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MicroTech II®
Applied Rooftop Unit Controller
Protocol Information

BACnet® Networks
LONWORKS® Networks

- RPS/RFS/RCS/RDT/ RPR/RPE/RDE — RoofPak™ Packaged Singlezone Heating and Cooling Rooftop Units
- RDS/RAH/RAR — RoofPak Outdoor Air Handling Units

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Revision History

ED15060-0	July 10, 2001	Preliminary release. BACnet properties only.
ED15060-1	August 31, 2001	Preliminary release. Added LONWORKS variables, Alarm Notification, and Network Addressing.
ED15060-2	October 4, 2001	Added access via BACnet standard object types and Index.
ED15060-3	October 24, 2001	Clarified network addressing sections of each network type.
ED15060-4	November 30, 2001	Incorporated changes of application software revision 1.26, removed nonstandard objects that have corresponding standard objects, and other minor corrections.
ED15060-5	January 29, 2002	Incorporated changes in applications software revision 1.29, reformatted and revised data points,
ED15060-6	September 18, 2002	Incorporated unique BACnet Device Object Instance property, 6-compressor units and other minor format and text revisions.
ED15060-7	November 10, 2003	Incorporated changes of application software revision 1.44 and 2.07 for individual alarm notification.
ED15060-8	October 20, 2004	Revised LonMark alarm notification text. Added clarification to Alarm tables for Series 100 and Series 200 Application Software.
ED15060-9	March 29, 2006	Updated PICS statement. Changed nvoOAMinPos to nviOAMinPos. Added Compressor Outdoor Air Temperature Lockout and Economizer Enable data points. Added note regarding writing BACnet analog values, p.7 & p.21.
ED15060-10	November 15, 2006	Revised Cooling Reset Enable Value in Detailed Data Point section (LonWorks).
ED15060-11	April, 2008	Relocated Occ Schedule pont to Occupancy section in BACnet and LON data tables. Added Cooling Reset Enable State, Cooling Reset Enable Value, Heating Reset Enable State and Heating Reset Enable Value data points to BACnet table.
ED15060-12	September 2008	Removed 56400 bps baud rate option from Data Link Layer Options in PICS appendix and updated software revision numbers in PICS and Software Revision section.
ED15112-13	May 2012	Clarified Appliation Mode description.

Software Revision

Keypad Menu Path Setup/Service\Unit Configuration\AHU ID=

This edition documents Network Protocols for version 1.53 of the standard Daikin MicroTech II® Rooftop Unit Controller application software and version 2.09 of the 6-compressor version of the Daikin MicroTech II Rooftop Unit Controller applications and all subsequent versions until otherwise indicated. However, if your software is of a later version (for example, 1.54 or 2.10), some of the information in this document may not completely describe your application.

You can determine the revision of the application software from the keypad/display. The path for this information from the main menu is Setup\Service\Unit Configuration\AHU ID=.

Reference Documents

Company	Number	Title	Source
Daikin	IM 696	MicroTech II Applied Rooftop Unit Controller Installation Manual	www.DaikinApplied.com
Daikin	OM 137	MicroTech II Applied Rooftop Discharge Air Controller Operation Manual	www.DaikinApplied.com
Daikin	OM 138	MicroTech II Applied Rooftop Space Comfort Controller Operation Manual	www.DaikinApplied.com
American Society of Heating, Refrigerating and Air-Conditioning Engineers	ANSI/ ASHRAE 135-2001	BACnet® A Data Communication Protocol for Building Automation and Control Networks	www.ashrae.org
LonMark Interoperability Association	078-0014-01E	LonMark® Layers 1-6 Interoperability Guidelines, Version 3.0	www.lonmark.org
LonMark Interoperability Association	078-0120-01E	LonMark Application Layer Interoperability Guidelines, Version 3.2	www.lonmark.org
LonMark Interoperability Association	8500_10	LonMark Functional Profile: Space Comfort Controller, Version 1.0	www.lonmark.org
LonMark Interoperability Association	8600_10	LonMark Functional Profile: Discharge Air Controller, Version	www.lonmark.org
Echelon Corporation	078-0156-01G	LONWORKS FTT-10A Free Topology Transceiver Users Guide	www.echelon.com

Notice

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

Limited Warranty

Consult your local Daikin sales representive or warranty details. Refer to Form 933-430285Y. To find your local Daikin Representative, go to www.DaikinApplied.com.

Introduction

This document contains the necessary information you need to incorporate a MicroTech II Applied Rooftop Unit Controller into your building automation system. It lists all BACnet® properties, LONWORKS® variables, and corresponding MicroTech II Applied Rooftop Unit Controller data points. It also contains the BACnet Protocol Implementation Conformance Statement (PICS). BACnet and LONWORKS terms are not defined. Refer to the respective specifications for definitions and details.

Unit Controller Data Points

The MicroTech II Applied Rooftop Unit Controller contains data points or unit variables that are accessible from three user interfaces: the unit keypad, a BACnet network (BACnet/IP or MS/TP), or a LONWORKS network. Not all points are accessible from each interface. This manual lists all important data points and the corresponding path for each applicable interface. Refer to the applicable Operation Manual for keypad details. See Reference Documents section. This manual contains the network details necessary to incorporate the unit controller into your network.

Protocol Definitions

The MicroTech II Applied Rooftop Unit Controller can be configured in either an interoperable BACnet or LonWorks network. The controller must have the corresponding network communications module installed. There are three network communications modules: BACnet/IP, BACnet MS/TP (Master/Slave Token Passing), and LONWORKS. There are two LonWorks modules: one in accordance with the LonMark Space Comfort Controller functional profile and one in accordance with the Discharge Air Controller functional profile.

BACnet Protocol

BACnet is a standard communication protocol for Building Automation and Control Networks developed by the American National Standards Institute (ANSI) and American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) specified in ANSI/ASHRAE standard 135-2001. It addresses all aspects of the various systems that are applied to building control systems. BACnet provides the communication infrastructure needed to integrate products manufactured by different vendors and to integrate building services that are now independent.

LONWORKS Networks

A control network specification for information exchange built upon the use of LonTalk for transmitting data developed by the Echelon Corporation.

LonTalk Protocol

A protocol developed and owned by the Echelon Corporation. It describes how information should be transmitted between devices on a control network.

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.

Basic Protocol Information

Setting Unit Controller Communications Parameters

There are 12 communication parameters involved in setting up the unit controller for proper communication with the various communication module options (BACnet IP, BACnet MS/TP or LON). These parameters are set differently depending on which communication module is ordered and shipped with the unit. The table below lists the four possible sets of default parameter settings. Not all the parameters apply to all the module options. The entries in the table that are shown in **bold** font apply to a particular module option. **Changing these parameters requires the MicroTech II ServiceTools for Rooftop and Self-Contained units.**

Communication Setup Parameter Settings

Parameter Name	BACnet IP	BACnet MS/TP	LON (DAC or SCC)	No Communication Module
IP Address	**172.16.83.46**	172.16.83.46	172.16.83.46	172.16.83.46
IP Subnet Mask	**255.255.0.0**	255.255.0.0	255.255.0.0	255.255.0.0
UDP Port Number	**47808**	47808	47808	47808
IP Router Address	**172.16.128.0**	172.16.128.0	172.16.128.0	172.16.128.0
IP Network Address	**1001**	1001	1001	1001
MSTP Network Address	2001	**2001**	**2001**	2001
MSTP MAC Address[1]	129	**2**	**129**	129
MSTP Baud Rate	19200	**19200**	**19200**	19200
Communication Option[5]	**None**	**MSTP**	**MSTP**	MSTP
Device Instance Number[2]	**XXXXXX**	**XXXXXX**	XXXXXX	XXXXXX
Max APDU Length[3]	**1024**	**501**	501	501
Device Object Name[4]	**MTII RTUC XXXXXXXXX**	MTII RTUC XXXXXXXXX	MTII RTUC XXXXXXXXX	MTII RTUC XXXXXXXXX

Notes:

1. The MSTP MAC Address is not adjustable from the MicroTech II ServiceTools. It is set via the dipswitch block on the MS/TP communication module.
2. The Device Instance Number is factory set equal to the last six significant digits of the 18 digit number on the bar-code label on the unit's main control board (MCB). For example if the last six digits are 043.066, then the Device Instance Number is set to 43066.
3. The Max APDU Length automatically changes based on the Communication Option parameter. It should be 1024 for BACnet IP and 501 for BACnet MS/TP.
4. The Device Object Name is factory set as indicated in the table where the Xs are replaced by the last nine digits of the 18 digit number on the bar-code label on the unit's main control board (MCB). For example if the last nine digits are 000.043.066, then the Device Object Name is set to MTII RTUC 000043066 for an applied rooftop unit or MTII SCUC 000043066 for a vertical self-contained unit.
5. If the Communication Option is changed in the field, a Reset, Archive and Cold Reset (in that order) must be performed on the controller after all the communication related parameters are set as required.

BACnet Networks

Compatibility

The MicroTech II Applied Rooftop Unit Controller conforms to the BACnet Standard (ANSI/ASHRAE 135-2001) as stated in the Protocol Implementation and Conformance Statement (PICS). See BACnet Protocol Implementation Conformance Statement on page 84.

BACnet Objects

MicroTech II Applied Rooftop Unit Controllers incorporate standard BACnet object types (i.e., object types defined in the BACnet Standard) and additional proprietary BACnet object types 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 MicroTech II Applied Rooftop Unit Controller; each occurrence or instance has different properties and controls different unit variables or data points. Each instance is designated with a unique instance index. Some properties can be adjusted (read/write properties, e.g., setpoints) from the network and others can only be interrogated (read-only properties, e.g., status information).

Each data point accessible from a BACnet network is described with a table that gives the Object Identifier, Property Identifier, Full BACnet Reference or path, and the Name enumeration of the property.

Note: Analog values can be written to the MicroTech II unit controller via BACnet at a priority of 1 to 16, where 1 is the highest priority and 16 is the lowest priority. All analog values written to the MicroTech II controller via BACnet should be at a priority of 16. An analog value written via BACnet may be different from the corresponding value actually used for control if it was written at a priority other than 16. This situation can happen when the value is later changed via the keypad.

Example of BACnet Data Point

Keypad Menu Path Airflow\Airflow Summary\Disch Fan=

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Output	4	255	Present_Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Start Stop Control.DF On Off.Present Value				

Enumeration
0 = Off
1 = On

Object Identifier

Object Identifiers are each designated with an Object type as defined in the BACnet specification. The first column of the data point definition gives the object type. This object happens to be Discharge Fan Status (See page 40.)

The object identifier is a property of the object that you can read from the object. The name of the property is "Object_Identifier" and the property identifier is 75.

Each object in a rooftop controller has a unique identifier. BACnet object identifiers are two-part numbers of BACnet Object Identifier data type. The first part identifies the object type (the first 10 bits of the 32-bit BACnet Object Identifier [See ANSI/ASHRAE 135-2001 BACnet A Data Communication Protocol for Building Automation and Control Networks]). The first column of the data point definition gives the object type. The second part identifies the instances of that particular object type (the last 22 bits of the 32-bit BACnet Object Identifier).

The object identifier is shown in the data points listing as two numbers. The first number is shown in the Type ID column and designates the Object type enumeration. The second number is shown in the Instance column and designates the instance of that particular object type.

The object identifier is a property of the object that you can read from the object code. The name of the property is "Object_Identifier" and the property identifier is 75. The ASHRAE BACnet specification reserves the first 128 numbers for ASHRAE defined objects. Manufacturers may define additional object types and assign a number above 127 as long as they conform to the requirements of the ASHRAE BACnet specification.

Each object also has a name. Object names are character strings. The object name is a property of the object that you can read from the object. The name of the property is "Object_Name" and the property identifier is 77.

Objects are sometimes referred to as an object type and instance number as they are in the BACnet specification. The example object above would be: Binary Output, Instance 325.

Property Identifier

Each object has a number of properties or attributes. Each property has a unique identifier of BACnet Property Identifier data type. Property identifiers are an enumerated set; a number identifies each member. The Property Identifier enumeration number is shown in the Property ID column. In the example above the property identifier is 85.

Property Name

Each property also has a unique name. Property names are character strings and shown in the Property Name column. In the example above the property name is Present Value.

⚠ CAUTION

Do not change the character string of object and property names because the MicroTech II service tools use the name to identify the object.

Full Reference

The full reference is the path of the property within the network where the MicroTech II Applied Rooftop Unit Controller resides. It is a character string equivalent to the object identifier and the property identifier. In the example above the full reference is MTII RTUC #########. Applications.McQ.RT.Start Stop Control.DF On Off.Present Value.

Enumerated Values

Some properties are standard data types and some are enumerated sets. If the property value is an enumerated set, all enumerated values and corresponding meaning are given in the Enumeration column of the data point listing.

MicroTech II Applied Rooftop Unit Controller Device Object

Each BACnet compatible device must have one and only one BACnet Device Object.

Device Object Identifier

The MicroTech II Applied Rooftop Unit Controller Device 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 manufacturing. The device object identifier can be read from the unit controller. The name of the property is "Object_Identifier" and the property identifier is 75.

The initial device object instance number is derived from the unit controller serial number. The serial number is also the Ethernet MAC address of the controller. An Ethernet MAC address is a unique 18-bit number separated into 6 groups of 8 bits (an 8-bit group is also known as an octet) and declared as a series of independent decimal values with periods (.) between decimal values (for example: 000.016.141.000.041.229). Each decimal value represents one octet and ranges from 0 to 255.

The serial number is printed on a label fixed to the unit controller Main Control Board in both decimal value form and as a bar code of the decimal values.

The device object instance number is initially assigned as series of six decimal digits equal to the last six digits (two octets) of the serial number (for example for the serial number given above: 041229).

⚠ CAUTION

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

Device Object Name

The Device Object Name uniquely specifies a device in the network. It must be unique in the network. The device name for the MicroTech II Applied Rooftop Unit Controller device is MTII RTUC #########. The ######### is a unique nine digit number. It is the last nine digits of the board serial number assigned during the manufacturing process. (The serial number is also the Ethernet MAC address of the controller.) The device name is the "prefix" of all object names in the MicroTech II Applied Rooftop Unit Controller. All objects include the device name and a period "." (MTII RTUC #########.) preceding the object name.

The serial number is printed on a label fixed to the unit controller Main Control Board in both decimal value form and as a bar code of the decimal values.

The Device Object name is also available to the network in the device. The property name is "Object_Name" and property identifier is 77.

The Device Object Name is changeable with AAHU ServiceTool software. However, please note that an archive must be performed following a Device Object Name change. Failure to do so can lead to controller problems requiring that the entire application be re-downloaded.

Device Object Properties

The device object contains many other informative properties as shown in Table 1.

Table 1. MicroTech II Applied Rooftop Device Object Properties

Property	Identifier	Value	Data Type
Object Identifier	75	Instance number assigned at manufacturing, based on the board serial number	BACnet Object Identifier
Object Name	77	MTII RTUC #########[1]	Character String
Object Type	79	8	BACnet Object Type
Vendor Name	121	Daikin	Character String
Vendor Identifier	120	3	Unsigned 16
Model Name	70	mdcu_	Character String
Firmware Version	44	variable	Character String
Application Software Revision	12	variable	Character String
Description	28	Used by MDCU Active X Control Only	Character String
Local Time	57	variable	Time
Local Date	56	variable	Date
IP Address	1135	variable	Array
IP Mask	1136	variable	Array
IP Router Address	1137	variable	Array
Communications Option	2159	Enumerated	None, MSTP
Network Address	875	1001	Unsigned 16
MS/TP Baud Rate	2173	Enumerated	9600, 19200, and 38400
MS/TP Network Address	2161	variable	Integer
Max APDU Length Accepted	62	variable	Unsigned 16

Network Considerations

Access to Properties

Object properties are accessible from the network by specifying the device object identifier, object identifier, and the property identifier. To access a property, you must specify the object identifier including the device object identifier or the object name including the device object name and the property identifier.

BACnet/IP Addressing

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

The device object of the MicroTech II Applied Rooftop Unit Controller contains an Internet Protocol Subnet Mask (Default is 255.255.0.0) and a default IP address of 172.16.83.46. The controller does not support DHCP (Dynamic Host Configuration Protocol) IP addressing.

The MicroTech II Applied Rooftop Unit Controller can be incorporated into an BACnet/IP network dedicated to BACnet devices only or an Ethernet network shared with BACnet devices and other devices.

[1] Early versions of the MicroTech II Applied Rooftop Unit Controller used mdcu_######### as the device object name. See Appendix A for details.

Shared Ethernet Networks

Integrating the MicroTech II Applied Rooftop Unit Controller into a shared Ethernet LAN requires close cooperation with the network administrator of the shared Ethernet network. First, obtain the IP Subnet Mask of the shared network from the network administrator. Then, obtain ***static*** IP Addresses for all MicroTech II Unit Controllers you are integrating into the shared network. Finally obtain the address of an IP Router to use for sending IP messages to and from the BACnet IP subnets. Once you have these, refer to Setting Unit Controller Communication Parameters in the Basic Protocol Information section found previously in this document.

The default BACnet/IP Network Address in the MicroTech II Unit Controller is 1001. The Network Address must be unique for each BACnet network segment. All BACnet/IP devices on each individual BACnet/IP segment must have the same BACnet/IP Network Address. This is the Network Address property of the device object of the MicroTech II Applied Rooftop Unit Controller.

Finally, the Communication Option property of the MicroTech II Applied Rooftop Unit Controller device object must be set to NONE for BACnet/IP communications to take place. MSTP is the default value for this property. Refer to Setting Unit Controller Communication Parameters in the Basic Protocol Information section found previously in this document.

Configuring the Unit Controller

The MicroTech II Main Control Board is designed, programmed, and configured at the factory to be a MicroTech II Applied Rooftop Unit Controller. The unit is ready to operate with the default values of the various parameters set at the factory. Default values may be changed with the unit's keypad or via the network. See the appropriate operation manual for default values and keypad operating instructions. See Reference Documents section.

BACnet MS/TP Network Addressing

The BACnet MS/TP device address (Media Access Control [MAC] address) of the MicroTech II controller in a BACnet Master Slave/Token Passing (MS/TP) Local Area Network (LAN) is set in an eight-position DIP switch on the BACnet MS/TP Communications Module. The MAC address is physically set in eight binary switches. Bit 0 of the address corresponds to switch position 1 and bit 7 of the address corresponds to switch position 8. All MicroTech II controllers must be master controllers; therefore, bit 7 is always equal to 0 (open). An open switch (switch handle up) is a 0, and a closed switch (switch down) is a 1. This address must be unique and is determined during installation. After you set handle the address in the switches, 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 receive LED flickers when the module is receiving data from the network, and the transmit LED flickers when the module is sending data to the network. The default data transmission rate is set to 19,200 bps (baud). This rate can be changed to 9600 or 38,400 with the ServiceTool software. Please refer to Setting Unit Controller Communications Parameters in the Basic Protocol Information section found previously in this document.

The default BACnet MS/TP network address of the MicroTech II Applied Rooftop Unit Controller is 2001. This must be set the same as all other BACnet devices on the network for devices to communicate with each other. To change this address, refer to Setting Unit Controller Communications Parameters.

For BACnet MS/TP communications, the Communication Option property of the MicroTech II controller must be set to MS/TP. Please refer to Setting Unit Controller Communications Parameters in the Basic Protocol Information section found previously in this document.

LONWORKS Networks

LONWORKS technology, developed by Echelon Corporation, is the basis for LonMark interoperable systems. This technology is independent of the communications media. The LonMark Interoperable Association has developed standards for interoperable LONWORKS technology systems. In particular they have published standards for HVAC equipment including the Discharge Air Controller functional profile and the Space Comfort Controller functional profile. These profiles specify a number of mandatory and optional standard network variables and standard configuration parameters. This manual defines these variables and parameters available in the MicroTech II Applied Rooftop Unit Controller.

Compatibility

The MicroTech II Applied Rooftop Unit Controllers with the LONWORKS communications modules operate in accordance with the Discharge Air Controller (DAC) functional profile and the Space Comfort Controller (SCC) functional profile of the LonMark Interoperability standard.

LONWORKS Variables

MicroTech II Applied Rooftop Unit Controllers incorporate LONWORKS network variables to access unit data points. The controller uses LONWORKS Standard Network Variable Types (SNVT) from each profile. Some data points can be adjusted (input network variables, nvi) (read/write attributes, e.g., setpoints) from the network and others can only be interrogated (output network variables, nvo) (read only attributes, e.g., status information). Configuration variables (nci) are included with the read/write attributes.

Each data point accessible from a LONWORKS network is described with a table that gives the LONWORKS Name, Profile, SNVT Type, and SNVT Index. If the variable is a configuration variable the table also includes the SCPT Reference and the SCPT Index.

Example of LONWORKS Data Point

LonWorks

LonWorks Name	Profile	SNVT Type	SNVT Index
nvoBldgStatPress	DAC, SCC	SNVT_press_p	113

LONWORKS Name

Each network variable has a name that you use to access the data point. This is the name of the variable from the profile. In the example above the name network variable is nvoBldgStatPress.

Profile

The profile column designates the MicroTech II Communications Module that incorporates this network variable. The variable itself may not be a standard component of that particular profile, but the communications module does implement and it is available to the network.

SNVT Type

This column gives the name of the standard network variable type from the master list.

SNVT Index

This column gives the number of the standard network variable type from the master list.

SCPT Reference

This column gives the name of the Standard Configuration Parameter Type (SCPT) from the master list.

SCPT Index

This column gives the number of the Standard Configuration Parameter Type (SCPT) from the master list.

Network Considerations

Network Topology

Each MicroTech II LONWORKS Communications Module is equipped with an FTT-10A transceiver for network communications. This transceiver allows for (1) free topology network wiring schemes using twisted pair (unshielded) cable and (2) polarity insensitive connections at each node. These features greatly simplify installation and reduce network commissioning problems. Additional nodes may be added with little regard to existing cable routing.

Free Topology Networks

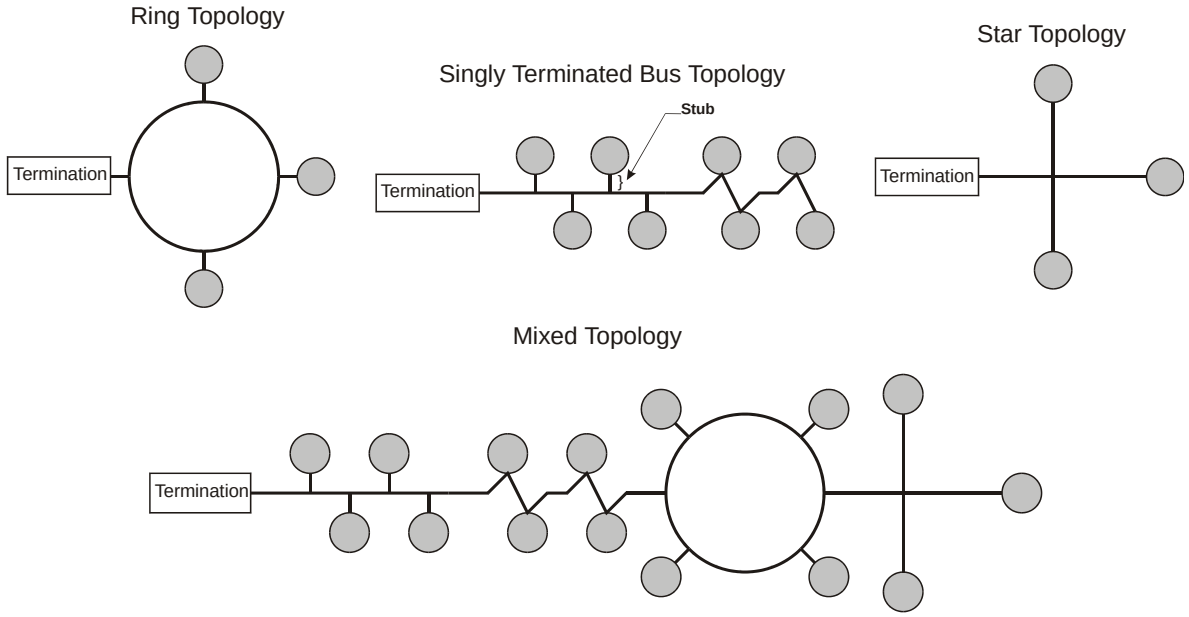
A LONWORKS "free topology network" means that devices (nodes) can be connected to the network in a variety of geometric configurations. For example, devices can be daisy-chained from one device to the next, connected with stub cables branching off from a main cable, connected using a tree or star topology, or any of these configurations can be mixed on the same network as shown in Figure 1. Free topology segments require termination for proper transmission performance. Only one termination is required. It may be placed anywhere along the segment**. Refer to Echelon LONWORKS FTT-10A Transceiver User's Guide.** See Reference Documents section.

Free topology networks may take on the following topologies:

- Bus
- Ring
- Star
- Mixed - Any combination of Bus, Ring, and Star

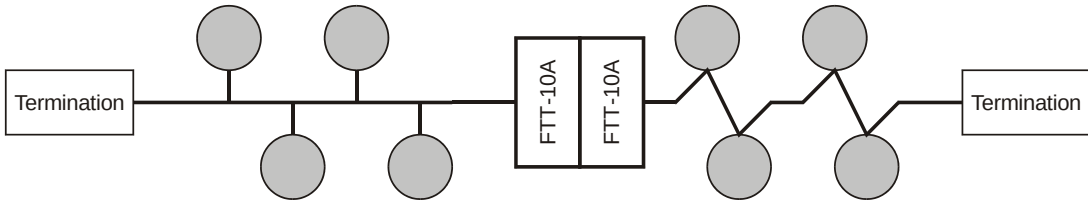
Note: Limitations to wire lengths apply and must be observed.

Figure 1. Singly Terminated Free Topology



A network segment is any part of the free topology network in which each conductor is electrically continuous. Each of the four diagrams is a illustration of a network segment. Some applications may require two or more segments; see "Free Topology Restrictions." If necessary, segments can be joined with FTT-10A-to-FTT-10A physical layer repeaters. See Figure 2. **Refer to Echelon LonWorks FTT-10A Transceiver User's Guide.**

Figure 2. Combining Network Segments with a Repeater



Free Topology Restrictions

Although free topology wiring is very flexible, there are restrictions. A summary follows, refer to the **Echelon FTT-10A User's Guide** for details.

1. The maximum number of nodes per segment is 64.
2. The maximum total bus length depends on the wire size:

Wire Size	Maximum Node-to-Node Length	Maximum Cable Length
24 AWG	820 ft (250 m)	1476 ft (450 m)
22 AWG	1312 ft (400 m)	1640 ft (500 m)
16 AWG	1640 ft (500 m)	1640 ft (500 m)

   The longest cable path between any possible pair of nodes on a segment must not exceed the maximum node-to-node distance. If two or more paths exist between a pair of nodes (e.g., a loop topology), the longest path should be considered. Note that in a bus topology, the longest node-to-node distance is equal to the total cable length.

   a. The total length of all cable in a segment must not exceed the maximum total cable length.

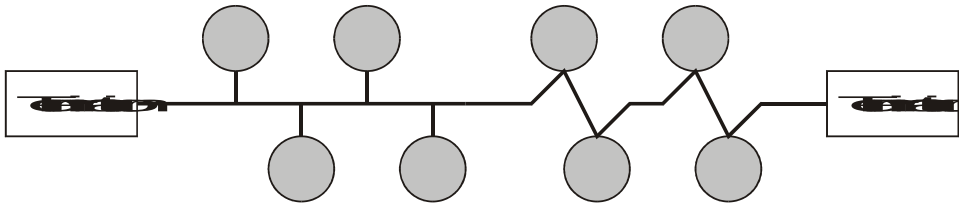
3. One termination is required in each segment. It may be located anywhere along the segment.

Doubly Terminated Networks

You can extend the maximum total cable length without using a repeater by using doubly-terminated network topology. See Figure 3. The trade-offs are (1) this network topology must be rigorously followed during the installation and subsequent retrofits and (2) two terminations must be installed at the ends of the bus for proper transmission performance. **Refer to Echelon LONWORKS FTT-10A Transceiver User's Guide.**

Note: Limitations to wire lengths apply and must be observed.

Figure 3. Doubly Terminated Network Topology



Doubly Terminated Topology Restrictions

The restrictions on doubly-terminated bus topology are as follows:

1. The maximum number of nodes per segment is 64.
2. The maximum total bus length depends on the wire size:

Wire Size	Maximum Cable Length
24 AWG	2952 ft (900 m)
22 AWG	4590 ft (1400 m)
16 AWG	8855 ft (2700 m)

3. The maximum stub length is 9.8 ft (3 m). The length of the MicroTech II Applied Rooftop LONWORKS cable harness stub is 7.2 ft (2.19 m).

   A stub is a piece of cable that is wired between the node and the bus. See Figure 1. Note that if the bus is wired directly to the node, there is no stub, and thus the stub length is zero. If you are wiring to a field terminal strip on a unit, be sure to account for any factory wiring between the terminal strip and the controller. This wiring is considered part of the stub.

4. Two terminations are required in each segment. One must be located at each end of the bus.

Network Cable Termination

LONWORKS network segments require termination for proper data transmission performance. The type and number of terminations depend on network topology. **Refer to Echelon LONWORKS FTT-10A Transceiver User's Guide**.

LonWorks Network Addressing

Every Neuron Chip has a unique 48-bit Neuron ID or physical address. This address is generally used only at initial installation or for diagnostic purposes. For normal network operation, a device address is used.

Device addresses are defined at the time of network configuration. All device addresses have three parts. The first part is the Domain ID, designating the domain. Devices must be in the same domain in order to communicate with each other. The second part is the Subnet ID that 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. The third part is the Node ID that identifies an individual device within the subnet.

A group is a logical collection of devices within a domain. Groups are assembled with regard for their physical location in the domain. There may be up to 256 groups in domain. A group address is the address that identifies all devices of the group. There may be any number of devices in a group when unacknowledged messaging is used. Groups are limited to 64 devices if acknowledged messaging is used.

A broadcast address identifies all devices within a subnet or domain.

LONWORKS network variables for both the Discharge Air Controller and the Space Comfort Controller are defined below. Variables are used in both the Space Comfort Controller and Discharge Air Controller profiles unless marked otherwise.

Commissioning the Network

Pressing the service pin, switch on the MicroTech II LONWORKS Communications Module, generates a service pin message, which contains the Neuron ID and the program code identification of the node. A service pin message is a network message that is generated by a node and broadcast on the network. It can be used to commission the LONWORKS network.

A network configuration tool maps device Neuron IDs to the domain/subnet/node logical addressing scheme when it creates the network image, the logical network addresses and connection information for all devices (nodes) on the network.

External Interface File (XIF)

LonMark guidelines specify exact documentation rules so that proprietary configuration tools are not required to commission and configure LONWORKS devices. The MicroTech II LONWORKS Applied Rooftop Communications Module is self-documenting so that any network management tool can obtain all the information needed over the network to connect it into the system and to configure and manage it. An External Interface File (a specially formatted PC text file with an extension .XIF) is also available so that any network tool can design and configure it prior to installation. For a copy of the XIF file contact your local Daikin representative.

Configuring the Unit Controller

The MicroTech II Applied Rooftop Controller Main Control Board is designed, programmed, and configured at the factory to be a rooftop unit controller in accordance with either the LonMark Discharge Air Controller (DAC) or LonMark Space Comfort Controller (SCC) functional profile. The unit is ready to operate with the default values of the various parameters set at the factory. Default values may be changed with the unit's keypad or via the network. See the appropriate operation manual for default values and keypad operating instructions.

Note: The Communications Option property in the device object must be set to MSTP for communications on a LONWORKS network. Please refer to Setting Unit Controller Communications Parameters in the Basic Protocol Information section found previously in this document.

Data Integrity

The integrity of some data depends on a valid network connection to maintain current values. The following data points require a valid network connection if bound. If data points listed in Table 2 do not change after a given time, the controller reverts to the default values of the variable.

Table 2. Receive Heart Beat Variables

Data Point	LonWorks Variable
Occupancy Scheduler Input	nviOccSchedule
Application Mode	nviApplicMode
Remote Discharge Fan Capacity Setpoint	nviSupFanCap
Building Static Pressure	nviBldgStatPress
Outdoor Air Temperature	nviOutdoorTemp
Return Air Temperature	nviRATemp
Space Temperature	nviSpaceTemp
Relative Humidity	nviSpaceRH

Typical Application: Minimum Integration

When you have integrated the unit into your network, you can monitor and control unit operation from your workstation. At a minimum, you can:

- Display and monitor a minimum of important data points on your workstation display
- Turn the unit on or off from your workstation
- Set the schedule from your workstation and
- Operate the unit safely

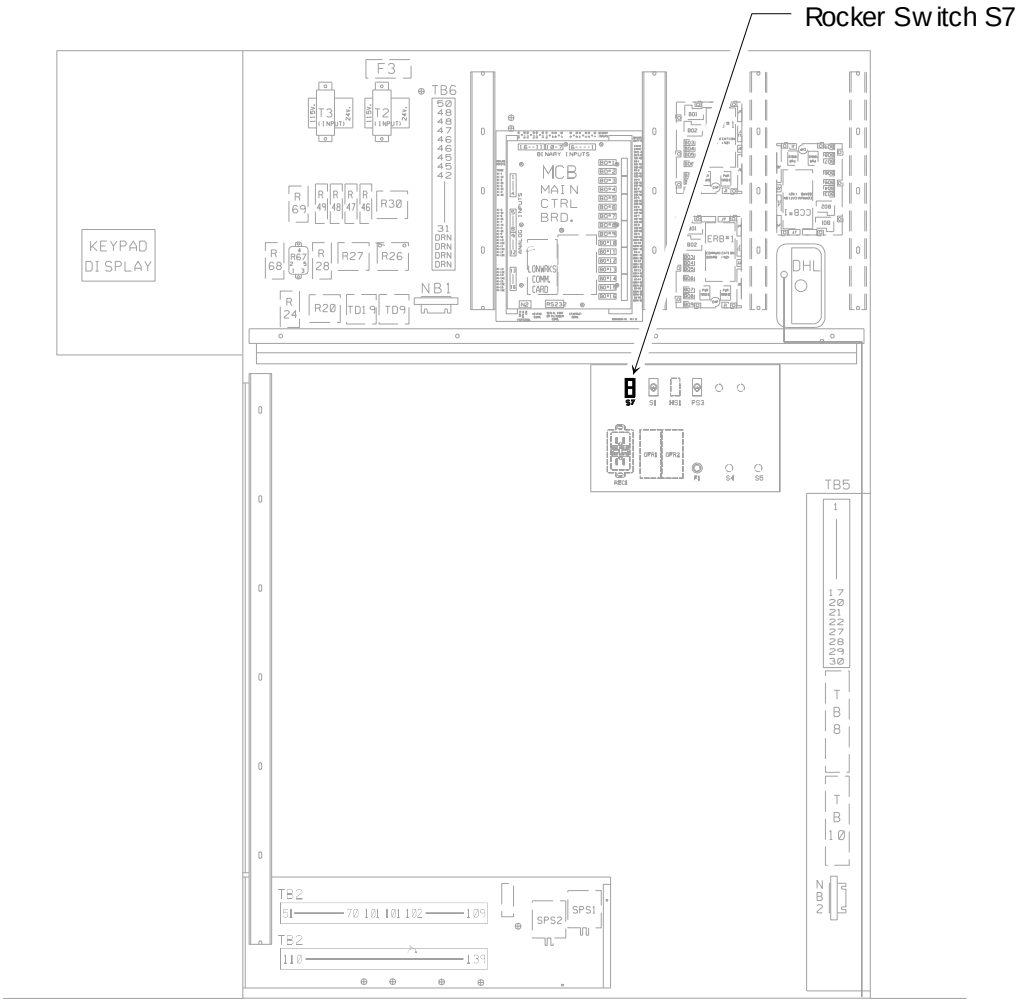
This section gives you the basic information and outlines a procedure to set up the unit for network control.

Set up the Unit for Network Control

To control the MicroTech II controller over the network, follow the setup steps below.

1. Set the S7 rocker switch on the control panel to AUTO. Figure 4 shows the general location of a typical installation. Some models use variations of this switch panel, but all are in the same general location.

Figure 4. Location of Switch S7



2. On the unit keypad, set the Control Mode function to AUTO. The keypad password (4545) is required to edit this function. For a detailed description of how to use the keypad refer to the appropriate Operation Manual. The keypad can be very useful to verify network operation.

Display Important Data Points

Typical workstation displays of MicroTech II unit controller attributes include the following significant data points (page number of detailed description in parenthesis). Each data point is identified with a number that also identifies it in the Comprehensive Data Point Tables. These data points are also shaded in the comprehensive tables so that you can distinguish them from the rest of the data points in the table. References in the text of this section also identify these data points with a number and shading.

Table 3. Significant Data Points

No	Configuration	No	Temperatures/Pressures	No	Setpoints	No	Clear Alarms
1	Unit Status (72)	5	Discharge Air Temperature (39)	9	Duct Static Pressure Setpoint (41)	14	Alarm, Faults: Clear All (80)
2	Application Mode (25)	6	Return Air Temperature (69)	10	Unoccupied Cooling Setpoint (75)	15	Alarm, Problems: Clear All (81)
3	Occupancy (59)	7	Outdoor Air Temperature (65)	11	Occupied Cooling Setpoint (62)	16	Alarm, Warnings: Clear All (83)
4	Occupancy Mode (59)	8	Duct Static Pressure (41)	12	Occupied Heating Setpoint (63)		
				13	Unoccupied Heating Setpoint (76)		

You can display any number of additional data points based on job requirements or individual preference. See LonWorks Variables on page 22 for lists of all LONWORKS Variables available to a LONWORKS network. See BACnet Standard Objects on page 18 for a list of all Standard BACnet Objects available to a BACnet network. For a more detailed description of all available data points, see the Detailed Data Point Information section on page 25 of this document.

Network Off

The unit can be turned off over the network by writing to the (2) Application Mode (See page 25). Writing AUTO to Application Mode allows the unit controller to determine its mode of operation based on input conditions. Writing OFF to Application Mode shuts down the unit, etc.

The Emergency Override Mode Flag (See page 47) can also be used to shut down the unit from the network.

Network Occupancy Scheduling

Using the keypad, set the Occupancy Mode to Auto. Schedule unit operation over the network with the Occ Scheduler input. Switching from OCC, UNOCC, BYPASS, or AUTO commands the unit into the mode you select.

Note: MicroTech II unit controllers use an internal keypad schedule during stand-alone operation. In BACnet the keypad schedule writes to the commandable Present Value property of the Occupancy Scheduler Input object at priority 15. To command the schedule from the supervisory controller you must write to this property at a higher priority, for example, priority 8. If network scheduling is abandoned later and you want to schedule from the keypad again, you must relinquish command from the supervisory controller (that is, write NULL to the commandable Present Value property of the Occupancy Scheduler Input object at the same priority as you were commanding the schedule).

Alarms

Alarms in a MicroTech II controller are divided into three classes: Faults, Problems, and Warnings.

- Fault Alarms have the highest priority.
- Problem Alarms have medium priority.
- Warning Alarms have the lowest priority.

Notification

BACnet

MicroTech II unit controllers with application software version 1.44 or 2.07 may have their alarms monitored by one of two methods: 1) individually by three BACnet Analog Values, or 2) by alarm class using three BACnet Binary Values.

1. To monitor alarms individually, read the desired instance based on the three BACnet Analog Value objects for Fault alarms, Problem Alarms, and Warning Alarms. The value of each of these objects (as described in the Alarms section tables) will be the largest number in its enumeration that corresponds to an active alarm. Each of these objects will be set to zero if no alarms are active in that group. These objects are explained in further detail in 1) Alarm, Faults: Clear Individual, 2 Alarm, Problems: Clear Individual or 3) Alarm, Warnings: Clear Individual: valid alarm values of 4 through 252 (Alarm), 0 (Normal).
2. To monitor alarms by alarm class, read the Present_Value property of any one of three Binary Value objects; 1) Alarm, Faults: Clear All, 2) Alarm, Problems: Clear All or 3) Alarm, Warnings: Clear All. If the Present_Value property of these objects reads ACTIVE, an alarm in that class has occurred.

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Alarms within MicroTech II unit controllers can be monitored individually by using the In Alarm attribute of the Unit Status Network Variable Output (i.e. nvoUnitStatus_in_alarm). This attribute displays a value that corresponds to the highest priority alarm that is active. It is possible to have multiple active alarms, but only the highest priority is displayed in this attribute. For example, if there is a simultaneous Dirty Filter Warning (value of 24) and a Freeze Fault (value of 252), then the Freeze Fault value of 252 will display in nvoUnitStatus_in_alarm because it is the higher priority alarm of the two. Once the Freeze Fault condition is corrected and the fault is cleared, the next priority active alarm value (in this example, value of 24 for Dirty Filter alarm) is displayed. The values for all alarms are described in the Alarms section tables. If the attribute nvoUnitStatus_in_alarm displays a zero, there are no active alarms.

Alarms may also be monitored by alarm class if desired. When the nvoUnitStatus_in_alarm attribute reads a value in the range of 1 to 99, a Warning Alarm is active. When the attribute reads a value in the range of 100 to 199, a Problem Alarm is active. When the attribute reads a value in the range of 200 to 255, a Fault Alarm is active.

Clearing

BACnet

MicroTech II unit controllers with application software version 1.29 and later have three Binary Value objects that can be used to clear alarms; (14) Alarm, Faults: Clear All (See page 80), (15) Alarm, Problems: Clear All (See page 81) and (16) Alarm, Warnings: Clear All (See page 83). Alarms in a particular class may be cleared by writing INACTIVE to the Present Value property of the associated Binary Value object that reads ACTIVE. If the unit is still in the alarm condition after clearing, the Present Value property of the associated Binary Value object changes to read ACTIVE again to indicate the alarm still exists.

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MicroTech II unit controllers with application software version 1.34 and later have three Network Variable Inputs (nvi's) of type SNVT_Switch that can be used to clear alarms; 1) nviAlarmFault, 2) nviAlarmProblem and 3) nviAlarmWarning. Alarms in a particular class may be cleared by changing the state part of the SNVT from 1 (Alarm) to 0 (Normal). If the unit is still in the alarm condition after clearing, the In Alarm attribute of the Unit Status Network Variable Output (nvoUnitStatus) changes to read 1 (Warning Alarm), 100 (Problem Alarm) or 200 (Fault Alarm) again to indicate the alarm still exists.

Unit Controller Sequence of Operation

The sequence of operation for a MicroTech II unit controller depends on the control type. Refer to the appropriate MicroTech II Operation Manual for sequence of operation details. See www.DaikinApplied.com for unit controller OM. These manuals also describe keypad operation.

Comprehensive Data Point Tables

These comprehensive data point tables contain the significant parameters of specific data points. The shaded data points with numbers are the data points listed in Table 3.

BACnet Standard Objects

Network Control Property (Keypad attributes available as BACnet Standard Objects for network control of the unit)	**Page**	**Read Or Read/ Write**	**Object Type**	**Instance**	**SCC**	**DAC**	**Description**
System Summary							
*(1) Unit Status	72	R	AV	3810	✓	✓	0=OffUnoc, 1=OffNet, 2=Off Sw, 3=OffAlm, 4=Calib, 5=Startup, 6=Recirc, 7=FanOnly, 8=Econo, 9=Cooling, 10=MWU, 11=Heating, 12=MinDAT, 13=UnocEcon, 14=UnocFanO, 15=UnocDAT, 16=UnocClg, 17=UnocHtg, 18=Balance, 19=OffMan, 20=ManCtrl
Cooling Capacity	31	R	AV	3620	✓	✓	Feedback of cooling capacity (%)
Heating Capacity	50	R	AV	3695	✓	✓	Feedback of heating capacity (%)
Cooling Control Status	31	R	AV	3665	✓	✓	0=All Clg, 1=Econo, 2= Mech Clg, 3=Off Amb, 4=Off Alarm, 5=Off None, 6=Off Bal, 7=Off Sw, 8=Off Net, 9=Off Man
Heating Control Status	51	R	AV	3715	✓	✓	0=HtEna, 1=OffAmb, 2=OffAlarm, 3=OffNone, 4=N/A, 5=OffSw, 6=OffNet,7=OffMan
*(2) Application Mode	25	R/W	AV	3605	✓	✓	0=Auto, 1=Off, 2=HeatOnly, 3=CoolOnly, 4=FanOnly
VAV Box Output	77	R	BO	265	N/A	✓	Indicates the state of VAV box output (MCB-BO # 12) 0=Off, 1=On
Occupancy							
*(3) Occupancy	59	R	AV	3815	✓	✓	0=Occ, 1=Unocc, 2=Bypass
*(4) Occupancy Mode	59	R/W	AV	3825	✓	✓	0=Occ, 1=Unocc, 2=Bypass, 3=Auto. **Note: This is an override object and not intended to be used to command Occupancy. For typical operation, this should be set to Auto**.
Occupancy Scheduler Input	61	R/W	BV	1455	✓	✓	**Note: This BV is used to command Occupied & Unoccupied operation when Occupancy Mode is set to Auto. The BAS must write to this object at a priority less than 15.**
Occupancy Source	62	R	AV	3820	✓	✓	0=None, 1=Int Sched, 2=Net Sched, 3=Occ Mode, 4=Remote Sw, 5=N/A
Emergency Override Mode Flag	47	R/W	AV	3610	✓	✓	0=Norm, 1=Off (Shuts unit off via a network signal, puts Unit Status = OffNet)
Temperature							
Control Temperature	29	R	AV	135	✓	✓	Current temp of the input that the unit has been configured to use as the control temp
*(5) Discharge Air Temperature	39	R	AI	115	✓	✓	Current reading of sensor
*(6) Return Air Temperature	69	R	AI	120	✓	✓	Current reading of sensor
Space Temperature	71	R**	AI	100	✓	✓	Current reading of sensor
*(7) Outdoor Air Temperature	65	R**	AI	125	✓	✓	Current reading of sensor
Entering Fan Temperature	49	R	AI	130	✓	✓	Current reading of sensor
Airflow Summary							
Airflow Status	25	R	BI	160	✓	✓	0=Noflo, 1=Flow (Differential pressure switch sensing discharge airflow)
Discharge Fan Status	40	R	BO	255	✓	✓	0=Off, 1=On (Indicates if controller is commanding the discharge fan on)
Return Fan Status	70	R	BO	260	✓	✓	0=Off, 1=On (Controller's command to the return or exhaust fan)
Fan Operation Output	50	R	BO	250	✓	✓	0=Off, 1=On (Relay output which indicates that fans are ON (MCB BO # 3))
Duct Pressure							
*(9) Duct Static Pressure	41	R	AV	3790	N/A	✓	Current reading of sensor. If unit has two sensors the lower of the two is displayed
Duct Static Pressure Setpoint	41	R/W	AV	3730	N/A	✓	Default = 1.00" WC

Network Control Property (Keypad attributes available as BACnet Standard Objects for network control of the unit)	**Page**	**Read Or Read/ Write**	**Object Type**	**Instance**	**SCC**	**DAC**	**Description**
Discharge Fan Capacity	40	R	AV	3735	N/A	✓	Current discharge fan capacity (%)
Building Pressure							
Building Static Pressure	27	R**	AI	1505	✓	✓	Current reading of sensor value or network input
Building Static Pressure Setpoint	27	R/W	AV	3755	✓	✓	Default = 0.050" WC
Return Fan Capacity	69	R	AV	3745	✓	✓	Current return or exhaust fan capacity (%)
Zone Cooling							
Effective Cooling Enable Setpoint	44	R	AV	3640	✓	✓	If Control Temp > (this setpoint + ½ Cool Enable Dead Band), Then cooling is enabled
Cooling Operating Hours	32	R	Runtime Total.	1515	✓	✓	Indicates hours of unit mechanical cooling.
Cooling Reset Enable State	32	R/W	Applic.	790	N/A	✓	Enables or disables discharge air temperature cooling reset control for DAC. **Note: When this object is enabled, the type of cooling discharge temp reset is determined by the object**.
Cooling Reset Enable Value	33	R/W	Applic.	790	N/A	✓	Indicates the type of discharge air temperature cooling reset control enabled. **Note: Cooling Reset Enable State must be enabled or this property has no effect.**
*(11) Occupied Cooling Setpoint	62	R/W	AV	3655	✓	✓	Default = 75°F
Control Temperature Source	30	R/W	AV	3600	✓	✓	0=Return, 1=Space, 2=OAT
*(10) Unoccupied Cooling Setpoint	75	R/W	AV	3795	✓	✓	Default = 85°F
Zone Heating							
Effective Heating Enable Setpoint	45	R	AV	3690	✓	✓	If Control Temp < (this setpoint – ½ Heat Enable Dead Band), Then heating is enabled
*(12) Occupied Heating Setpoint	63	R/W	AV	3710	✓	✓	Default = 70°F
*(13) Unoccupied Heating Setpoint	76	R/W	AV	3800	✓	✓	Default = 55°F
Heating Reset Enable State	52	R/W	Applic.	615	N/A	✓	Enables or disables the discharge air temperature heating reset control for the Discharge Air Controller. **Note: when this property is enabled, the type of heating discharge temperature reset is determined by the Heating Reset Enable Value**.
Heating Reset Enable Value	52	R/W	Applic.	615	N/A	✓	Enables or disables the discharge air temperature heating reset control for the Discharge Air Controller. **Note: Heating Reset Enable State must be enabled or this property has no effect.**
Discharge Cooling							
Effective Cooling Discharge Setpoint	44	R	AV	3635	✓	✓	Current Discharge air setpoint which the unit will use in the cooling mode
Discharge Air Cooling Setpoint	38	R/W	AV	3630	N/A	✓	Default = 55°F
Min Discharge Air Cooling Setpoint	56	R/W	AV	3645	✓	✓	Default = 55°F
Max Discharge Air Cooling Setpoint	55	R/W	AV	3650	✓	✓	Default = 65°F
OA Damper							
Outdoor Air Damper Position	64	R	AI	460	✓	✓	Feedback value (%)
Effective Min Outdoor Damper Pos Spt	46	R	AV	3765	✓	✓	Current OA damper min position setpoint (%)
Outdoor Air Flow	65	R	AV	3780	✓	✓	Current outdoor air flow on units with optional DesignFlow (CFM)
Outdoor Air Damper Min Position	64	R/W	AV	3775	✓	✓	Default = 10%
Min Outdoor Airflow/Damper Position	57	R/W	AV	3770	✓	✓	Sets the Effective Min Outdoor Damper Position Stp when Design Flow is set to YES
Economizer Changeover Method	42	R/W	AV	3785	✓	✓	0=Enthalpy, 1=Dry Bulb
Economizer Changeover Temp Spt	43	R/W	AV	3760	✓	✓	Default=60°F, Makes changeover decision if Economizer Changeover Method=Dry Bulb

Network Control Property (Keypad attributes available as BACnet Standard Objects for network control of the unit)	Page	Read Or Read/ Write	Object Type	Instance	SCC	DAC	Description
Discharge Heating							
Effective Heating Discharge Setpoint	45	R	AV	3685	✓	✓	Current discharge air setpoint which the unit uses in the heating mode
Discharge Air Heating Setpoint	39	R/W	AV	3680	N/A	✓	Default = 100°F
Min Discharge Air Temperature Limit	57	R/W	AV	3805	✓	N/A	Default = 55°F Sets low limit on units equipped with modulating or multistage heating
Min Discharge Air Heating Setpoint	56	R/W	AV	3700	✓	✓	Default = 60°F
Max Discharge Air Heating Setpoint	55	R/W	AV	3705	✓	✓	Default = 120°F
Energy Recovery							
Energy Recovery Exhaust Temperature	48	R	AV	4210	✓	✓	Current reading of sensor
Energy Recovery Supply Temperature	49	R	AV	4205	✓	✓	Current reading of sensor
Dehumidification							
Dehumidification Status	36	R	AV	3675	✓	N/A	Indicates if dehumidification is active
Relative Humidity	66	R	AI	805	✓	N/A	Displays value of optional relative humidity sensor
Dew Point Temperature	37	R	AV	810	✓	N/A	Indicates current calculated dew point
Relative Humidity Control Type	66	R/W	AV	3670	✓	N/A	0=None, 1=RelHum, 2=DewPnt (Turns Dehumidification ON and OFF)
Relative Humidity Setpoint	67	R/W	AV	3660	✓	N/A	Relative humidity setpoint used when Relative Humidity Control Type is set to RelHum
Dew Point Setpoint	37	R/W	AV	3625	✓	N/A	Dew point setpoint used when Relative Humidity Control Type is set to DewPnt
Schedule							
Daily Schedule	33	R	Sch	1460	✓	✓	MicroTech II keypad daily schedule (writes to Occupancy BV-1455 at priority level 15). Not used if network scheduling provided through supervisory controller
Holidays	53	R/W	Cal	1465	✓	✓	MicroTech II keypad holiday date list (writes to Occupancy BV-1455 at priority level 15). Not used if network scheduling provided through supervisory controller
Unit Configuration							
Remote Discharge Fan Cap Control Flag	67	R/W	AV	3720	N/A	✓	0=Duct Pres, 1=Position
Remote Discharge Fan Capacity Spt	68	R/W	AV	3725	N/A	✓	Default = 25%
Remote Return Fan Cap. Control Flag	68	R/W	AV	3750	✓	✓	0=None, 1=Tracking, 2=Bldg Press, 3=Position
Remote Return Fan Capacity Spt	69	R/W	AV	3740	✓	✓	Default = 25%
Zone Temperature Setup							
Space Setpoint Type	71	R/W	AV	3615	✓	N/A	0=Tstat, 1=Keypad/Network (Set to Network for network control of setpoints)
Alarms							
*(14) Alarm, Faults: Clear All	80	R/W	BV	4150	✓	✓	Indicates Fault Alarm has occurred
*(15) Alarm, Problems: Clear All	81	R/W	BV	4145	✓	✓	Indicates Problem Alarm has occurred
*(16) Alarm, Warnings: Clear All	83	R/W	BV	4140	✓	✓	Indicates Warning Alarm has occurred
Alarms (100 Series Application Software v1.44 and later)							
Alarms-Fault Individual Notification	78	R	AV	4862	✓	✓	Individual notification of the highest priority active Fault alarm enumeration
Alarms-Problem Individual Notification	82	R	AV	4861	✓	✓	Individual notification of the highest priority active Problem alarm enumeration
Alarms-Warning Individual Notification	83	R	AV	4863	✓	✓	Individual notification of the highest priority active Warning alarm enumeration

Network Control Property (Keypad attributes available as BACnet Standard Objects for network control of the unit)	**Page**	**Read Or Read/ Write**	**Object Type**	**Instance**	**SCC**	**DAC**	**Description**
Alarms (200 Series Application Software v2.07 and v2.08)							
Alarms-Fault Individual Notification	81	R	AV	4870	✓	✓	Individual notification of the highest priority active Fault alarm enumeration
Alarms-Problem Individual Notification	82	R	AV	4872	✓	✓	Individual notification of the highest priority active Problem alarm enumeration
Alarms-Warning Individual Notification	83	R	AV	4873	✓	✓	Individual notification of the highest priority active Warning alarm enumeration

** To write a network value to the present value of this input, set the OUT-OF-SERVICE property to TRUE. If Network communications is lost with OUT-OF-SERVICE set to TRUE, the unit controller uses the last value written.

Note: Objects that appear in multiple locations on the keypad are only listed in the location they first appear on the keypad

Note: Analog values can be written to the MicroTech II unit controller via BACnet at a priority of 1 to 16, where 1 is the highest priority and 16 is the lowest priority. All analog values written to the MicroTech II controller via BACnet should be at a priority of 16. An analog value written via BACnet may be different from the corresponding value actually used for control if it was written at a priority other than 16. This situation can happen when the value is later changed via the keypad.

LONWORKS Variables

Network Control Property Keypad attributes available as LONWORKS Variables for network control of the unit	**Variable Name**	**Page**	**SNVT/SCPT Index**	**SCC**	**DAC**	**Description**
System Summary						
*(1) Unit Status	nvoUnitStatus	72	112	✓	✓	Mode 0=AUTO, 1=HEAT, 2=MRNG_WRMUP, 3=COOL, 4=NIGHT_PURGE, 5=PRE_COOL, 6=OFF, 7=TEST, 8=EMERG_HEAT, 9=FAN_ONLY, 10=FREE_COOL, 11=ICE, 0XFF=NUL
Cooling Capacity	nvoUnitStatus	31	112	✓	✓	Cool_Output Feedback of cooling capacity (%)
Heating Capacity	nvoUnitStatus	50	112	✓	✓	Heat_Output Feedback of heating capacity (%)
*(2) Application Mode	nviApplicMode	25	108	✓	✓	0=AUTO, 1=HEAT, 2=MRNG_WRMUP, 3=COOL, 4=NIGHT_PURGE, 5=PRE_COOL, 6=OFF, 7=TEST, 8=EMERG_HEAT, 9=FAN_ONLY, 10=FREE_COOL, 11=ICE, 12=MAX_HEAT
Occupancy						
*(3) Occupancy	nvoEffectOccup	59	109	✓	✓	0=OCCUPIED, 1=UNOCCUPIED, 2=BYPASS, 3=STANDBY, 0xFF=NUL
*(4) Occupancy Mode	nviOccManCmd	59	109	✓	✓	0=OCCUPIED, 1=UNOCCUPIED, 2= BYPASS, 3=STANDBY, 0xFF=NUL
Occupancy Scheduler Input	nviOccSchedule	61	128	✓	✓	Network schedule
Emergency Override Mode Flag	nviEmergOverride	47	103	✓	✓	0=NORMAL, 1=PRESSURIZE, 2=DEPRESSURIZE, 3=PURGE, 4=SHUTDOWN, 5=FIRE, 0xFF=NUL
Temperature						
*(5) Discharge Air Temperature	nvoDischAirTemp	39	105	✓	✓	Current reading of sensor
*(6) Return Air Temperature	nviRATemp	69	105	✓	✓	Network input of Return Temperature
*(6) Return Air Temperature	nvoRATemp	69	105	✓	✓	Current reading of sensor
Space Temperature	nviSpaceTemp	71	105	✓	✓	Network input of Space Temperature
Space Temperature	nvoSpaceTemp	71	105	✓	✓	Current reading of sensor
*(7) Outdoor Air Temperature	nviOutdoorTemp	65	105	✓	✓	Network input of Outdoor Air Temperature
*(7) Outdoor Air Temperature	nvoOutdoorTemp	65	105	✓	✓	Current reading of sensor
Airflow Summary						
Discharge Fan Status	nvoUnitStatus	40	112	✓	N/A	Fan_Output 0% = OFF, 100% = ON
Return Fan Status	nvoRetFanStatus	70	95	✓	✓	0=Off, 1=On , 0xFF=Undefined
Duct Pressure						
Duct Static Pressure	nvoDuctStatPress	41	113	N/A	✓	Current reading of sensor. If unit has two sensors the lower of the two is displayed
Duct Static Pressure Setpoint	nviDuctStaticSP	41	113	N/A	✓	Default = 1.00” WC
Discharge Fan Capacity	nvoUnitStatus	40	112	N/A	✓	Fan_Output Current discharge fan capacity (%)
Building Pressure						
*(8) Building Static Pressure	nviBldgStatPress	27	113	✓	✓	Network input of Building Static Pressure
*(8) Building Static Pressure	nvoBldgStatPress	27	113	✓	✓	Current reading of sensor value
*(9) Building Static Pressure Setpoint	nviBldgStaticSP	27	113	✓	✓	Default = 0.050” WC
Return Fan Capacity	nvoRetFanStatus	69	95	✓	✓	Current return or exhaust fan capacity (%)
Zone Cooling						
Effective Cooling Enable Setpoint	nvoEffectSetpt	44	105	✓	✓	Current cooling enable setpoint which the unit will use in the cooling mode
*(11) Occupied Cooling Setpoint	nciSetpoints SCPTsetPnts	62	106/60	✓	✓	Occupied_Cool Default = 75°F
*(10) Unoccupied Cooling Setpoint	nciSetpoints SCPTsetPnts	75	106/60	✓	✓	Unnoccupied_Cool Default = 85°F

Network Control Property Keypad attributes available as LONWORKS Variables for network control of the unit	Variable Name	Page	SNVT/SCPT Index	SCC	DAC	Description
Zone Heating						
Effective Heating Enable Setpoint	nvoEffectSetpt	45	105	✓	✓	Current heating enable setpoint which the unit will use in the heating mode
*(12) Occupied Heating Setpoint	nciSetpoints SCPTsetPnts	63	106/60	✓	✓	Occupied_Heat Default = 70°F
*(13) Unoccupied Heating Setpoint	nciSetpoints SCPTsetPnts	76	106/60	✓	✓	Unoccupied_Heat Default = 55°F
Discharge Cooling						
Effective Cooling Discharge Setpoint	nvoEffDATempSp	44	105	N/A	✓	Current discharge air setpoint which the unit will use in the cooling mode
Discharge Air Cooling Setpoint	nviDAClSP	38	105	N/A	✓	Default = 55°F
Min Discharge Air Cooling Setpoint	nciMinDAC1SP SCPTminDischargeAirCoolingSetpoint	56	105/206	✓	✓	Default = 55°F
Max Discharge Air Cooling Setpoint	nciMaxDAC1SP SCPTmaxDischargeAirCoolingSetpoint	55	105/205	✓	✓	Default = 65°F
Clg Reset	nciCoolResetEn SCPTcoolingResetEnable	32	95/211	N/A	✓	State 0 = None, 1 = Value has meaning Value 0 = None, 1 = Space, 2 = Return, 3 = OAT, 4 = Ext mA, 5 = Ext V, 6 = Airflow
OA Damper						
Outdoor Air Damper Position	nvoUnitStatus	64	112	✓	✓	Economizer_Output Feedback value (%)
Effective Min Outdoor Damper Pos Spt	nviOAMinPos	46	81	✓	✓	Current OA damper min position setpoint (%)
Outdoor Air Flow	nvoOAFlow	65	15	✓	✓	Current outdoor air flow on units with optional DesignFlow (CFM)
Economizer Enable	nviEconEnable	43	95	✓	✓	Enables or disables economizer via two properties: State=0, economizer disabled State=1, economizer enabled via LON Value=0 and State=1, economizer disabled via LON Value>0 and State=1, economizer enabled via LON
OA Ambient	nvoEconEnabled	58	95	✓	✓	Indicates whether outside air is suitable for free cooling
Outdoor Air Damper Min Position	nciOAMinPos SCPTminRnge	64	81/23	✓	✓	Default = 10%
Min Outdoor Airflow/Damper Position	nviMinOAFlowSP	57	15	✓	✓	Sets the Effective Min Outdoor Damper Position Stp when Design Flow is set to YES
Discharge Heating						
Effective Heating Discharge Setpoint	nvoEffDATempSp	45	105	N/A	✓	Current discharge air setpoint which the unit will use in the heating mode
Discharge Air Heating Setpoint	nviDAHtSP	39	105		✓	Default = 100°F
Min Discharge Air Heating Setpoint	nciMinDAHtSP SCPTminDischargeAirHeatingSetpoint	56	105/208	✓	✓	Default = 60°F
Max Discharge Air Heating Setpoint	nciMaxDAHtSP SCPTmaxDischargeAirHeatingSetpoint	55	105/207	✓	✓	Default = 120°F
Htg Reset	nciHeatResetEn SCPTheatingResetEnable	52	95/212	N/A	✓	State 0 = None, 1 = Value has meaning Value 0 = None, 1 = Space, 2 = Return, 3 = OAT, 4 = Ext mA, 5 = Ext V
Dehumidification						
Dehumidification Status	nvoDehumidifier	36	95	✓	N/A	0% = Off, 100%= On
Relative Humidity	nviSpaceRH	66	81			Network input
Relative Humidity	nvoSpaceRH	66	81	✓	N/A	Value of optional relative humidity sensor or network input
Dew Point Temperature	nvoSpaceDewPt	37	105	✓	N/A	Indicates current calculated dew point (calculated from Relative Humidity)
Relative Humidity Setpoint	nviSpaceDehumSP	67	81	✓	N/A	Relative humidity setpoint used when Relative Humidity Control Type is set to RelHum

Network Control Property Keypad attributes available as LONWORKS Variables for network control of the unit	**Variable Name**	**Page**	**SNVT/SCPT Index**	**SCC**	**DAC**	**Description**
Unit Configuration						
Remote Discharge Fan Capacity Spt	nviSupFanCap	68	81	N/A	✓	Default = 25% Sets the discharge air vane position or VFD speed when Discharge Fan Capacity Control Flag is set to POSITION
Timer Settings						
Local Bypass Time	nciBypassTime SCPTbypassTime	55	123/34	✓	✓	Sets the max amount of time that the controller can be in Bypass mode
Alarms						
In Alarm	nvoUnitStatus	54	112	✓	✓	In_Alarm 0 = No Alarm
*(14) Alarm, Fault: Clear All	nviAlarmFault	80	95	✓	✓	Clear all Fault Alarms. Change state part of SNVT from 1 (Alarm) to 0 (Normal).
*(15) Alarm, Problems: Clear All	nviAlarmProblem	81	95	✓	✓	Clear all Problem Alarms. Change state part of SNVT from 1 (Alarm) to 0 (Normal).
*(16) Alarm, Warnings: Clear All	nviAlarmWarning	83	95	✓	✓	Clear all Warning Alarms. Change state part of SNVT from 1 (Alarm) to 0 (Normal).
Non-Keypad Variables						
HVAC Unit Type Identifier	nciHvacType SCPThvacType	54	145/169	✓	N/A	Equipment Type = RoofTop
Minimum Send Time	nciMinOutTm SCPTminSendTime	58	107/52	✓	✓	Defines min period of time between automatic network variable output time (reducing traffic on network)
Receive Heartbeat	nciRcvHrtBt SCPTmaxRcvTime	66	107/48	✓	✓	Default is 0 seconds
Send Heartbeat	nciSndHrtBt SCPTmaxSendTime	70	107/49	✓	✓	Default is 0 seconds
Temperature Setpoint Input	nviSetpoint	72	105	✓	✓	Adjusts effective heat enable and effective cool enable setpoint via the network. Effective Heat SP = nviSetpoint – 0.5 (Occupied_Cool – Occupied_Heat). Effective Cool SP = nviSetpoint + 0.5 (Occupied_Cool – Occupied_Heat).

Note: Objects that appear in multiple locations on the keypad are only listed in the location they first appear on the keypad

Detailed Data Point Information

The data points or properties (attributes) defined in this section reference data that is generated in the MicroTech II Applied Rooftop Unit Controller.

AHU ID

Keypad Menu Path Setup/Service\Unit Configuration\AHU ID=

This read-only property identifies the version of application software loaded into the unit controller.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	52	AHU ID	63002
Full Reference				
MTII RTUC #########.Applications.McQ.RT.AHU ID				

Airflow Status

Keypad Menu Path Airflow\Airflow Summary\Flow Status=

This read-only property indicates discharge airflow status. A binary-differential pressure switch senses this airflow status.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Input	3	160	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Airflow Switch.Present Value				

Enumeration
0 = Noflo
1 = Flow

Application Mode

Keypad Menu Path System Summary\System\Appl Mode=

This read/write attribute sets the unit in an application mode (auto, off, heat only, cool only, fan only, or dehumidification). Application Mode does not "force" the unit into any state. However, it disables certain unit operation. For example, an Application Mode of "Cool Only" disables heating, "Heat Only" disables cooling, and "Fan Only" disables heating and cooling. attribute has no affect unless Control Mode is set to Auto. Control Mode is only set at the keypad/display.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3605	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Application Mode MAV.Present Value				

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

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviApplicMode	DAC, SCC	SNVT_hvac_mode	108

Enumeration Definitions

Value	Identifier	Notes
0	HVAC_AUTO	Controller automatically changes between application modes
1	HVAC_HEAT	Heating only
2	HVAC_MRNG_WRMUP	Application-specific morning warm-up
3	HVAC_COOL	Cooling only
4	HVAC_NIGHT_PURGE	Application-specific night purge
5	HVAC_PRE_COOL	Application-specific pre-cool
6	HVAC_OFF	Controller not controlling outputs
7	HVAC_TEST	Equipment being tested
8	HVAC_EMERG_HEAT	Emergency heat mode (heat pump)
9	HVAC_FAN_ONLY	Air not conditioned, fan turned on
10	HVAC_FREE_COOL	Cooling with compressor not running
11	HVAC_ICE	Ice-making mode
12	HVAC_MAX_HEAT	
13	HVAC_ECONOMY	Controller automatically changes between application modes
14	HVAC_DEHUMID	Controller automatically changes between application modes
0xFF	HVAC_NUL	Value not available

Enumeration Correspondence

BACnet Application Mode		Lon SNVT_hvac_mode	
0	Auto	0	HVAC_AUTO
2	Heat Only	1	HVAC_HEAT
2	Heat Only	2	HVAC_MRNG_WRMUP
3	Cool Only	3	HVAC_COOL
3	Cool Only	4	HVAC_NIGHT_PURGE
3	Cool Only	5	HVAC_PRE_COOL
1	Off	6	HVAC_OFF
0	Auto	7	HVAC_TEST
2	Heat Only	8	HVAC_EMERG_HEAT
4	Fan Only	9	HVAC_FAN_ONLY
3	Cool	10	HVAC_FREE_COOL
0	Auto	11	HVAC_ICE
2	Heat Only	12	HVAC_MAX HEAT
0	Heat Only	12	HVAC_ECONOMY
0	Heat Only	12	HVAC_MAX DEHUMID
0	Heat/Cool	0xFF	HVAC_NUL

Building Static Pressure

Keypad Menu Path Airflow\Bldg Pressure\Bldg Press=

This read/write property connects a network building static pressure sensor or network output from another controller. When a building static pressure sensor is locally wired to the controller, this variable has priority if a valid value is present.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure (gauge)	BACnet: WC LONWORKS: kPa	Real	BACnet: -0.250 – +0.250 WC LONWORKS: -62.25 .. 62.25 Pa (1.0 Pa)	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Input	0	1505	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Static P Select.Building Static Pres.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoBldgStatPress	DAC, SCC	SNVT_press_p	113
nviBldgStatPress	DAC, SCC	SNVT_press_p	113

Building Static Pressure Dead Band

Keypad Menu Path Airflow\Bldg Pressure\BSP Db=

This read/write property sets a dead band around the Building Static Pressure Setpoint (See below.) No building static pressure control action is taken when the current building static pressure input is within this dead band.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure (gauge)	BACnet: WC	Real	BACnet: 0.001-0.100 WC	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
PID	252	565	Deadband	2205
Full Reference				
MTII RTUC #########.Applications.McQ.RT.RF Cap Ctrl.Bldg Stat PID.Deadband				

Building Static Pressure Setpoint

Keypad Menu Path Airflow\Bldg Press\Bldg SP Spt=

This read/write property sets the building static pressure setpoint used for controlling the return air or exhaust fan inlet vanes or VFD. The inlet vanes or VFD is modulated to maintain the building static pressure sensor input at this Setpoint.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure (gauge)	BACnet: WC LonWorks: kPa	Real	BACnet: -0.250 – +0.250 WC LONWORKS: -62.25 .. 62.25 Pa (1.0 Pa)	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3755	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.RF Cap Ctrl.Bldg Static P Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviBldgStaticSP	DAC, SCC	SNVT_press_p	113

Bypass Hours

Keypad Menu Path Setup/Service\Operating Hours\Bypass=

This read-only property indicates the hours of schedule-bypass operation. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	1530	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Bypass Op Time.Present Value				

Chilled Water Capacity

Keypad Menu Path System Summary\System\Clg Capacity=
Or Temperatures\Zone Cooling\Clg Capacity=
Or Temperatures\Discharge Cooling\Clg Capacity=

This read-only attribute indicates the current percentage of unit maximum chilled water flow. This attribute is only valid when Design Flow is not active (i.e., Design Flow is set to No on the keypad/display).

Measurement	Units	Data Type	Valid Range	Default Value
Per cent	NA	Real	0-100%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3620	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Clg Capacity AV.Present Value				

Compressor 1 Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Comp 1=

This read-only property indicates the hours compressor #1 has been operating. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	855	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.C1 Comp 1 Runtime.Present Value				

Compressor 2 Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Comp 2=

This read-only property indicates the hours compressor #2 has been operating. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	865	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.C2 Comp 1 Runtime.Present Value				

Compressor 3 Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Comp 3=

This read-only property indicates the hours compressor #3 has been operating. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	860	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.C1 Comp 2 Runtime.Present Value				

Compressor 4 Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Comp 4=

This read-only property indicates the hours compressor #4 has been operating. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	870	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.C2 Comp 2 Runtime.Present Value				

Compressor 5 Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Comp 5=

This read-only property indicates the hours compressor #5 has been operating. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	4560	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.C1 Comp 3 Runtime.Present Value				

Compressor 6 Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Comp 6=

This read-only property indicates the hours compressor #6 has been operating. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	4565	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.C2 Comp 3 Runtime.Present Value				

Compressor Outdoor Air Temperature Lockout

Keypad Menu Path System Summary\Zone Cooling\OATClg Lock=

This read/write property indicates the Compressor Outdoor Air Temperature Lockout setpoint.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0-100	55

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	4916	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.OA Comp Lock AV				

Control Temperature

Keypad Menu Path System Summary\Temperatures\Control Temp=
Or Temperatures\Zone Cooling\Control Temp=
Or Temperatures\Zone Heating\Control Temp=

This read-only property indicates the value of the current temperature input selected by the Control Temperature Source data point.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real		NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	135	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Control Temperature.Present Value				

Control Temperature Source

Keypad Menu Path Temperatures\Zone Cooling\CtrlTemp Src=
Or Temperatures\Zone Heating\CtrlTemp Src=

This read/write property selects the temperature sensor used for the unit heating/cooling changeover decision. This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3600	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Ctrl Temp Src MAV.Present Value				

Enumeration
0 = Return
1 = Space
2 = OAT

Cooling Capacity

Keypad Menu Path System Summary\System\Clg Capacity=
Or Temperatures\Zone Cooling\Clg Capacity=
Or Temperatures\Discharge Cooling\Clg Capacity=

This read-only property indicates the current percentage of unit maximum cooling capacity.

The BACnet property reads only the subject attribute; however the LONWORKS variable is only a part of the LONWORKS Unit Status network variable. See Unit Status on page 72 for details of LONWORKS network variable.

The BACnet property only applies to the subject data point. The LONWORKS variable covers six other data points: Unit Status (See page 72),

Heating Capacity (See page 50), Discharge Fan Status (See page 40), Discharge Fan Capacity (See page 40), Outdoor Air Damper Position (See page 64), and In Alarm (See page 54).

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3620	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Clg Capacity AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoUnitStatus_cool_output	DAC, SCC	SNVT_hvac_status	112

Cooling Control Status

Keypad Menu Path System Summary\System\Clg Status=

This read-only property indicates whether cooling (economizer or mechanical) is currently allowed. If cooling is disabled, the reason is indicated.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3665	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Clg Status MAV.Present Value				

Enumeration
0 = All Clg
1 = Econo
2 = Mech Clg
3 = Off Amb
4 = Off Alarm
5 = Off None
6 = Off Bal
7 = Off Sw
8 = Off Net
9 = Off Man

Cooling Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Mech Cool=

This read-only property indicates the hours of unit mechanical cooling. The value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	1515	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling Op Time.Present Value				

Cooling Reset Enable State

Keypad Menu Path No Keypad Equivalent

This read/write configuration property enables or disables the discharge air temperature cooling reset control for the Discharge Air Controller.

Note: When this property is enabled, the type of cooling discharge temperature reset is determined by the object (See Cooling Reset Enable Value on page 33).

Measurement	Units	Data Type	Valid Range	Default Value
State	NA	BACnet: Boolean LONWORKS: Structure	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	Cooling Stpt Status	940
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Cooling Stpt Status				

Enumeration
0 = Disabled, 1= Enabled

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciCoolResetEn_state	DAC	SCPTcoolingResetEn	211	SNVT_switch	95

Structure

```
typedef struct {
    unsigned    value;    Enumerated
    signed      state;    0=Disabled, 1=Enabled
} SNVT_switch;
```

Cooling Reset Enable Value

Keypad Menu Path Temperatures\Discharge Cooling\Clg Reset=

This read/write configuration property indicates the type of discharge air temperature cooling reset control enabled for BACnet only. Cooling Reset Enable State (See page 32) must be enabled or this property has no effect.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	Effective Value	50043
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Effective Value				

Enumeration
0 = None
1 = Space
2 = Return
3 = OAT
4 = Ext Ma
5 = Ext V
6 = Air Flow

LONWORKS

Note: Selecting True does not change the type of Cooling Reset. Selecting False disables Cooling Reset.

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciCoolResetEn_value	DAC	SCPTcoolingResetEn	211	SNVT_switch	95

Structure

```
typedef struct {
    unsigned    value;    0-255
    signed      state;    0=Disabled
                          1=Enabled
} SNVT_switch;
```

Daily Schedule

Keypad Menu Path No Direct Keypad Equivalent

This is the MicroTech II object that specifies the normal weekly schedule. It contains four adjustable properties that set the weekly schedule.

- Time period that the schedule is effective
- Schedule for each day of the week
- Exceptions to the schedule
- Property that controls the unit

BACnet

Standard BACnet object type of Schedule.

Effective Time Period Values

Effective time period in days of BACnet Date Range data type. See ANSI/ASHRAE 135-2001 for a definition of data type.

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Schedule	17	1460	Effective Period	32
Full Reference				
MTII RTUC #########.Schedule.Occupancy Schedule.Effective Period				

Weekly Schedule Values

Weekly schedule in a seven element BACnet Array of BACnet Daily Schedule data type. See ANSI/ASHRAE 135-2001 for a definition of the data type.

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Schedule	17	1460	Weekly Schedule	123
Full Reference				
MTII RTUC #########.Schedule.Occupancy Schedule.Weekly Schedule				

Exception Schedule Values

Exception schedule of days as a sequence of BACnet Special Events data type. See ANSI/ASHRAE 135-2001 for a definition of the data type.

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Schedule	17	1460	Exception Schedule	38
Full Reference				
MTII RTUC #########.Schedule.Occupancy Schedule.Exception Schedule				

List of Property References Values

MicroTech II rooftop object properties as a sequence of BACnet Object Property Reference data type. See ANSI/ASHRAE 135-2001 for a definition of the data type.

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Schedule	17	1460	List of Prop Refs	54
Full Reference				
MTII RTUC #########.Schedule.Occupancy Schedule.List of Prop Refs				

Date

Keypad Menu Path Setup/Service\Time/Date\Date

This read/write property sets the current date of the form day, month, year, and day of the week.

Values

Dates as BACnet date data types. See ANSI/ASHRAE 135-2001 for a definition of the data type.

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Device	8	10	Local Date	56
Full Reference				
MTII RTUC #########.Local Date				

Dehumidification Control

Keypad Menu Path Setup/Service\Dehum Setup\Dehum Ctrl=

This read/write property determines when dehumidification can operate. If it is set to Occupied, dehumidification can only operate during occupied times. If it is set to Always, dehumidification can operate during occupied and unoccupied times.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	Dehum Ctrl	63307
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dehum Ctrl				

Enumeration
0 = Occupied
1 = Always

Dehumidification: Maximum Cooling Stages

Keypad Menu Path Setup/Service\Dehum Setup\Maximum Stages=

This read/write property sets the maximum number of cooling stages that can be active during a dehumidification operation.

Measurement	Units	Data Type	Valid Range	Default Value
Count	Stage	Real	1–8	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	Dehum Max Stages	63308
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dehum Max Stages				

Dehumidification: Minimum Cooling Stages

Keypad Menu Path Setup/Service\Dehum Setup\Minimum Stages=

This read/write property sets the number of cooling stages that are immediately activated during a dehumidification operation

Measurement	Units	Data Type	Valid Range	Default Value
Count	Stage	Real	1–8	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	Dehum Min Stages	63310
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dehum Min Stages				

Dehumidification Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Dehumidify=

This read-only property indicates the hours of Dehumidification. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	1535	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Dehum Op Time.Present Value				

Dehumidification Status

Keypad Menu Path Humidity\Dehumidification\Dehum Status=

This read-only property indicates whether or not dehumidification operation is active.

Measurement	Units	Data Type	Valid Range	Default Value
State	NA	BACnet: Real LONWORKS:Structure	Enumerated	NA

Note: The keypad/display returns Off (False or On (True).

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3675	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dehum Status AV. Present Value				

Enumeration
0 = False
1 = True

LONWORKS Variable

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoDehumidifier_state	SCC	SNVT_switch	95

Structure

```
typedef struct {
    unsigned    value;      Not Used
    signed      state;      0=False
                            1=True
} SNVT_switch;
```

Dew Point Dead Band

Keypad Menu Path Humidity\Dehumidification\DewPnt Db=

This read/write property sets a deadband around the dew point setpoint.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0-10°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	Dew Point Deadband	63314
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dew Point Deadband				

Dew Point Setpoint

Keypad Menu Path Humidity\Dehumidification\DewPoint Spt=

This read/write property sets the dew point setpoint.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0-99°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3625	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dew Point Spt AV.Present Value				

LONWORKS

The percentage value provided in nviSpaceDehumSP is converted to a Dew Point setpoint temperature between 0°F and 100°F. For example 50% becomes 50°F. See Relative Humidity Setpoint on page 67.

Dew Point Temperature

Keypad Menu Path Humidity\Dehumidification\DewPoint =

This read-only attribute indicates the current dew point calculated from the current reading of the optional relative humidity sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: -50°–250°F LONWORKS: -46°–121°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	810	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dew Pt Temperature.Present Value				

LONWORKS Variable

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoSpaceDewPt	SCC	SNVT_temp_p	105

Discharge Air Cooling Dead Band

Keypad Menu Path Temperatures\Discharge Cooling\Clg Db=

This read/write property sets a dead band around the

Effective Cooling Discharge Setpoint (See on page 44.)

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0.0°–10.0°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	DAT Clg Deadband	63302
Full Reference				
MTII RTUC ##########.Applications.McQ.RT.Cooling.DAT Clg Deadband				

Discharge Air Cooling Setpoint

Keypad Menu Path Temperatures\Discharge Cooling\DAT Clg Spt=

This read/write property sets the

Effective Cooling Discharge Setpoint (See on page 44.) This setpoint is set to this value when it is not being set by a reset schedule.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 40.0–100.0 °F LONWORKS: 4°–38°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3630	Present Value	85
Full Reference				
MTII RTUC ##########.Applications.McQ.RT.Cooling.DAT Clg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviDAClSP	DAC	SNVT_temp_p	105

Discharge Air Heating Dead Band

Keypad Menu Path Temperatures\Discharge Heating\Htg Db=

This read/write property sets a dead band around the Effective Heating Discharge Setpoint (See on page 45.)

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0-10°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	615	DAT Htg Deadband	63305
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.DAT Htg Deadband				

Discharge Air Heating Setpoint

Keypad Menu Path Temperatures\Discharge Heating\DAT Htg Spt=

This read/write property sets the Effective Heating Discharge Setpoint (See on page 45.) The Effective Heating Discharge Setpoint (See page 45) is set to this value when it is not being reset by a reset schedule.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 40.0–140.0°F LONWORKS: 4°–60°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3680	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.DAT Htg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviDAHtSP	DAC	SNVT_temp_p	105

Discharge Air Temperature

Keypad Menu Path System Summary\Temperatures
Or Temperatures\Discharge Cooling\Disch Air=
Or Temperatures\Discharge Heating\Disch Air=

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

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 0.0–275.0°F LONWORKS: 4°–135°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Input	0	115	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.DA Temperature.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	Number
nvoDischAirTemp	DAC, SCC	SNVT_temp_p	105

Discharge Fan Capacity

Keypad Menu Path Airflow\Duct Pressure\Disch Fan Cap=

This read-only attribute indicates the current discharge fan capacity. The BACnet property reads only the subject attribute; however the LONWORKS variable is only a part of the LONWORKS Unit Status network variable. See Unit Status on page 72 for details of LONWORKS network variable.

The BACnet property only applies to the subject data point. The LONWORKS variable covers six other data points: Unit Status (See page 72), Cooling Capacity (See page 31),

Heating Capacity (See page 50), Discharge Fan Status (See page 40), Outdoor Air Damper Position (See page 64), and In Alarm (See page 54).

Measurement	Units	Data Type	Valid Range	Default Value
Discharge Fan Capacity	Percent	BACnet: Real LONWORKS: Structure	BACnet: 0-100% LONWORKS: 0%=Off and 100%=On	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3735	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.DF Cap Ctrl.DF Cap Ctrl PV AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoUnitStatus_fan_output	SCC	SNVT_hvac_status	112

Discharge Fan Status

Keypad Menu Path Airflow\Airflow Summary\Disch Fan=

This read-only property indicates whether the controller is commanding the unit discharge fan on.

The BACnet property only applies to the subject data point. The LonWorks variable covers six other data points: Unit Status (See page 72), Cooling Capacity (See page 31),

Heating Capacity (See page 50), Discharge Fan Capacity (See page 40), Outdoor Air Damper Position (See page 64), and In Alarm (See page 54).

Measurement	Units	Data Type	Valid Range	Default Value
Discharge Fan Status	Percent	BACnet: Real LONWORKS: Structure	0-100%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Output	4	255	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Start Stop Control.DF On Off.Present Value				

Enumeration
0 = Off 1 = On

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoUnitStatus_fan_output	SCC	SNVT_hvac_status	112

Duct Static Pressure

Keypad Menu Path Airflow\Duct Pressure\Duct Press=

This read-only attribute indicates the current reading of the duct static pressure sensor. When a unit is equipped with two duct static pressure sensors, this attribute displays the lower of the two sensor readings. Static pressure control is then based on the lower of the two readings.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure (gauge)	BACnet: IWC LONWORKS: Pa	Real	BACnet: 0–4 IWC LONWORKS: 0–1000 Pa (1.0 Pa)	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3790	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Static P Select.Duct Press AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoDuctStatPress	DAC	SNVT_press_p	113

Duct Static Pressure Dead Band

Keypad Menu Path Airflow\Duct Pressure\DSP Db=

This read/write property sets a dead band around the Duct Static Pressure Setpoint (See page 41.) No duct static pressure control action is taken when the current duct static pressure input is within this dead band.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure (gauge)	BACnet: IWC	Real	BACnet: 0.00–0.50 IWC	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
PID	252	505	Deadband	2205
Full Reference				
MTII RTUC #########.Applications.McQ.RT.DF Cap Ctrl.Duct Stat PID.Deadband				

Duct Static Pressure Setpoint

Keypad Menu Path Airflow\Duct Press\DuctSP Spt=

This read/write property sets the duct static pressure setpoint used to control the discharge air fan inlet vanes or VFD.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Pressure (gauge)	BACnet: IWC LONWORKS: Pa	Real	BACnet: 0.20–4.00 IWC LONWORKS: 50–1000 Pa (1.0 Pa)	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3730	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.DF Cap Ctrl.Duct SP Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviDuctStaticSP	DAC	SNVT_press_p	113
nvoEffDuctStatSP	DAC	SNVT_press_p	113

Economizer Changeover Differential

Keypad Menu Path Temperatures\OA Damper\EconChgovrDiff=

This read/write property sets a differential above the Economizer Changeover Temperature Setpoint (See on page 43.) When Economizer Changeover Method is set to Dry Bulb, economizer operation is disabled when the Outdoor Air Temperature (See on page 65) is above the Economizer Changeover Temperature Setpoint by more than this differential. If Economizer Changeover Method is set to Enthalpy, this property has no effect on unit operation.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F	Real	0–10 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	425	Temp Differential	962
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.Temp Differential				

Economizer Changeover Method

Keypad Menu Path Temperatures\OA Damper\EconChgovr=

This read/write property determines the method that makes the economizer changeover decision. When it is set to Enthalpy, the decision is based on the enthalpy switch. When the switch is closed, OA Ambient indicates Low and economizer operation is enabled. When the switch is open, OA Ambient indicates High and economizer operation is disabled. When it is set to Dry Bulb, the economizer changeover decision is based on the outdoor air temperature compared to the Economizer Changeover Temperature Setpoint (See on page 43.). When the outdoor air temperature is below the Economizer Changeover Temperature Setpoint, OA Ambient indicates Low and economizer operation is enabled. When the outdoor air temperature is above the Economizer Changeover Temperature Setpoint (See on page 43.) by more than the Economizer Changeover Differential, OA Ambient indicates High and economizer operation is disabled.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3785	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.Econ Chgovr MAV.Present Value				

Enumeration
0 = Enthalpy
1 = Dry Bulb

Economizer Changeover Temperature Setpoint

Keypad Menu Path Temperatures\OA Damper\EconChgovrT=

This read/write property sets the outdoor temperature that enables or disables the economizer operation when Economizer Changeover Method (See on page 42.) is set to Dry Bulb. If Economizer Changeover Method is set to Enthalpy, this parameter has no effect on the unit operation.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0–99°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3760	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.Econ Chgovr Temp AV.Present Value				

Economizer Enable

Keypad Menu Path No Keypad Equivalent

This read/write configuration property enables or disables the economizer. The point nviEconEnable has 2 properties; a State and a Value. When the State = 0, Economizer control through the network is disabled. When State = 1, the Economizer can be controlled through the network. When the Value = 0 and the State = 1, the Economizer is disabled through the Lon network. When the Value is greater than zero and the State = 1, the Economizer is enabled through the Lon network.

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

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nviEconEnable	DAC, SCC	NA	NA	SNVT_switch	95

Structure

```
typedef struct {
    unsigned    value;    Enumerated
    signed      state;    0=Disabled
                          1=Enabled
} SNVT_switch;
```

Economizer Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Economizer=

This read-only attribute indicates the hours that the unit has been in the Economizer operating state. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	1525	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Economizer Op Time.Present Value				

Effective Cooling Discharge Setpoint

Keypad Menu Path Temperatures\Discharge Cooling\Eff Clg Spt=

This read-only attribute reveals the cooling discharge air temperature setpoint that the controller is currently using. When the unit is in a cooling state, economizer dampers and/or mechanical cooling are controlled to maintain the unit discharge air temperature input at this temperature. The controller either sets this attribute to the Discharge Air Cooling Setpoint (See on page 38) or to a value based on the results of a discharge air temperature reset schedule.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	40.0–100.0 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3635	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Eff DAT Clg Spt AV.Present Value				

LONWORKS

See Effective Discharge Air Temperature Setpoint.

Effective Cooling Enable Setpoint

Keypad Menu Path Temperatures\Zone Cooling\Eff Clg Spt=

This read-only attribute reveals the cooling changeover setpoint that the controller is currently using. When (See on page 29) rises above this value by more than one-half the Occupied Cooling Dead Band (See page 62), cooling operation is enabled. When the Control Temperature drops below this value by more than one-half the Occupied Cooling Dead Band, cooling operation is disabled. The controller sets this attribute to the Occupied Cooling Setpoint (See on page 62.) For space comfort control, the controller sets this attribute based on the optional space sensor setpoint adjustment setting when the Space Setpoint Type (See page 71) is set to Tstat.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0–99.0 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3640	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Eff Zone Clg Spt AV.Present Value				

LONWORKS

See Effective Setpoint Output.

Effective Discharge Air Temperature Setpoint

Keypad Menu Path No Keypad Equivalent

This read-only attribute reveals the effective discharge air temperature setpoint that the unit is using for control. This attribute is set equal to the Effective Heating Discharge Setpoint (See page 45) when the unit is in the heating operating state and equal to the

Effective Cooling Discharge Setpoint (See page 44) when the unit is in any other operating state.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°C	Fixed Point Scalar - signed long	-273.17 .. +327.66°C (0.01°C).	NA

BACnet

See Effective Cooling Discharge Setpoint and Effective Heating Discharge Setpoint.

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoEffDATempSp	DAC	SNVT_temp_p	105

Effective Heating Discharge Setpoint

Keypad Menu Path Temperatures\Discharge Heating\Eff Htg Spt=

This read-only attribute reveals the heating discharge air temperature setpoint that the controller is currently using. When the unit is in a heating operating state, heating capacity is controlled to maintain the unit discharge air temperature input at this setpoint (except when the unit is equipped with single stage heat). The controller sets this attribute either to the Discharge Air Heating Dead Band

Keypad Menu Path Temperatures\Discharge Heating\Htg Db=

This read/write property sets a dead band around the Effective Heating Discharge Setpoint (See on page 45.)

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0-10°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	615	DAT Htg Deadband	63305
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.DAT Htg Deadband				

Discharge Air Heating Setpoint (See on page 39) or to a value based on the results of a discharge air temperature reset schedule.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	40.0–100.0 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3685	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Eff DAT Htg Spt AV.Present Value				

LONWORKS

See Effective Discharge Air Temperature Setpoint.

Effective Heating Enable Setpoint

Keypad Menu Path Temperatures\Zone Heating\Eff Htg Spt=

This read-only attribute reveals the heating changeover setpoint that the controller is currently using. When the current (See on page 29) falls below this parameter by more than one-half the Occupied Heating Dead Band (See page 63), heating operation is enabled. When the current Control Temperature rises above this parameter by more than one-half the Occupied Heating Dead Band heating operation is disabled. The controller sets this attribute to the Occupied Heating Setpoint (See on page 63.) For space comfort control, the controller sets this attribute based on the optional space sensor setpoint adjustment setting when the Space Setpoint Type (See page 71) is set to Tstat.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0–99.0 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3690	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Eff Zone Htg Spt AV.Present Value				

LONWORKS

See Effective Setpoint Output.

Effective Minimum Outdoor Damper Position Setpoint

Keypad Menu Path Temperatures\OA Damper\Eff Min OA Pos=

This read-only attribute for BACnet networks and a read/write attribute for LONWORKS networks reveals the outdoor air minimum position setpoint that the controller is currently using. Economizer dampers are controlled to maintain this position for minimum ventilation.

Measurement	Units	Data Type	Valid Range	Default Value
Position	Percent	Real	0.0–100.0%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3765	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.Eff Min OA Flow AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviOAMinPos	DAC, SCC	SNVT_lev_percent	81

Effective Setpoint Output

Keypad Menu Path No Keypad Equivalent

This a read-only attribute is only used in LONWORKS networks. It monitors the effective temperature setpoint. It is always set equal to either the Effective Cooling Enable Setpoint (See page 44) or the point Effective Heating Enable Setpoint depending on the current unit operating state.

The Effective Cooling Enable Setpoint and the Effective Heating Enable Setpoint depend on the Occupied Cooling Setpoint (See page 62), Occupied Heating Setpoint (See page 63), and Temperature Setpoint Input (See page 72.) If the Temperature Setpoint Input (nviSetpoint) 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)

Effective Setpoint Output (nvoEffectSetpt) equals Effective Heating Enable Setpoint when unit is in a heating operating state and equals Effective Cooling Enable Setpoint in all other operating states.

If the Temperature Setpoint Input (nviSetpoint) is set to a ***invalid*** value:

Effective Cooling Enable Setpoint = Occupied Cooling Enable Setpoint

Effective Heating Enable Setpoint = Occupied Heating Enable Setpoint

Effective Setpoint Output (nvoEffectSetpt) equals Effective Heating Enable Setpoint when unit is in a heating operating state and equals Effective Cooling Enable Setpoint in all other operating states.

Note: On space comfort control units the Space Setpoint Type (See page 72) must not be set to Tstast, otherwise the optional space sensor adjustment overrides Temperature Setpoint Input (nviSetpt).

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°C	Real	-273.17°–+327.66°C (0.01°C).	NA

BACnet

See Effective Cooling Enable Setpoint and Effective Heating Enable Setpoint.

LONWORKS

LONWORKS Name	Profile	SNVT Type	Number
nvoEffectSetpt	DAC, SCC	SNVT_temp_p	105

Emergency Override Mode Flag

Keypad Menu Path System Summary\Occupancy\Emerg Override=

This read/write property completely shuts the unit off. If this property is set to Off, the unit cannot start based on a time clock or any other means. The only way the unit can be started is to change the value to Norm.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

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

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Value	2	3610	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Emerg Override MAV.Present Value				

Enumeration
0 = Norm
1 = Off

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviEmergOverride	DAC, SCC	SNVT_hvac_emerg	103

Enumeration Definitions

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

Enumeration Correspondence

BACnet Emergency Override Mode Flag		Lon SNVT_hvac_emrg	
0	Normal	0	EMERG_NORMAL
0	Normal	1	EMERG_PRESSURIZE
0	Normal	2	EMERG_DEPRESSURIZE
0	Normal	3	EMERG_PURGE
1	Off	4	EMERG_SHUTDOWN
		5	EMERG_FIRE
0	Normal	0xFF	EMERG_NUL

Energy Recovery

Keypad Menu Path Temperatures\Energy Recovery\Energy Rec=

This read/write property turns the optional energy recovery system on and off.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	530	Heat Recovery	63442
Full Reference				
MTII RTUC #########.Applications.McQ.RT.RF Cap Ctrl.Heat Recovery				

Enumeration
0 = No
1 = Yes

Energy Recovery Exhaust Temperature

Keypad Menu Path No Keypad Equivalent

This read only property indicates the current temperature from the unit exhaust air temperature sensor. This is the temperature of exhaust air after it passes through the Energy Recovery Wheel.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0.0–99.0°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	4210	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.nviExh Temp AV.Present Value				

Energy Recovery Hours

Keypad Menu Path Setup/Service\Operating Hours\Erecovery=

This read-only property indicates the hours that the optional energy recovery system has been in operation. This value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	1540	Present Value	85

Full Reference
MTII RTUC #########.Applications.McQ.RT.Energy Rec Op Time.Present Value

Energy Recovery Supply Temperature

Keypad Menu Path No Keypad Equivalent

This read only property indicates the current temperature from the unit supply air temperature sensor. This is the temperature of ventilation air after it passes through the Energy Recovery Wheel.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0.0–99.0°F	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Value	2	4205	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.nviSupply Temp AV.Present Value				

Entering Fan Temperature

Keypad Menu Path System Summary\Temperatures\Ent Fan=

This read-only attribute indicates the current value of the unit entering fan air temperature sensor. This sensor is standard on all units equipped with gas or electric heat.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	50.0°–140°F	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Input	0	130	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Ent Fan Temperature.Present Value				

Face and Bypass Control

Keypad Menu Path Setup/Service\Heating Setup\F&BP Ctrl=

This read/write property determines the type of heating valve control to be used on units equipped with face and bypass heating.

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

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Application	236	615	F BP Method	63453
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.F BP Method				

Enumeration
0 = Open Valve
1 = Mod Valve

Face and Bypass Changeover Temperature Setpoint

Keypad Menu Path Setup/Service\Heating Setup\F&BP Chgovr=

This read/write property sets the temperature that drives the heating valve fully open when the Face and Bypass Control (See on page 49) property is set to ModValve.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0.0°–60.0°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	615	F BP Changeover	63451
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.F BP Changeover				

Fan Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Fan=

This read-only attribute indicates hours of unit fans operation. The value accumulates to 65,535 hours before rolling over.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	1510	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Fan Op Time.Present Value				

Fan Operation Output

Keypad Menu Path Airflow\Airflow Summary\Fan Operation=

This read-only attribute indicates the on/off status of the Fan Operation Output (MCB-BO3).

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Value	4	250	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Start Stop Control.Fan Op.Present Value				

Enumeration
0 = Off
1 = On

Heating Capacity

Keypad Menu Path System Summary\System\Htg Capacity=
Or Temperatures\Zone Heating\Htg Capacity=
Or Temperature\Discharge Heating\Htg Capacity=

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

The BACnet property reads only the subject attribute; however the LONWORKS variable is only a part of the LONWORKS Unit Status network variable. See Unit Status on page 72 for details of LONWORKS network variable.

The BACnet property only applies to the subject data point. The LONWORKS variable covers six other data points: Unit Status (See page 72), Cooling Capacity (See page 31), Discharge Fan Status (See page 40), Discharge Fan Capacity (See page 40), Outdoor Air Damper Position (See page 64), and In Alarm (See page 54).

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3695	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Htg Capacity AV.Present Value				

LonWorks

LonWorks Name	Profile	SNVT Type	SNVT Index
nvoUnitStatus_heat_output_primary	DAC, SCC	SNVT_hvac_status	112

Heating Control Status

Keypad Menu Path System Summary\System\Htg Status=

This read-only attribute indicates whether heating is currently allowed. If heating is disabled, the reason is indicated.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3715	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Htg Status MAV.Present Value				

Enumeration
0 = Ht. Ena
1 = Off Amb
2 = Off Alarm
3 = Off None
4 = N/A
5 = Off Sw
6 = Off Net
7 = Off Man

Heating Operating Hours

Keypad Menu Path Setup/Service\Operating Hours\Heating=

This read-only property indicates the hours of unit heating operation. This value accumulates to 65,535 hours before rolling over. This value can be reset or adjusted.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Hours	Real	0-65,535 hours	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Runtime Totalization	275	1520	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating Op Time.Present Value				

Heating Reset Enable State

Keypad Menu Path No Keypad Equivalent

This read/write configuration property enables or disables the discharge air temperature heating reset control for the Discharge Air Controller.

Note: When this property is enabled, the type of heating discharge temperature reset is determined by the Heating Reset Enable Value.

Measurement	Units	Data Type	Valid Range	Default Value
State	NA	BACnet: Real LONWORKS: Structure	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	615	Heating Stpt Status	938
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Heating Stpt Status				

Enumeration
0 = Disabled
1 = Enabled

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciHeatResetEn_state	DAC	SCPTheatingResetEn	212	SNVT_switch	95

Structure

```
typedef struct {
    unsigned    value;      Enumerated
    signed      state;      0=Disabled
                            1=Enabled
} SNVT_switch;
```

Heating Reset Enable Value

Keypad Menu Path Temperatures/Discharge Heating/Htg Reset=

This read/write configuration property enables or disables the discharge air temperature heating reset control for the Discharge Air Controller.

Note: Selecting True does not change the type of Heating Reset. Selecting False disables Heating Reset.

Note: Heating Reset Enable State must be enabled or this property has no effect.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	615	Effective Value	50043
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Effective Value				

Enumeration
0 = None
1 = Space
2 = Return
3 = OAT
4 = Ext mA
5 = Ext V

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciHeatResetEn_value	DAC	SCPTheatingResetEn	212	SNVT_switch	95

Structure

typedef struct {

unsigned	value;	Enumerated
signed	state;	0=Disabled 1=Enabled

} SNVT_switch;

Enumeration Definitions

Value	Identifier	Notes
0	None	
1	Space	
2	Return	
3	OAT	
4	Ext Ma	
5	Ext V	
6	Airflow	

Enumeration Correspondence

	BACnet	LonWorks
0	None	None
1	Space	Space
2	Return	Return
3	OAT	OAT
4	Ext Ma	Ext Ma
5	Ext V	Ext V
6	Airflow	Airflow

Holidays

Keypad Menu Path Schedules\Holiday Schedule\Hol?=

This read/write property specifies the dates for holidays. You can list the holidays here and then specify this property in the Schedule object for exceptions to the weekly schedule.

Measurement	Units	Data Type	Valid Range	Default Value
Holidays	Dates	BACnet Calendar Entry	NA	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Calendar	6	1465	Date List	23
Full Reference				
MTII RTUC #########.Schedule.Calendar.Date List				

HVAC Unit Type Identifier

Keypad Menu Path No Keypad Equivalent

This read/write configuration property indicates the primary application and equipment type for the space comfort controller device. For other SCC object types the application and equipment type can be determined directly from the object type and corresponding device class within the standard program id. The HVAC Unit-Type configuration property can be polled by a tool or an operator interface device, to help the user identify the type of equipment. The HVAC Unit-Type is set at the time of manufacture.

Measurement	Units	Data Type	Valid Range	Default Value
HVAC Unit Type	NA	Real	Enumerated	NA

BACnet

No BACnet equivalent.

LonWorks

LonWorks Name	Profile	SNVT Type	SNVT Index	SCPT Reference	SCPT Index
nciHvacType	SCC	SNVT_hvac_type	145	SCPThvacType	169

Enumeration Definitions (SNVT_HVT.H)

Value	Identifier	Notes
0	HVT_GENERIC	Generic
1	HVT_FAN_COIL	Fan Coil
2	HVT_VAV	Variable Air Volume Terminal
3	HVT_HEAT_PUMP	Heat Pump
4	HVT_ROOFTOP	Rooftop Unit
5	HVT_UNIT_VENT	Unit Ventilator
6	HVT_CHILL_CEIL	Chilled Ceiling
7	HVT_RADIATOR	Radiator
8	HVT_AHU	Air Handling Unit
9	HVT_SELF_CONT	Self-Contained Unit
0xFF	HVT_NUL	Invalid value

In Alarm

Keypad Menu Path No Keypad Equivalent

This read-only attribute indicates whether the unit is currently in alarm.

The BACnet property reads only the subject attribute; however the LONWORKS variable is only a part of the LONWORKS Unit Status network variable. See Unit Status on page 72 for details of LONWORKS network variable.

The BACnet property only applies to the subject data point. The LONWORKS variable covers six other data points: Unit Status (See page 72), Cooling Capacity (See page 31),

Heating Capacity (See page 50), Discharge Fan Status (See page 40), Discharge Fan Capacity (See page 40), Outdoor Air Damper Position (See page 64), and In Alarm (See page 54).

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

BACnet

See Alarms on page 78.

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoUnitStatus_in_alarm	DAC, SCC	SNVT_hvac_status	112

Local Bypass Time

Keypad Menu Path Setup/Service\Timer Settings\Bypass=

This read/write configuration property sets the maximum amount of time that the controller can be in the Bypass (occupancy) mode following a single Bypass request from either a local (hardwired) bypass switch or nviOccManCmd (Occupancy Mode) (See page 59.) Additional Bypass requests can restart the timer.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Minutes	Real	0–300 min	120 minutes (2 hours).

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	1440	Bypass Time	50302
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Occupancy.Bypass Time				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciBypassTime	DAC, SCC	SCPTbypassTime	34	SNVT_time_min	123

Maximum Discharge Air Cooling Setpoint

Keypad Menu Path Temperatures\Discharge Cooling\Max Clg Spt

This read/write configuration property defines the maximum discharge air cooling setpoint for the controller. It is used to limit the discharge air cooling setpoint determined by the discharge air temperature reset function.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 0.0–99.0 °F LONWORKS: -17.7°–37.2°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3650	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Max DAT Clg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciMaxDAClSP	DAC, SCC	SCPTmaxDAClSP	Not Available	SNVT_temp_p	105

Maximum Discharge Air Heating Setpoint

Keypad Menu Path Temperatures\Discharge Heating\Max Htg Spt

This read/write configuration property defines the maximum discharge air heating setpoint for the controller. It is used to limit the discharge air heating setpoint determined by the discharge air temperature reset function.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 40.0°–140.0 °F LONWORKS: 4.4°–60°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3705	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Max DAT Htg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciMaxDAHtSP	DAC, SCC	SCPTmaxDAHtSP	Not Available	SNVT_temp_p	105

Maximum Purge Time

Keypad Menu Path Temperatures\OA Damper\Max Purge=

This read/write attribute sets the maximum time prior to occupancy that the units purge. This feature functions only when an optional space (or zone) temperature sensor is installed and when a unit internal schedule is being used.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Minutes	Real	0-240 min	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	425	Max Purge	63645
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.Max Purge				

Minimum Discharge Air Cooling Setpoint

Keypad Menu Path Temperatures\Discharge Cooling\Min Clg Spt=

This read/write configuration property defines the minimum discharge air cooling setpoint for the controller. It is used to limit the discharge air cooling setpoint determined by the discharge air temperature reset function.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 40.0°–100.0 °F LONWORKS: 4.4°–37.7°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3645	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Min DAT Clg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciMinDAClSP	DAC, SCC	SCPTminDAClSP	Not Available	SNVT_temp_p	105

Minimum Discharge Air Heating Setpoint

Keypad Menu Path Temperatures\Discharge Heating\Min Htg Spt=

This read/write configuration property defines the minimum discharge air heating setpoint. It limits the discharge air heating setpoint determined by the discharge air temperature reset function.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 40.0°–140.0 °F LONWORKS: 4.4°–60,0°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3700	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Min DAT Htg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciMinDAHtSP	DAC, SCC	SCPTminDAHtSP	Not Available	SNVT_temp_p	105

Minimum Discharge Air Temperature Control Flag

Keypad Menu Path Temperatures\Discharge Heating\Min DAT Ctrl=

This read/write property activates or deactivates the low discharge temperature limit available on units equipped with modulating or multistage heat. The low discharge temperature limit is not available on units with single stage heat.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	320	Min DAT Ctrl	63652
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Unit State.Min DAT Ctrl				

Enumeration
0 = No
1 = Yes

Minimum Discharge Air Temperature Limit

Keypad Menu Path Temperatures\Discharge Heating\MinDAT Limit=

This read/write property sets the low discharge temperature limit available on space comfort control units equipped with modulating or multistage heat.

On discharge air control units, the Effective Cooling Discharge Setpoint serves as the low discharge temperature limit.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0.0–70.0°F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3805	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Unit State.Min DAT Limit AV.Present Value				

Minimum Outdoor Airflow Setpoint

Keypad Menu Path Temperatures\OA Damper\MinOA Flow=

This read/write property sets the airflow (cfm) setpoint when the unit is equipped with the optional Design Flow Outdoor Air control. When Design Flow is set to Yes, the

Effective Minimum Outdoor Damper Position Setpoint (See page 46) is reset to maintain the Outdoor Air Flow (See page 65) at this setting.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Air flow	BACnet: cubit feet per minute LONWORKS: liters/sec	Real	BACnet: 100 – 50000 CFM LONWORKS: 0–65,534 (1 liter/sec).	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3770	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.Min OA Airflow AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviMinOAFlowSP	DAC, SCC	SNVT_flow	15

Minimum Send Time

Keypad Menu Path No Keypad Equivalent

This read/write configuration property defines the minimum period of time between automatic network variable output transmissions.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Seconds	Fixed Point Scalar - unsigned long	0.0–6553.4 sec (0.1 sec).	NA

BACnet

No BACnet equivalent.

LONWORKS

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

OA Ambient

Keypad Menu Path Temperatures\OA Damper\OA Ambient=

This read-only attribute indicates whether the outdoor air is suitable for free cooling based on outdoor air temperature or enthalpy. If it is, Low (0) is displayed. If not, High (1) is displayed.

Measurement	Units	Data Type	Valid Range	Default Value
Condition of Outside Air	NA	BACnet: Real LONWORKS: Structure	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	52	OA Ambient	63770
Full Reference				
MTII RTUC #########.Applications.McQ.RT.OA Ambient				

Enumeration
0 = Low
1 = High

LONWORKS Variable

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoEconEnabled_state	DAC, SCC	SNVT_switch	95

Structure

typedef struct {

unsigned	value;	No Used
signed	state;	0=Low 1=High

} SNVT_switch;

Occupancy

Keypad Menu Path System Summary\Occupancy\Occupancy=

This read-only property indicates whether the unit is currently in an occupied, unoccupied, or bypass mode of operation.

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

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Value	2	3815	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Occupancy.Occupancy PV MAV.Present Value				

Enumeration
0 = Occ
1 = Unocc
2 = Bypass

LONWORKS

LONWORKS Name	Profile	SNVT Type	Number
nvoEffectOccup	DAC, SCC	SNVT_occupancy	109

Enumeration Definitions

Value	Identifier	Notes
0	OC_OCCUPIED	Area is occupied
1	OC_UNOCCUPIED	Area is unoccupied
2	OC_BYPASS	Area is temporarily occupied for the bypass period
3	OC_STANDBY	Area is temporarily unoccupied
0xFF	OC_NUL	Value not available

Enumeration Correspondence

BACnet Occupancy		Lon SNVT_occupancy	
0	Occ	0	OC_OCCUPIED
1	Unocc	1	OC_UNOCCUPIED
2	Bypass	2	OC_BYPASS
0	Occ	3	OC_STANDBY
3	Auto	0xFF	OC_NUL

Occupancy Mode

Keypad Menu Path System Summary\Occupancy\Occ Mode=

This read/write property sets the unit into a different occupancy mode. It is typically sent by a wall-mounted occupant-interface module or a supervisory node, to manually control occupancy modes, or to override the scheduled occupancy.

If a local Bypass Input is present, it can be used with this network variable input. The local input, when active, forces a Bypass request (equivalent to OC_BYPASS), (determined by the configuration property nciBypassTime [Local Bypass

Time (See on page 55)]). When nviOccManCmd indicates OC_BYPASS, the Local Bypass Time is also used. Whenever an update of nviOccManCmd is received indicating OC_BYPASS, the bypass timer is restarted. This network variable input should never be bound to a network variable that uses a Send Heartbeat function.

This input is used with nviOccSchedule to determine the effective occupancy mode. Refer to Occupancy (nvoEffectOccup) for more information.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3825	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT. Occupancy.Occ Man Cmd MAV.Present Value				

Enumeration
0 = Occ
1 = Unocc
2 = Bypass
3 = Auto

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviOccManCmd	DAC, SCC	SNVT_occupancy	109

Enumeration Definitions

Value	Identifier	Notes
0	OC_OCCUPIED	Area is occupied
1	OC_UNOCCUPIED	Area is unoccupied
2	OC_BYPASS	Area is temporarily occupied for the bypass period
3	OC_STANDBY	Area is temporarily unoccupied
0xFF	OC_NUL	Value not available

Enumeration Correspondence

BACnet nviOccManCmd		Lon SNVT_occupancy	
0	Occ	0	OC_OCCUPIED
1	Unocc	1	OC_UNOCCUPIED
2	Bypass	2	OC_BYPASS
0	Occ	3	OC_STANDBY
3	Auto	0xFF	OC_NUL

Occupancy Scheduler Input

Keypad Menu Path No Keypad Equivalent

This read/write property commands the Occupancy function of the controller when Occupancy Mode (See page 59) is set to Auto. It is typically sent by a scheduler or a supervisory node. SNVT_tod_event is a structure containing three parts. The first part, current_state, is required for this network variable input. The additional parts, next_state and time_to_next_state, are optional. They can be used for control strategies that provide improved transitions between states. A scheduler node should send OC_NUL and 0, respectively, if it does not use these functions. The controller node ignores these values if the functions are not supported by the controller. The unit controller does not support these functions.

This input is used in conjunction with nviOccManCmd (Occupancy Mode) (See page 59) to determine the effective occupancy mode. Refer to nvoEffectOccup (Occupancy) for more information.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Value	5	1455	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Occupancy.Occupancy.Present Value				

Enumeration
0 = Unoccupied
1 = Occupied

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviOccSchedule_current_state	DAC, SCC	SNVT_tod_event	128

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		next scheduled occupancy state
time_to_next_state	Occupancy Scheduler Time	minutes	0 to 65,535	

Enumeration Definitions (occup_t)

Value	Identifier	Notes
0	OC_OCCUPIED	Area is occupied
1	OC_UNOCCUPIED	Area is unoccupied
2	OC_BYPASS	Area is temporarily occupied for the bypass period
3	OC_STANDBY	Area is temporarily unoccupied
0xFF	OC_NUL	Value not available

Enumeration Correspondence

BACnet		LONWORKS	
1	Occ	0	OC_OCCUPIED
0	Unocc	1	OC_UNOCCUPIED
		2	OC_BYPASS
1	Occ	3	OC_STANDBY
3		0xFF	OC_NUL

Occupancy Source

Keypad Menu Path System Summary\Occupancy\Occ Src=

This read-only property indicates the input source or function that is responsible for setting the Occupancy (See on page 59) attribute to Occupied.

Measurement	Units	Data Type	Valid Range	Default Value
Schedule Source	NA	Real	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3820	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Occupancy.Occupancy Status MAV.Present Value				

Enumeration
0 = None
1 = Int Sched
2 = Net Sched
3 = Occ Mode
4 = Remote Sw
5 = N/A

Occupied Cooling Dead Band

Keypad Menu Path Temperatures\Zone Cooling\Clg Deadband=

This read/write property sets a dead band around the

Effective Cooling Enable Setpoint (See page 44.)

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	1.0–9.9 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	Zone Clg Deadband	63995
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Zone Clg Deadband				

Occupied Cooling Setpoint

Keypad Menu Path Temperatures\Zone Cooling\Occ Clg Spt=

This read/write configuration property sets the

Effective Cooling Enable Setpoint (See page 44.) The Effective Cooling Enable Setpoint is set to this value when it is not being set by another function.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

The BACnet property only applies to the subject data point, but the LONWORKS variable is a structure that covers three other data points: Unoccupied Cooling Setpoint (Seepage 75), Occupied Heating Setpoint (See page 63), and Unoccupied Heating Setpoint (See page 76).

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS:°C	Real	BACnet: 0.0°–99.0 °F LONWORKS: -17.7°–37.2°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3655	Present Value	85

Full Reference
MTII RTUC #########.Applications.McQ.RT.Cooling.Occ Clg Spt AV.Present Value

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciSetpoints_Occuppied Cool	DAC, 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 Dead Band

Keypad Menu Path Temperatures\Zone Heating\Htg Deadband=

This read/write property sets the temperature dead band around the Effective Heating Discharge Setpoint (See on page 45.)

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	0.1°–9.9°F	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Application	236	615	Zone Htg Deadband	63996
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Zone Htg Deadband				

Occupied Heating Setpoint

Keypad Menu Path Temperatures\Zone Heating\Occ Htg Spt=

This read/write configuration property sets the Occupied Heating Setpoint (See page 45.) The Effective Heating Enable Setpoint is set to this value when it nor being set by any other function.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

The BACnet property only applies to the subject data point, but the LONWORKS variable is a structure that covers three other data points: Occupied Cooling Setpoint (See page 62), Unoccupied Cooling Setpoint (See page 75), and Unoccupied Heating Setpoint (See page 76).

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 0.0°–99.0 °F LONWORKS: -17.7°–37.2°C	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Value	2	3710	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Heating.Occ Htg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciSetpoints_occuppied heat	DAC, 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;
```

Outdoor Air Damper Minimum Position

Keypad Menu Path Temperatures\OA Damper\MinOA Pos=

This read/write configuration property sets the

Effective Minimum Outdoor Damper Position Setpoint (See page 46) setpoint for the unit. The Effective Minimum Outdoor Air Damper Position Setpoint is set to this value when it is not being set by any other function.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Position	Percent	Real	0–100%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3775	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.OAD Min Pos Reset AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nviOAMinPos	DAC, SCC	SCPTminRnge	23	SNVT_lev_percent	81

Outdoor Air Damper Position

Keypad Menu Path Temperatures\OA Damper\OA Damper Pos=

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

The BACnet property reads only the subject attribute; however the LONWORKS variable is only a part of the LONWORKS Unit Status network variable. See Unit Status on page 72 for details of LONWORKS network variable.

The BACnet property only applies to the subject data point. The LONWORKS variable covers six other data points: Unit Status (See page 72), Cooling Capacity (See page 31),
Heating Capacity (See page 50), Discharge Fan Status (See page 40), Discharge Fan Capacity (See page 40), and In Alarm (See page 54).

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Input	0	460	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.OA Damper Pos.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoUnitStatus_econ_output	DAC, SCC	SNVT_hvac_status	112

Outdoor Air Flow

Keypad Menu Path Temperatures\OA Damper\OA Flow=

This read-only attribute indicates the current outdoor airflow based on an optional Outdoor airflow sensor input used when the unit is equipped with the DesignFlow Outdoor control feature.

Measurement	Units	Data Type	Valid Range	Default Value
Air Flow	BACnet: cubit feet per minute LONWORKS: liters per second	Real	BACnet: 0-70000 CFM LONWORKS: 0–65,534 liters/sec (1 liter/sec)	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Value	2	3780	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Damper Ctrl.Airflow Measurmnt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoOAFlow	DAC, SCC	SNVT_flow	15

Outdoor Air Temperature

Keypad Menu Path System Summary\Temperatures\OA Temp=
Or Temperatures\OA Damper\OA Temp=

This read-only attribute indicates the current value of a unit-mounted outdoor air temperature sensor. If you are using one temperature sensor to determine the outdoor air temperature for the entire network, you can write the temperature to this property if you set the Out of Service property to True.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 50°–140°F LONWORKS: 10°–60°C	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Input	0	125	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.OA Temperature.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviOutdoorTemp	DAC, SCC	SNVT_temp_p	105
nvoOutdoorTemp	DAC, SCC	SNVT_temp_p	105

Receive Heartbeat

Keypad Menu Path No Keypad Equivalent

This read/write configuration property defines the maximum time that elapses after the last update to a specified network variable input before the unit starts to use its default values.

Measurement	Units	Data Type	Valid Range	Default Value
Time	Seconds	Fixed Point Scalar - unsigned long	0.0–6553.4 sec (0.1 sec).	NA

BACnet

No BACnet equivalent.

LONWORKS

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

Relative Humidity

Keypad Menu Path Humidity\Dehumidification\Rel Humidity=

The BACnet propery is a read-only property indicates the current reading of the optional relative humidity sensor. LONWORKS includes both a network input variable to set the data point and a network output variable to interrogate the data point.

Measurement	Units	Data Type	Valid Range	Default Value
Relative Humidity	Percent	Real	10%–110%	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Input	0	805	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Rel Humidity.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviSpaceRH	SCC	SNVT_lev_percent	81
nvoSpaceRH	SCC	SNVT_lev_percent	81

Relative Humidity Control Type

Keypad Menu Path Humidity\Dehumidification\Dehum Mehtod=

This read/write property turns dehumidification on or off and selects whether dehumidification is based on relative humidity or dew point.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

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

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Analog Value	2	3670	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.Dehum Method MAV.Present Value				

Enumeration
0 = None
1 = RelHum
2 = DewPnt

Relative Humidity Dead Band

Keypad Menu Path Humidity\Dehumidification\RH Db=

This read/write property sets a dead band around the Relative Humidity Setpoint.

Measurement	Units	Data Type	Valid Range	Default Value
Relative Humidity	Percent	Real	0–10%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	790	RH Deadband	63872
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.RH Deadband				

Relative Humidity Setpoint

Keypad Menu Path Humidity\Dehumidification\RH Setpoint=

This read/write property sets the relative humidity setpoint used when Dehumidify Method is set to Relative Humidity.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Relative Humidity	Percent	Real	0-99%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3660	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Cooling.RH Setpoint AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviSpaceDehumSP	SCC	SNVT_lev_percent	81

Remote Discharge Fan Capacity Control Flag

Keypad Menu Path Setup/Service\Unit Configuration\DF CapCtrl=

This read/write property selects the discharge fan airflow control used on a VAV unit. If this parameter is set to Duct Static Pressure, the discharge fan airflow maintains the duct static pressure at the duct static pressure set point. If this parameter is set to Position, the discharge fan airflow is controlled to an inlet vane position or VFD speed set via the Remote Discharge Fan Capacity Setpoint (See page 68.)

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3720	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.DF Cap Ctrl.DF Cap Ctrl MAV.Present Value				

Enumeration
0 = Duct Press
1 = Position

Remote Discharge Fan Capacity Setpoint

Keypad Menu Path Setup/Service\Unit Configuration\Remote DF Cap=

This read/write property sets the discharge air vane position or VFD speed when the Discharge Fan Capacity Control Flag is set to Position.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Fan Capacity	Percent	Real	0–100 %	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3725	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.DF Cap Ctrl.Remote DF Pos AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviSupFanCap	DAC	SNVT_lev_percent	81

Remote Return Fan Capacity Control Flag

Keypad Menu Path Setup/Service\Unit Configuration\RF/EF Ctrl=

This read/write property selects the return or exhaust fan airflow control. If the unit is equipped with return fan inlet vanes or a VFD and this property is set to Tracking, the return fan airflow is controlled based on an adjustable tracking relationship between the discharge fan and return fan airflow. If this parameter is set to Building, the return or exhaust fan airflow is controlled independently of the discharge fan airflow to maintain the building static pressure at a building static pressure set point. If this parameter is set to Position, the return or exhaust fan airflow is controlled to an inlet vane position or VFD speed set point set via the Remote Return Fan Capacity Setpoint (See page 71.)

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3750	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.RF Cap Ctrl.RF Cap Ctrl MAV.Present Value				

Enumeration
0 = None
1 = Tracking
2 = Bldg Pres
3 = Position

Remote Return Fan Capacity Setpoint

Keypad Menu Path Setup/Service\Unit Configuration\Rem RF/EF Cap=
Or Setup/Service\Fan Balance\Rem RF/EF Cap=

This read/write property sets the return/exhaust air vane position or VFD speed when

Remote Return Fan Capacity Control Flag (See on page 67) property is set to Position. It is also used when the Fan Balance property is set to On to manually position the return fan vanes of VFD during the fan balance procedure.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Fan Capacity	Percent	Real	0–100%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3740	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.RF Cap Ctrl.Remote RF Pos AV.Present Value				

Return Air Temperature

Keypad Menu Path System Summary\Temperatures\Return Air=

The BACnet property is a read-only attribute that indicates the current reading from the unit return air temperature sensor. LONWORKS includes a network input variable to set the return air temperature and a network output variable to interrogate the sensor.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 10°–175°F LONWORKS: -12.2°–79.4°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Input	0	120	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.RA Temperature.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviRATemp	DAC, SCC	SNVT_temp_p	105
nvoRATemp	DAC, SCC	SNVT_temp_p	105

Return Fan Capacity

Keypad Menu Path Airflow\Duct Pressure\RF/EF Fan Cap=
Or Airflow\Bldg Pressure\RF/EF Fan Cap=

This read-only attribute indicates the current return fan or exhaust fan capacity.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Measurement	Units	Data Type	Valid Range	Default Value
Fan Capacity	Percent of discharge fan capacity or VFD maximum speed	BACnet: Real LONWORKS: Structure	0-100%	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3745	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.RF Cap Ctrl.RF Cap Ctrl PV AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoRetFanStatus_value	DAC, SCC	SNVT_switch	95

Structure

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

Return Fan Status

Keypad Menu Path Airflow\Airflow Summary\RF/EF=

This read-only property indicates whether the controller is commanding the return or exhaust fan on.

Measurement	Units	Data Type	Valid Range	Default Value
Fan Status	NA	BACnet: Real LONWORKS: Structure	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Output	4	260	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Start Stop Control.RF On Off.Present Value				

Enumeration
0 = Off
1 = On

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoRetFanStatus_state	DAC, SCC	SNVT_switch	95

Structure

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

Send Heartbeat

Keypad Menu Path No Keypad Equivalent

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

Measurement	Units	Data Type	Valid Range	Default Value
Time	Seconds	Fixed Point Scalar - unsigned long	0.0–6553.4 sec (0.1 sec).	NA

BACnet

No BACnet equivalent.

LONWORKS

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

Space Setpoint Type

Keypad Menu Path Setup/Service\Zone Temp Setup\Spt Source=

This read/write property determines the source for setting the Effective Cooling Enable Setpoint and point Effective Heating Enable Setpoint. When this property is set to Network, the Effective Cooling Enable Setpoint and Effective Heating Enable Setpoint are set to the Occupied Cooling Setpoint (See on page 62) and Occupied Heating Setpoint (See on page 63) respectively from BACnet networks. For LonWorks networks see

Effective Setpoint Output on page 46. When this property is set to Tstat, the Effective Cooling Enable Setpoint and Effective Heating Enable Setpoint are set from the remotely mounted space temperature sensor.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

Note: The keypad/display returns Tstat or Keypad

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3615	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Spt Source MAV. Present Value				

Enumeration
0 = Tstat
1 = Network

Space Temperature

Keypad Menu Path System Summary\Temperatures\Space Temp=

This read-only attribute indicates the current space or zone temperature from the optional space air temperature sensor.

Note: If the optional space temperature sensor is not installed, the Space Sensor attribute in the Unit Configuration menu of the keypad/display should be set to No to disable the alarm function associated with an open circuit at the space temperature sensor input.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 10°–95°F LONWORKS: -12.2°–35°	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Input	0	100	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Space Temperature.Present Value				

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviSpaceTemp	DAC, SCC	SNVT_temp_p	105
nvoSpaceTemp	DAC, SCC	SNVT_temp_p	105

Temperature Setpoint Input

Keypad Menu Path No Keypad Equivalent

This read/write property is only used in LONWORKS networks. It determines the

Effective Setpoint Output (See page 46.) If the value is valid, the Effective Setpoint Output is determined by this value (See page 46.) If the value is not valid, the Effective Setpoint Output does not depend on this value (See page 46.)

Note: On space comfort control units the Space Setpoint Type must not be set to Tstat, otherwise the space setpoint adjustment on the optional space sensor overrides the Temperature Setpoint Input (nviSetpoint).

Note: The unoccupied setpoints are not changed.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°C	Fixed Point Scalar - signed long	4.4°–37.7°C	NA

BACnet

No BACnet equivalent.

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nviSetpoint	DAC, SCC	SNVT_temp_p	105

Time

Keypad Menu Path Setup/Service\Time/Date\Time=

This read/write property sets the current time of the form hours, minutes, seconds, and hundredths of a second. See ANSI/ASHRAE 135-2001 for a definition of the data type.

Measurement	Units	Data Type	Valid Range	Default Value
Time	hours, minutes, seconds, and hundredths of a second	BACnet time data types	NA	NA

BACnet

Object Identifier			Property	
Object Type	Type ID	Instance	Name	ID
Device	8	10	Local Time	57
Full Reference				
MTII RTUC #########.Local Time				

Unit Status

Keypad Menu Path System Summary\System\UnitStatus=

This read-only property indicates the current unit operating state.

The BACnet property only applies to the subject data point. The LONWORKS variable covers six other data points: Unit Status (See page 72), Cooling Capacity (See page 31),

Heating Capacity (See page 50), Discharge Fan Status (See page 40), Discharge Fan Capacity (See page 40), Outdoor Air Damper Position (See page 64), and In Alarm (See page 54).

Measurement	Units	Data Type	Valid Range	Default Value
Unit Status	NA	BACnet: Real LONWORKS: Structures	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3810	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Unit State.Unit State PV MAV.Present Value				

Enumeration
0 = Off Unoc
1 = Off Net
2 = Off Sw
3 = Off Alm
4 = Calib
5 = Startup
6 = Recirc
7 = Fan Only
8 = Econo
9 = Cooling
10 = MWU
11 = Heating
12 = Min DAT
13 = UnocEcon
14 = UnocFanO
15 = UnocDAT
16 = UnocClg
17 = UnocHtg
18 = Balance
19 = Off Man
20 = Man Ctrl

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Index
nvoUnitStatus_modeMapped	DAC, SCC	SNVT_hvac_status	112

Measurement	HVAC Status
Type Category	Structure
Type Size	12 bytes

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;
```

Field Definitions

Field	Data Point Reference	Valid Range	Notes
mode	See below	Enumerated	compatible with SNVT_hvac_mode
heat_output_primary	Heating Capacity	-163.83 .. +163.83% (percentage of full scale)	primary heat output
heat_output_secondary	Not Applicable	-163.83 .. +163.83% (percentage of full scale)	secondary heat output
cool_output	Cooling Capacity	-163.83 .. +163.83% (percentage of full scale)	cooling output
econ_output	Out Door Air Damper Position	-163.83 .. +163.83% (percentage of full scale)	economizer output
fan_output	Discharge Fan Capacity	-163.83 .. +163.83% (percentage 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 alarm*

* The value assigned to each alarm is the same for both BACnet and LONMARK applications. For these enumerations, refer to tables labeled "Alarm, Faults: Individual Notification", "Alarm, Problems: Individual Notification", and "Alarm, Warnings: Individual Notification" found in the "Alarms" section of this document.

Enumeration Definitions

Value	Identifier	Notes
0	HVAC_AUTO	Controller automatically changes between application modes
1	HVAC_HEAT	Heating only
2	HVAC_MRNG_WRMUP	Application-specific morning warm-up
3	HVAC_COOL	Cooling only
4	HVAC_NIGHT_PURGE	Application-specific night purge
5	HVAC_PRE_COOL	Application-specific pre-cool
6	HVAC_OFF	Controller not controlling outputs
7	HVAC_TEST	Equipment being tested
8	HVAC_EMERG_HEAT	Emergency heat mode (heat pump)
9	HVAC_FAN_ONLY	Air not conditioned, fan turned on
10	HVAC_FREE_COOL	Cooling with compressor not running
11	HVAC_ICE	Ice-making mode
0xFF	HVAC_NUL	Value not available

Enumeration Correspondence

BACnet Unit Status		Lon SNVT_hvac_mode	
0	Off Unocc	6	HVAC_OFF
1	Off Net	6	HVAC_OFF
2	Of Sw	6	HVAC_OFF
3	Off Alrm	6	HVAC_OFF
4	Calib	7	HVAC_TEST
5	Startp	6	HVAC_OFF
6	Recirc	9	HVAC_FAN_ONLY
7	Fan Only	9	HVAC_FAN_ONLY
8	Econo	10	HVAC_FREE_COOL
9	Cooling	3	HVAC_COOL
10	MWU	2	HVAC_MRNG_WRMUP
11	Heating	1	HVAC_HEAT
12	Min DAT	9	HVAC_FAN_ONLY
13	UnocEcon	10	HVAC_FREE_COOL
14	UnocFanO	9	HVAC_FAN_ONLY
15	UnocDAT	9	HVAC_FAN_ONLY
16	UnocClg	3	HVAC_COOL
17	UnocHtg	1	HVAC_HEAT
18	Balance	7	HVAC_TEST
10	Off Man	6	HVAC_OFF
20	Man Ctrl	7	HVAC_TEST

Unoccupied Cooling Differential

Keypad Menu Path Temperatures\Zone Cooling\UnoccClgDiff=

This read/write property sets a differential above the Unoccupied Cooling Setpoint (See below.) Once activated, unoccupied cooling operation is terminated when the Space Temperature (See page 71.) falls below the Unoccupied Cooling Setpoint by more than this differential.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	1.0°–10.0 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	320	Night Setup Diff	63709
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Unit State.Night Setup Diff				

Unoccupied Cooling Setpoint

Keypad Menu Path Temperatures\Zone Cooling\UnoccClg Spt=

This read/write configuration property sets the temperature above which the unit starts and provides cooling (night setup) during unoccupied periods. An optional space temperature sensor is required for unoccupied cooling operation.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

The BACnet property only applies to the subject data point, but the LONWORKS variable is a structure that covers three other data points: Occupied Cooling Setpoint (See page 62), Occupied Heating Setpoint (See page 63), and Unoccupied Heating Setpoint (See page 76).

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 0.0°–99.0 °F LONWORKS: -17.7°–37.2°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3795	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Unit State.Unocc Clg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciSetpoints_unoccupied_cool	DAC, 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;
```

Unoccupied Heating Differential

Keypad Menu Path Temperatures\Zone Heating\UnoccHtgDiff=

This read/write property sets a differential above the Unoccupied Heating Setpoint. (See below.) Once activated, unoccupied heating operation is terminated when the Send Heartbeat (See on page 70) rises above the Unoccupied Heating Setpoint by more than this differential.

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	°F	Real	1.0°–10.0 °F	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Application	236	320	Night Setback Diff	63708
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Unit State.Night Setback Diff				

Unoccupied Heating Setpoint

Keypad Menu Path Temperatures\Zone Heating\UnoccHtg Spt=

This read/write configuration property sets the temperature above which the unit starts up and provides unoccupied heating (night setback). An optional space temperature sensor is required for unoccupied heating.

This attribute uses maximum and minimum limits set with the unit keypad. If the Present Value is set beyond these limits from the network, the Reliability attribute of the object indicates Out of Range Low or Out of Range High (whichever is appropriate). When this happens, the application detects the out of range condition and restores the Present Value to the previous valid value (i.e., within the limits) it had before being set out of range.

The BACnet property only applies to the subject data point, but the LONWORKS variable is a structure that covers three other data points: Occupied Cooling Setpoint (See page 62), Unoccupied Cooling Setpoint (See page 75), and Occupied Heating Setpoint (See page 63).

Measurement	Units	Data Type	Valid Range	Default Value
Temperature	BACnet: °F LONWORKS: °C	Real	BACnet: 0.0°–99.0 °F LONWORKS: -17.7°–37.2°C	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Analog Value	2	3800	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Unit State.Unocc Htg Spt AV.Present Value				

LONWORKS

LONWORKS Name	Profile	SCPT Reference	SCPT Index	SNVT Type	SNVT Index
nciSetpoints_unoccupied_heat	DAC, 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;
```

VAV Box Output

Keypad Menu Path System Summary\System\VAV Output=

This read-only property indicates the state of the VAV Box Output (MCB-B012). This output is provided for field use for interlocking field VAV box operation with the unit heating or cooling. The value is 0 when the unit is in any heating state and 1 in any other state.

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

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Output	4	265	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Start Stop Control.VAV Output.Present Value				

Enumeration
0 = Heat
1 = Cool

Alarms

Two methods of obtaining alarm information are available in the MicroTech II controller. One is to monitor individual alarms, and the other is to monitor alarms according to alarm class.

Alarms in a MicroTech II controller are divided into three classes: Faults, Problems, and Warnings. Fault alarms have the highest priority. Problem alarms have the next priority. Warning alarms have the lowest priority. The alarms within each class are also prioritized. Refer to the appropriate Operation Manual for a description of each alarm. See Reference Documents on page 3 for document part numbers.

There are multiple mechanisms, with dependencies based on protocol, available in the MicroTech II unit controller for working with alarms. Using one of these mechanisms, alarms can be recognized and acknowledged by alarm class or individually, and cleared from the network by alarm class.

Classes

Fault Alarms (Highest Priority)

Table 4. Fault Alarms in Order of Priority

Alarm Message	Indication	Clear
Freeze	Freezestat condition while SAF on	Manual
Smoke	Smoke detected by SAF and/or RAF smoke detector	Manual
OAT Sensor	OAT sensor failure while selected as the Control Temperature Source	Manual
Space Sensor	Space temp sensor failure when Control Temperature Source parameter is set to Space	Manual
Return Sensor	RAT sensor failure	Manual
Disch Sensor	DAT sensor failure	Manual
Duct Hi Limit	Excessive discharge compartment pressure sensed by DHL sensor	Manual
Hi Return Tmp	RAT exceeded the Hi Return Tmp setting	Manual
Hi Disch Tmp	DAT exceeded the Hi Disch Tmp setting	Manual
Lo Disch Tmp	DAT fell below the Lo Disch Tmp setting	Manual
Fan Fail	Airflow not sensed by PC7 after SAF was started	Manual
OA Dmpr Stuck	OA Dampers < 50% open after Startup (100% OA units only)	Manual

Problem Alarms (Medium Priority)

Table 5. Problem Alarms in Order of Priority

Alarm Message	Indication	Clear
Freeze	Freezestat tripped while SAF was off	Automatic
OAT Sensor	OAT sensor failure when Control Temperature Source parameter not set to OAT	Automatic
Space Sensor	Space temp sensor failure on unit with RAT sensor	Automatic
Return Sensor	RAT sensor failure Control Temperature Source parameter not set to Return	Automatic
Ent Fan Sensor	EFT sensor failure	Automatic
Lo Airflow	Excessive temperature rise sensed across heat section on single stage heat unit	Manual
Heat Fail	Gas furnace safety lockout condition occurred	Automatic
Fan Retry	Airflow not sensed by PC7 after SAF was started	Automatic
Hi Pres-Ckt1	HP1 or HP3 open indicating ckt # 1 high refrigerant pressure	Manual
Hi Pres-Ckt2	HP2 or HP4 open indicating ckt # 2 high refrigerant pressure	Manual
Lo Pres-Ckt1	LP1 remained opened after ckt #1 solenoid valve open	Automatic
Lo Pres-Ckt2	LP2 remained opened after ckt #2 solenoid valve open	Automatic
Frost-Ckt1 d	Evaporator coil frost condition occurred on ckt #1	Automatic
Frost-Ckt2 d	Evaporator coil frost condition occurred on ckt #2	Automatic
Comp #1 Alm	Comp #1 off on low oil pressure (OP1) or motor protector (MP1)	Automatic
Comp #2 Alm	Comp #2 off on low oil pressure (OP2) or motor protector (MP2)	Automatic
Comp #3 Alm	Comp #3 off on low oil pressure (OP3) or motor protector (MP3)	Automatic

Alarm Message	Indication	Clear
Comp #4 Alm	Comp #4 off on low oil pressure (OP4) or motor protector (MP4)	Automatic
Comp #5 Alm	Comp #5 off on low oil pressure (OP3) or motor protector (MP5)	Automatic
Comp #6 Alm	Comp #6 off on low oil pressure (OP4) or motor protector (MP6)	Automatic
Ckt1 Clg Ena	Clg enable input to CCB1 off when cooling was on	Manual
Ckt2 Clg Ena	Clg enable input to CCB2 off when cooling was on	Manual
GenC Clg Ena	Clg enable input to CCB1 off when cooling was on	Manual
HtgB Htg Ena	Htg enable input to EHB1 off when heating was on	Manual
Ckt1 Comm Fail	Comm failure occurred between MCB and CCB1	Automatic
Ckt2 Comm Fail	Comm failure occurred between MCB and CCB2	Automatic
GenC Comm Fail	Comm failure occurred between MCB and CCB1	Automatic
HtgB Comm Fail	Comm failure occurred between MCB and EHB1	Automatic
ERecB Comm Fail	Comm failure occurred between MCB and ERB1 (100 Series application only)	Automatic

Warning Alarms (Lowest Priority)

Table 6. Warning Alarms in Order of Priority

Alarm Message	Indication	Clear
PumpDown-Ckt1	LP1 still closed 180 seconds into ckt #1 pumpdown operation	Manual
PumpDown-Ckt2	LP2 still closed 180 seconds into ckt #2 pumpdown operation	Manual
Airflow Switch	PC7 sensed airflow when unit was off	Manual
Dirty Filter	Pressure drop across first filter section exceeded the setting of PC5	Manual
Dirty FnlFltr	Pressure drop across final filter section exceeded the setting of PC6	Manual
Ckt1 H/W	Clg enable input to CCB1 on when cooling off	Manual
Ckt2 H/W	Clg enable input to CCB2 on when cooling off	Manual
GenC H/W	Clg enable input to CCB1 on when cooling off	Manual
HtgB H/W	Htg enable input to EHB1 on when heating off	Manual

Alarm Monitoring

The Applied Rooftop Unit controller provides individual alarm identification through a unique value for each alarm beginning with Applied Rooftop application version 1.44 & 2.07. The value assigned to each alarm is the same for both BACnet and LONMARK applications.

BACnet

Alarms within MicroTech II unit controllers can be monitored via BACnet by one of the two following methods; 1) individually by three BACnet Analog Values, or 2) by alarm class using three BACnet Binary Values.

1. To monitor alarms individually, read the desired instance based on the three BACnet Analog Value objects for Fault alarms, Problem Alarms, and Warning Alarms. The value of each of these objects described in the tables that follow will be the largest number in its enumeration that corresponds to an active alarm. Each of these objects will be set to zero if no alarms are active in that group. These objects are explained in further detail in 1) Alarm, Faults: Individual Notification, 2 Alarm, Problems: Individual Notification (page 82) or 3) Alarm, Warnings: Individual Notification: valid alarm values of 4 through 252 (Alarm), 0 (Normal).
2. To monitor alarms by alarm class, read the Present_Value property of any one of three Binary Value objects; 1) Alarm, Faults: Clear All, 2) Alarm, Problems: Clear All or 3) Alarm, Warnings: Clear All. If the Present_Value property of these objects reads ACTIVE, an alarm in that class has occurred.

LONMARK

Alarms within MicroTech II unit controllers can be monitored individually by using the In Alarm attribute of the Unit Status Network Variable Output (i.e. nvoUnitStatus_in_alarm). This attribute displays a value that corresponds to the highest priority alarm that is active. It is possible to have multiple active alarms, but only the highest priority is displayed in this attribute. For example, if there is a simultaneous Dirty Filter Warning (value of 24) and a Freeze Fault (value of 252), then the Freeze Fault value of 252 will display in nvoUnitStatus_in_alarm because it is the higher priority alarm of the two. Once the Freeze Fault condition is corrected and the fault is cleared, the next priority active alarm value (in this example,

value of 24 for Dirty Filter alarm) is displayed. The values for all alarms are described in the Alarms section tables. If the attribute nvoUnitStatus_in_alarm displays a zero, there are no active alarms.

Alarms may also be monitored by alarm class if desired. When the nvoUnitStatus_in_alarm attribute reads a value in the range of 1 to 99, a Warning Alarm is active. When the attribute reads a value in the range of 100 to 199, a Problem Alarm is active. When the attribute reads a value in the range of 200 to 255, a Fault Alarm is active.

Alarm Clearing

BACnet

Alarms within MicroTech II unit controllers can be cleared via BACnet by alarm class using three BACnet Binary Values. To clear alarms by alarm class, change the Present_Value property of any one of three Binary Value objects; 1) Alarm, Faults: Clear All, 2) Alarm, Problems: Clear All or 3) Alarm, Warnings: Clear All from ACTIVE to INACTIVE. If the unit is still in the alarm condition, the Present_Value property of the associated Binary Value object again reads ACTIVE to indicate the alarm still exists.

LONMARK

Alarms within MicroTech II unit controllers can be cleared by alarm class using three Network Variable Inputs (nvi's) of type SNVT_Switch; 1) nviAlarmFault, 2) nviAlarmProblem and 3) nviAlarmWarning. To clear alarms in a particular class, change the state portion of the SNVT from 1 (Alarm) to 0 (Normal). If the unit is still in the alarm condition, the In Alarm attribute of the Unit Status Network Variable Output (nvoUnitStatus_in_alarm) again reads 1 (Warning Alarm), 100 (Problem Alarm) or 200 (Fault Alarm) to indicate the alarm still exists.

Objects

Alarm, Faults: Clear All

Keypad Menu Path No Direct Keypad Equivalent

This read/write property indicates whether there is an active fault Alarm. To determine whether at least one fault Alarm is active read the property. To clear all active fault Alarms, change the property value from Alarm (1) to Normal (0).

Measurement	Units	Data Type	Valid Range	Default Value
Alarms	NA	BACnet: Real LONWORKS: Structure	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Value	5	4150	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Alarm Fault BV.Present Value				

Enumeration
0 = Normal 1 = Alarm

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Number
nviAlarmFault	DAC, SCC	SNVT_Switch	95

Structure

```
typedef struct {
    unsigned    value;    Not Used
    signed      state;    0=Normal
                          1=Alarm
} SNVT_switch;
```

Alarm, Faults: Individual Notification

This BACnet Analog Value object allows individual notification of Fault alarms. The value in the table below will be the largest number in its enumeration that corresponds to an active Fault alarm. This object will be set to zero if no Fault alarms are active.

In order to clear all Fault alarms at once, see Alarm, Faults: Clear All.

Object Identifier				Property	
Object Type	**Type ID**	**Instance-100 Series Application Code**	**Instance-200 Series Application Code**	**Name**	**ID**
Analog Value	2	4862	4870	Present Value	85
Full Reference					
MTII RTUC #########.Applications.McQ.RT.Alarm Faults.Faults MAV					

Enumeration
0 – No Active Faults 204 – Outdoor Air Damper Stuck 208 – Fan Fail 212 – Low Discharge Air Temp 216 – High Discharge Air Temp 220 – High Return Air Temp 224 – Duct High Limit 228 – Discharge Sensor Fail 232 – Return Sensor Fail 236 – Space Sensor Fail 240 – Outdoor Air Sensor Fail 248 – Smoke Fault 252 – Freeze Fault

Alarm, Problems: Clear All

Keypad Menu Path No Direct Keypad Equivalent

This read/write property indicates whether there is an active Problem Alarm. To determine whether at least one Problem Alarm is active read the property. To clear active all Problem Alarms, change the property value from Alarm (1) to Normal (0).

Measurement	Units	Data Type	Valid Range	Default Value
Alarms	NA	BACnet: Real LONWORKS: Structure	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Value	5	4145	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Alarm Problem BV.Present Value				

Enumeration
0 = Normal 1 = Alarm

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Number
nviAlarmProblem	DAC, SCC	SNVT_Switch	95

Structure

```
typedef struct {
    unsigned    value;    Not Used
    signed      state;    0=Normal
                          1=Alarm
} SNVT_switch;
```

Alarm, Problems: Individual Notification

This BACnet Analog Value object allows individual notification of Problem alarms. The value in the table below will be the largest number in its enumeration that corresponds to an active Problem alarm. This object will be set to zero if no Problem alarms are active.

In order to clear all Problem alarms at once, see Alarm, Problems: Clear All.

Object Identifier				Property	
Object Type	**Type ID**	**Instance-100 Series Application Code**	**Instance-200 Series Application Code**	**Name**	**ID**
Analog Value	2	4861	4872	Present Value	85
Full Reference					
MTII RTUC #########.Applications.McQ.RT.Alarm Problems.Problems MAV					

Enumeration
0 – No Active Problems
104 – Energy Recovery Board Comm Fail (100 Series application code only)
105 – Heating Board Comm Fail
106 – Generic Condenser Board Comm Fail
109 – Compressor Board # 2 Comm Fail
110 – Compressor Board # 1 Comm Fail
113 – Heating Board Enable Fail
114 – Generic Condenser Board Enable Fail
117 – Compressor Board # 2 Enable Fail
118 – Compressor Board # 1 Enable Fail
129 – Compressor # 6 Fail (App 2.07 only)
130 – Compressor # 5 Fail (App 2.07 only)
131 – Compressor # 4 Fail
132 – Compressor # 3 Fail
133 – Compressor # 2 Fail
134 – Compressor # 1 Fail
153 - Frost Protect - Circuit # 2
154 - Frost Protect - Circuit # 1
158 - Low Pressure - Circuit # 2
159 - Low Pressure - Circuit # 1
166 – High Pressure – Circuit # 2
167 – High Pressure – Circuit # 1
170 – Fan Retry
173 - Heat Fail
176 - Low Airflow
179– Entering Fan Sensor Problem
182 – Return Air Sensor Problem
185 – Space Sensor Problem
188 – OAT Sensor Problem
197 – Freeze Problem

Alarm, Warnings: Clear All

Keypad Menu Path No Direct Keypad Equivalent

This read/write property indicates whether there is an active Warning Alarm. To determine whether at least one Warning Alarm is active read the property. To clear all active Warning Alarms, change the property value from Alarm (1) to Normal (0).

Measurement	Units	Data Type	Valid Range	Default Value
Alarms	NA	BACnet: Real LONWORKS: Structure	Enumerated	NA

BACnet

Object Identifier			Property	
Object Type	**Type ID**	**Instance**	**Name**	**ID**
Binary Value	5	4140	Present Value	85
Full Reference				
MTII RTUC #########.Applications.McQ.RT.Alarm Warning BV.Present Value				

Enumeration
0 = Normal
1 = Alarm

LONWORKS

LONWORKS Name	Profile	SNVT Type	SNVT Number
nviAlarmWarning	DAC, SCC	SNVT_Switch	95

Structure

```
typedef struct {
    unsigned    value;    Not Used
    signed      state;    0=Normal
                          1=Alarm
} SNVT_switch;
```

Alarm, Warnings: Individual Notification

This BACnet Analog Value object allows individual notification of Warning alarms. The value in the table below will be the largest number in its enumeration that corresponds to an active Warning alarm. This object will be set to zero if no Warning alarms are active.

In order to clear all Warning alarms at once, see Alarm, Warnings: Clear All.

Object Identifier				Property	
Object Type	**Type ID**	**Instance-100 Series Application Code**	**Instance-200 Series Application Code**	**Name**	**ID**
Analog Value	2	4863	4873	Present Value	85
Full Reference					
MTII RTUC #########.Applications.McQ.RT.Alarm Warnings.Warnings MAV					

Enumeration
0 – No Active Warnings
4 – Heating Board Hardware Warning
8 – Generic Cond Board Hardware Warning
12 – Compressor Board 2 Hardware Warning
16 – Compressor Board 1 Hardware Warning
20 – Dirty Final Filter Warning
24 - Dirty Filter Warning
28 – Airflow Switch Warning
36 – Incomplete Pumpdown - Circuit # 2
40 - Incomplete Pumpdown - Circuit # 1

Appendix A: Protocol Implementation Conformance Statement (PICS)

This section contains the Protocol Implementation Conformance Statement (PICS) for the MicroTech II Rooftop Unit Controller as required by ANSI/ASHRAE (American National Standards Institute/American Society of Heating, Refrigeration, and Air Conditioning Engineers) Standard 135-2001, BACnet; A Data Communication Protocol for Building Automation and Control Networks.

BACnet Protocol Implementation Conformance Statement

Date:		September 2008
Vendor Name:		Daikin Rooftop Unit
Product Name:		Controller MTII RUC
Product Model Number:		
Applications Software Version:	Rooftop Unit	2506010153
	Rooftop Unit, Six-Compressor	2506010209 (old)
Firmware Revision:		5.3
BACnet Protocol Revision:		Version 1 Revision 2

Product Description

The MicroTech II Rooftop Unit Controller with optional BACnet Communication Module is a microprocessor-based controller designed to operate applied rooftop units and be integrated into BACnet building automation systems.

The controller provides normal temperature, static pressure and ventilation control and alarm monitoring with alarm-specific component shutdown in critical system conditions. Access to temperatures, pressures, operating states, alarm messages, control parameters and schedules is available through an equipment-mounted keypad/display and the BACnet control network.

BACnet Standardized Device Profile

Based on BIBBs supported, the MicroTech II Rooftop Unit Controller with optional BACnet Communications Module ***is nearly*** a BACnet Advanced Application Controller (B-AAC). Refer to the section below entitled BACnet Interoperability Building Blocks (BIBBs) Supported for a complete listing of BIBBS.

BACnet Interoperability Building Blocks (BIBBs) Supported

BIBB Name	Designation
Data Sharing – ReadProperty – A	DS-RP-A
Data Sharing – ReadProperty – B	DS-RP-B
Data Sharing – ReadPropertyMultiple – A	DS-RPM-A
Data Sharing – ReadPropertyMultiple – B	DS-RPM-B
Data Sharing – Write Property – A	DS-WP-A
Data Sharing – WriteProperty – B	DS-WP-B
Data Sharing – WritePropertyMultiple – A	DS-WPM-A
Data Sharing – WritePropertyMultiple – B	DS-WPM-B
Data Sharing – COV – Unsolicited – A	DS-COVU-A
Data Sharing – COV – Unsolicited – B	DS-COVU-B
Device Management – Dynamic Device Binding – A	DM-DDB-A
Device Management – Dynamic Device Binding – B	DM-DDB-B
Device Management – Dynamic Object Binding – A	DM-DOB-A
Device Management – Dynamic Object Binding – B	DM-DOB-B
Device Management – Private Transfer – A	DM-PT-A
Device Management – Private Transfer – B	DM-PT-B
Device Management – UTCTimeSynchronization – B	DM-UTC-B
Device Management – ReinitializeDevice – B	DM-RD-B
Device Management – List Manipulation – B	DM-LM-B
Device Management – Object Creation and Deletion – B	DM-OCD-B

Standard Object Types Supported

Object-Type	Creatable	Deleteable	Optional Properties Supported	Writable Properties Not Required To Be Writable
Analog Input	☐	☐	Description Reliability COV_Increment	Object_Name Present_Value Description Out_Of_Service Units COV_Increment
Analog Output	☐	☐	Description Reliability COV_Increment	Object_Name Present_Value Description Units Relinquish_Default COV_Increment
Analog Value	☐	☐	Description Reliability Relinquish_Default COV_Increment	Object_Name Present_Value Description Reliability Units Relinquish_Default COV_Increment
Binary Input	☐	☐	Description Reliability	Object_Name Present_Value Description Out_Of_Service
Binary Output	☐	☐	Description Reliability	Object_Name Present_Value Description Relinquish_Default
Binary Value	☐	☐	Description Reliability Relinquish_Default	Object_Name Present_Value Description Reliability Relinquish_Default
Calendar	☐	☐	Description	Object_Name Description Date_List
Device	☐	☐	Description Local_Time Local_Date UTC_Offset ADPU_Segment_Timeout	Object_Name Application_Software_Version Description Max_ADPU_Length_Accepted Local_Time Local_Date UTC_Offset Daylight_Saving_Status ADPU_Segment_Timeout APDU_Timeout Number_Of_APDU_Retries

Object-Type	Creatable	Deleteable	Optional Properties Supported	Writable Properties Not Required To Be Writable
Schedule	☐	☐	Description Weekly_Schedule Exception_Schedule	Object_Name Description Effective_Period Weekly_Schedule Exception_Schedule List_Of_Object_Property_Refs

Data Link Layer Options

☒ BACnet IP, (Annex J)

☒ MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400 bps

Segmentation Capability

☒ Segmented requests supported Window Size: 127

☒ Segmented responses supported Window Size: 127

Device Address Binding

Static Device Binding ☐ Yes

☒ No

Character Sets Supported

☒ ANSI X3.4 ☐ IBM™/Microsoft™ DBCS ☐ ISO 8859-1

☐ ISO 10646 (UCS-2) ☐ ISO 10646 (UCS-4) ☐ JIS C 6226

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

Appendix B: Early Versions of the BACnet Device Object

Early versions of the MicroTech II Applied Rooftop Unit Controller used different values for some device object properties. The major differences other than variable properties are highlighted in Table 7 and Table 8.

Table 7. Earlier Version A of the MicroTech II Applied Rooftop Device Object Properties

Property	Property Identifier	Value	Data Type
Object Identifier	75	(8):1000	BACnet Object Identifier
Object Name	77	mdcu_ #########	Character String
Object Type	79	BACDevice	BACnet Object Type
Vendor Name	121	Daikin	Character String
Vendor Identifier	120	3	Unsigned16
Model Name	70	mdcu_	Character String
Firmware Version	44	variable	Character String
Application Software Revision	12	variable	Character String
Description	28		Character String
Local Time	57	variable	Time
Local Date	56	variable	Date

Table 8. Earlier Version B of the MicroTech II Applied Rooftop Device Object Properties

Property	Property Identifier	Value	Data Type
Object Identifier	75	(8):10	BACnet Object Identifier
Object Name	77	MicroTech II #########	Character String
Object Type	79	BACDevice	BACnet Object Type
Vendor Name	121	Daikin	Character String
Vendor Identifier	120	3	Unsigned16
Model Name	70	MT II RCU	Character String
Firmware Version	44	variable	Character String
Application Software Revision	12	variable	Character String
Description	28		Character String
Local Time	57	variable	Time
Local Date	56	variable	Date

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