCC	Yes	SNVT_temp_p	105

Economizer Capacity

Keypad Menu Path Economizer/Eff.Eco.Position

This read-only attribute indicates the current economizer capacity or outdoor air damper position.

For LonWorks, this variable is supported under the Unit Status network parameter. Unit Status reflects the current operating state, or mode, of the unit. It includes additional variables that display multiple unit sub-states. See Unit State for details.

Measurement	Units	Data Type	Valid Range	Default Value
Percent	Percent	Real LonWorks: Structure	0 - 100%	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	15	Present_Value	85
Full Reference				
RTU_C#########.EconOutput.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nvoUnitStatus.econ_output	DAC, SCC	Yes	SNVT_hvac_status	112

Effective Setpoint

Keypad Menu Path SetPoints /Eff.Temp.SP

This read-only attribute monitors the effective temperature setpoint. It is always set equal to the current controlling setpoint (that was last calculated) depending on the current unit operating state (i.e. cooling or heating).

The Effective Setpoint Output depends on the Occupied Cooling Setpoint, the Occupied Heating Setpoint, and Temperature Setpoint Input. If the Temperature Setpoint Input is set to a ***valid*** value:

Effective Cooling Enable Setpoint = Temperature Setpoint Input
+½(Occupied Cooling Enable Setpoint–Occupied Heating Enable Setpoint)

Effective Heating Enable Setpoint = Temperature Setpoint Input
-½(Occupied Cooling Enable Setpoint–Occupied Heating Enable Setpoint)

The Effective Setpoint Output (nvoEffectSetpt) equals Effective Heating Enable Setpoint when the control temperature is less than Occupied Heating Enable Setpoint + [1/2(Occupied Cooling Enable Setpoint–Occupied Heating Enable Setpoint)]. It is set equal to the Effective Cooling Enable Setpoint when the control temperature is greater than the Occupied Cooling Enable Setpoint – [1/2(Occupied Cooling Enable Setpoint–Occupied Heating Enable Setpoint)].

If the Temperature Setpoint Input is set to an ***invalid*** value:

Effective Cooling Enable Setpoint = Occupied Cooling Enable Setpoint

Effective Heating Enable Setpoint = Occupied Heating Enable Setpoint

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F / °C	Real	5.0°C - 35.0°C 40.0°F - 95.0°F	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	50	Present_Value	85
Full Reference				
RTU_C#########.EffectSetpt.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nvoEffectSetpt	SCC	Yes	SNVT_temp_p	105

Local Space Temperature Setpoint

Keypad Menu Path Setpoints/Setpoint Adjust

This read-only attribute monitors the local temperature setpoint. It is always set equal to the current local setpoint.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F / °C	Real	10.0°C - 35.0°C 50.0°F - 95.0°F	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	51	Present_Value	85
Full Reference				
RTU_C#########.EffectSetpt.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nvoSetpoint	SCC	Yes	SNVT_temp_p	105

Room Sensor Setpoint Enable

Keypad Menu Path Setpoints/Setpoint Adj Enable

This read/write property is used to enable or disable the local hard-wired setpoint adjustment mounted on the room sensor.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
State	NA	Unsigned	Enumerated	Enabled

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Binary Value	5	65	Present Value	85
Full Reference				
RTU_C#########.LocSetptEnable.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	UCPT Reference
UCPTlocalSptEnable	SCC	NA	NA	UCPTlocalSptEnable

Valid Range

Value	Room Sensor Setpoint Enable
0	Remote (Disabled)
1	Local (Enabled)

Emergency Override

This read/write property shuts off the unit controller. If this property is set to Shutdown, the controller cannot start based on a time clock or any other means. The only way to start the controller is to change the value to Normal.

If a value other than EMERG_SHUTDOWN (4), is written, this variable reverts back to 0.

Measurement	Units	Data Type	Valid Range	Default Value
NA	NA	Unsigned	Enumerated	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	19	10	Present_Value	85
Full Reference				
RTU_C#########.EmergOverride.Present_Value				
Enumeration				
1 = Normal				
2 = Shutdown				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nviEmergOverride	DAC, SCC	No	SNVT_hvac_emerg	103

Enumeration Definitions

Value	Identifier	Notes
0	EMERG_NORMAL	No emergency mode
1	EMERG_PRESSURIZE	Emergency pressurize mode (not used)
2	EMERG_DEPRESSURIZE	Emergency depressurize mode (not used)
3	EMERG_PURGE	Emergency purge mode (not used)
4	EMERG_SHUTDOWN	Emergency shutdown mode
5	EMERG_FIRE	(not used)
0xFF	EMERG_NUL	Value not available

Indoor Fan Occupancy

Keypad Menu Path Mode / Indoor Fan Mode

Depending on the occupancy, this read/write property controls the cycling of the indoor fan. It can be set to run in continous mode, cycle on only when in heating/cooling or run continuously when in occupied and cycle in unoccupied.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
NA	NA	Unsigned	Enumerated	No	Unit control value

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	19	85	Present_Value	85
Full Reference				
RTU_C#########.IndoorFanOcc.Present_Value				

Enumeration
1 = Continous Mode
2 = Cycle On in Heating/Cooling
3 = Continous in Occupied and Cycle in Unoccupied

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nviIndoorFanOcc	DAC, SCC	No	UNVTIndoorFanOcc	NA

Enumeration Definitions

nviIndoorFanOcc	Identifier	Notes
0	INDOORFAN_CONT	Continous Mode
1	INDOORFAN_CYCLE	Cycle On in Heating/Cooling
2	INDOORFAN_CONT_IN_OCC	Continous in Occupied and Cycle in Unoccupied

Heating Capacity Primary

Keypad Menu Path Unit Status/CAPY:Prim/Sec

This read-only attribute indicates the current percentage of unit primary maximum heating capacity.

For LonWorks, this variable is supported under the Unit Status network parameter. Unit Status reflects the current operating state, or mode, of the unit. It includes additional variables that display multiple unit sub-states. See Unit State for details.

Measurement	Units	Data Type	Valid Range	Default Value
Heating Capacity Primary	Percent	BACnet: Real LonWorks: Structure	0.0 - 100.0%	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	2	Present_Value	85
Full Reference				
RTU_C#########.HeatOutput.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoUnitStatus.heat_output_primary	DAC, SCC	Yes	SNVT_hvac_status	112

Heating Capacity Secondary

Keypad Menu Path Unit Status/CAPY:Prim/Sec

This read-only attribute indicates the current percentage of unit secondary maximum heating capacity. For LonWorks, this variable is supported under the Unit Status network parameter. Unit Status reflects the current operating state, or mode, of the unit. It includes additional variables that display multiple unit sub-states. See Unit State for details.

Measurement	Units	Data Type	Valid Range	Default Value
Heating Capacity Secondary	Percent	BACnet: Real LonWorks: Structure	0.0 - 100.0%	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	44	Present_Value	85
Full Reference				
RTU_C#########.HeatOutputSec.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nvoUnitStatus.heat_output_secondary	DAC, SCC	Yes	SNVT_hvac_status	112

Local OA Temperature

Keypad Menu Path Temperature/Outside Air Temp

This read-only attribute indicates the current outdoor air temperature from the local outdoor air temperature sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F / °C	Real	-40.0°C - 80.0°C -40.0°F - 176.0°F	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	5	Present_Value	85
Full Reference				
RTU_C#########.LocalOAT.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nvoLocalOATemp	DAC, SCC	Yes	SNVT_temp_p	105

Local Space Temperature

Keypad Menu Path Temperature/Space Temp

This read-only attribute indicates the current space air temperature from the local space air temperature sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F / °C	Real	-40.0°C - 80.0°C -40.0°F - 176.0°F	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	4	Present_Value	85
Full Reference				
RTU_C#########.LocalSpaceT.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nvoLocalSpaceTmp	SCC	Yes	SNVT_temp_p	105

Minimum Send Time

This read/write configuration property defines the minimum period of time between automatic network variable output transmissions. It is used to reduce traffic on the network.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

BACnet

No BACnet equivalent.

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciMinOutTm	DAC, SCC	SNVT_time_sec	107	SCPTminSendTime	52

Object Request

This input network variable provides the mechanism to request an operation or a mode for a functional block within a device.

A request consists of an object ID (the **object_id** field) and an object request (the **object_request** field). The object ID is the functional block index for a functional block on the device. The Node Object functional block is index zero. The remaining functional blocks are numbered sequentially, starting with one.

The following functions are supported:

RQ_NORMAL – If the specified functional block was in the disabled or overridden state, this request cancels that state, and returns the functional block to normal operation. If the functional block was already in the normal state, a request to enter the normal state is not an error. After device reset, the state of functional blocks on the device is application-specific. An **RQ_NORMAL** request that specifies the Node Object functional block index is a request for all functional blocks in the device to leave the disabled and overridden states.

RQ_UPDATE_STATUS – Requests the status of the specified functional block to be sent to the **nvoStatus** output network variable. The state of the functional block is unchanged. An **RQ_ UPDATE_STATUS** request that specifies the Node Object functional block is a request for the status of the device and all functional blocks on the device. The status bits of the Node Object (with the exception of **invalid_request** and **invalid_id**) are defined to be the inclusive-OR of the status bits of all the other functional blocks in the device; with the possible addition of error conditions and other conditions attributed to the device as a whole, rather than to any individual functional block. For example, if **eedb_failure** is supported for the Node Object, then it should be set when reporting the Node Object functional block status whenever any of the functional blocks in the device reports communications failure, as well as when there is a communications failure at the device level.

RQ_REPORT_MASK – Requests a *status mask* reporting the status bits that are supported by the specified functional block to be sent to the **nvoStatus** output network variable. A one bit in the status mask means that the device may set the corresponding bit in the object status when the condition defined for that bit occurs. A zero bit in the status mask means that the bit is never set by the device.

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
Object Request	NA	Structure	NA	No	NA

BACnet

No BACnet equivalent

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index Number
nviRequest	Node Object	No	SNVT_obj_status	92

Structure

```
typedef struct {
                    unsigned long     object_id;
                    object_           object_
                    request_t         request;
} SNVT_obj_ request
```

Enumeration Definitions (object_request_t)

Value	Identifier	Description
0	RQ_NORMAL	Enable object and remove override
1	RQ_DISABLED	Disable object
2	RQ_UPDATE_STATUS	Report object status
3	RQ_SELF_TEST	Perform object self-test (not supported)
4	RQ_UPDATE_ALARM	Update alarm status (not supported)
5	RQ_REPORT_MASK	Report status bit mask
6	RQ_OVERRIDE	Override object
7	RQ_ENABLE	Enable object
8	RQ_RMV_OVERRIDE	Remove object override
9	RQ_CLEAR_STATUS	Clear object status (not supported)
10	RQ_CLEAR_ALARM	Clear object alarm (not supported)
11	RQ_ALARM_NOTIFY_ENABLED	Enable alarm notification (not supported)
12	RQ_ALARM_NOTIFY_DISABLED	Disable alarm notification (not supported)
13	RQ_MANUAL_CTRL	Enable object for manual control (not supported)
14	RQ_REMOTE_CTRL	Enable object for remote control (not supported)
15	RQ_PROGRAM	Enable programming of special configuration properties (not supported)
16	RQ_CLEAR_RESET	Clear reset-complete flag (reset_complete) (not supported)
17	RQ_RESET	Execute reset-sequence of object (not supported)
-1(0xFF)	OC_NUL	Invalid Value

Object Status

This output network variable reports the status for any functional block on a device. It is also used to report the status of the entire device and all functional blocks on the device. A status update consists of an object ID (the object_id field) and multiple status fields. The object ID is the functional block index as described under nviRequest. If the object ID is zero, the status of the device itself and all functional blocks on the device is reported. The status fields are one-bit bitfields. The only supported status fields are the report_mask, invalid_id, and invalid_request fields; all other status fields are not supported.

invalid_request – Set to one if an unsupported request code is received on the nviRequest input network variable.

invalid_id – Set to one if a request is received for a functional block index that is not defined in the device. No further checking of the request code is required when set to one.

report_mask Set to one if an RQ_REPORT_MASK request is received by the nviRequest input network variable, and the nvoStatus output network variable is set to contain the status mask. The status mask is an nvoStatus value that describes the status bits that are supported beyond the three mandatory status bits. The status mask consists of all fields in the nvoStatus output network variable, with the exception of the invalid_id, and invalid_request fields. A one bit in the mask means that the functional block may set the corresponding bit in the nvoStatus output network variable when the condition defined for that bit occurs. A zero bit means that the functional block may never set the bit.

Measurement	Units	Data Type	Valid Range	Default Value
Object Status	NA	Structure	NA	NA

BACnet

No BACnet equivalent

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Number
nvoStatus	Node Object	No	SNVT_obj_request	93

Structure

```
typedef struct {
```

```
    unsigned long    object_id;
    unsigned         invalid_id;
    unsigned         invalid_request;
    unsigned         disabled;
    unsigned         out_of_limits;
    unsigned         open_circuit;
    unsigned         out_of_service;
    unsigned         mechanical fault;
    unsigned         feedback_failure;
    unsigned         over_range;
    unsigned         under_range;
    unsigned         electrical_fault;
    unsigned         unable_to_measure;
    unsigned         eedb_failure;
    unsigned         fail_self_test;
    unsigned         self_test_in_progress;
    unsigned         locked_out;
    unsigned         manual_control;
    unsigned         in_alarm;
    unsigned         in_override;
    unsigned         report_mask;
    unsigned         programming_mode;
    unsigned         programming_fail;
    unsigned         alarm_notify_disabled;
    unsigned         reset_complete;
    unsigned         reserved2;
} SNVT_obj_status
```

Effective Occupancy

Keypad Menu Path Effect/Occupancy

This read-only property indicates which occupancy mode the unit is actually using. The unit controller calculates this. If the Occupancy Override Setpoint (not settable via the network) is set to Network then the unit controller must calculate the mode according to the Effective Occupancy Output state table in the LonMark Space Comfort Controller document (www.lonmark.org). The following is a modified state table based on that table.

Occupancy Schedule Override (nviOccManCmd) register 71,2	Occupancy Schedule (nviOccSchedule) register 19	Effective Occupancy (nvoEffectOccup) register 18
Occupied	Don't Care	Occupied
Unoccupied	Don't Care	Unoccupied
Bypass	Occupied	Occupied
Bypass	Unoccupied	Bypass
Bypass	NUL	Occupied
NUL	Occupied	Occupied
NUL	Unoccupied	Unoccupied
NUL	NUL	Occupied

[1] Bypass can be initiated by Occupancy Schedule Override transitioning to Bypass. It remains in Bypass for the duration of the Local Bypass Time. The timer is reinitiated by another transition of the Occupancy Schedule Override to Bypass.

[2] If the bypass timer needs to be reset and the Occupancy Schedule Override is already in Bypass, then the communication module must a) set the Occupancy Schedule Override to Occupied, b) read the Occupancy Schedule Override register and verify that it is set to Occupied, then c) set the Occupancy Schedule Override to Bypass.

Measurement	Units	Data Type	Valid Range	Default Value
Occupancy	NA	Unsigned	Enumerated	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	4	Present_Value	85
Full Reference				
RTU_C#########.EffectOcc.Present_Value				

Enumeration
1 = Occupied
2 = Unoccupied
3 = Bypass

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoEffectOccup	DAC, SCC	Yes	SNVT_occupancy	109

Enumeration
0 = OC_OCCUPIED
1 = OC_UNOCCUPIED
2 = OC_BYPASS
3 = OC_STANDBY
0xFF = OC_NUL

Occupancy Mode (Occupany Schedule Override)

This read/write property sets the unit controller Occupancy Mode. It overrides the occupancy schedule that the unit is using. Occupancy Schedule Override has priority over Occupancy Schedule Input. It is typically sent by a wall-mounted occupant-interface module or a supervisory controller to manually control occupancy modes, or to override the scheduled occupancy. This input is also used with Occupancy Schedule Input to determine the Effective Occupancy Mode. Refer to Effective Occupancy for more information.

This property is used to place the unit from Unoccupied Mode to Bypass Mode. If the Timed Override button on the room sensor is pressed while the unit is in the Unoccupied mode, or if this network property changes from Unoccupied to Bypass, then the occupancy changes to Bypass and the bypass timer (see Occupancy Schedule Override Setpoint) starts counting down. When the timer reaches zero, occupancy changes back to Unoccupied. Additional bypass requests (made by pressing the Timed Override button or by changing this property to Occupied then back to Bypass) resets the Bypass timer to the maximum value. Set Occupancy Schedule Override Setpoint to zero to disable the bypass feature.

The unit operates the same way in the Bypass Mode as it does in the Occupied Mode. In Bypass Mode, the unit uses the occupied heating and cooling setpoints.

For LonWorks, this network variable input should never be bound to a network variable that uses a Send Heartbeat function.

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
Mode	NA	Unsigned	NA	No	Auto

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	7	85	Present_Value	85
Full Reference				
RTU_C#########.OccManCmd.Present_Value				

Enumeration
1 = Occupied
2 = Unoccupied
3 = Bypass
4 = NUL (Auto)

LONWORKS

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviOccManCmd	DAC, SCC	No	SNVT_occupancy	109

Enumeration
0 = OC_OCCUPIED
1 = OC_UNOCCUPIED
2 = OC_BYPASS
3 = OC_STANDBY
0xFF = OC_NUL

Occupancy Schedule

This input network variable is used to schedule a group of rooftop units that are coupled to one occupancy schedule. For example, there could be four rooftop units for a small office building and all four units could be tied to the same occupancy schedule starting at 8:00 AM and ending at 5:00 PM, Monday through Friday.

This read/write property commands the occupancy function of the unit controller when Occupancy Mode is set to NUL (Auto). It is typically sent by a scheduler or a supervisory node. SNVT_tod_event is a structure containing three parts.

- Current_state, (required)
- Next_state (not used)
- Time_to_next_state (not used)

This network variable is used in conjunction with Optimal Start. This network variable can only be set via the network.

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
State	NA	Unsigned LONWORKS: structured	Enumerated	Yes	0xFF (NUL)

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	19	8	Present_Value	85
Full Reference				
RTU_C#########.EffectOcc.Present_Value				

Enumeration
1 = Occupied
2 = Unoccupied
3 = NUL (Powerup)

LONWORKS

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviOccSchedule	DAC, SCC	Yes	SNVT_tod_event	128

Enumeration (occup_t)
0 = OC_OCCUPIED
1 = OC_UNOCCUPIED
2 = OC_BYPASS
3 = OC_STANDBY
0xFF = OC_NUL

Structure

```
typedef struct {
        occup_t          Current_state;      See Below
        occup_t          next_state;         Not Used
        unsigned long    time_to_next_state; Not Used
}SNVT_tod_event
```

Field Definitions

Field	Data Point Reference	Units	Valid Range	Notes
current_state	Occupancy Scheduler Input	occup_t		Current scheduled occupancy state
next_state	Occupancy Scheduler Next	occup_t		Not Used
time_to_next_state	Occupancy Scheduler Time	Minutes	0 to 65534	Not Used

Network Occupancy Scheduling

Using the keypad, set OCCPCY OVERR SP to Network. Schedule unit operation over the network with the Occupancy Schedule network input. Switching from OCC, UNOCC, BYPASS (TntOvrd), or AUTO commands the unit into the desired mode.

Occupancy Schedule Override Setpoint

Keypad Menu Path Time Delays/Ten.Over.Time

This read/write configuration property defines the amount of time that the unit operates in the Bypass mode. Writing 0 disables the feature.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Minutes	Real	0 - 360 min	120

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	3	Present Value	85
Full Reference				
RTU_C#########.OccSchOverrideSP.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciBypassTime	SCC	SNVT_time_min	123	SCPTbypassTime	34

Occupied Cooling Setpoint

Keypad Menu Path Setpoint/OccCoolSP

This read/write configuration property sets the Occupied Cooling Setpoint.

The BACnet property only applies to the subject data point. The LonWorks variable is a structure that covers three other parameters: Unoccupied Cooling Setpoint, Occupied Heating Setpoint, and Unoccupied Heating Setpoint.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value

Temperature	°F/°C	Real LonWorks: structured	4.4°C - 37.7°C 40°F - 100.0°F LonWorks: 40°F - 95.0°F	72°F / 22°C

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	9	Present Value	85
Full Reference				
RTU_C#########.OccCoolSP.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciSetpoints.Occupied_Cool	SCC	SCPTsetPnts	60	SNVT_temp_setpt	106

Structure

```
typedef struct {
        signed long     occupied_cool;
        signed long     standby_cool;       Not Used
        signed long     unoccupied_cool;
        signed long     occupied_heat;
        signed long     standby_heat;       Not Used
        signed long     unoccupied_heat;
} SNVT_temp_setpt;
```

Occupied Heating Setpoint

Keypad Menu Path Setpoint/OccHeatSP

This read/write configuration property sets the Occupied Heating Setpoint.

The BACnet property only applies to the subject data point. The LonWorks variable covers three other parameters: Occupied Cooling Setpoint, Unoccupied Cooling Setpoint, and Unoccupied Heating Setpoint.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	2.2°C - 35.5°C 36.0°F - 96.0 °F LonWorks: 36°F - 91.0°F	68°F / 20°C	72°F / 22°C

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	11	Present Value	85
Full Reference				
RTU_C#########. OccHeatSetpt.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciSetpoints.Occupied_heat	SCC	SCPTsetPnts	60	SNVT_temp_setpt	106

Structure

```
typedef struct {
        signed long   occupied_cool;
        signed long   standby_cool;      Not Used
        signed long   unoccupied_cool;
        signed long   occupied_heat;
        signed long   standby_heat;      Not Used
        signed long   unoccupied_heat;
} SNVT_temp_setpt;
```

Effective Outdoor Air Temperature

Keypad Menu Path Temperatures/EffOutAirTemp

This output network variable indicates the current value of the Outdoor Air Temperature for monitoring purposes. This value reflects the network input (if valid) or the value from a locally wired sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real	-40.0°C - 80.0°C -40.0°F - 176.0°F	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	0	4	Present Value	85
Full Reference				
RTU_C#########. EffectOAT.Present_Value				

LONWORKS

Variable Name	Profile	Uses Heart-beat	SNVT Type	SNVT Index
nvoOutdoorTemp	DAC, SCC	Yes	SNVT_temp_p	105

Network Outdoor Air Temperature

This read/write attribute indicates the outdoor air temperature input value provided by the network. If an input is not available from the network or the value is unreliable, the outdoor temperature reverts to the local sensor value.

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
Temperature	°F/°C	Real	-40°C - 50°C -40°F - 122°F	Yes	327.67 (0x7FFF)

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	29	Present Value	85
Full Reference				
RTU_C#########. OutdoorTempInput.Present_Value				

LONWORKS

Variable Name	Profile	Uses Heart-beat	SNVT Type	SNVT Index
nviOutdoorTemp	DAC, SCC	Yes	SNVT_temp_p	105

Receive Heartbeat

This read/write configuration property defines the maximum time that elapses after the last update to a specified network variable input before the communication module reverts to it default values.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Seconds	Real	0.0 - 6553.4 sec	0 seconds

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	43	Present Value	85
Full Reference				
RTU_C#########. ReceiveHrtBt.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciRcvHrtBt	DAC, SCC	SNVT_time_sec	107	SCPTmaxRcvTime	48

Return Air Temperature

Keypad Menu Path Temperatures/Return Air Temp

This read-only attribute indicates the current reading from the Maverick I unit return air temperature sensor. This value is used for control purposes.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F / °C	Real	-40.0°C - 80.0°C -40.0°F - 176.0°F	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	0	2	Present_Value	85
Full Reference				
RTU_C#########.EffectRAT.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoRATemp	DAC, SCC	Yes	SNVT_temp_p	105

Return/Exhaust Fan Capacity

This read-only attribute indicates the current return fan or exhaust fan capacity. This output network variable is used to monitor the status of the exhaust fan. If there is only on/off control, the expected capacity is 0% for off and 100% for on. If there is modulating fan speed control, the range is 0% to 100% (fan off to full speed). LonWorks only: When a value of 1 - 200 is read then set the state field to 1, otherwise set it to 0.

Measurement	Units	Data Type	Valid Range	Default Value
Fan Capacity	Percent	Real LonWorks: Structure	0 - 100%	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	0	10	Present_Value	85
Full Reference				
RTU_C#########.ExhFanCap.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoExhFanStatus.value	DAC, SCC	Yes	SNVT_switch	NA

Structure

```
typedef struct {
        un-
        signed      value;    0–100%
        signed      state;    0=Off
                              1=On
} SNVT_switch;
```

Send Heartbeat

This read/write configuration property defines maximum period of time that expires before the specified network variable output is automatically updated.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Seconds	Real	0.0 - 6553.4 sec	0 seconds

BACnet

No BACnet equivalent.

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciSndHrtBt	DAC, SCC	SNVT_time_sec	107	SCPTmaxSendTime	49

Communication Module Software Version

This read configuration property is used to identify the application software, version and revision that have been installed in the communication module.

Measurement	Units	Data Type	Valid Range	Default Value
NA	NA	Real	0 - 0xFFFF	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Device	8	Variable	Firmware_Revision	44
Full Reference				
Firmware_Revision				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
UCPTcommDevMajVer	DAC, SCC	NA	NA	SCPT	165
UCPTcommDevMinVer					166

Application Version

Keypad Menu Path General Information /Software Version

This read only attribute reflects the current Application Version of the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
NA	NA	Real	NA	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Device	8	Variable	Application_Software_ Version	12
Full Reference				
RTU_C#########. Application_Software_Version				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
UCPTunitDevMajVer UCP-TunitDevMinVer	DAC, SCC	NA	NA	SCPT	165 166

Integrated Furnace Controller Software Version

Keypad Menu Path Furnace Ctrl/IFC Revision

This read only configuration property is used to identify the application software, version, and revision that have been installed in the integrated furnace controller.

Measurement	Units	Data Type	Valid Range	Default Value
NA	NA	Real	0 - 0xFFFF	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	45	Present_Value	85
Full Reference				
RTU_C#########. Integrated_Furnace_Controller_Software_Version.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
UCPTifcDevMajVer	DAC, SCC	NA	NA	SCPT	165
UCPTifcDevMinVer					166

Honeywell Economizer Software Version

Keypad Menu Path Economizer/EconFirmVers

This read only configuration property is used to identify the application software, version and revision that have been installed in the Honeywell Economizer.

Measurement	Units	Data Type	Valid Range	Default Value
NA	NA	Real	0 - 0xFFFF	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	46	Present_Value	85
Full Reference				
RTU_C#########. Honeywell_ Economizer_Software_Version.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
UCPTeconDevMajVer	DAC, SCC	NA	NA	SCPT	165
UCPTeconDevMinVer					166

Location

This read/write configuration property is used to describe the location of the unit.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Name	Character	ASCII character	NA	0

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Device	8	Variable	Location	58
Full Reference				
RTU_C#########. Location				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciLocation	DAC, SCC	SNVT_str_asc	36	SCPTlocation	17

Local Space CO_2

This read-only attribute indicates the current space CO_2 level from an optional space CO_2 sensor. This value reflects the network input nviSpaceIAQ (if valid) or the value from a locally wired sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Concentration	ppm	Real	0 - 2000 ppm	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	0	13	Present_Value	85
Full Reference				
RTU_C#########. EffectSpaceCO2.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoSpaceCO2	DAC, SCC	Yes	SNVT_ppm	29

Remote Space IAQ

Keypad Menu Path Economizer /Ext.DCV Level

This read/write attribute indicates the current space CO_2 level from the network. This value takes priority over a locally wired sensor. The unit controller only passes this value to the Economizer Logic Module (ELM). It does not set or otherwise command this value.

Measurement	Units	Data Type	Valid Range	Default Value
Concentration	ppm	Real	0 - 2000 ppm	32767 (0x7FFF)

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	31	Present_Value	85
Full Reference				
RTU_C#########.SpaceIAQInput.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviSpaceIAQ	DAC, SCC	Yes	SNVT_ppm	29

LonWorks: 0 = Invalid (default)

Effective Space Temperature

Keypad Menu Path Temperatures/Eff Space Temp

This read-only attribute indicates the current value of the Space Temperature for monitoring purposes. This value reflects the network input (if valid) or the value from a locally wired sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real	-40°F - 140°F -40°C - 60°C	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	0	3	Present_Value	85
Full Reference				
RTU_C#########. EffectSpaceT.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoSpaceTemp	SCC	Yes	SNVT_temp_p	105

Network Space Temperature

This read/write attribute indicates the space temperature input value provided by the network. If an input is not available from the network or the value is unreliable, the temperature reverts to the local sensor value.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real	14°F - 122°F -0°C - 50°C	32767 (0x7FFF)

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	28	Present_Value	85
Full Reference				
RTU_C#########. SpaceTempInput.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviSpaceTemp	SCC	Yes	SNVT_temp_p	105

Effective Supply Fan Capacity

Keypad Menu Path Unit Status/Indoor Fan (ON then 100%, OFF then 0%)

This read-only attribute indicates the current discharge fan capacity. For LonWorks, this variable is supported under the Unit Status network parameter. Unit Status reflects the current operating state, or mode, of the unit. It includes additional variables that display multiple unit sub-states. See Unit State for details.

Measurement	Units	Data Type	Valid Range	Default Value
Fan Capacity	Percent	Real LonWorks: Structure	0-100%	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	0	8	Present_Value	85
Full Reference				
RTU_C#########. FanOutput.Present_Value				

LonWorks

Variable Name	Profile	Uses Heart-beat	SNVT Type	SNVT Index
nvoUnitStatus.fan_output	DAC, SCC	Yes	SNVT_hvac_status	112

Economizer Enable

This read/write configuration property enables or disables economizer functionality for free cooling and also for ventilation for indoor air quality (IAQ). This property can be set to free cooling disabled and ventilation enabled, both free cooling and ventilation enabled, both free cooling and ventilation disabled or Auto. When set to Auto, then the unit control decides; this will cause the unit control to enable free cooling and enable ventilation.

The LonWorks variable (nviEconEnable) has two properties: a State and a Value field. In application version 1.5 only the State field is referenced. In version 2.0 and later, both fields are referenced.

Measurement	Units	Data Type	Valid Range	Default Value
State	NA	Unsigned LonWorks: Structure	Enumerated	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	19	85	Present_Value	85
Full Reference				
RTU_C#########.EconEnable.Present_Value				

Enumeration
1 = Disable Free Cooling, Enable Ventilation
2 = Enable Free Cooling, Enable Ventilation

3 = Auto (unit control decides)
4 = Disable All Economizer Functionality

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviEconEnable	DAC, SCC	Yes	SNVT_switch	95

Structure

```
typedef struct {
        un-
        signed      value;
        signed      state;
} SNVT_switch;
```

Valid Range (LonWorks Version 2.0+)

State	Value	Economizer
0	200	Disable All Economizer Functionality (unit control v2.x+) Auto (unit control v1.5)
0	0 - 199	Disable Free Cooling, Enable Ventilation (unit control v2.x+) Disable All Economizer Functionality (unit control v1.5)
1	NA	Enable Free Cooling, Enable Ventilation
-1 0xFF (255)	NA	Auto (unit control decides)

Valid Range (LonWorks Version 1.5)

State	Value	Economizer
0	NA	Disable All Economizer Functionality (unit control v1.x) Disable Free Cooling, Enable Ventilation (unit control v2.x+)
1	NA	Enable Free Cooling, Enable Ventilation
-1 0xFF (255)	NA	Auto (unit control decides)

Demand Control Ventilation Limit

Keypad Menu Path Economizer/Econ.DCV Limit

This read/write attribute indicates the current Demand Control Ventilation Limit from the network.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Percent	Percent	Real	0 - 100%	32767 (0x7FFF)

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	53	Present_Value	85
Full Reference				
RTU_C#########. DemandControlVentLimit.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviMinVentLim	DAC, SCC	No	SNVT_lev_percent	81

Ventilation Limit

This read/write attribute indicates the current Ventilation Limit from the network.

Measurement	Units	Data Type	Valid Range	Default Value
Percent	Percent	Real	0 - 100%	32767 (0x7FFF)

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	54	Present_Value	85
Full Reference				
RTU_C#########. VentLimit.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviMaxVentLim	DAC, SCC	No	SNVT_lev_percent	81

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Space CO2 High Limit Setpoint

Keypad Menu Path Economizer/DCV Level Setpt

This read/write configuration property commands the space CO_2 setpoint level. The network accepts a value of 0, 500-2000 ppm. Writing 0 disables the CO_2 limit function of the unit controller.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Concentration	ppm	Real	0, 500 - 2000 ppm	0

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	48	Present_Value	85
Full Reference				
RTU_C#########.SpaceCO2HighLimitSpt.Present Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SCPT Type	SCPT Index
nciSpaceCO2Lim	DAC, SCC	No	SCPTlimitCO2	42

Exhaust On/Off Setpoint

Keypad Menu Path Economizer/Econ.Exh.ON/OFF

This read/write configuration property is used to command the setpoint on the economizer that turns the exhaust fan off and on depending on the position of the damper.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Percent	Percent	Real	0 - 100%	25% = 5000

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	55	Present_Value	85
Full Reference				
RTU_C#########. ExhOnOffSetpt.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciExhaustSpt	DAC, SCC	SNVT_lev_percent	81	SCPTminReturnExhaustFanCapacity	60

Remote Space Temperature Setpoint Adjust

This read/write property is used in both BACnet and LonWorks networks. If the value is valid and Room Sensor Setpoint Enable is set to Disabled (Network) then it is used in the calculation of the Effective Setpoint Output. Otherwise, the Effective Setpoint Output does not depend on this value.

NOTE: This value does not affect unoccupied setpoints.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real	10°C - 35°C 50°F - 95°F	32767 (0x7FFF)

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	56	Present_Value	85
Full Reference				
RTU_C#########.RemoteSpaceSetpt.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nviSetpoint	SCC	No	SNVT_temp_p	105

Unit State

Keypad Menu Path Unit Status/Mode

This read-only property indicates the current operating state of the unit. For LonWorks, this master variable (nvoUnitStatus.mode) includes additional variables that reflect various unit sub-states. Note that when “Unit State” displays “Standby” at the keypad, the corresponding “Unit State” parameter displays “Off” from the BAS.

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
Unit State	NA	Unsigned LonWorks: structured	Enumerated	Yes	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	19	15	Present_Value	85
Full Reference				
RTU_C#########. UnitStatus.Present_Value				

Enumeration
1=Off
2=Start
3=Recirc
4=Fan Only
5=MinDAT
6=Htg
7=Econo
8=Clg

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoUnitStatus.Mode	DAC, SCC	Yes	SNVT_hvac_status	112

Field Definitions

Field	Data Point Reference	Valid Range	Notes
Mode	See below	Enumerated	compatible with SNVT_hvac_mode
Heat_output_primary	Primary Heating Capacity	-163.83 - +163.83% (% of full scale)	primary heat output
Heat_output_secondary	Secondary Heating Capacity	-163.83 - +163.83% (% of full scale)	secondary heat output
Cool_output	Cooling Capacity	-163.83 - +163.83% (% of full scale)	cooling output
Econ_output	Out Door Air Damper Position	-163.83 - +163.83% (% of full scale)	economizer output
Fan_output	Discharge Fan Capacity	-163.83 - +163.83% (% of full scale)	fan output
in_alarm	In Alarm	0 = No Alarm 1-99 = Warning 100-199 = Problem 200-255 = Fault	Any non-zero value means unit is in alarm1

Enumeration (Mode) Definitions (hvac_t)

Value	Identifier	Notes
1	HVAC_HEAT	Unit State is Heat
3	HVAC_COOL	Unit State is Cool
6	HVAC_OFF	Unit State is either Off, Startup, or Standby
9	HVAC_FAN_ONLY	Air not conditioned, fan turned on
0xFF	HVAC_NUL	Off (control powerup)

Structure

```
typedef struct {
        Hvac_t          mode;
        Signed long     heat_output_primary;
        Signed long     heat_output_secondary;
        Signed long     cool_output;
        signed long     econ_output;
        signed long     Fan_output;
        Unsigned        in_alarm;
} SNVT_hvac_status;
```

BACnet Unit Support

This is a BACnet-only parameter that sets the units that are sent from the communication module to the BACnet network. Units can be either metric or English.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Unit Support	NA	BACnet: Unsigned LonWorks: Structured	Metric English	Metric

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Multi-State Value	19	16	Present_Value	85
Full Reference				
RTU_C#########. UnitSupport.Present_Value				

LonWorks

No LonWorks equivalent.

Unoccupied Cooling Setpoint

Keypad Menu Path Setpoints/Unc Cool SP

This read/write configuration property sets the temperature above which the Maverick I Rooftop Unit Controller starts and provides cooling (night setup) during unoccupied periods. An optional space temperature sensor is required for unoccupied cooling operation. The BACnet property only applies to the subject data point. The LonWorks variable is a structure that covers three other data points: Unoccupied Cooling Setpoint, Occupied Heating Setpoint, and Unoccupied Heating Setpoint.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real	40°F - 100°F 4.4°C - 37.7°C LonWorks: 40.0°F - 95.0°F	85°F / 29.44°C

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	10	Present_Value	85
Full Reference				
RTU_C#########. UnoccCoolSetpt.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciSetpoints.unoccupied_cool	SCC	SCPTsetPnts	60	SNVT_temp_setpt	106

Structure

typedef struct {

Signed long	occupied_cool;
Signed long	standby_cool; (Not used)
Signed long	Unoccupied_cool;
signed long	occupied_heat;
signed long	standby_heat; (Not used)
Unsigned	Unoccupied_heat;

} SNVT_temp_setpt;

Unoccupied Heating Setpoint

Keypad Menu Path Setpoints/Unc Heat SP

This read/write configuration property sets the temperature above which the Maverick I Rooftop Unit Comptroller starts up and provides unoccupied heating (night setback). An optional space temperature sensor is required for unoccupied heating. The BACnet property only applies to the subject data point. The LonWorks variable is a structure that covers three other data points: Unoccupied Cooling Setpoint, Occupied Heating Setpoint, and Unoccupied Heating Setpoint.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real LonWorks: Structure	36°F - 91°F 2.2°C - 35.5°C LonWorks: 36°F - 91°F	55°F / 12.7°C

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	12	Present_Value	85
Full Reference				
RTU_C#########. UnoccHeatSetpt.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciSetpoints.unoccupied_heat	SCC	SCPTsetPnts	60	SNVT_temp_setpt	106

Structure

typedef struct {

Signed long	occupied_cool;
Signed long	standby_cool; (Not used)
Signed long	Unoccupied_cool;
signed long	occupied_heat;
signed long	standby_heat; (Not used)
Unsigned	Unoccupied_heat;

} SNVT_temp_setpt;

Space RH Configuration Setpoint

Keypad Menu Path Dehumidification/ Dehumidification Setpt.

This is the read/write configuration property that the network can use to set the space relative humidity configuration setpoint from the network. Writing 0 disables the dehumidification function in the controller. This configuration setpoint does not have a corresponding relative humidity network input or relative humidity setpoint input. The relative humidity is read by the Field Input 2 hard-wired input on the unit control board. To read the relative humidity value, Field Input 2 must be configured for 'percent' units. See Field Input 2 Configuration for details for selecting units. This parameter is saved in EEPROM (Flash) memory; therefore, the number of writes to it must be limited in order to avoid damage to the unit controller.

Measurement	Units	Data Type	Valid Range	Default Value
Relative Humidity	Percent	Real LonWorks: Structure	35 - 100%	0

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	65	Present_Value	85
Full Reference				
RTU_C#########.SpaceRHCfgSpt.Present Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SCPT Type	SCPT Index
nviSpaceRHSpt	DAC, SCC	No	SCPThumSetpt	81

Field Input 1

Keypad Menu Path Temperature / Field Config 1

This read-only attribute indicates the current value of the Field Input 1. This input must be a temperature value.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real	-40°F - 176°F -40°C - 80°C	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	61	Present_Value	85
Full Reference				
RTU_C#########. FieldInput1.Present_Value				

LonWorks

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoFieldInput1	DAC, SCC	No	SNVT_temp_p	105

Field Input 2

Keypad Menu Path Temperature / Field Config 2

This read-only attribute indicates the current value of the Field Input 2. The inputs supported are below. The high and low range are configured by using the Field Input 2 network parameter as described below.

Input	Data Type	Valid Range	Default Value
Percent % (Default) Liters/Sec CFM °C °F PPM Pascals IWC (Inches of water)	Real	-500000 - 500000	NA

BACnet

In BACnet, the unit type is configured by writing to the object (AV:62) unit type property.

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	62	Present_Value	85
Full Reference				
RTU_C#########. FieldInput2.Present_Value				

Unit Type	Engineering Unit Type Value
Percent % (Default)	98
Liters/Sec	87
CFM	84
°C	62
°F	64
PPM	96
Pascals	53
IWC (Inches of water)	58

LonWorks

Field Input 2 unit type is configured by writing to the nvoFieldInput2 type property. This variable can be configured to be one of the following SNVT types.

Variable Name	Profile	Uses Heartbeat	SNVT Type	SNVT Index
nvoFieldInput2	SCC, DAC	No	SNVT_lev_percent	81
			SNVT_flow	15
			SNVT_flow_p	161
			SNVT_temp_p	105
			SNVT_ppm	29
			SNVT_press_p	113

Field Input 2 Configuration

Keypad Menu Path NA

These read/write configuration properties configure the low scaled value and high scaled value for Field Input 2. In BACnet, the unit type is configured by writing to the FieldInput2 (AV:62) object property. In LonWorks, the unit type is configured by writing to nvoFieldInput2.

Calculating the scaled value for a given voltage:

The Field Input 2 port on the unit controller provides a 0-10 volt input signal. The voltage value must be scaled to the desired units. The LowVoltRange is the desired scaled value at 0 volts. The HighVoltRange is the desired scaled value at 10 volts.

LONWORKS only: These values default to SI units, and if needed, are converted to English (non-SI) units by the receiving unit.

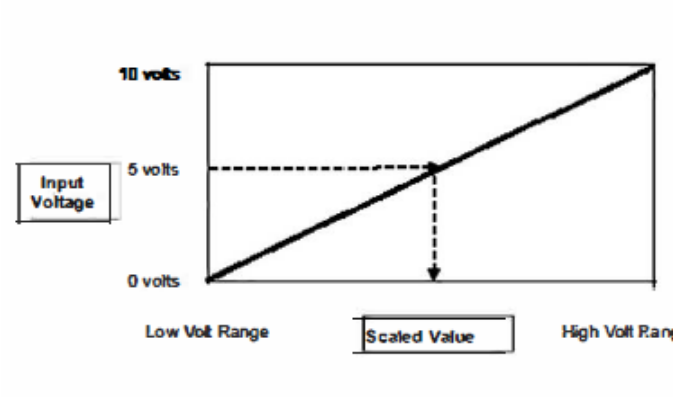
The input voltage versus scaled value is assumed to be linear.

Scaled Value = (InputVoltage / 10 volts) * (HighVoltRange – LowVoltRange) + LowVoltRange

NOTE: The LowVoltRange value will be larger than the HighVoltRange value for inverted voltage signal inputs.

⚠ CAUTION

Please note that anytime a command is written to a network configuration parameter, or to a BACnet object that controls a configuration parameter, this information is stored in the unit controller's EEPROM/FLASH memory. Recognize that writing to the unit controller's EEPROM/FLASH memory is an operation that has a finite limit. For this reason the number of writes made to configuration parameters, or BACnet objects linked to configuration parameters, must be limited in order to avoid damage to the unit controller.



Low Volt Range

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
User Defined	Same as the The Units property in the Field Input 2 object.	Real	-500000 - 500000	No	0%

High Volt Range

Measurement	Units	Data Type	Valid Range	Uses Heartbeat	Default Value
User Defined	Same as the The Units property in the Field Input 2 object.	Real	-500000 - 500000	No	100%

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	63	Present_Value	85
Full Reference				
RTU_C#########. FieldInput2LowVoltRange.Present_Value				

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	64	Present_Value	85
Full Reference				
RTU_C#########. FieldInput2HighVoltRange.Present_Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Index	UCPT Index
nciFieldInput	SCC	NA	NA	UCPTfieldInput

Structure

```
typedef struct {
        float   LowVoltRange;
        float   HighVoltRange;
} UNVT_field_input;
```

RH Setpoint

Keypad Menu Path Humidity Control/ RH Setpoint.

This read/write configuration property allows the BACnet network to set the relative humidity input value.

Measurement	Units	Data Type	Valid Range	Default Value
Relative Humidity	Percent	Real	35 - 100%	60

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	66	Present_Value	85
Full Reference				
RTU_C#########.RHSetpoint.Present Value				

LonWorks

No LonWorks equivalent.

VAV Pressure

Keypad Menu Path VAV/ Current Pressure.

This read-only property allows the BACnet network to monitor the status of the VAV Supply Pressure (AV:68) setpoint input when the unit is configured for VAV operation.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure	inches water column	Real	0 - 5	NA

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Input	2	14	Present_Value	85
Full Reference				
RTU_C#########.VAVPressure.Present Value				

LonWorks

No LonWorks equivalent.

VAV Supply Temp

Keypad Menu Path VAV/ Supply Temp

This read/write configuration property determines the supply air temperature setpoint that the VAV system is attempting to maintain. Applies when the unit is configured for VAV operation. BACnet only.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F/°C	Real	50 - 60°F 10 - 15.6°C	55°F / 12.8°C

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	67	Present_Value	85
Full Reference				
RTU_C#########.VAVSupplyTemp.Present Value				

LonWorks

No LonWorks equivalent.

VAV Supply Pressure

Keypad Menu Path VAV/ Supply Pressure.

This read/write configuration property determines the supply pressure setpoint that the VAV system is attempting to maintain. Applies when the unit is configured for VAV operation. BACnet only.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure	inches water column	Real	0- 4.4	2

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	68	Present_Value	85
Full Reference				
RTU_C#########.VAVSupplyPressure.Present Value				

LonWorks

No LonWorks equivalent.

VAV Max Pressure

Keypad Menu Path VAV/ Max Pressure.

This read/write configuration property determines the maximum VAV pressure setpoint. Applies when the unit is configured for VAV operation. BACnet only.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure	inches water column	Real	0 - 4.9	3

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	2	69	Present_Value	85
Full Reference				
RTU_C#########.VAVMaxPressure.Present Value				

LonWorks

No LonWorks equivalent.

Alarm Management

The Maverick I unit controller has various ways of managing alarms, depending on the network protocol.

Alarm Monitoring

Alarms in the unit controller are divided into three classes: Faults, Problems, and Warnings. Fault alarms have the highest priority. Problem alarms have the next priority. Warning alarms have the lowest priority. Each alarm is assigned a priority number from 1-254. See Table 10 for descriptions of alarm classes.

The unit controller also provides individual alarm identification through a unique value for each alarm. Alarms are sorted by the severity (priority) of the alarm. They are assigned the same priority number for both LonWorks and BACnet networks. An alarm number of 0 indicates no active alarm. Table 11 provides a list of alarm enumerations.

BACnet

Alarms within a Maverick I Rooftop Unit Controller can be monitored by using Current Alarm (AV:27). This object displays a value that corresponds to the highest priority active alarm. It is possible to have multiple active alarms, but only the highest priority is displayed.

LonWorks

Alarms within a Maverick I Rooftop Unit Controller can be monitored individually by using the In_Alarm variable. In_Alarm is part of the Unit Status network variable, nvoUnitStatus. in_alarm). This attribute displays a value that corresponds to the highest priority active alarm. It is possible to have multiple active alarms, but only the highest priority is displayed in this attribute. The values for all alarms are described in the Alarm section. If nvoUnitStatus.in_alarm displays a zero, there are no active alarms.

Alarm Clearing

Alarms in Table 11 can be cleared after the condition that caused the alarm has been corrected.

BACnet

Alarms can be cleared via BACnet in two ways. To clear all active alarms, change the Present_Value property of BV:66 (Clear All Alarms) to 1. To clear a single alarm, change the Present_Value of AV:57 (Clear One Alarm) to the value of the alarm that needs to be cleared.

LonWorks

Active alarms can be cleared in two ways. To clear all active alarms, change nviClearAllAlarm to 1. To clear a single alarm, change nviClear1Alarm to the value of the alarm that needs to be cleared.

Table 10: Alarm Classes

Alarm Class	Alarm Number Range	Action
Warning	1 - 99	Warnings are conditions that should be addressed, but do not shut down or limit unit operation in any way. Some of these alarms must be cleared manually, others will clear automatically when conditions return to normal. Warning alarms have the lowest priority.
Problem	100 - 199	Problem alarms do not cause unit shutdown but do limit operation of the unit in some way. Some of these alarms must be cleared manually, others clear automatically when conditions return to normal. Problem alarms have the next highest priority.
Shutdown Fault	200 - 254	Faults are conditions that are serious enough to completely shut down the unit. The alarm condition must be corrected and the alarm cleared before unit operation can resume. Fault alarms have the highest priority.

Table 11: Alarm Enumerations

Alarm Description	Alarm Class	Alarm Number (Priority)	Description
No Active Alarm		0	
Unspecified Alarms	Warning	1	In communication module v2.0 and earlier, alarm code 1 is sent if the alarm is not recognized. In v2.0 and higher, the alarm number is sent if the alarm is not recognized
Clogged Filter Warning-CFS	Warning	24	Unit controller displays warning
Running Blower Fault- Air Flow Switch Stuck	Warning	28	Switch indicates airflow when fan commanded off
Condenser Coil 1 Temperature Out of Range	Warning	30	No defrost operation, but unit continues to operate in either heating or cooling
Condenser Coil 2 Temperature Out of Range	Warning	31	No defrost operation, but unit continues to operate in either heating or cooling
Discharge Air Temperature Out of Range	Warning	32	If the sensor has ever been installed to the unit, the alarm will be set if it becomes unavailable
Invalid Thermostat selection	Warning	42	Indicates that a combination of thermostat inputs is invalid
LOW FLAME SENSE	Warning	44	IFC flashes error code on LED, transmits the warning through the network, but otherwise operates normally
Low Discharge Air Temp-DAT	Warning	71	Threshold is 40°F
High Return Air Temp-RAT	Warning	72	Threshold is 120°F
Return Air Sensor Fail-RAT	Warning	81	If the sensor has ever been installed to the unit, the alarm will be set if it becomes unavailable
Discharge Air Sensor Fail-DAT	Warning	82	If the sensor has ever been installed to the unit, the alarm will be set if it becomes unavailable
Comm Module Miscommunication	Warning	90	Communication module indicates miscommunication with the Unit controller
RTU-C Miscommunication with IFC	Warning	91	The unit controller indicates miscommunication with the IFC
Internal Control Fault – RTU-C	Warning	93	An internal fault occurred in the unit controller
Internal Control Fault – IFC	Warning	94	An internal fault occurred in the IFC
FLAME LOST	Problem	101	If lost 17 times within single call for heat, locks out for 1 hour. Otherwise retry ignition
Low Voltage Circuit 2	Problem	104	Comfort Alert Code 9. Shutdown circuit 2 and wait for voltage to return to operational levels
Low Voltage Circuit 1	Problem	105	Comfort Alert Code 9. Shutdown circuit 1 and wait for voltage to return to operational levels
Lockout Temperature – cooling	Problem	110	When the outdoor temperature drops below the cooling lockout temperature setpoint, the unit will prevent the compressor from operating in cool mode
Lockout Temperature – heating	Problem	111	When the outdoor temperature exceeds the heating lockout temperature setpoint, the unit will prevent any source of heat from operating
Condenser Coil 2 Temp Sensor Fail-OCT2	Problem	120	No defrost operation, but unit continues to operate in either heating or cooling
Condenser Coil 1 Temp Sensor Fail-OCT1	Problem	121	No defrost operation, but unit continues to operate in either heating or cooling
ELM - OAE Sensor Fail	Problem	122	Can prevent the operation of the Economizer
ELM - RAE Sensor Fail	Problem	123	Can prevent the operation of the Economizer
ELM - MAT Sensor Fail	Problem	124	Can prevent the operation of the Economizer
ELM – CO2 Sensor Fail	Problem	125	Can prevent the operation of the Economizer
ELM Actuator Fault	Problem	126	Can prevent the operation of the Economizer
MANUAL RESET LIMIT SWITCH OPEN	Problem	129	IFC Runs blower for off delay, inducer for post-purge time and locks out for one hour
Open Circuit 2	Problem	131	Comfort Alert Code 5 Circuit 2 shutdown and retry after ASCD
Open Circuit 1	Problem	132	Comfort Alert Code 5 Circuit 1 shutdown and retry after ASCD
PRESSURE SWITCH 2 CLOSED	Problem	133	Leave inducer de-energized until pressure switch open
PRESSURE SWITCH 1 CLOSED	Problem	134	Leave inducer de-energized until pressure switch open
PRESSURE SWITCH 2 OPEN	Problem	135	Energize inducer indefinitely until pressure switch closes or call for heat goes away.
PRESSURE SWITCH 1 OPEN	Problem	136	Energize inducer indefinitely until pressure switch closes or call for heat goes away.

Note that if an alarm is pased but is not in Table 11, then the communication module has received an unsupported (unrecognized) alarm. For communication module firmware v2.0 and older, an alarm number = 1 is sent if the communication module receives an unexpected alarm from the unit controller. For communication module firmware v2.x and newer, the alarm number is passed to the unit controller if the alarm is not supported. In this case, the alarm enumeration is not shown in Table 11.

Alarm Description	Alarm Class	Alarm Number (Priority)	Description
AC Low Pressure Switch 2 Trip-LP2	Problem	137	If the low pressure switch trips 3 times within 120 minutes of operation during the same call for cooling or heating operation, the control will lock out compressor and outdoor fan operation. If the lock-out due to low pressure occurs at an outdoor ambient temperature below 5 °F, the control will automatically exit the lock-out mode when the outdoor ambient temperature rises above 5 °F
AC Low Pressure Switch 1 Trip-LP1	Problem	138	If the low pressure switch trips 3 times within 120 minutes of operation during the same call for cooling or heating operation, the control will lock out compressor and outdoor fan operation. If the lock-out due to low pressure occurs at an outdoor ambient temperature below 5 °F, the control will automatically exit the lock-out mode when the outdoor ambient temperature rises above 5 °F
Welded Contactor Circuit 2	Problem	141	Comfort Alert Code 8 Run outdoor and indoor fans continuously for circuit 2 and change mode of operation to Unoccupied Auto. This procedure prevents the ambient from reaching extreme temperatures
Welded Contactor Circuit 1	Problem	142	Comfort Alert Code 8 Run outdoor and indoor fans continuously for circuit 2 and change mode of operation to Unoccupied Auto. This procedure prevents the ambient from reaching extreme temperatures
Freeze Sensor 2 Out of Range -FS2	Problem	144	When reading the temperature below 42°F continuously for 15 minutes, the control shutdowns compressor and runs indoor fan continuously. After 15 minutes of continuous reading above 47°F, the control recovers from the alarm and resumes operation
Freeze Sensor 1 Out of Range -FS1	Problem	145	When reading the temperature below 42°F continuously for 15 minutes, the control shutdowns compressor and runs indoor fan continuously. After 15 minutes of continuous reading above 47°F, the control recovers from the alarm and resumes operation
Freeze Sensor #2 Fail-FS2	Problem	146	Occurs when sensors are either open or shorted. This can prevent the operation of the compressors
Freeze Sensor #1 Fail-FS1	Problem	147	(Described above)
AC HI Pressure Switch 2 Trip-HP2	Problem	148	The Unit controller control recognizes an open high pressure switch after two seconds from its occurrence. Since the high pressure switch is wired in series with the compressor relay, the compressor shutdowns immediately. The outdoor fan finishes its delay off time and it also shutdowns, until the pressure switch is closed again AND the anti-short cycle delay is expired. Three occurrences of a high pressure switch within the same call will lock the circuit out. The lockout is reset by clearing the alarm
AC HI Pressure Switch 1 Trip-HP1	Problem	149	(See above)
Locked Rotor Circuit 1	Problem	151	Comfort Alert Code 4 Circuit 1 shutdown
Missing Phase Circuit 1	Problem	152	Comfort Alert Code 6 Circuit 1 shutdown
Reverse Phase Circuit 1	Problem	153	Comfort Alert Code 7 Circuit 1 shutdown
Locked Rotor Circuit 2	Problem	154	Comfort Alert Code 4 Circuit 2 shutdown
Missing Phase Circuit 2	Problem	155	Comfort Alert Code 6 Circuit 2 shutdown
Reverse Phase Circuit 2	Problem	156	Comfort Alert Code 7 Circuit 2 shutdown
Low Pressure – Circuit 2 Problem – Lockout	Problem	158	Clearable: Can be cleared via the network. This fault can also automatically reset if the call for cooling is removed
Low Pressure – Circuit 1 Problem – Lockout	Problem	159	Clearable: Can be cleared via the network. This fault can also automatically reset if the call for cooling is removed
High Pressure– Circuit 2 Problem – Lockout	Problem	166	Clearable: Can be cleared via the network. This fault can also automatically reset if the call for cooling is removed.
High Pressure– Circuit 1 Problem – Lockout	Problem	167	Clearable: Can be cleared via the network. This fault can also automatically reset if the call for cooling is removed.
MAIN LIMIT OPEN	Problem	170	IFC Main Limit Open. To clear must cycle power or wait for 1 hour delay.
GAS VALVE SERVO CIRCUIT OPEN	Problem	171	Modulating furnace only
GAS VALVE SERVO FAULT	Problem	172	Modulating furnace only
NO GAS VALVE FEEDBACK	Problem	173	Modulating furnace only
FAILED IGNITION	Problem	174	IFC locks out for 1 hour
UNEXPECTED FLAME	Problem	175	IFC Energizes inducer and main blower. Locks out for 1 hour

Note that if an alarm is pased but is not in Table 11, then the communication module has received an unsupported (unrecognized) alarm. For communication module firmware v2.0 and older, an alarm number = 1 is sent if the communication module receives an unexpected alarm from the unit controller. For communication module firmware v2.x and newer, the alarm number is passed to the unit controller if the alarm is not supported. In this case, the alarm enumeration is not shown in Table 11.

Alarm Description	Alarm Class	Alarm Number (Priority)	Description
Space Sensor Alarm	Problem	185	If the space sensor fails open or shorted, the space sensor alarm will be set, but the control will continue to operate using the return air sensor in place of the space sensor. If the control has never sensed a valid space sensor input, it will assume no space sensor is present to be used, and not set the space sensor alarm. If a valid space sensor input is ever detected, the control will set a non-volatile flag to indicate the control should have and use a space sensor. When the non-volatile flag is set, the control will detect space sensor alarm conditions
Outdoor Air Temperature Sensor Fail-OAT	Problem	188	Control changes defrost to time x temperature mode. The heat source continues to be heat pump, independently of the outdoor air temperature. Additional heat sources are also available in case the demand is not satisfied
Low Voltage	Fault	201	De-energize all relay outputs. The fault becomes inactive and relays function as normal when the voltage returns to acceptable levels.
Blower Fault - Blower Not Running-FP	Fault	208	Complete unit shutdown. Clearable: Can be cleared via the network.
Space Sensor & Return Sensor Fail	Fault	244	Leave indoor fan running if requested. Do not allow cooling or heating functions. Cannot be cleared via the network.
Smoke Detection (Selectable Fault Response)	Fault	248	The unit controller reads the smoke detection input as open -- complete shutdown. Cannot be cleared via the network.
Emergency Stop Fault	Fault	250	Complete shutdown. Cannot be cleared via the network.

Note that if an alarm is pased but is not in Table 11, then the communication module has received an unsupported (unrecognized) alarm. For communication module firmware v2.0 and older, an alarm number = 1 is sent if the communication module receives an unexpected alarm from the unit controller. For communication module firmware v2.x and newer, the alarm number is passed to the unit controller if the alarm is not supported. In this case, the alarm enumeration is not shown in Table 11.

Clear All Alarms

This read/write property clears all clearable active alarms. Writing 1 to this variable clears all clearable active alarms. This variable reverts back to 0 when the alarms clear.

Measurement	Units	Data Type	Valid Range	Default Value
Alarms	NA	BACnet: unsigned LonWorks: Structure	Enumerated	0

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Binary Value	5	66	Present_Value	85
Full Reference				
RTU_C#########.ClearAllAlarms.Present Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Number
nviClearAllAlarm	DAC, SCC	SNVT_count	8

Clear One Alarm

This read/write property clears one clearable active alarm. To clear a particular alarm, write the value corresponding to that alarm to this variable. This variable reverts back to 0 when the alarm clears.

Measurement	Units	Data Type	Valid Range	Default Value
Alarms	NA	BACnet: unsigned LonWorks: Structure	Enumerated	0

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	57	66	Present_Value	85
Full Reference				
RTU_C#########.ClearOneAlarm.Present Value				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Number
nviClear1Alarm	DAC, SCC	SNVT_count	8

Current Alarm

This read-only attribute indicates the highest active alarm.

For LonWorks, Current Alarm is supported by the Unit Status network variable. Unit Status reflects the current operating state, or mode, of the unit. It includes additional variables that display multiple unit sub-states. See Unit State for details.

Measurement	Units	Data Type	Valid Range	Default Value
Alarms	NA	BACnet: unsigned LonWorks: Structure	Enumerated	0

BACnet

Object Type	Object Type Identifier	Instance Number	Property Name	Property ID
Analog Value	57	2	Present_Value	85
Full Reference				
RTU_C#########. Alarm.Present_Value				
See Table 11 alarm enumerations				

LonWorks

Variable Name	Profile	SNVT Type	SNVT Number
nvoUnitStatus.in_alarm	DAC, SCC	SNVT_hvac_status	112
See Table 11 alarm enumerations			

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.

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. A password of 1234 is required.

DeviceCommunicationControl - Enable

When the BACnet communication module receives a network command to enable, information passed to/from the BACnet network is restored. A password of 1234 is required.

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 cold start or warm start, maintaining non-volatile memory. The functionality of a cold and warm start is the same
2. Resets the device. A password of 1234 is required.

BACnet PICS - Maverick I Unit Controller

This section contains the Protocol Implementation Conformance Statement (PICS) for the Maverick I Rooftop Unit Controller as required by ANSI/ASHRAE Standard 135-2004, BACnet; A Data Communication Protocol for Building Automation and Control Networks.

Date	March 2022
Vendor Name	Daikin Applied
Product Name	Rooftop Unit Controller
Product Model Number	RTU-C
Application Software Version	2.36
Firmware Revision	2.06
BACnet Protocol Version	Version 1 Revision 4

Product Description

The Maverick I Rooftop Unit Controller with optional BACnet communication module is a microprocessor-based controller designed to integrate into BACnet building automation systems.

The controller provides normal temperature, static pressure, ventilation control, and alarm monitoring with alarm-specific component shutdown in critical system conditions. Access to control parameters are available through the unit keypad/display and the BACnet network.

BACnet Standardized Device Profile

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

Data Sharing

☒	Data Sharing – ReadProperty – B	DS-RP-B
☒	Data Sharing – ReadPropertyMultiple – B	DS-RPM-B
☒	Data Sharing – WriteProperty – B	DS-WP-B
☒	Data Sharing – WritePropertyMultiple – B	DS-WPM-B
☒	Device Management – Dynamic Device Binding – B	DM-DDB-B
☒	Device Management – Dynamic Object Binding – B	DM-DOB-B
☒	Device Management – Dynamic Communication Control – B	DM-DCC-B
☒	Device Management – ReinitializeDevice – B	DM-RD-B

Device Address Binding

☐ Yes Static Device Binding

☒ No

Standard Object Types Supported

Object Type	Creatable	Deleteable	Optional	Writable
Analog Input	☐	☐	Description Reliability Min_Pres_Value Max_Pres_Value	
Analog Value	☐	☐	Description Reliability	Present_Value
Binary Value	☐	☐	Description Reliability Inactive_Text Active_Text	Present_Value
Multi-state Value	☐	☐	Description Reliability State_Text	Present_Value
Device	☐	☐	Location	Location

Note: Although all the above standard object types are supported they may not be used.

Data Link Layer Options

☒ BACnet IP, (Annex J)

☐ BACnet IP, (Annex J), Foreign Device

☒ ISO 8802-3, Ethernet (Clause 7)

☒ 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

Networking Options

☐ Router, Clause 6 – List all routing configureations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.

☐ Annex H, BACnet Tunneling Router over IP

☐ BACnet/IP Broadcast Management Device (BBMD) registration by Foreign Devices

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
ED15125	April 2010	Preliminary release.
ED15125-1	Sep 2010	- Corrected discrepancy with Occ Mode to match detailed data section.
ED15125-2	Nov 2012	- Changed Control Temperature Alarm from a Problem (195) to a fault (244). - Alarms that are not recognized by the communication boards are now passed through instead of sending alarm 1. - Added a network point to allow the network to command the indoor fan to either 1) run in continuous mode, 2) cycle on only when in heating or cooling or 3) run continuously when in occupied and cycle when unoccupied. - Added network points for two field inputs that are located on the unit control board. Field input 1 is always a temperature. The unit type for Field input 2 is configurable. The value from the unit control is always a voltage from 0 to 10 volts. It can be configured for one of five unit types. It includes configurations for the unit type, low range and high range. - Updated wording in Economizer Enable section and added an enumeration to disable all economizer functionality. This was done to support a change in the unit control. The unit control now supports Disabled Free Cooling, Enabled Free Cooling or Disable all Economizer Functionality. - Added a network point for the Space Relative Humidity Configuration Setpoint. -Fixed reference to OM 1077 in Reference Docs table -Updated Daikin logo and associated references. - Corrected an error in the description of which BACnet object numbers are needed to clear all and clear one alarm. The object numbers in the table of the same section and of the main table were correct.
ED15125-3	Jul 2013	- Changed definition of nviIndoorFanOcc in document from SNVT_state to UNVTIndoorFanOcc. The software didn't change.
ED15125-4	May 2015	Corrected SNVT/SCPT index references.
ED15125-5	Apr 2022	Added new BACnet points for VAV control: AI:14, AV:67, AV:68, AV:69.
ED15125-6	Jun 2022	Changed psi to inches water column for AI:14, AV:68, AV:69.
ED15125-7	Oct 2023	Changed description for AV:28 and nviSpaceTemp to Network Space Temp Input

Daikin Applied Training and Development

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