DAIKIN

Sales and Engineering Data Sheet

ED 15062-8

Group: **Controls**
Part Number: **ED 15062**
Date: **October 2016**
Supersedes: **ED 15062-7**

MicroTech® II Chiller Unit Controller Protocol Information

LonWorks® Networks, BACnet® Networks (MS/TP)

WSC	Water-Cooled Centrifugal, Single-Compressor
WDC	Water-Cooled Centrifugal, Dual-Compressor
WPV	Water-Cooled Centrifugal, Single-Compressor
HSC	Water-Cooled Single-Compressor Centrifugal, Heat Recovery
HDC	Water-Cooled Dual-Compressor Centrifugal, Heat Recovery
TSC	Water-Cooled Single-Compressor Centrifugal, Templifier®
WMC	Water-Cooled Centrifugal, Magnetic Bearing
WCC	Water-Cooled Centrifugal, Dual Compressor Series Counterflow
AGZ	Air-Cooled Global Scroll
ACZ	Air-Cooled Scroll Condensing Unit
WGZ	Water-Cooled Global Scroll
AGS	Air-Cooled Global Screw
WGS	Water-Cooled Global Screw
TGZ	Templifier® Water Heater

LONMARK® PARTNER

Member of BACnet International

Notice

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Limited Warranty

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

Revision History

Version	Release Date	Description
ED 15062-0	January 2003	Initial release.
ED 15062-1	June 2004	Added WGZ and WGS to Table 3, changed BACnet Communication Module Firmware Rev number from 3.09 to 1.03, added BCM.CIT to Software Revision Table, added WGS to front page and Chiller Model table, changed the “Full Reference” label in the “Variable Details” tables to “Object Name”, removed Device Object Name and Property from the “Full Reference”(Object Name), added units to “Who is Frequency” description.
ED 15062-1	May 2005	Added HSC and TSC chiler models
ED 15062-2	November 2005	Corrected BACnet Alarm Table, added WCC chiller model, updated “Set up the Unit for Network Control” section
ED 15062-3	June 2006	Removed all references to BACnet IP/ Ethernet. Refer to ED 15100 (new)
ED 15062-4	February 2009	Removed information regarding the previous BACnet MS/TP communication module (PN 350147406) which has been replaced with PN 350147407, added references to TGZ chiller. Added 76800 baud rate. Added information in the Configuring the Unit Controller section regarding the BACnet Configuration Tool, which is required for setting certain parameters with the new BACnet communication module.
ED 15062-5	April 2009	Removed Table 1 (Receive Heartbeat Variables) and replaced Data Integrity section with new text description of ncidefaults and nciRcvHrtbt interaction.
ED 15062-6	January 2013	Added individual compressor data points.
ED 15062-7	June 2015	Specified that hours are reported at 1/10th the actual hours. Corrected Compressor Status for BACnet to be an enumerated value, not a bit field. Removed references to out-dated software/firmware. Added clarification to “Actual Capacity” data point for centrifugal chillers. Changed branding. Changed description of Chiller On Off data point.
ED 15062-8	October 2016	Removed Detailed Data section, updated LonWorks and BACnet firmware versions, added description of Receive Heartbeat functionality in text and LonWorks data tables, corrected several range/ default values in all data tables, corrected Reference Documents table and Password Menu table along with other formatting updates. Updated Table 2 for WMC chiller power data; added new note 6 and corrected note 2

Software Revision

This edition documents the following versions of the standard MicroTech® II BACnet® Communication Module and LonWorks® Communication Module software and all subsequent revisions until otherwise indicated. However, if your software is of a later revision, some of the information in this document may not completely describe your software.

Software	Revision
LonWorks Communication Module Firmware	CHCHLA25
BACnet Communication Module Application Software Version	2.00

Reference Documents

Company	Number	Title	Source
LonMark® International	078-0120-01F	LonMark Layers 1–6 Interoperability Guidelines, Version 3.0	www.lonmark.org
LonMark International	078-0120-01F	LonMark Application Layer Interoperability Guidelines, Version 3.3	www.lonmark.org
Echelon® Corporation	078-0156-01G	LONWORKS® FTT-10A Free Topology Transceiver Users Guide	www.echelon.com
LonMark International	8040_10	LonMark Functional Profile: Chiller, Version 1.0	www.lonmark.org
American Society of Heating, Refrigerating and Air-Conditioning Engineers	ANSI/ASHRAE 135-2004	BACnet®- A Data Communication Protocol for Building Automation and Control Networks	www.ashrae.org
Daikin Applied	IM 735	MicroTech II Chiller Unit Controller LONWORKS Communication Module	www.DaikinApplied.com
Daikin Applied	IM 906	MicroTech II Chiller Unit Controller BACnet MS/TP Communication Module, PN 350147407 (current)	www.DaikinApplied.com
Daikin Applied	IM 736	MicroTech II Chiller Unit Controller BACnet MS/TP Communication Module, PN 350147406[1] (discontinued)	www.DaikinApplied.com
Daikin Applied	IM 837	MicroTech II Chiller Unit Controller BACnet IP/Ethernet Communication Module, PN 350147406	www.DaikinApplied.com
Daikin Applied	IOMM ACZ/AGZ	MicroTech II Air-Cooled Condensing Unit Installation, Operation, and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	OMM ACZ	MicroTech II Air-Cooled Condensing Unit Operation and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	IOMM AGZ	MicroTech II Air-Cooled Scroll Chiller Installation, Operation, and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	OMM WGZ	MicroTech II Water-Cooled Scroll Chiller Operation and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	IOMM WPV	MicroTech II Centrifugal Chiller Installation, Operation, and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	IOMM WSCWDC	MicroTech II Chiller Unit Controller Installation, Operation, and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	OM AGS	MicroTech II Air-Cooled Screw Chiller Operating Manual	www.DaikinApplied.com
Daikin Applied	OM CentrifMicro II	MicroTech II Unit Controller for Centrifugal Chillers and Templifiers Operating Manual	www.DaikinApplied.com
Daikin Applied	OM WGS	MicroTech II Water-Cooled Screw Chiller Operating Manual	www.DaikinApplied.com
Daikin Applied	IOM WMC	MicroTech II Magnetic Bearing Compressor Chiller Installation, Operation, and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	IOMM TSC	MicroTech II Templifier Single Compressor Centrifugal Installation, Operation, and Maintenance Manual	www.DaikinApplied.com
Daikin Applied	OMM TGZ	MicroTech II Templifier TGZ Heat Recovery Water Heaters Operating Manual	www.DaikinApplied.com
Daikin Applied	ED 15057	MicroTech II Chiller Unit Controller Implementation Conformance Statement (PICS)	www.DaikinApplied.com

1. The legacy version of the BACnet Communication Module hardware consisted of a printed circuit board inside a tan metal enclosure, which was mounted to the door of the unit control panel.

This document provides the information needed to integrate a MicroTech II Chiller Unit Controller from Daikin Applied into your Building Automation System (BAS). It includes all necessary BACnet properties, LONWORKS variables, and corresponding MicroTech II Chiller Unit Controller data points. It also contains the BACnet Protocol Implementation and Conformance Statement (PICS). BACnet and LONWORKS terms are not defined. Refer to the appropriate specifications and functional profile for definitions and details.

Chiller Models

The following table lists the model designators of Daikin Applied Chiller units and the corresponding description.

Unit Model Number	Description
WSC	Water-Cooled Centrifugal, Single-Compressor
WDC	Water-Cooled Centrifugal, Dual-Compressor
WPV	Water-Cooled Centrifugal, Packaged Unit
HSC	Water-Cooled Single-Compressor Centrifugal, Heat Recovery
HDC	Water-Cooled Dual-Compressor Centrifugal, Heat Recovery
TSC	Water-Cooled Single-Compressor Centrifugal, Templifier
WMC	Water-Cooled Centrifugal, Magnetic Bearing
WCC	Water-Cooled Centrifugal, Dual Compressor Series Counterflow
AGZ-A, B, C	Air-Cooled Global Scroll
ACZ-A, B	Air-Cooled Scroll, Condensing Unit
WGZ	Water-Cooled Global Scroll
AGS-A, B, C, D	Air-Cooled Global Screw
WGS	Water-Cooled Global Screw
TGZ	Templifier Water Heater

Unit Controller Data Points

The MicroTech II Chiller Unit Controller contains data points or unit variables that are accessible from as many as four user interfaces: the unit keypad/display, the Operator Interface Touch Screen, a BACnet MS/TP network, or a LONWORKS network. Not all points are accessible from each interface. This manual lists all important data points and alarm messages, along with the corresponding unit controller interface menu path for each network object. Refer to the respective chiller operation manual, available on www.DaikinApplied.com, for user interface details.

Protocol Definitions

The MicroTech II Chiller Unit Controller can be configured in either an interoperable BACnet MS/TP or LONWORKS network. The unit controller must have the corresponding BACnet MS/TP or LONWORKS communication module installed for network integration. See Reference Documents for literature numbers.

NOTE: To integrate a MicroTech II chiller via BACnet IP or Ethernet, refer to Protocol Document ED 15100 and BACnet Communication Module IM 837, both available on www.DaikinApplied.com.

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 135-2004. 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 the LonTalk® protocol 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.

The LONWORKS Communication Module is LonMark 3.3 certified in accordance with the Chiller Functional Profile, Version 1.0. Refer to www.lonmark.org for details.

BACnet Networks

Compatibility

The MicroTech II Chiller Unit Controller is tested according to the BACnet Testing Laboratory (BTL) Test Plan. It is designed to meet the requirements of the BACnet Standard (ANSI/ASHRAE 135-2004) as stated in the Protocol Implementation and Conformance Statement (PICS). The PICS is located at the end of this manual or the separate PICS document, ED 15057 (www.DaikinApplied.com.)

MicroTech II Chiller Unit Controller Device Object

MicroTech II Chiller Unit Controllers incorporate standard BACnet object types (i.e., object types defined in the BACnet Standard) that support the requirements of 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 Chiller 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 BACnet compatible device must have only one BACnet Device Object.

All critical properties of the device object can be changed in the user interface and/or Daikin Applied's BACnet Configuration Tool. See Table 1 and Network Considerations for additional information.

Device Object Identifier

⚠ 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.

The MicroTech II Chiller Unit Controller Device Object Identifier (Device Instance Number) specifies the unit within the network. The initial device object instance number is calculated from the MS/TP MAC Address. This number must be unique on the entire BACnet network.

Detailed information about the device object name, object type, and instance number can be found in the Comprehensive Data Point Tables section. For further details on BACnet objects, please refer to ASHRAE Standard 135-2004 (www.ashrae.org).

Device Object Name

The Object Name is the name of the object in the device. Device Object Names must be unique within each BACnet device. The device name for the MicroTech II Chiller Unit Controller is MTII Chiller UC ####. The #### represents the device object instance number. The device name is the "prefix" of all object names in the MicroTech II Chiller Unit Controller. All objects include the device name and a period "." (MTII Chiller UC ####.) preceding the object name. The device object instance number default is 3000.

The device object contains all required properties and the Max_Master and Max_Info_Frames optional properties.

NOTE: Changing the device instance automatically changes the device name and thus the full reference for all objects.

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

Network Considerations

Access to Properties

To access a property, it is necessary to specify the object identifier, including the device object identifier or the object name, in addition to the device object name and the property identifier.

Configuring the Unit Controller

The MicroTech II Chiller Unit Controller is ready to operate with the default values of the various parameters set at the factory. Most default values may be changed with the unit's keypad or via the network. Several key parameters require the use of the Daikin Applied BACnet Configuration Tool as described in the next section, Setting MS/TP Addressing Parameters using the BACnet Configuration Tool. Refer to the appropriate MicroTech II Communication Module Installation Manual (IM 906 - BACnet MS/TP or IM 837 - BACnet IP/Ethernet) for adjusting network parameters. Also refer to the MicroTech II Chiller Unit Controller Operation Manual for unit settings (www.DaikinApplied.com).

Setting MS/TP Addressing Parameters using the BACnet Configuration Tool

Certain BACnet MS/TP addressing parameters require a separate software tool in order to configure and verify settings. Daikin Applied's BACnet Configuration Tool is used to set baud rate, device instance number, and MAC address (particularly with multiple chillers on a single network.)

The BACnet Configuration Tool is available as a free download on www.DaikinApplied.com. Refer to the BACnet MS/TP Communication Module Installation Manual, IM 906, for detailed instructions on installing and using the BACnet Configuration Tool to view default values and change network parameters. Figure 1 shows the main screen of the BACnet Configuration Tool user interface.

Table 1 lists the primary network parameter settings and device object properties supported by the MicroTech II Chiller Unit Controller.

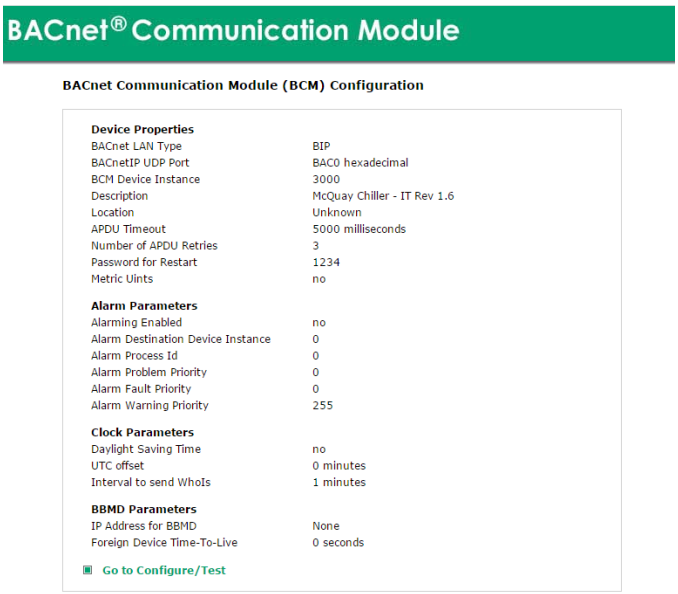
Also refer to the appropriate MicroTech II Chiller Unit Controller Operation Manual for keypad operating instructions. Installation and operation manuals are available at www.DaikinApplied.com.

Table 1: MicroTech II Chiller Unit Controller Network Parameters

Property	Default Value
Device Object Identifier	device
Device Object Name	MT II Chiller #####
Device Instance[1]	3000
MS/TP MAC Address[1,3]	18
MS/TP Baud Rate[1]	38400
Max Master	127
Max Info Frames	20
MS/TP Station Address[2]	0 (zero)
APDU Timeout	3000 milliseconds
APDU Retries	3
Daylight Savings Time	No
UTC Offset Difference	0

1. Must be set using the BACnet Configuration Tool.
2. This is the MS/TP address of the BACnet communication module.
3. Cycle power after configuring for the changes to take effect.

Figure 1: BACnet Configuration Tool Main Screen



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 Chiller Functional Profile. This profile specifies a number of mandatory and optional standard network variables and standard configuration parameters. This manual defines the variables and parameters available in the MicroTech II Chiller Unit Controller that are supported by the Chiller Functional Profile.

LONWORKS Variables

MicroTech II Chiller Unit Controllers incorporate LONWORKS network variables to access unit data points. The unit 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.

External Interface File (XIF)

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

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

Network Considerations

Network Topology, Addressing, and Commissioning

MicroTech II Chiller Unit Controllers support LonMark standards for network design, wiring, addressing and commissioning.

Refer to the LonMark Application Layer Interoperability Guidelines Version 3.3, LonMark Layers 1-6 Interoperability Guidelines Version 3.3 (www.lonmark.org) and LONWORKS FTT-10A Free Topology Transceiver Users Guide (www.echelon.com).

Configuring the Unit Controller

The MicroTech II Chiller Unit Controller is designed, programmed, and configured in accordance with the LonMark Chiller Functional Profile. The unit is ready to operate with the default values of the various pre-configured parameters. Default values may be changed at the unit controller keypad or via the network. Refer to the applicable MicroTech II Chiller Unit Controller Operation Manual (www.DaikinApplied.com).

Receive Heartbeat Functionality

There are certain LONWORKS network configuration properties (ncis) that are supported by Receive Heartbeat. Each nci is bound to a respective network variable input (nvi). These ncis, along with the corresponding nvi, follow certain rules based on both nciDefaults and nciRcvHrtbt settings. The nci variables that are used when the Receive Heartbeat timer expires include:

- nciCapacityLim
- nciChillerEnable
- nciCoolSetpt
- nciHeatSetpt
- nciMode

The value of these variables under certain conditions (such as unit controller power-up or loss of network communication) are described below.

1. When nciDefaults = 0 and nciRcvHrtbt = 0:
   - Nvi variable values are cleared on a loss of power. Upon restoration of power, the unit controller uses the values of the nci variables shown above. Nvi variable values remain and continue to be used on a loss of communications.
2. When nciDefaults = 0 and nciRcvHrtbt > 0:
   - Nvi variable values are cleared on a loss of power. Upon restoration of power, the unit controller uses the values of the nci variables shown above.
   - Nvi variable values remain and continue to be used upon loss of communication until the Receive Heartbeat (nciRcvHrtbt) time expires. After that time expires, the nci variable values are used by the unit controller.
3. When nciDefaults = 1 and nciRcvHrtbt =/> 0:
   - The last known value of nvi variables is used upon a loss of power or a loss of communication.

The LONWORKS comprehensive data table section provides additional information. See “Table 11: LonWorks Network Variable Inputs (NVIs)” and “Table 12: LonWorks Network Configuration Inputs (NCIs)” for details on nciCapacityLim, nciChillerEnable, nciCoolSetpt, nciHeatSetpt, nciMode, nciRcvHrbt, and nciDefault settings.

Network Setup Instructions

The following section explains how to set the network protocol from the MicroTech Chiller Unit Controller user interface. The steps vary somewhat depending on the type of chiller. Refer to the appropriate MicroTech II Unit Controller IOM for keypad display/touch screen menu operation details (www.DaikinApplied.com).

Once the BAS setup process is complete and communication has been established between the MicroTech II Unit Controller and the network, it is then possible to monitor and control unit operation. Some of the important functions include:

- Configure and monitor data points
- View and clear alarms
- Turn the unit on or off
- Operate the unit safely

Network Setup for Centrifugal Chillers

1. Disable the chiller. The chiller should not be operating while performing this procedure.
2. At the chiller touch screen interface panel:
    a. Set the Protocol default to the appropriate BAS network in the applicable menu screen.
    b. Enter the password of “2001.”
    c. In the SETPOINTS/MODE screen, change the #3 setpoint, Control Source, to BAS.
3. Re-enable the chiller.
4. Verify that the chiller is operational from the BAS interface.

Network Setup for all other Chillers

1. Disable the chiller. The chiller should not be operating while performing this procedure.
2. Set the Protocol default to the appropriate BAS network in the applicable menu screen.
    a. Use the table below to determine the operator password for the specific chiller model.
    b. Enter the password.
3. Adjust the Set/Unit Setpoint screen 1 to Source = Network.
4. Re-enable the chiller.
5. Verify that the chiller is operational from the BAS.

Password Menu Screens

Model	AGZ-A	ACZ-A	AGZ-B AGZ-C	ACZ-B	AGS-A AGS-B	AGS-C	AGS-D	WGS	WMC WSC WDC WCC WPV HSC HDC TSC	WGZ/TGZ
Menu Screen	12	6	9	7	12	16	17	15	14	10
Password	2001	2001	2001	2001	8945	8453	8745	8745	2001	2001

Note that chiller models AGZ-A/B, ACZ-A/B, WGZ, and TGZ have a single unit controller. Models AGS-B/C and WGS have one unit controller with multiple circuit controllers. Unit settings for AGS-B/C and WGS models are adjusted from the unit controller.

Network Parameters

The following section defines the network parameters available to the BAS from the MicroTech II Chiller Unit Controller.

Table 2 lists all BACnet objects and LONWORKS variables that are supported for each MicroTech II chiller model type.

Table 2: Data Points for Chiller Models

Data Point	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	AGS	WGZ TGZ	WGS
Active Setpoint	X	X		X	X	X
Actual Capacity	X	X		X	X	X
Actual RPM	X[5]					
Alarm Digital Output	X	X	X	X	X	X
Capacity Limit (LONWORKS)	X	X[1]	X[1]	X	X	X
Capacity Limit Output	X	X[1]	X[1]	X	X	X
Capacity Limit Setpoint	X	X[1]	X[1]	X	X	X
Chiller Enable	X	X	X	X	X	X
Chiller Enable (LONWORKS)	X	X	X	X	X	X
Chiller Limited	X	X[1]	X[1]	X	X	X
Chiller Local/Remote	X	X	X	X	X	X
Chiller Location	X	X	X	X	X	X
Chiller Mode (LONWORKS)	X	X		X	X	X
Chiller Mode Setpoint	X	X		X	X	X
Chiller ON OFF	X	X	X	X	X	X
Chiller Power[6]	X					
Chiller Status BACnet	X	X	X	X	X	X
Chiller Status (LONWORKS)	X	X	X	X	X	X
Chiller Type	X	X		X	X	X
Clear Alarm	X	X	X	X	X	X
Compressor 2 Active Capacity Limit	X[5]					
Compressor 2 VFD Speed	X[5]					
Compressor Current[2]	X					X
Compressor Discharge Temperature	X			X		X
Compressor Percent RLA	X					X
Compressor Power[2]	X					X
Compressor Run Hours	X	X	X	X	X	X
Compressor Select	X	X	X	X	X	X
Compressor Starts	X	X	X	X	X	X
Compressor Status	X[5]					
Compressor Suction Line Temperature	X			X	X	X
Compressor Voltage[2]	X					X
Condenser Entering Water Temperature	X				X	X
Condenser Flow Switch Status	X				X	X
Condenser Leaving Water Temperature	X				X	X
Condenser Pump Run Hours	X					
Condenser Refrigerant Pressure	X	X	X	X	X	X
Condenser Saturated Refrigerant Temperature	X	X	X	X	X	X
Condenser Water Flow Rate	X					X
Condenser Water Pump Status	X				X	X
Cool Setpoint	X	X		X	X	X
Cool Setpoint (LONWORKS)	X	X		X	X	X
Current Alarm (LONWORKS)	X	X	X	X	X	X
Default Values	X	X	X	X	X	X
Design RPM	X[5]					
Device Object	X	X	X	X	X	X
Evaporator Entering Water Temperature	X			X	X	X

1. Dual Circuit chillers only
2. Optional Solid State Starter or Magnetic Bearing compressor required. Voltage, Power and Current are per compressor
3. Not available on WMC chiller
4. Available on AGS A and B vintage chillers only
5. Available on WMC chiller only
6. Optional Solid State Starter or Magnetic Bearing compressor required

Data Point	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	AGS	WGZ TGZ	WGS
Evaporator Flow Switch Status	X	X	X	X	X	X
Evaporator Leaving Water Temperature for Unit	X	X		X	X	X
Evaporator Leaving Water Temperature for Compressor	X	X		X		
Evaporator Pump Run Hours	X					
Evaporator Refrigerant Pressure	X	X	X	X	X	X
Evaporator Saturated Refrigerant Temperature	X	X	X	X	X	X
Evaporator Water Flow Rate	X					
Evaporator Water Pump Status	X	X		X	X	X
Fault Alarms, Analog Input Object	X	X	X	X	X	X
Fault Alarms, Multi-state Input Object	X	X	X	X	X	X
Heat Recovery Entering Water Temperature	X					
Heat Recovery Leaving Water Temperature	X					
Heat Setpoint	X					
Heat Setpoint (LONWORKS)	X					
Ice Setpoint	X	X		X	X	X
IGV Percentage Open	X[5]					
Inverter Temperature	X[5]					
Liquid Line Refrigerant Pressure				X[4]		
Liquid Line Refrigerant Temperature	X			X[4]	X	
Maximum RPM	X[5]					
Maximum Send Time	X	X	X	X	X	X
Minimum RPM	X[5]					
Minimum Send Time	X	X	X	X	X	X
Motor Cavity Temperature	X[5]					
Network Clear Alarm (LONWORKS)	X	X		X	X	X
Oil Feed Pressure[3]	X					
Oil Feed Temperature[3]	X					
Oil Sump Pressure[3]	X					
Oil Sump Temperature[3]	X					
Outdoor Air Temperature		X	X	X		
Power Factor						
Problem Alarms, Analog Input Object	X	X	X	X	X	X
Problem Alarms, Multi-state Input Object	X	X	X	X	X	X
Pump Select	X					
Receive Heartbeat	X	X	X	X	X	X
Run Enabled	X	X	X	X	X	X
Warning Alarms, Analog Input Object	X	X	X	X	X	X
Warning Alarms, Multi-state Input Object	X	X	X	X	X	X

1. Dual Circuit chillers only
2. Optional Solid State Starter or Magnetic Bearing compressor required. Voltage, Power and Current are per compressor
3. Not available on WMC chiller
4. Available on AGS A and B vintage chillers only
5. Available on WMC chiller only
6. Optional Solid State Starter or Magnetic Bearing compressor required

BACnet Network Objects

This section describes the data that is available to the BAS via the BACnet network. Table 3 - Table 9 contain the information needed to integrate the MicroTech II Chiller Unit Controller into the BACnet network. The tables are organized by Analog Inputs, Analog Values, Binary Inputs, Binary Values, Multi-State Inputs, Multi-State Outputs, and Alarm Objects. The parameters are listed alphabetically by point name within each table. Each BACnet object may or may not be available on the unit controller interface. If it is available, the display menu shows one path where the object appears, but note that it may also be available on more than one keypad menu. See Appendix A: Protocol Implementation Conformance Statement (PICS) and Appendix B: Keypad Menu Paths.

Table 3: Analog Inputs

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Active Setpoint	AI:7	R	ActiveLvgWaterTarget	-40°- 199°F -40°- 93°C Default: NA	The current setpoint used to control the temperature of the Leaving Chilled Water or Leaving Hot Water. Based on the operating mode of the chiller, this value is derived from the Cool Setpoint, Heat Setpoint, or Ice Setpoint. The default mode is Cooling and is used unless changed by the Mode input.
Actual Capacity	AI:9	R	ChillerCapacity	0 - 160% Default: NA	The percent of capacity the chiller is currently producing. It may be more or less than the nominal capacity of the chiller. For positive displacement chillers (those using screw and scroll compressors) this is a percentage of total compressors running. For centrifugal chillers, this data point represents the combined percent RLA of the compressors.
Actual RPM		R		0 - 32,678 RPM Default: NA	The actual speed of the compressor. Available on WMC chiller only.
Compressor 1	AI:56		Comp1ActualRPM		
Compressor 2	AI:60		Comp2ActualRPM		
Capacity Limit Output	AI:8	R	ActiveCapacityLimit	0 - 160% Default: NA	Measures the ratio of operating capacity to full capacity of the chiller. Indicates the current value of the Capacity Limit.
Chiller Power	AI:67	R	TotalChillerKW	0 - 160% Default: NA	Total kilowatts of all compressors. Available on centrifugal chillers only. Optional Solid State Starter or Magnetic Bearing compressor required.
Compressor 2 Active Capacity Limit	AI:88	R	Comp2ActiveCapLimit	0 - 100% Default: NA	The active capacity limit for compressor 2. Available on WMC chiller only.
Compressor 2 VFD Speed	AI:80	R	Comp2Speed	0 - 100% Default: NA	The VFD speed for compressor 2. Available on WMC chiller only.
Compressor Current		R		0 - 65,535 Amps Default: NA	The number of amps being drawn from the selected compressor. See Compressor Select for more information.
Compressor Select	AI:51		Current		
Compressor 2	AI:76		Comp2Current		
Compressor 3	AI:95		Comp3Current		
Compressor 4	AI:103		Comp4Current		
Compressor 5	AI:111		Comp5Current		
Compressor 6	AI:117		Comp6Current		
Compressor Discharge Temperature		R		-459.9° - 621°F -273.3° - 327.2°C Default: NA	The refrigerant temperature of the selected compressor. See Compressor Select for more information.
Compressor Select	AI:18		DischargeTemp		
Compressor 2	AI:72		Comp2DischargeTmp		The current compressor refrigerant temperature of compressor 2. Not available on all chiller models. See Compressor Select for more information.
Compressor Percent RLA		R		0 - 160% Default: NA	The motor current of the selected compressor. See Compressor Select for more information.
Compressor Select	AI:24		CompMotorCurrentPercent		
Compressor 2	AI:75		Comp2CurrentPercent		
Compressor 3	AI:94		Comp3CurrentPercent		
Compressor 4	AI:102		Comp4CurrentPercent		
Compressor 5	AI:110		Comp5CurrentPercent		
Compressor 6	AI:116		Comp6CurrentPercent		

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Compressor Power					
Compressor Select	AI:54		Kilowatts		
Compressor 2	AI:77		Comp2Kilowatts		
Compressor 3	AI:96	R	Comp3Kilowatts	0 – 65,535 kW Default: NA	The motor power of the selected compressor. See Compressor Select for more information.
Compressor 4	AI:104		Comp4Kilowatts		
Compressor 5	AI:112		Comp5Kilowatts		
Compressor 6	AI:118		Comp6Kilowatts		
Compressor Run Hours					
Compressor Select	AI:26		CompHours		
Compressor 2	AI:93	R	Comp2Hours	0 – 65,535 hours* Default: NA	The number of hours the selected compressor motor has been running. See Compressor Select for more information. *Note the value returned must be multiplied by 10 to give actual run hours.
Compressor 3	AI:101		Comp3Hours		
Compressor 4	AI:109		Comp4Hours		
Compressor Starts					
Compressor Select	AI:25		CompStarts		
Compressor 2	AI:92	R	Comp2Starts	0 – 65,535 starts Default: NA	The number of times the selected compressor motor has started. See Compressor Select for more information.
Compressor 3	AI:100		Comp3Starts		
Compressor 4	AI:108		Comp4Starts		
Compressor Status					
Compressor Select	AI:123		CompressorStatus		
Compressor 2	AI:91		Comp2Status		
Compressor 3	AI:99	R	Comp3Status	0 = Off 1 = Start Oil Pump 2 = Interlock/Prelube 3 = Run 4 = Shutdown 5 = Postlube Default: NA	Operating status of the compressor that is currently selected. Available on WMC chiller only. See Compressor Select for more information.
Compressor 4	AI:107		Comp4Status		
Compressor 5	AI:115		Comp5Status		
Compressor 6	AI:121		Comp6Status		
Compressor Suction Line Temperature					The current suction line refrigerant temperature. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:15	R	SuctionTemp	-40° – 244°F -40° – 118°C Default: NA	
Compressor 2	AI:69		Comp2SuctTemp		The current suction line refrigerant temperature for compressor 2. Not available on all chiller models. See Compressor Select for more information.
Compressor Voltage					
Compressor Select	AI:52		Voltage		
Compressor 2	AI:79		Comp2Voltage		
Compressor 3	AI:98	R	Comp3Voltage	0 – 65,535 VAC Default: NA	The current voltage of the selected compressor. There is a separate output for each compressor. See Compressor Select for more information.
Compressor 4	AI:106		Comp4Voltage		
Compressor 5	AI:114		Comp5Voltage		
Compressor 6	AI:120		Comp6Voltage		
Condenser Entering Water Temperature	AI:3	R	EntCondWaterTemp	-40° – 244°F -40° – 118°C Default: NA	The current temperature of the water entering the condenser.
Condenser Leaving Water Temperature	AI:4	R	LvgCondWaterTemp	-40° – 244°F -40° – 118°C Default: NA	The current temperature of the leaving condenser water.
Condenser Pump Run Hours					The number of hours that the selected condenser pump motor has been turned on. See Pump Select for more information. *Note the value returned must be multiplied by 10 to give actual run hours.
Pump Select	AI:28	R	CondPumpOperHours	0 – 65,535 hours* Default: NA	
Pump 2	AI:90		CondPmp2Hrs		The number of hours that the selected condenser pump 2 has been turned on. Not available on all chiller models.
Condenser Refrigerant Pressure					The current refrigerant pressure in the selected condenser. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:16	R	CondPressure	-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	
Compressor 2	AI:74		Comp2CondPress		The current refrigerant pressure for compressor 2. Not available on all chiller models.
Condenser Saturated Refrigerant Temperature					The current saturated refrigerant temperature in the condenser. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:17	R	CondSatTemp	-40° – 244°F -40° – 118°C Default: NA	
Compressor 2	AI:73		Comp2CondSatTemp		The current saturated refrigerant temperature in the condenser for compressor 2. Not available on all chiller models.

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Condenser Water Flow Rate	AI:50	R	CondWaterFlowRate	0 - 65,534 GPM 0 - 4,135 Liters/Sec Default: NA	The current condenser water flow rate. Flow rate for centrifugal chillers measured in GPM only.
Design RPM		R		0 – 32,678 RPM Default: NA	Indicates the Turbocor compressor(s) calculated speed target based on conditions and request demand. Available on WMC chiller only.
Compressor 1	AI:63		Comp1DesignRPM		
Compressor 2	AI:64		Comp2DesignRPM		
Evaporator Entering Water Temperature	AI:1	R	EntEvapWaterTemp	-40° – 245°F -40° – 118°C Default: NA	The temperature of the evaporator entering water temperature.
Evaporator Leaving Water Temperature for Unit	AI:2	R	LvgEvapWaterTempUnit	-40° – 244°F -40° – 118°C Default: NA	The current temperature of the evaporator leaving chilled water.
Evaporator Leaving Water Temperature for Compressor		R		-40° – 244°F -40° – 118°C Default: NA	The current leaving chilled water temperature of the selected compressor. See Compressor Select for more information. Applies to centrifugal chillers only.
Compressor Select	AI:23		LvgEvapWaterTempComp		
Compressor 2	AI:68		Comp2EvapLvgWTmp		The current leaving chilled water temperature of compressor 2. Not available on all chiller models.
Evaporator Pump Run Hours		R		0 – 65,535 hours* Default: NA	The number of hours that the selected evaporator pump has been turned on. There is a separate output for each pump. See Pump Select. *Note the value returned must be multiplied by 10 to give actual run hours.
Pump Select	AI:27		EvapPumpOperHours		
Pump 2	AI:89		EvapPmp2Hrs		The number of hours pump 2 has been running. Not available on all chiller models.
Evaporator Refrigerant Pressure		R		-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	The current refrigerant pressure in the evaporator. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:13		EvapPressure		
Compressor 2	AI:71		Comp2EvapPress		The current refrigerant pressure in the evaporator for compressor 2. Not available on all chiller models.
Evaporator Saturated Refrigerant Temperature		R		-40° – 244°F -40° – 118°C Default: NA	The current saturated refrigerant temperature in the evaporator. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:14		EvapSatTemp		
Compressor 2	AI:70		Comp2EvapSatRTmp		The current saturated refrigerant temperature in the evaporator for compressor 2. Not available on all chiller models.
Evaporator Water Flow Rate	AI:49	R	EvapWaterFlowRate	0 - 65,534 GPM Default: NA	The current evaporator water flow rate. Flow rate measured in GPM only for centrifugal chillers.
Heat Recovery Entering Water Temperature	AI:5	R	HeatRecEntWaterTemp	-40° – 244°F -40° – 118°C Default: NA	The current temperature of the water entering the heat recovery section.
Heat Recovery Leaving Water Temperature	AI:6	R	HeatRecLvgWaterTemp	-40° – 244°F -40° – 118°C Default: NA	The current temperature of the water leaving the heat recovery section.
IGV Percentage Open		R		0 – 110% Default: NA	The current percentage that vanes are open for each compressor (0% = closed, 110% = open/full capacity). Available on WMC chiller only.
Compressor 1	AI:58		Comp1IGVPercentOpen		
Compressor 2	AI:62		Comp2IGVPercentOpen		
Inverter Temperature		R		32 – 212°F 0 – 100°C Default: NA	The current drive temperature. There is a separate output for each compressor. Available on WMC chiller only.
Compressor 1	AI:66		Comp1InverterTmp		
Compressor 2	AI:87		Comp2InverterTmp		
Liquid Line Refrigerant Pressure	AI:12	R	LiquidLinePress	-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	The current liquid line refrigerant pressure. There is a separate output for each compressor/circuit. See Compressor Select for more information.
Liquid Line Refrigerant Temperature		R		-40° – 244°F -40° – 118°C Default: NA	The current liquid line refrigerant temperature. There is a separate output for each compressor/ circuit. See Compressor Select for more information.
Compressor Select	AI:11		LiquidLineTemp		
Compressor 2	AI:85		Comp2LiqLineTemp		The current liquid line refrigerant temperature for compressor 2. Not available on all chiller models.
Maximum RPM		R		0 – 32,678 RPM Default: NA	The maximum (choke) RPM. This is the speed the Turbocor compressor calculates above which the efficiency of the compressor begins to decrease. Available on WMC chiller only.
Compressor 1	AI:55		Comp1MaxRPM		
Compressor 2	AI:59		Comp2MaxRPM		

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Minimum RPM		R		0 – 32,678 RPM Default: NA	The minimum (surge) RPM. This is the speed the Turbocor compressor calculates as the minimum safe operating speed above onset of stall. Available on WMC chiller only.
Compressor 1	AI:57		Comp1MinRPM		
Compressor 2	AI:61		Comp2MinRPM		
Motor Cavity Temperature		R		-4° – 212°F -20° – 100°C Default: NA	The current temperature of the compressor's motor starter cavity. Available on WMC chiller only.
Compressor 1	AI:65		Comp1MotorCavityTmp		
Compressor 2	AI:86		Comp2MotorCavityTmp		
Oil Feed Pressure		R		-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	The current compressor oil feed pressure. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:19		OilFeedPressure		
Compressor 2	AI:81		Comp2OilFeedPress		The current compressor oil feed pressure for compressor 2. Not available on all chiller models.
Oil Feed Temperature		R		-40° – 244°F -40° – 118°C Default: NA	The current compressor oil feed temperature. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:21		OilFeedTemp		
Compressor 2	AI:83		Comp2OilFeedTemp		The current compressor oil feed temperature for compressor 2. Not available on all chiller models.
Oil Sump Pressure		R		-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	The current compressor oil sump pressure. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:20		OilSumpPressure		
Compressor 2	AI:82		Comp2OilFeedPress		The current compressor oil sump pressure for compressor 2. Not available on all chiller models.
Oil Sump Temperature		R		-40° – 244°F -40° – 118°C Default: NA	The current compressor oil sump temperature. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Select	AI:22		OilSumpTemp		
Compressor 2	AI:84		Comp2OilSumpTemp		The current compressor oil sump temperature for compressor 2. Not available on all chiller models.
Outdoor Air Temperature	AI:10	R	OutdoorAirTemp	-40° – 244°F -40° – 118°C Default: NA	The current outdoor air temperature.
Power Factor		R		-99 – +100 Default: NA	The cosine of the phase angle between the voltage applied to a load and the current passing through the load. The power factor is assigned an analog value scaled by 0.01 (i.e. a value of +95 corresponds to a power factor of 0.95). For a more detailed description of power factor, see Application Guide AG 31-002, available on www.DaikinApplied.com.
Compressor Select	AI:53		PowerFactor		
Compressor 2	AI:78		Comp2PowerFactor		
Compressor 3	AI:97		Comp3PowerFactor		
Compressor 4	AI:105		Comp4PowerFactor		
Compressor 5	AI:113		Comp5PowerFactor		
Compressor 6	AI:119		Comp6PowerFactor		

Table 4: Analog Outputs

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Capacity Limit Setpoint	AO:32	W	NetworkCapacityLimitPct	0 - 160% Default: 100%	Sets the chiller's maximum operating capacity as a percentage of full capacity. This level may be adjusted, but not above the specified limit. The input network variable sets the operating value (input). Refer to the appropriate MicroTech II Chiller Operation Manual for suitable variable values.
Cool Setpoint	AO:29	W	NetworkCoolTempSetpoint	10° - 120°F -12.2° - 48.9°C Default: 44°F / 6.7°C	Determines the temperature of the Leaving Chilled Water. Refer to the appropriate Operation Manual for suitable variable values.
Heat Setpoint	AO:31	W	NetworkHeatTempSetpoint	50° – 150°F 10° – 65.6°C Default: varies by model	Provides the heating setpoint (i.e. sets the temperature of the leaving evaporator water) when the chiller is operating in the heat mode. The value is ignored if the unit controller is in Cooling mode. Refer to the appropriate Operation Manual for suitable variable values.
Ice Setpoint	AO:30	W	NetworkIceTempSetpoint	15° – 35°F -9.5° – 1.7°C Default: 25°F / -3.9°C	Determines the temperature of the leaving evaporator water. Refer to the appropriate Operation Manual for suitable variable values.

Table 5: Binary Inputs

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Alarm Digital Output	BI:40	R	AlarmDigitalOutput	0 = No Alarm 1 = Alarm Default: NA	The Poll Singular method requires one Binary Input object in the BACnet Communication Module to be polled for alarm notification. This object indicates whether an alarm condition has occurred. The user interface displays the alarm text. Refer to the BACnet Alarm Management section for additional information.
Chiller Limited	BI:39	R	ChillerLimited	0 = Not Limited (Inactive) 1 = Limited (Active) Default: NA	Indicates the main running mode and states of the chiller, and whether conditions exist that prevent the chiller from reaching setpoint.
Chiller Local/Remote	BI:38	R	ChillerLocalRemote	0 = Remote 1 = Local Default: NA	Indicates whether the chiller is in local control or allowed to be controlled remotely over the network.
Condenser Flow Switch Status	BI:35	R	CondWaterFlowStatus	0 = No Flow (Inactive) 1 = Flow (Active) Default: NA	The status of the water flow through the condenser.
Condenser Water Pump Status	BI:37	R	CondPumpState	0 = No Flow (Inactive) 1 = Flow (Active) Default: NA	Indicates whether the selected pump has been commanded on or off. See Pump Select.
Evaporator Flow Switch Status	BI:34	R	EvapWaterFlowStatus	0 = No Flow (Inactive) 1 = Flow (Active) Default: NA	The status of water flow through the evaporator.
Evaporator Water Pump Status	BI:36	R	EvapPumpState	0 = Pump Commanded Off (Inactive) 1 = Pump Commanded On (Active) Default: NA	Indicates whether the selected pump has been commanded on or off. See Pump Select.
Run Enabled	BI:33	R	UnitOFF	0 = Off (Inactive) 1 = Run Allowed (Active) Default: NA	Indicates that the chiller can start if operating conditions are met. See Pump Select.

Table 6: Binary Values

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Chiller Enable	BV:41	W	ChillerEnable	0 = Request Chiller Off (Disable) 1 = Request Chiller On (Enable) Default: 0 = Request Chiller Off	Enables (starts) the chiller to run if the operating conditions are satisfied, or disables (stops) the chiller from running. When this property is read, it indicates the current operating state of the chiller.
Clear Alarm	BV:42	W	ClearAlarm	0 = Normal 1 = Clear Alarm Default: NA	Clears all active alarms. It cannot clear all alarms in the Fault category (alarms that shut down the chiller). Fault alarms must be cleared from the chiller. See the BACnet Alarm Management section for additional details. The alarms that are cleared at the chiller but not over the network are as follows: • Low Evaporator Pressure • High Condenser Pressure (by pressure sensor) • High Condenser Pressure (by pressure switch) • Low Oil Pressure • Freeze Protection • High Motor Temperature *Note: The above list pertains only to centrifugal chillers. The only alarm that can be cleared remotely on all other chiller types is the Flow Loss alarm.*

Table 7: Multi-State Inputs

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Chiller Mode Output	MSI:44	R	ActiveMode	1 = Ice 2 = Cool 3 = Heat Default: 2 = Cool	The current operating mode of the chiller.
Chiller Status	MSI:43	R	UnitStatus	1 = Off 2 = Start 3 = Run 4 = Pre-shutdown 5 = Service Default: Determined by the current state of the chiller.	The unit status of the chiller.
Chiller Type	MSI:48	R	DaikinChillerType	1 = AGZS 2 = AGZD 3 = WGZD/TGZD 4 = WSC/WDC 5 = AGSU 6 = ACZS 7 = ACZD 8 = WMC 9 = WGSD 10 = AGSD 11 = AGZS 12 = AGZDU 13 = WGZU 14 = ACZSU 15 = ACZDU Default: NA	The chiller model to which the MicroTech II unit controller is connected.

Table 8: Multi-State Outputs

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range/Default (In Units)	Description
Chiller Mode Setpoint	MSO:45	W	ChillerOperationMode	1 = Ice 2 = Cool 3 = Heat Default: 2 = Cool	Sets the mode of operation for the chiller. Refer to the appropriate MicroTech II Chiller Operating Manual for suitable variable values.
Compressor Select	MSO:46	W	CompSelect	1 - 6 (See Description column for details) Default: 1	Selects the compressor/circuit (No.1, 2, 3, 4, 5 or 6) that is to be interrogated. The unit controller returns the information for the selected compressor/circuit. First select a compressor/circuit, then interrogate the selected compressor/circuit. See Table 1 to determine the network points available for each chiller type. Compressor/circuit values and descriptions are as follows: 1 = Comp/Circuit No. 1 2 = Comp/Circuit No. 2 3 = Comp/Circuit No. 3 (Circuit No. 1 on Scroll Chillers and Condensing Units) 4 = Comp/Circuit No. 4 (Circuit No. 2 on Scroll Chillers and Condensing Units) 5 = Comp No. 5 (Circuit No. 1 on Scroll Chillers and Condensing Units) 6 = Comp No. 6 (Circuit No. 2 on Scroll Chillers and Condensing Units) The following points are supported by Compressor Select: • Compressor Current • Compressor Discharge Temperature • Compressor Percent RLA • Compressor Power • Compressor Run Hours • Compressor Starts • Compressor Status • Compressor Voltage • Condenser Refrigerant Pressure • Condenser Saturated Refrigerant Temperature • Evaporator Leaving Water Temperature for Compressor • Evaporator Refrigerant Pressure • Evaporator Saturated Refrigerant Temperature • Liquid Line Refrigerant Pressure • Liquid Line Refrigerant Temperature • Oil Feed Pressure • Oil Feed Temperature • Oil Sump Pressure • Oil Sump Temperature
Pump Select	MSO:47	W	PumpSelect	1 = Pump 1 2 = Pump 2 Default: 1	Selects which pump (No.1 or No. 2) supplies the data. The unit controller returns the information for the respective condenser or evaporator pump. Select the desired pump first and then interrogate it. See Condenser Pump Run Hours and Evaporator Pump Run Hours.

The following alarm objects are supported by the MicroTech II chiller unit controller. This is not a comprehensive list. Refer to the BACnet Alarm Management section on page 27 for a full description of the points listed in Table 9, including all Fault, Warning, and Problem alarm messages and alarm clearing details.

Table 9: BACnet Alarm Objects

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range	Description
Alarm Digital Output	BI:40	R	AlarmDigitalOutput	0 = No Alarm 1 = Alarm	The Poll Singular method requires one Binary Input object in the BACnet Communication Module to be polled for alarm notification. This object indicates whether an alarm condition has occurred. The user interface displays the alarm text. See BACnet Alarm Management.
Clear Alarm	BV:42	W	ClearAlarm	0 = Normal 1 = Clear Alarm	Clears all active alarms. It cannot clear all alarms in the Fault category (alarms that shut down the chiller). Some Fault alarms must be cleared from the chiller. See BACnet Alarm Management.
Fault Alarms		R			Indicates the index number of Fault alarms. See BACnet Alarm Management.
Analog Input Object	AI:901		AIFaultAlarm		
Multi-state Input Object	MSI:901		MSIFaultAlarm		
Problem Alarms		R			Indicates the index number of Problem alarms. See BACnet Alarm Management.
Analog Input Object	AI:900		AIProblemAlarm		
Multi-state Input Object	MSI:900		MSIProblemAlarm		
Warning Alarms		R			Indicates the index number of Warning alarms. See BACnet Alarm Management.
Analog Input Object	AI:902		AIWarningAlarm		
Multi-state Input Object	MSI:902		MSIWarningAlarm		

LONWORKS Network Variables

This section descries the data available to the BAS via the LONWORKS network. Table 10 - Table 12 contain the relevant information needed to integrate the MicroTech II Chiller Unit Controller into the LONWORKS network. Tables are organized by Network Output Variable Outputs (NVOs), Network Variable Inputs (NVIs), and Network Configuration Properties (NVIs). The parameters are listed alphabetically by variable name within each table. Each LONWORKS point may or may not be available on the unit controller interface. If it is available, the display menu shows the path where the point appears, but note that it may also be available on more than one keypad menu. See the applicable MicroTech II Chiller Unit Controller Operation Manual (Reference Documents) and Appendix B: Keypad Menu Paths.

Network Variable Outputs

TABLE 10: LONWORKS Network Variable Outputs (NVOs)

Point Name	LONWORKS Variable (NV Index)	SNVT Type (SNVT Index)	Range/Default (In Units)	Heart-beat	Description
Active Setpoint	nvoActiveSetpt	temp_p (105)	-40°– 199°F -40°– 93°C Default: NA	N	The current setpoint used to control the temperature of the Leaving Chilled Water or Leaving Hot Water. Based on the operating mode of the chiller, this value is derived from the Cool Setpoint, Heat Setpoint, or Ice Setpoint. The default mode of Cooling is used unless changed by the Mode input.
Actual Capacity	nvoActCapacity	lev_percent (81)	0 – 160% Default: NA	N	The percent of capacity the chiller is currently producing. It may be more or less than the nominal capacity of the chiller. For positive displacement chillers (those using screw and scroll compressors) this is a percentage of total compressors running. For centrifugal chillers, this data point represents the combined percent RLA of the compressors.
Capacity Limit (Output)	nvoCapacityLim	lev_percent (81)	0 – 160% Default: NA	N	Measures the ratio of operating capacity to full capacity of the chiller. Indicates the current value of the Capacity Limit.
Chiller Limited	nvoChillerStat	chlr_status (127)	0 = Not Limited (Inactive) 1 = Limited (Active) Default: NA	N	Indicates the main running mode and states of the chiller, and whether conditions exist that prevent the chiller from reaching setpoint. This variable is supported by Chiller Status.
Chiller Local/Remote	nvoChillerStat	chlr_status (127)	0 = Remote 1 = Local Default: NA	N	Indicates whether the chiller is in local control or allowed to be controlled remotely over the network. This variable is supported by Chiller Status.
Chiller Mode Output	nvoChillerStat	chlr_status (127)	1 = Ice 2 = Cool 3 = Heat Default: 2 = Cool	N	The current operating mode of the chiller.
Chiller ON OFF	nvoOnOff	switch (06)	0 = False (Off) 1 = True (Run Allowed) Default: NA	N	Indicates the current state of the chiller. It is normally recommended to monitor Chiller Status for the current operating state of the chiller.

Point Name	LONWORKS Variable (NV Index)	SNVT Type (SNVT Index)	Range/Default (In Units)	Heart-beat	Description
Chiller Status	nvoChillerstat. chlr_run_mode	chlr_status (127)	**Chiller Run Mode (chiller_t)** 0 = CHLR_OFF 1 = CHLR_START 2 = CHLR_RUN 3 = CHLR_PRESHUTDN 4 = CHLR_SERVICE **Chiller Operating Mode (hvac_t)** 1 = HVAC_HEAT 3 = HVAC_COOL 11 = HVAC_ICE Default: NA	N	The unit status of the chiller. Chiller Status includes the Run Mode. The Run Mode is defined as Off, Start, Run, Pre-shutdown and Service. The Run Mode provides the primary running states of a chiller and the state provides an indicator of other conditions present. **Chiller State** / **Description** In_Alarm: 1 = Chiller is in an alarm condition. This condition may also be observed in the Node Object's status. 0 = No alarm condition. Run_Enabled: 1 = Chiller starts if operating conditions are satisfied. 0 = Chiller not permitted to run. Chiller may be in local mode or placed in a disabled condition and can't be run via a remote request. Local: 1 = Chiller has been placed in a locally controlled mode of operation and cannot respond to remote requests. 0 = Chiller is not in local mode and network visible values maybe changed or monitored remotely. Limited: 1 = Chiller conditions may exist that prevents the Chiller from reaching setpoint. 0 = Chiller is not restricted from attempting to reach setpoint. CHW_flow: 1 = Chiller fluid flow is detected. 0 = No chilled fluid flow present. CONDW_flow: 1 =Condenser fluid flow has been detected 0 = No condenser fluid flow is observed.
Compressor Current	nvoCurrent	amp (1)	-3,276.8 - 3,276.7 Amps Default NA	N	The number of amps being drawn by the selected compressor. See Compressor Select for more information.
Compressor Discharge Temperature	nvoCompDisTemp	temp_p (105)	-460° - 621°F -273.17° - 327.66°C Default: NA	N	The refrigerant temperature of the selected compressor. See Compressor Select for more information.
Compressor Percent RLA	nvoCompPercRLA	lev_percent (81)	-163.84 - 163.83% Default: NA	N	The motor current of the selected compressor. See Compressor Select for more information.
Compressor Power	nvoKiloWatts	power_kilo (28)	0 - 65,535 kiloWatts Default: NA	N	The compressor motor power of the selected compressor. See Compressor Select for more information.
Compressor Run Hours	nvoCompHrs	count (8)	0 - 65,535 hours* Default: NA	N	The number of hours the selected compressor motor has been running. See Compressor Select for more information. *Note the value returned must be multiplied by 10 to give actual run hours.
Compressor Starts	nvoCompStarts	count (8)	0 - 65,535 starts Default: NA	N	The number of times the selected compressor motor has started. See Compressor Select for more information.
Compressor Suction Line Temperature	nvoSuctionTemp	temp_p (105)	-40° - 244°F -40° - 118°C Default: NA	N	The current suction line refrigerant temperature. There is a separate output for each compressor. See Compressor Select for more information.
Compressor Voltage	nvoVoltage	Volt_ac (138)	0 - 65,534 VAC Default: NA	N	The current voltage of the selected compressor. There is a separate output for each compressor. See Compressor Select for more information.

Point Name	LONWORKS Variable (NV Index)	SNVT Type (SNVT Index)	Range/Default (In Units)	Heart-beat	Description
Condenser Entering Water Temperature	nvoEntCndWTemp	temp_p (105)	-40° - 244°F -40° - 118°C Default: NA	N	The current temperature of the water entering the condenser.
Condenser Flow Switch Status	nvoCndWFlow	switch (95)	0 = No Flow (Inactive) 1 = Flow (Active) Default: NA	N	The status of the water flow through the condenser.
Condenser Leaving Water Temperature	nvoLvgCndWTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current temperature of the leaving condenser water.
Condenser Pump Run Hours	nvoCondPumpHrs	count (8)	0 – 65,535 hours* Default: NA	N	The number of hours that the selected condenser pump motor has been turned on. See Pump Select for more information. *Note the value returned must be multiplied by 10 to give actual run hours.
Condenser Refrigerant Pressure	nvoCondRefPress	press (30)	-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	N	The current refrigerant pressure in the selected condenser. There is a separate output for each compressor. See Compressor Select for more information.
Condenser Saturated Refrigerant Temperature	nvoSatCndRefTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current saturated refrigerant temperature in the condenser. There is a separate output for each compressor. See Compressor Select for more information.
Condenser Water Flow Rate	NvoCondFlowRate	flow (15)	0 – 65,534 GPM 0 - 4,135 Liters/Sec Default: NA	N	The current condenser water flow rate.
Condenser Water Pump Status	nvoCndWPump	Switch (95)	0 = Pump commanded off 1 = Pump commanded on Default: NA	N	Indicates whether the selected pump has been commanded on or off. See Pump Select for more information.
Current Alarm	nvoAlarmDescr	str_asc (36)	0 – 30 characters plus a NUL terminator Default: NA	N	Indicates the current alarm. The type of alarm is included in the text string. Alarm messages are shown in LonWorks Alarm Management. The unit controller can accommodate 15 simultaneous alarms. Alarm messages are sent sequentially one every five seconds.
Evaporator Entering Water Temperature	nvoEntChWTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The temperature of the evaporator entering water temperature.
Evaporator Flow Switch Status	nvoChWFlow	switch (95)	0 = No Flow (Inactive) 1 = Flow (Active) Default: NA	N	The status of the water flow through the evaporator.
Evaporator Leaving Water Temperature for Unit	nvoLvgCHWTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current temperature of the evaporator leaving chilled water.
Evaporator Pump Run Hours	nvoEvapPumpHrs	count (8)	0 – 65,535 hours* Default: NA	N	The number of hours that the selected evaporator pump has been turned on. There is a separate output for each pump. See Pump Select for more information. *Note the value returned must be multiplied by 10 to give actual run hours.
Evaporator Refrigerant Pressure	nvoEvapRefPress	press (30)	-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	N	The current refrigerant pressure in the evaporator. There is a separate output for each compressor. See Compressor Select for more information.
Evaporator Saturated Refrigerant Temperature	nvoSatEvpRefTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current saturated refrigerant temperature in the evaporator. There is a separate output for each compressor. See Compressor Select for more information.
Evaporator Water Flow Rate	NvoEvapFlowRate	flow (15)	0 - 65,534 GPM 0 - 4,135 Liters/Sec Default: NA	N	The current evaporator water flow rate. Flow rate measured in GPM only for centrifugal chillers.
Evaporator Water Pump Status	nvoChWPump	switch (95)	0 = Pump Commanded Off (Inactive) 1 = Pump Commanded On (Active) Default: NA	N	Indicates whether the selected pump has been commanded on or off. See Pump Select for more information.
Heat Recovery Entering Water Temperature	nvoEntHRWTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current temperature of the water entering the heat recovery section.

Point Name	LONWORKS Variable (NV Index)	SNVT Type (SNVT Index)	Range/Default (In Units)	Heart-beat	Description
Heat Recovery Leaving Water Temperature	nvoLvgHRWTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current temperature of the water leaving the heat recovery section.
Liquid Line Refrigerant Pressure	nvoLiquLinePress	press (30)	-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	N	The current liquid line refrigerant pressure. There is a separate output for each compressor/circuit. See Compressor Select for more information.
Liquid Line Refrigerant Temperature	nvoLiquLineTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current liquid line refrigerant temperature. There is a separate output for each compressor/circuit. See Compressor Select for more information.
Oil Feed Pressure	nvoOilFeedPress	press (30)	-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	N	The current compressor oil feed pressure. There is a separate output for each compressor. See Compressor Select for more information.
Oil Feed Temperature	nvoOilFeedTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current compressor oil feed temperature. There is a separate output for each compressor. See Compressor Select for more information.
Oil Sump Pressure	nvoOilSumpPress	press (30)	-3,276.8 - 3,276.7 psi -22,592.1 - 22,592.1 kPa Default: NA	N	The current compressor oil sump pressure. There is a separate output for each compressor. See Compressor Select for more information.
Oil Sump Temperature	nvoOilSumpTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current compressor oil feed temperature. There is a separate output for each compressor. See Compressor Select for more information.
Outdoor Air Temperature	nvoOutdoorTemp	temp_p (105)	-40° – 244°F -40° – 118°C Default: NA	N	The current outdoor air temperature.
Run Enabled	nvoChillerStat	chlr_status (127)	0 = Off (Inactive) 1 = Run Allowed (Active) Default: NA	N	Indicates that the chiller can start if operating conditions are met. This variable is supported by Chiller Status.

Network Variable Inputs

TABLE 11: LONWORKS Network Variable Inputs (NVIs)

Point Name	LONWORKS Variable (NV Index)	SNVT Type (SNVT Index)	Range/Default (In Units)	Heart-beat	Description
Capacity Limit Setpoint	nviCapacityLim	lev_percent (81)	0 - 160% Default: 100%	N	Measures the ratio of operating capacity to full capacity. This level may be adjusted, but not above the specified limit. This variable sets the operating value (input). Refer to the appropriate MicroTech II Chiller Operation Manual for suitable variable values.
Chiller Enable	nviChillerEnable	Switch (95)	0 = Request Chiller Off 1 = Request Chiller On Default: 0 (Off)	N	Enables (starts) the chiller to run if the operating conditions are satisfied, sets the default power-up and restart mode, or disables (stops) the chiller from running. Indicates the current operating state of the chiller.
Chiller Mode Setpoint	nviMode	hvac_mode (108)	1 = HVAC_HEAT 3 = HVAC_COOL 11 = HVAC_ICE Default: 3 = Cool	N	Sets the mode of operation for the chiller. Refer to the appropriate MicroTech II Chiller Operating Manual for suitable variable values.
Compressor Select	nviCompSelect	count (8)	1 - 6 (See Description column at right for details) Default: 1	N	Selects the compressor/circuit (No.1, 2, 3, 4, 5 or 6) that is to be interrogated. The unit controller returns the information for the selected compressor/circuit. First select a compressor/circuit, then interrogate the selected compressor/circuit. See Table 1 to determine the network parameters available for each chiller type. Compressor/circuit values and descriptions are as follows: 1 = Comp/Circuit No. 1 2 = Comp/Circuit No. 2 3 = Comp/Circuit No. 3 (Circuit No. 1 on Scroll Chillers and Condensing Units) 4 = Comp/Circuit No. 4 (Circuit No. 2 on Scroll Chillers and Condensing Units) 5 = Comp No. 5 (Circuit No. 1 on Scroll Chillers and Condensing Units) 6 = Comp No. 6 (Circuit No. 2 on Scroll Chillers and Condensing Units) The following points are supported by Compressor Select: • Compressor Current • Compressor Discharge Temperature • Compressor Percent RLA • Compressor Power • Compressor Run Hours • Compressor Starts • Compressor Status • Compressor Voltage • Condenser Refrigerant Pressure • Condenser Saturated Refrigerant Temperature • Evaporator Leaving Water Temperature for Compressor • Evaporator Refrigerant Pressure • Evaporator Saturated Refrigerant Temperature • Liquid Line Refrigerant Pressure • Liquid Line Refrigerant Temperature • Oil Feed Pressure • Oil Feed Temperature • Oil Sump Pressure • Oil Sump Temperature
Cool Setpoint	nviCoolSetpt	temp_p (105)	10° – 120°F -12.2° – 48.9°C Default: 44°F / 6.7°C	N	Determines the cooling setpoint temperature of the leaving evaporator water when the chiller is operating in Cooling Mode. Cooling is the normal mode of chiller operation, unless overridden by the optional Mode variable that changes it to another mode. Refer to the appropriate Operation Manual for suitable variable values.
Heat Setpoint	nviHeatSetpt	temp_p (105)	50° – 150°F 10° – 65.6°C Default: varies by model	N	Provides the leaving evaporator setpoint when the chiller is operating in the heat mode. The value is ignored if the chiller is in Cooling mode. Refer to the appropriate Operation Manual for suitable variable values.
Ice Setpoint	nviIceSpt	temp_p (105)	15° – 35°F -9.5° – 1.7°C Default: 25°F / -3.9°C	N	Determines the ice setpoint temperature of the leaving evaporator water when the chiller is operating in Ice Mode. Refer to the appropriate Operation Manual for suitable variable values.
Network Clear Alarm	nviClearAlarm	switch (95)	0 = No Alarm 1 = Clear Alarm Default = 0	N	Clears all active alarms. It cannot clear all alarms in the Fault category (alarms that shut down the chiller). Fault alarms must be cleared from the MicroTech II chiller unit controller. See LonWorks Alarm Management.

Point Name	LONWORKS Variable (NV Index)	SNVT Type (SNVT Index)	Range/Default (In Units)	Heart-beat	Description
Pump Select	nviPumpSelect	Switch (95)	0 = Pump 1 1 = Pump 2 Default: 0 (Pump 1)	N	Selects which pump (No.1 or No. 2) supplies the data. The unit controller returns the information for the respective condenser or evaporator pump. Select the desired pump first and then interrogate it. See Evaporator Pump Run Hours and Condenser Pump Run Hours.

Network Configuration Inputs

TABLE 12: LONWORKS Network Configuration Inputs (NCIs)

Point Name	LONWORKS Variable (NV Index)	SNVT/SCPT Type (Index)	Range/Default (In Units)	Heart-beat	Description
Capacity Limit	nciCapacityLim	SNVT Type: NA (81) SCPT_limitChlrCap (81)	0 - 160% Default: 100%	Y	Sets the chiller's maximum operating capacity as a percentage of full capacity. Sets a default value for the capacity limit of the chiller (nviCapacityLim), unlessnciDefaults = 1. If nciDefaults = 1, nviCapacityLim remains the last valid value after power is restored. The capacity limit value is not the nominal capacity limit of the chiller. Refer to the appropriate Operating Manual for suitable variable values. The chiller object uses nciCapacityLim on power-up or loss of communication unless nciDefaults = 1. Loss of communication is determined by Receive Heartbeat (nciRCvHrtBt). If Receive Heartbeat is greater than zero, then communication is considered lost when nviCapacityLim is not written to again before the Receive Heartbeat timer expires. Each time nviCapacityLim is written, the Receive Heartbeat timer is reset. If Receive Heartbeat is set to 0, then this function is disabled and communication loss is never detected. See Receive Heartbeat and Default Values in this table for additional information.
Chiller Enable	nciChillerEnable	switch (95) SCPT_pwrUpState (73)	0 = Request Chiller Off 1 = Request Chiller On Default: 0 = Request Chiller Off	Y	Sets the default power-up and restart mode of the chiller (nviChillerEnable), unless nciDefaults = 1. If nciDefaults = 1, nviChillerEnable will retain the last valid value when power is restored. Refer to the unit controller Operating Manual for variable values. The chiller object uses nciChillerEnable on power-up or loss of communication unless nciDefaults =1. Loss of communications is determined by Receive Heartbeat (nciRCvHrtBt). If Receive Heartbeat is greater than zero, then communication is considered lost if nviChillerEnable is not written to again before the Receive Heartbeat timer expires. Each time nviChillerEnable is written, the Receive Heartbeat timer is reset. If Receive Heartbeat is set to 0, then this function is disabled and communication loss is never detected. See Receive Heartbeat and Default Values in this table for additional information.
Cool Setpoint	nciCoolSetpt	temp_p (105) SCPT_ CoolSetpoint (75)	10° – 120°F -12.2° – 48.9°C Default: 44°F / 6.7°C	Y	Cool Setpoint (nviCoolSetpt) is set to nciCoolsetpt on power-up or loss of communication unless nciDefaults =1. If nciDefaults = 1, nviCoolSetpt will retain the last valid value when power is restored. Refer to the appropriate Operating Manual for suitable variable value. Loss of communication is determined by Receive Heartbeat (nciRCvHrtBt). If Receive Heartbeat is greater than zero, then communication is considered lost when nviCoolSetpt is not written to again before the Receive Heartbeat timer expires. Each time nviCoolSetpt is written, the Receive Heartbeat timer is reset. If Receive Heartbeat is set to 0, then this function is disabled and communication loss is never detected. See Receive Heartbeat and Default Values in this table for additional information.
Default Values	nciDefaults	switch (95) SCPT_ DefautBehavior (71)	0 = Use default values 1 = Use manufacturer-specified values Default: 0 = Use default values	N	Determines the set of values used upon chiller power-up and communication failure. The choice is the stated default (nci) values or last valid value and is used with the following variables: • Chiller Enable • Capacity Limit • Cool Setpoint • Heat Setpoint • Mode

Point Name	LonWorks Variable (NV Index)	SNVT/SCPT Type (Index)	Range/Default (In Units)	Heart-beat	Description
Heat Setpoint	nciHeatSetpt	temp_p (105) SCPT_ HeatSetpoint (78)	50° – 150°F 10° – 65.6°C Default: varies by model	Y	Establishes the default setpoint for the Leaving Water Temperature when the chiller is in Heating mode unless nciDefaults =1. If nciDefaults = 1, the default values are specified during manufacturing. The chiller uses nciHeatSetpt upon power-up or loss of communication unless nciDefaults =1. Refer to the appropriate Operating Manual for suitable variable values. Loss of communication is determined by Receive Heartbeat (nciRCvHrtBt). If Receive Heartbeat is greater than zero, then communication is considered lost when nviHeatSetpt is not written to again before the Receive Heartbeat timer expires. Each time nviHeatSetpt is written, the Receive Heartbeat timer is reset. If Receive Heartbeat is set to 0, then this function is disabled and communication loss is never detected. See Receive Heartbeat and Default Values in this table for additional information.
Chiller Location	nciLocation	str_asc (36) SCPT_location (17)	Any NULL-terminated ASCII string up to 31 bytes Default: 00000 (ASCII string of zeros plus NULL)	N	Provides a description of the chiller location.
Maximum Send Time	nciMaxSendTime	time_sec (107) SCPT_ maxSendTime (49)	0 – 6,553.4 sec Default: 0 sec (no automatic update)	N	Controls the maximum period of time that expires before the following network variables are transmitted: • nvoChillerStat • nvoActiveSetpt • nvoActualCapacity • nvoLvgChWTemp • nvoLvgCndWTemp • nvoEntCndWTemp • nvoEntChWTemp
Minimum Send Time	nciMinSendTime	time_sec (107) SCPT_ minSendTime (52)	0 – 6,553.4 sec Default: 0 sec (no automatic update)	N	Controls the minimum period of time that expires before objects can be re-transmitted.
Chiller Mode	nciMode	hvac_mode (108) SCPT_HVACmode (74)	1 = HVAC_HEAT 3 = HVAC_COOL 11 = HVAC_ICE Default: 3 = HVAC_COOL	Y	Establishes the default operating mode of the chiller, unless nciDefaults = 1. If nciDefaults = 1, the last valid value is used. Chiller Mode Setpoint – Network (nviMode) is set equal to nciMode on power-up or loss of communication unless nciDefaults =1. Loss of communication is determined by Receive Heartbeat (nciRCvHrtBt). If Receive Heartbeat is greater than zero, then communication is considered lost when nviMode is not written to again before the Receive Heartbeat timer expires. Each time nviMode is written, the Receive Heartbeat timer is reset. If Receive Heartbeat is set to 0, then this function is disabled and communication loss is never detected. Writing a value other than those shown in the Range column will result in HVAC_COOL (3) being written If nciDefaults = 1, the following default values are specified: • Heat Mode • Cool Mode (default) • Ice Mode See Receive Heartbeat and Default Values in this table for additional information.
Receive Heartbeat	nciRcvHrtBt	time_sec (107) SCPT_ maxRcvTime (49)	0 – 6,553.4 sec Default: 0 sec (0xFFF = invalid data)	Y	Defines the maximum time that elapses after the last update to a specified network variable input before the unit starts to use the value contained in the corresponding network configuration variable (nci). This variable is only applicable when nciDefaults is set to 0. **If nciDefaults is set to 1, this variable will be set to 0 by the chiller application**. The following variables use Receive Heartbeat: • nciCapacityLim • nciChillerEnable • nciCoolSetpt • nciHeatSetpt • nciMode See Receive Heartbeat on page 8 for additional information.

BACnet Alarm Management

The MicroTech II Chiller Unit Controller has various ways of managing alarms. Using one of the mechanisms described in this section, alarms can be recognized, acknowledged, and cleared. Alarms are managed using the unit controller keypad/display or from the BAS.

Alarms and other changes to object property values are supported by BACnet EventNotification Services. Refer to Table 13 for a description of how the MicroTech II Chiller Unit Controller implements the event notification service.

Alarm Classes

BACnet alarms in a MicroTech II Chiller Unit Controller are divided into three classes: Faults, Problems, and Warnings. Fault alarms have the highest severity level. Problem alarms have medium severity level. Warning alarms have the lowest severity level.

Fault Alarms

Fault alarms require an acknowledgment from the operator. These alarms indicate that the compressor is shut down.

Problem Alarms

Problem alarms do not cause compressor shutdown but limit operation of the chiller in some way.

Warning Alarms

A warning is enunciated whenever an abnormal condition exists which does not affect chiller operation.

BACnet Alarm Monitoring

The BACnet Communication Module has three methods for handling BACnet alarms: Alarm Annunciation, Poll Multiple, and Poll Singular.

Alarm Annunciation

This method of alarm notification sends a BACnet ConfirmedEventNotification to a single BACnet device specified in the BACnet Configuration Tool interface. Refer to MicroTech II Chiller Unit Controller BACnet Communication Module, IM 906, for instructions on using the tool (www.DaikinApplied.com).

The ConfirmedEventNotification Service includes the fields shown in Table 1. See ANSI/ASHRAE 135-2004, BACnet-A Data Communication Protocol for Building Automation and Control Networks for detailed definitions.

Not all BACnet devices can receive an alarm message of this type. A BAS integrator may not want to use this method to handle alarms. If either case is true, it is possible to use the Poll Multiple or Poll Singular method.

Poll Multiple

The Poll Multiple method requires that three objects in the BACnet Communication Module are polled for alarm notification. One object indicates Warning Alarms, one indicates Problem Alarms, and one indicates Fault Alarms. The BACnet Communication Module includes three Analog Input objects and three Multi-state objects that contain the alarm information. The Analog Input objects return a number for an alarm condition. The Multi-state object returns the same number for the alarm condition and the text of the alarm message. See Table 14 - Table 16 for a description of the Analog Input alarm objects and Multi-state alarm objects for all Warning, Problem, and Fault alarm messages supported by BACnet.

Poll Singular

Alarm Digital Output

The Poll Singular method requires that one Binary Input object in the BACnet Communication Module be polled for alarm notification. This object indicates whether an alarm condition has occurred. The operator interface displays the alarm text. See below for a description of the Alarm Digital Output object. Table 14 - Table 16 provide the complete list of all Warning, Problem, and Fault alarm messages supported by BACnet.

Alarm Digital Output				
Object Type/ Instance	**Read/ Write Access**	**BACnet Object Name**	**Range**	**Description**
BI:40	R	AlarmDigitalOutput	0 = No Alarm 1 = Alarm	The Poll Singular method requires one Binary Input object in the BACnet Communication Module to be polled for alarm notification. This object indicates whether an alarm condition has occurred. The user interface displays the alarm text.

Table 13: Event Notification Service Details

Field	Source
Process Identifier	Device Instance Process ID as specified in the BACnet Configuration Tool
Initiating Device Identifier	Device Instance of the BACnet Communication Module as specified in the BACnet Configuration Tool
Event Object Identifier	Object Instance that generated the Alarm. (Subtract 1000 from this value to get the instance of the of the object in the BACnet Communication Module)
Time Stamp	The time the BACnet Communication Module detected the alarm initially
Notification Class	P = Problems W = Warnings F = Faults
Priority	Priority specified in the BACnet Configuration Tool
Event Type	Complex Event
Message Text	Alarm Message Text as shown in Table 14 - Table 16
Notify Type	ALARM
AckRequired	Alarm Notification Requirement
From State	The Event State of the BACnet Communication Module before the occurrence of the event that caused Alarm
To State	The Event State of the BACnet Communication Module after the occurrence of the event that caused the Alarm
Event Values	Conditions in the BACnet Communication Module at the time of the alarm. Each number in the Event Values column of Table 14 - Table 16 is the instance number of an object in the BACnet Communication Module that displays its present value in this field of the Event Notification message

Clearing Alarms

Alarms within the MicroTech II Chiller Unit Controller can be cleared via BACnet by setting the ClearAlarm variable to a value of one (1). After the alarms are cleared, this variable returns to Normal (0). See below for the full description of Clear Alarm.

Clear Alarm				
Object Type/ Instance	**Read/Write Access**	**BACnet Object Name**	**Range (In Units)**	**Description**
BV:42	W	ClearAlarm	0 = Normal 1 = Clear Alarm	Clears all active alarms. It cannot clear all alarms in the Fault category (alarms that shut down the chiller). Some Fault alarms must be cleared from the chiller. The alarms that **must** be cleared at the chiller (i.e. cannot be cleared from the network) are as follows: • Low Evaporator Pressure • High Condenser Pressure (by pressure sensor) • High Condenser Pressure (by pressure switch) • Low Oil Pressure • Freeze Protection • High Motor Temperature *Note: The above list pertains only to centrifugal chillers. The only alarm that can be cleared remotely on all other chiller types is the Flow Loss alarm.*

BACnet Alarm Messages

The following tables identify and describe each alarm, its class, the alarm text, and indicate system parameters at the time of the alarm. The tables are organized by Warning, Problem, and Fault alarms.

Table 14: BACnet Warning Alarms

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range (In Units)	Description
Analog Input Object	AI:902	R	AIWarningAlarm	Enumerated	Indicates the index number of Warning alarms. If the Present Value is zero, no alarm has occurred.
Multi-state Input Object	MSI:902	R	MSIWarningAlarm	Enumerated	Indicates the index number of Warning alarms in the Present Value property If the present value is zero, no alarm has occurred.
				30 characters max	Indicates the text of the alarm message in the State Text property.

Warning Alarm Number	Description	Event Values[2]	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
1	NO ACTION - Condenser Entering Water Temperature Sensor Failure	1,2,3,4,9	X					
2	NO ACTION - Evaporator Entering Water Temperature Sensor Failure	1,2,3,4,9,10	X			X	X	X
3	NO ACTION - Liquid Line Refrigerant Temperature Sensor Failure	1,2,3,4,9	X			X		
4	NO ACTION (STOP if Heat) - Condenser Leaving Water Temperature Sensor Failure	1,2,3,4,9	X			X		
9	Expansion Alarm - Warning	1,2,9,10				X	X	
239	Warning - Chiller Capacity Limited	1,2,3,4,9,10	X[1]					

1. WMC chiller only

2. Event Values are supported by the ConfirmedEventNotification feature. The values shown for each alarm correspond to the instance number of an object in the BACnet Communication Module that displays its present value in this field of the Event Notification message

Table 15: BACnet Problem Alarms

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range (In Units)	Description
Analog Input Object	AI:900	R	AIProblemAlarm	Enumerated	Indicates the index number of Problem alarms. If the Present Value is zero, no alarm has occurred.
Multi-state Input Object	MSI:900	R	MSIProblemAlarm	Enumerated	Indicates the index number of Problem alarms in the Present Value property If the present value is zero, no alarm has occurred.
				30 characters max	Indicates the text of the alarm message in the State Text property.

Problem Alarm Number	Description	Event Values[7]	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
5	RESTART DELAYED - Power Loss While Running 1	1,2,9,10					X	X
6	RESTART DELAYED - Power Loss While Running 2	1,2,9,10					X	X
7	RESTART DELAYED - Power Loss While Running 3	1,2,9,10					X[2]	
10	START INHIBITED - Ambient Temperature Low	1,2,3,4,9,10		X	X	X	X	X
11	INHIBIT LOAD - Condenser Pressure High 1	1,2,9,10		X[5]	X[3]	X	X	X
12	INHIBIT LOAD - Condenser Pressure High 2	1,2,9,10		X[5]	X[3]	X	X	X
13	INHIBIT LOAD - Condenser Pressure High 3	1,2,9,10					X[2]	
15	UNLOAD - Condenser Pressure High	1,2,9,10		X	X			
16	UNLOAD - Condenser Pressure High 1	1,2,3,4,9,10		X[5]	X[3]	X	X	X
17	UNLOAD - Condenser Pressure High 2	1,2,3,4,9,10		X[5]	X[3]	X	X	X
18	UNLOAD - Condenser Pressure High 3	1,2,9,10					X[2]	
20	CONDENSER PUMP ON - Condenser Water Freeze Protection 1	1,2,3,4,9	X			X		
21	CONDENSER PUMP ON - Condenser Water Freeze Protection 2	1,2,3,4,9	X			X		
24	PUMP 2 START ATTEMPTED - Condenser Pump 1 Failure	1,2,3,4,9	X					
25	PUMP 1 START ATTEMPTED - Condenser Pump 2 Failure	1,2,3,4,9	X					
26	LOAD - Discharge Temperature High 1	1,2,3,4,9	X					
27	LOAD - Discharge Temperature High 2	1,2,3,4,9	X					
30	NO EWT RESET - Entering Evaporator Temperature Sensor Failure	1,2,3,4,9	X					
31	INHIBIT LOAD - Evaporator Pressure Low	1,2,3,4,9,10		X[6]	X[4]			
32	INHIBIT LOAD - Evaporator Pressure Low 1	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
33	INHIBIT LOAD - Evaporator Pressure Low 2	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
34	INHIBIT LOAD - Evaporator Pressure Low 3	1,2,9,10					X[2]	
36	UNLOAD - Evaporator Pressure Low	1,2,3,4,9,10		X[6]	X[4]			
37	UNLOAD - Evaporator Pressure Low 1	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
38	UNLOAD - Evaporator Pressure Low 2	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
39	UNLOAD - Evaporator Pressure Low 3	1,2,9,10					X[2]	
41	UNLOAD - Compressor Motor Current High 1	1,2,3,4,9,10	X					
42	UNLOAD - Compressor Motor Current High 2	1,2,3,4,9,10	X					
43	UNLOAD - Compressor Motor Current High 3	1,2,9,10					X[2]	
45	EVAPORATOR PUMP ON - Evaporator Water Freeze Protection Comp 1	1,2,3,4,9	X					
46	EVAPORATOR PUMP ON - Evaporator Water Freeze Protection Comp 2	1,2,3,4,9	X					
49	PUMP 2 START ATTEMPTED - Evaporator Pump 1 Failure	1,2,3,4,9	X					
50	PUMP 1 START ATTEMPTED - Evaporator Pump 2 Failure	1,2,3,4,9	X					

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3. ACZ Dual Circuit chiller only
4. ACZ Single Circuit chiller only
5. AGZ Dual Circuit chiller only
6. AGZ Single Circuit chiller only
7. Event Values are supported by the ConfirmedEventNotification feature. The values shown for each alarm correspond to the instance number of an object in the BACnet Communication Module that displays its present value in this field of the Event Notification message

Table 16: BACnet Fault Alarms

Point Name	Object Type/ Instance	Read/Write Access	BACnet Object Name	Range (In Units)	Description
Analog Input Object	AI:901	R	AIFaultAlarm	NA	Indicates the index number of Fault alarms. If the present value is zero, no alarm has occurred.
Multi-state Input Object	MSI:901	R	MSIFaultAlarm	Enumerated	Indicates the index number of Fault Alarms in the Present Value property If the Present Value is zero, no alarm has occurred.
				30 characters max	Indicates the text of the alarm message in the State Text property.

Fault Alarm Number	Description	Event Values[9]	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
52	COMPRESSOR SHUTDOWN - Outside Air Temperature Sensor Fault	1,2,3,4,9,10		X	X	X	X	X
53	COMPRESSOR SHUTDOWN - Current Overload Trip 1	1,2,3,4,9,10	X				X	X
54	COMPRESSOR SHUTDOWN - Current Overload Trip 2	1,2,3,4,9,10	X				X	X
55	COMPRESSOR SHUTDOWN - Current Overload Trip 3	1,2,9,10					X[2]	
57	COMPRESSOR SHUTDOWN - Motor Current Imbalance 1	1,2,9,10	X				X	X
58	COMPRESSOR SHUTDOWN - Motor Current Imbalance 2	1,2,9,10	X				X	X
61	COMPRESSOR SHUTDOWN - Low Motor Current 1	1,2,9,10	X					
62	COMPRESSOR SHUTDOWN - Low Motor Current 2	1,2,9,10	X					
65	UNIT SHUTDOWN - Motor Protector Trip	1,2,3,4,9,10		X[6]	X[4]			
66	COMPRESSOR SHUTDOWN - Motor Protector Trip 1	1,2,3,4,9,10		X[5]	X[3]	X		
67	COMPRESSOR SHUTDOWN - Motor Protector Trip 2	1,2,3,4,9,10		X[5]	X[3]	X		
68	COMPRESSOR SHUTDOWN - Motor Temperature High 1	1,2,3,4,9,10	X				X	X
69	COMPRESSOR SHUTDOWN - Motor Temperature High 2	1,2,3,4,9,10	X				X	X
70	COMPRESSOR SHUTDOWN - Motor Temperature High 3	1,2,9,10					X[2]	
72	COMPRESSOR SHUTDOWN - Phase Loss 1	1,2,3,4,9,10	X[7]	X[5]	X[3]	X	X[1]	X
73	COMPRESSOR SHUTDOWN - Phase Loss 2	1,2,3,4,9,10	X[7]	X[5]	X[3]	X	X[1]	X
74	COMPRESSOR SHUTDOWN - Phase Loss 3	1,2,9,10					X[2]	
76	COMPRESSOR SHUTDOWN - Phase Reversal 1	1,2,3,4,9,10	X[7]				X[1]	X
77	COMPRESSOR SHUTDOWN - Phase Reversal 2	1,2,3,4,9,10	X[7]				X[1]	X
78	COMPRESSOR SHUTDOWN - Phase Reversal 3	1,2,9,10					X[2]	
80	COMPRESSOR SHUTDOWN - Overvoltage 1	1,2,3,4,9,10	X[7]				X[1]	X
81	COMPRESSOR SHUTDOWN - Overvoltage 2	1,2,3,4,9,10	X[7]				X[1]	X
82	COMPRESSOR SHUTDOWN - Overvoltage 3	1,2,9,10					X[2]	
84	COMPRESSOR SHUTDOWN - Undervoltage 1	1,2,3,4,9,10	X[7]				X	X
85	COMPRESSOR SHUTDOWN - Undervoltage 2	1,2,3,4,9,10	X[7]				X	X
86	COMPRESSOR SHUTDOWN - Undervoltage 3	1,2,9,10					X[2]	
88	COMPRESSOR SHUTDOWN - Condenser Pressure Sensor Fault	1,2,3,4,9,10		X[6]	X[4]			
89	COMPRESSOR SHUTDOWN - Condenser Pressure Sensor Fault 1	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
90	COMPRESSOR SHUTDOWN - Condenser Pressure Sensor Fault 2	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
91	COMPRESSOR SHUTDOWN - Condenser Pressure Sensor Fault 3	1,2,9,10					X[2]	
93	COMPRESSOR SHUTDOWN - Condenser Water Flow Loss	1,2,3,4,9	X			X		
94	COMPRESSOR SHUTDOWN - Condenser Pressure High	1,2,3,4,9,10	X	X[6]	X[4]			
95	COMPRESSOR SHUTDOWN - Condenser Pressure High 1	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
96	COMPRESSOR SHUTDOWN - Condenser Pressure High 2	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
97	COMPRESSOR SHUTDOWN - Condenser Pressure High 3	1,2,9,10					X[2]	
99	COMPRESSOR OFF - Current High with Compressor OFF 1	1,2,3,4,9	X					

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3. ACZ Dual Circuit chiller only
4. ACZ Single Circuit chiller only
5. AGZ Dual Circuit chiller only
6. AGZ Single Circuit chiller only
7. Solid State Starter option required. Not available on WMC chiller
8. WMC chiller only
9. Event Values are supported by the ConfirmedEventNotification feature. The values shown for each alarm correspond to the instance number of an object in the BACnet Communication Module that displays its present value in this field of the Event Notification message

Fault Alarm Number	Description	Event Values[9]	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
100	COMPRESSOR OFF - Current High with Compressor OFF 2	1,2,3,4,9	X					
103	COMPRESSOR SHUTDOWN - Discharge Temperature Sensor Fault 1	1,2,3,4,9,10	X				X	X
104	COMPRESSOR SHUTDOWN - Discharge Temperature Sensor Fault 2	1,2,3,4,9,10	X				X	X
105	COMPRESSOR SHUTDOWN - Discharge Temperature Sensor Fault 3	1,2,9,10					X[2]	
107	COMPRESSOR SHUTDOWN - Discharge Temperature High 1	1,2,3,4,9,10	X				X	X
108	COMPRESSOR SHUTDOWN - Discharge Temperature High 2	1,2,3,4,9,10	X				X	X
109	COMPRESSOR SHUTDOWN - Discharge Temperature High 3	1,2,9,10					X[2]	
111	COMPRESSOR SHUTDOWN - Condenser Entering Water Temperature Sensor Fault	1,2,3,4,9,10				X		X
112	COMPRESSOR SHUTDOWN - Evaporator Water Flow Loss	1,2,3,4,9,10	X	X	X	X	X	X
113	COMPRESSOR SHUTDOWN - Evaporator Leaving Water Temperature Low (Freeze)	1,2,3,4,9,10		X		X	X	X
114	COMPRESSOR SHUTDOWN - Evaporator Pressure Low	1,2,3,4,9,10		X[6]	X[4]			
115	COMPRESSOR SHUTDOWN - Evaporator Pressure Low 1	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
116	COMPRESSOR SHUTDOWN - Evaporator Pressure Low 2	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
117	COMPRESSOR SHUTDOWN - Evaporator Pressure Low 3	1,2,9,10					X[2]	
119	COMPRESSOR SHUTDOWN - Evaporator Pressure Sensor Fault	1,2,3,4,9,10		X[6]	X[4]			
120	COMPRESSOR SHUTDOWN - Evaporator Pressure Sensor Fault 1	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
121	COMPRESSOR SHUTDOWN - Evaporator Pressure Sensor Fault 2	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
122	COMPRESSOR SHUTDOWN - Evaporator Pressure Sensor Fault 3	1,2,9,10					X[2]	
124	COMPRESSOR SHUTDOWN - Ground Fault Trip 1	1,2,3,4,9,10	X[7]	X[6]		X	X[1]	X
125	COMPRESSOR SHUTDOWN - Ground Fault Trip 2	1,2,3,4,9,10	X[7]	X[6]		X	X[1]	X
126	COMPRESSOR SHUTDOWN - Ground Fault Trip 3	1,2,9,10					X[2]	
128	COMPRESSOR SHUTDOWN - Lift Pressure Low 1	1,2,9,10					X	X
129	COMPRESSOR SHUTDOWN - Lift Pressure Low 2	1,2,9,10					X	X
130	COMPRESSOR SHUTDOWN - Lift Pressure Low 3	1,2,9,10					X[2]	
132	COMPRESSOR SHUTDOWN - Liquid Line Pressure Sensor Fault 1	1,2,9,10					X	
133	COMPRESSOR SHUTDOWN - Liquid Line Pressure Sensor Fault 2	1,2,9,10					X	
134	COMPRESSOR SHUTDOWN - Liquid Line Pressure Sensor Fault 3	1,2,9,10					X[2]	
136	COMPRESSOR SHUTDOWN - Liquid Line Temperature Sensor Fault 1	1,2,9,10					X	
137	COMPRESSOR SHUTDOWN - Liquid Line Temperature Sensor Fault 2	1,2,9,10					X	
138	COMPRESSOR SHUTDOWN - Liquid Line Temperature Sensor Fault 3	1,2,9,10					X[2]	
140	UNIT LOCKOUT - Number of Allowed Re-Starts Exceeded	1,2,9,10		X[6]	X[4]			
141	COMPRESSOR LOCKOUT - Number of Allowed Re-Starts Exceeded 1	1,2,3,4,9,10		X[5]	X[3]	X	X	X
142	COMPRESSOR LOCKOUT - Number of Allowed Re-Starts Exceeded 2	1,2,3,4,9,10		X[5]	X[3]	X	X	X
143	COMPRESSOR LOCKOUT - Number of Allowed Re-Starts Exceeded 3	1,2,9,10					X[2]	
145	COMPRESSOR SHUTDOWN - Evaporator Leaving Water Temperature Sensor Fault	1,2,3,4,9,10		X		X	X	X
146	COMPRESSOR SHUTDOWN - Evaporator Leaving Water Temperature Sensor Fault 1	1,2,3,4,9	X					
147	COMPRESSOR SHUTDOWN - Evaporator Leaving Water Temperature Sensor Fault 2	1,2,3,4,9	X					

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3. ACZ Dual Circuit chiller only
4. ACZ Single Circuit chiller only
5. AGZ Dual Circuit chiller only
6. AGZ Single Circuit chiller only
7. Solid State Starter option required. Not available on WMC chiller
8. WMC chiller only
9. Event Values are supported by the ConfirmedEventNotification feature. The values shown for each alarm correspond to the instance number of an object in the BACnet Communication Module that displays its present value in this field of the Event Notification message

Fault Alarm Number	Description	Event Values[9]	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
150	UNIT STOP - Mechanical High Pressure Trip	1,2,9,10		X[6]	X[4]			
151	COMPRESSOR SHUTDOWN - Mechanical High Pressure Trip 1	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
152	COMPRESSOR SHUTDOWN - Mechanical High Pressure Trip 2	1,2,3,4,9,10	X	X[5]	X[3]	X	X	X
153	COMPRESSOR SHUTDOWN - Mechanical High Pressure Trip 3	1,2,9,10					X[2]	
155	COMPRESSOR SHUTDOWN - Oil Net Pressure Low 1	1,2,3,4,9	X					
156	COMPRESSOR SHUTDOWN - Oil Net Pressure Low 2	1,2,3,4,9	X					
159	COMPRESSOR SHUTDOWN - Oil Feed Temperature High 1	1,2,3,4,9	X					
160	COMPRESSOR SHUTDOWN - Oil Feed Temperature High 2	1,2,3,4,9	X					
163	COMPRESSOR SHUTDOWN - Oil Feed Temperature Low 1	1,2,3,4,9	X					
164	COMPRESSOR SHUTDOWN - Oil Feed Temperature Low 2	1,2,3,4,9	X					
167	COMPRESSOR SHUTDOWN - Oil Feed Temperature Sensor Fault 1	1,2,3,4,9	X					
168	COMPRESSOR SHUTDOWN - Oil Feed Temperature Sensor Fault 2	1,2,3,4,9	X					
171	COMPRESSOR SHUTDOWN - Oil Level Low 1	1,2,9,10					X	X
172	COMPRESSOR SHUTDOWN - Oil Level Low 2	1,2,9,10					X	X
173	COMPRESSOR SHUTDOWN - Oil Level Low 3	1,2,9,10					X[2]	
175	COMPRESSOR SHUTDOWN - Oil Filter Delta Pressure High 1	1,2,9,10					X	X
176	COMPRESSOR SHUTDOWN - Oil Filter Delta Pressure High 2	1,2,9,10					X	X
177	COMPRESSOR SHUTDOWN - Oil Filter Delta Pressure High 3	1,2,9,10					X[2]	
179	COMPRESSOR SHUTDOWN - Oil Feed Pressure Sensor Fault 1	1,2,3,4,9	X					
180	COMPRESSOR SHUTDOWN - Oil Feed Pressure Sensor Fault 2	1,2,3,4,9	X					
183	COMPRESSOR SHUTDOWN - Oil Sump Pressure Sensor Fault 1	1,2,3,4,9	X					
184	COMPRESSOR SHUTDOWN - Oil Sump Pressure Sensor Fault 2	1,2,3,4,9	X					
187	COMPRESSOR SHUTDOWN - Oil Sump Temperature Sensor Fault 1	1,2,3,4,9	X					
188	COMPRESSOR SHUTDOWN - Oil Sump Temperature Sensor Fault 2	1,2,3,4,9	X					
191	SHUTDOWN - Phase Voltage Protection	1,2,3,4,9		X[6]	X[4]			
192	COMPRESSOR SHUTDOWN - Starter Fault Compressor 1	1,2,3,4,9,10	X	X			X	X
193	COMPRESSOR SHUTDOWN - Starter Fault Compressor 2	1,2,3,4,9,10	X	X			X	X
194	COMPRESSOR SHUTDOWN - Starter Fault Compressor 3	1,2,9,10					X[2]	
196	COMPRESSOR SHUTDOWN - No Starter Transition 1	1,2,3,4,9	X				X[1]	
197	COMPRESSOR SHUTDOWN - No Starter Transition 2	1,2,3,4,9	X				X[1]	
200	COMPRESSOR START ABORT - Oil Pressure Low 1	1,2,3,4,9	X					
201	COMPRESSOR START ABORT - Oil Pressure Low 2	1,2,3,4,9	X					
204	COMPRESSOR SHUTDOWN - Subcooling Low 1	1,2,9,10					X	X
205	COMPRESSOR SHUTDOWN - Subcooling Low 2	1,2,9,10					X	X
206	COMPRESSOR SHUTDOWN - Subcooling Low 3	1,2,9,10					X[2]	
208	COMPRESSOR SHUTDOWN - Surge Suction Superheat High-Running 1	1,2,3,4,9	X					
209	COMPRESSOR SHUTDOWN - Surge Suction Superheat High-Running 2	1,2,3,4,9	X					
212	COMPRESSOR SHUTDOWN - Surge Suction Superheat High-Starting 1	1,2,3,4,9	X					
213	COMPRESSOR SHUTDOWN - Surge Suction Superheat High-Starting 2	1,2,3,4,9	X					
216	COMPRESSOR SHUTDOWN - Suction Temperature Sensor Fault 1	1,2,3,4,9,10	X				X	X
217	COMPRESSOR SHUTDOWN - Suction Temperature Sensor Fault 2	1,2,3,4,9,10	X				X	X
218	COMPRESSOR SHUTDOWN - Suction Temperature Sensor Fault 3	1,2,9,10					X[2]	

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3. ACZ Dual Circuit chiller only
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5. AGZ Dual Circuit chiller only
6. AGZ Single Circuit chiller only
7. Solid State Starter option required. Not available on WMC chiller
8. WMC chiller only
9. Event Values are supported by the ConfirmedEventNotification feature. The values shown for each alarm correspond to the instance number of an object in the BACnet Communication Module that displays its present value in this field of the Event Notification message

Fault Alarm Number	Description	Event Values[9]	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
220	COMPRESSOR START ABORT - Vanes Open OR No Start – Interlock Switch 1	1,2,3,4,9	X					
221	COMPRESSOR START ABORT - Vanes Open OR No Start – Interlock Switch 2	1,2,3,4,9	X					
224	COMPRESSOR SHUTDOWN - (Check Chiller Display for Cause)	1,2,3,4,9,10	X				X	X
225	C-Stop - General Comp Fault 1	1,2,3,4,9,10	X[8]					
226	C-Stop - General Comp Fault 2	1,2,3,4,9,10	X[8]					
227	C-Stop - Communication Fault 1	1,2,3,4,9,10	X[8]					
228	C-Stop - Communication Fault 2	1,2,3,4,9,10	X[8]					
229	C-Stop - Interlock Fault 1	1,2,3,4,9,10	X[8]					
230	C-Stop - Interlock Fault 2	1,2,3,4,9,10	X[8]					
231	C-Stop - Bearing Fault 1	1,2,3,4,9,10	X[8]					
232	C-Stop - Bearing Fault 2	1,2,3,4,9,10	X[8]					
233	C-Stop - Motor Fault 1	1,2,3,4,9,10	X[8]					
234	C-Stop - Motor Fault 2	1,2,3,4,9,10	X[8]					
235	C-Stop - Drive Fault 1	1,2,3,4,9,10	X[8]					
236	C-Stop - Drive Fault 2	1,2,3,4,9,10	X[8]					
237	C-Stop - Internal Control Err 1	1,2,3,4,9,10	X[8]					
238	C-Stop - Internal Control Err 2	1,2,3,4,9,10	X[8]					
240	U-Stop - Check Valve Fault 1	1,2,3,4,9,10	X[8]					
241	U-Stop - Check Valve Fault 2	1,2,3,4,9,10	X[8]					
242	U-Stop - LB Valve Fault 1	1,2,3,4,9,10	X[8]					
243	U-Stop - LB Valve Fault 2	1,2,3,4,9,10	X[8]					

1. AGS C Vintage chiller only (two circuits only)
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3. ACZ Dual Circuit chiller only
4. ACZ Single Circuit chiller only
5. AGZ Dual Circuit chiller only
6. AGZ Single Circuit chiller only
7. Solid State Starter option required. Not available on WMC chiller
8. WMC chiller only
9. Event Values are supported by the ConfirmedEventNotification feature. The values shown for each alarm correspond to the instance number of an object in the BACnet Communication Module that displays its present value in this field of the Event Notification message

LONWORKS Alarm Management

LONWORKS Alarm Monitoring

Two LONWORKS network variables indicate alarm conditions. The Chiller Status network output variable, nvoChillerStat, indicates that the unit controller is in alarm, but it does not identify the alarm condition. See Table 10 - Chiller Status. The Current Alarm network output variable, nvoAlarmDescr, indicates the alarm condition. See Table 10- Current Alarm.

LONWORKS Alarm Clearing

Use Network Clear Alarm, nviClearAlarm, to clear alarms by setting the state property to 1. The value property of nviClearAlarm is not usednviClearAlarm cannot clear all alarms in the Fault category (alarms that shut down the chiller). The following alarms can be cleared at the chiller but not over the network:

- Low Evaporator Pressure
- High Condenser Pressure (by pressure sensor)
- High Condenser Pressure (by pressure switch)
- Low Oil Pressure
- Freeze Protection
- High Motor Temperature

NOTE: The above list pertains only to centrifugal chillers. Flow Loss is the only alarm that can be cleared remotely on all other chillers.

LONWORKS Alarm Messages

Table 17 identifies each alarm, class, the alarm text, and indicates system parameters at the time of the alarm.

TABLE 17: LONWORKS Alarm Messages

Number	Alarm Description	Alarm Message	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
0	(reserved)							
1	Entering Condenser Water Temperature Sensor Fault	WARN - Ent Cond Temp Sensor Fail	X					
2	Entering Evaporator Water Temperature Sensor Fault	WARN - Ent Evap Temp Sensor Fail	X			X	X	X
3	Liquid Line Refrigerant Temperature Sensor Fault	WARN - Liq Line Temp Sensor Fail	X			X		
4	Leaving Condenser Water Temperature Sensor Fault	WARN - Lvg Cond Temp Sensor Fail	X			X	X	X
5	Repower After Power Loss 1	WARN - Pwr Loss While Running 1					X	X
6	Repower After Power Loss 2	WARN - Pwr Loss While Running 2					X	X
7	Repower After Power Loss 3	WARN - Pwr Loss While Running 3					X[2]	
9	Expansion Alarm - WARNING	WARNING (Check Unit for Detail)				X	X	
10	Low Ambient Temperature Lockout	NO START - Ambient Temp Low		X	X	X	X	X
11	High Condenser Pressure - Inhibit Loading Circuit 1	NO LOAD - Cond Press High 1		X[5]	X[3]	X	X	X
12	High Condenser Pressure - Inhibit Loading Circuit 2	NO LOAD - Cond Press High 2		X[5]	X[3]	X	X	X
13	High Condenser Pressure - Inhibit Loading Circuit 3	NO LOAD - Cond Press High 3					X[2]	
15	High Condenser Pressure - Unload	UNLOAD - Cond Press High		X[6]	X[4]			
16	High Condenser Pressure - Unload Circuit 1	UNLOAD - Cond Press High 1		X[5]	X[3]	X	X	X
17	High Condenser Pressure - Unload Circuit 2	UNLOAD - Cond Press High 2		X[5]	X[3]	X	X	X
18	High Condenser Pressure - Unload Circuit 3	UNLOAD - Cond Press High 3					X[2]	
20	Condenser Water Freeze Protect Comp 1	PUMP ON - Cond Water Freeze 1	X					
21	Condenser Water Freeze Protect Comp 2	PUMP ON - Cond Water Freeze 2	X					
22	Condenser Pump 1 Fault	PUMP 2 ON - Cond Pump Fail 1	X					
23	Condenser Pump 2 Fault	PUMP 1 ON - Cond Pump Fail 2	X					
24	High Discharge Temperature Comp 1	LOAD - Discharge Temp High 1	X					

1. AGS C Vintage chillers only (two circuits only)
2. AGS B Vintage chillers only (up to three circuits)
3. ACZ Dual Circuit chillers only
4. ACZ Single Circuit chillers only
5. AGZ Dual Circuit chillers only
6. AGZ Single Circuit chillers only
7. Solid State Starter option required. Not available on WMC chillers
8. Should be “No Start - Interlock Switch” on WMC chillers

Number	Alarm Description	Alarm Message	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
25	High Discharge Temperature Comp 2	LOAD - Discharge Temp High 2	X					
26	Entering Evap Temperature Sensor Fault (EWT Reset Active)	NO RESET - Evap EWT Sensor Fail	X					
27	Low Evaporator Pressure - Inhibit Loading	NO LOAD - Evap Press Low		X[6]	X[4]			
30	Low Evaporator Pressure - Inhibit Loading Circuit 1	NO LOAD - Evap Press Low 1	X	X[5]	X[3]	X	X	X
31	Low Evaporator Pressure - Inhibit Loading Circuit 2	NO LOAD - Evap Press Low 2	X	X[5]	X[3]	X	X	X
32	Low Evaporator Pressure - Inhibit Loading Circuit 3	NO LOAD - Evap Press Low 3					X[2]	
34	Low Evaporator Pressure - Unload	UNLOAD - Evap Press Low		X[6]	X[4]			
35	Low Evaporator Pressure - Unload Circuit 1	UNLOAD - Evap Press Low 1	X	X[5]	X[3]	X	X	X
36	Low Evaporator Pressure - Unload Circuit 2	UNLOAD - Evap Press Low 2	X	X[5]	X[3]	X	X	X
37	Low Evaporator Pressure - Unload Circuit 3	UNLOAD - Evap Press Low 3					X[2]	
39	High Motor Current On Compressor 1	UNLOAD - Comp Current High 1	X					
40	High Motor Current On Compressor 2	UNLOAD - Comp Current High 2	X					
44	Evaporator Freeze Protect Comp 1	PUMP ON - Evap Water Freeze 1	X					
45	Evaporator Freeze Protect Comp 2	PUMP ON - Evap Water Freeze 2	X					
46	Evaporator Pump 1 Fault	START 2 - Evap Pump Fail 1	X					
47	Evaporator Pump 2 Fault	START 1 - Evap Pump Fail 2	X					
49	Outside Ambient Temperature Sensor Fault	UNIT STOP - AmbAirTempSensorFail		X	X	X	X	X
50	Compressor Current Overload Trip 1	COMP STOP - Current Overload 1	X				X	X
51	Compressor Current Overload Trip 2	COMP STOP - Current Overload 2	X				X	X
52	Motor Current Imbalance On Compressor 1	COMP STOP - Current Imbalance 1	X					X
53	Motor Current Imbalance On Compressor 2	COMP STOP - Current Imbalance 2	X					X
54	Low Motor Current Comp 1	COMP STOP - Current Low 1	X					X
55	Low Motor Current Comp 2	COMP STOP - Current Low 2	X					X
56	Motor Protection	UNIT STOP - Comp Motor Protector		X[6]	X[4]			
57	Motor Protection Circuit 1	COMP STOP - Motor Protection 1		X[5]	X[3]	X		
58	Motor Protection Circuit 2	COMP STOP - Motor Protection 2		X[5]	X[3]	X		
59	High Motor Temperature Comp 1	COMP STOP - Motor Temp High 1	X				X[1]	X
60	High Motor Temperature Comp 2	COMP STOP - Motor Temp High 2	X				X[1]	X
61	High Motor Temperature Comp 3	COMP STOP - Motor Temp High 3	X	X	X	X	X	X
63	Phase Loss At Compressor 1	COMP STOP - Phase Loss 1	X[7]	X[5]	X[3]			X
64	Phase Loss At Compressor 2	COMP STOP - Phase Loss 2	X[7]	X[5]	X[3]			X
65	Phase Reversal At Compressor 1	COMP STOP - Phase Reversal 1	X[7]					X
66	Phase Reversal At Compressor 2	COMP STOP - Phase Reversal 2	X[7]					X
67	Overvoltage On Compressor 1	COMP STOP - Voltage High 1	X[7]					X
68	Overvoltage On Compressor 2	COMP STOP - Voltage High 2	X[7]					X
69	Undervoltage On Compressor 1	COMP STOP - Voltage Low 1	X[7]					X
70	Undervoltage On Compressor 2	COMP STOP - Voltage Low 2	X[7]					X
71	Condenser Pressure Sensor Fault	COMP STOP - CondPressSensFail		X[6]	X[4]			
72	Condenser Pressure Sensor Fault Circuit 1	COMP STOP - CondPressSensFail 1	X	X[5]	X[3]	X	X	X
73	Condenser Pressure Sensor Fault Circuit 2	COMP STOP - CondPressSensFail 2	X	X[5]	X[3]	X	X	X
74	Condenser Pressure Sensor Fault Circuit 3	COMP STOP - CondPressSensFail 3					X[2]	
76	No Condenser Water Flow	COMP STOP - Cond Water Flow Loss	X			X		X
77	High Condenser Pressure	COMP STOP - Cond Press High		X[6]	X[4]			
78	High Condenser Pressure Circuit 1	COMP STOP - Cond Press High 1	X	X[5]	X[3]	X	X	X
79	High Condenser Pressure Circuit 2	COMP STOP - Cond Press High 2	X	X[5]	X[3]	X	X	X
80	High Condenser Pressure Circuit 3	COMP STOP - Cond Press High 3					X[2]	
82	No Compressor Stop Comp 1	STOP Current High w/Comp Off 1	X					
83	No Compressor Stop Comp 2	STOP Current High w/Comp Off 2	X					
84	Discharge Temperature Sensor Fault Circuit 1	COMP STOP - DischTempSensFail 1	X	X	X	X	X	X

1. AGS C Vintage chillers only (two circuits only)
2. AGS B Vintage chillers only (up to three circuits)
3. ACZ Dual Circuit chillers only
4. ACZ Single Circuit chillers only
5. AGZ Dual Circuit chillers only
6. AGZ Single Circuit chillers only
7. Solid State Starter option required. Not available on WMC chillers
8. Should be “No Start - Interlock Switch” on WMC chillers

Number	Alarm Description	Alarm Message	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
85	Discharge Temperature Sensor Fault Circuit 2	COMP STOP - DischTempSensFail 2	X	X	X	X	X	X
86	Discharge Temperature Sensor Fault Circuit 3	COMP STOP - DischTempSensFail 3					X[2]	
88	High Discharge Temperature Circuit 1	COMP STOP - DischargeTempHigh 1	X					X
89	High Discharge Temperature Circuit 2	COMP STOP - DischargeTempHigh 2	X					X
90	High Discharge Temperature Circuit 3	COMP STOP - DischargeTempHigh 3					X[2]	
92	Entering Condenser Water Temperature Sensor Fault	COMP STOP - EntCondTempSensFail	X	X	X	X	X	X
93	No Evaporator Water Flow	COMP STOP - Evap Water Flow Loss	X	X	X	X	X	X
94	Evaporator Water Freeze Protect	COMP STOP - Evap Water Freeze				X	X	X
95	Low Evaporator Pressure	COMP STOP - Evap Press Low		X[6]	X[4]			
96	Low Evaporator Pressure Circuit 1	COMP STOP - Evap Press Low 1	X	X[5]	X[3]	X	X	X
97	Low Evaporator Pressure Circuit 2	COMP STOP - Evap Press Low 2	X	X[5]	X[3]	X	X	X
98	Low Evaporator Pressure Circuit 3	COMP STOP - Evap Press Low 3					X[2]	
100	Evaporator Pressure Sensor Fault	UNIT STOP - EvapPressSensor Fail		X[6]	X[4]			
101	Evaporator Pressure Sensor Fault Circuit 1	COMP STOP - EvapPressSensFail 1	X	X[5]	X[3]	X	X	X
102	Evaporator Pressure Sensor Fault Circuit 2	COMP STOP - EvapPressSensFail 2	X	X[5]	X[3]	X	X	X
103	Evaporator Pressure Sensor Fault Circuit 3	COMP STOP - EvapPressSensFail 3					X[2]	
105	Ground Fault Protection 1	COMP STOP - Ground Fault Trip 1	X[7]	X[6]		X	X[1]	X
106	Ground Fault Protection 2	COMP STOP - Ground Fault Trip 2	X[7]	X[6]		X	X[1]	X
107	Ground Fault Protection 3	COMP STOP - Ground Fault Trip 3					X[2]	
109	Below Minimum Lift Pressure Circuit 1	COMP STOP - Lift Pressure Low 1					X	X
110	Below Minimum Lift Pressure Circuit 2	COMP STOP - Lift Pressure Low 2					X	X
111	Below Minimum Lift Pressure Circuit 3	COMP STOP - Lift Pressure Low 3					X	
112	Below Minimum Lift Pressure Circuit 4	COMP STOP - Lift Pressure Low 4					X	
113	Liquid Line Pressure Sensor Fault Circuit 1	COMP STOP - LiqLPressSensFail 1		X	X	X	X	
114	Liquid Line Pressure Sensor Fault Circuit 2	COMP STOP - LiqLPressSensFail 2		X	X	X	X	
115	Liquid Line Pressure Sensor Fault Circuit 3	COMP STOP - LiqLPressSensFail 3					X[2]	
117	Liquid Line Refrigerant Temperature Sensor Fault Circuit 1	COMP STOP - LiqLTempSens Fail 1					X	
118	Liquid Line Refrigerant Temperature Sensor Fault Circuit 2	COMP STOP - LiqLTempSens Fail 2					X	
119	Liquid Line Refrigerant Temperature Sensor Fault Circuit 3	COMP STOP - LiqLTempSens Fail 3					X[2]	
121	Re-Start Fault	UNIT LOCKOUT - Re-Start Fault		X[6]	X[4]			
122	Re-Start Fault Circuit 1	COMP LOCKOUT - Re-Start Fault 1		X[5]	X[3]	X	X[1]	X
123	Re-Start Fault Circuit 2	COMP LOCKOUT - Re-Start Fault 2		X[5]	X[3]	X	X[1]	X
124	Re-Start Fault Circuit 3	COMP LOCKOUT - Re-Start Fault 3		X[5]	X[3]	X	X[1]	X
126	Leaving Evaporator Water Temperature Sensor Fault	UNIT STOP - Evap LWT Sensor Fail		X	X	X	X	X
127	Leaving Evaporator Water Temperature Sensor Fault Comp 1	COMP STOP - EvapLWT SensFail 1	X					
128	Leaving Evaporator Water Temperature Sensor Fault Comp 2	COMP STOP - EvapLWT SensFail 2	X					
129	Mechanical High Pressure	UNIT STOP - Mech High Press Trip		X[6]	X[4]			
130	Mechanical High Pressure Circuit 1	COMP STOP - MechHighPressTrip 1	X	X[5]	X[3]	X	X	X
131	Mechanical High Pressure Circuit 2	COMP STOP - MechHighPressTrip 2	X	X[5]	X[3]	X	X	X
132	Mechanical High Pressure Circuit 3	COMP STOP - MechHighPressTrip 3					X[2]	
134	Low Oil Net Pressure Comp 1	COMP STOP - Oil Net Press Low 1	X					
135	Low Oil Net Pressure Comp 2	COMP STOP - Oil Net Press Low 2	X					
136	High Oil Feed Temperature Comp 1	COMP STOP - Oil Feed Temp High 1	X					
137	High Oil Feed Temperature Comp 2	COMP STOP - Oil Feed Temp High 2	X					
138	Low Oil Feed Temperature Comp 1	COMP STOP - Oil Feed Temp Low 1	X					

1. AGS C Vintage chillers only (two circuits only)
2. AGS B Vintage chillers only (up to three circuits)
3. ACZ Dual Circuit chillers only
4. ACZ Single Circuit chillers only
5. AGZ Dual Circuit chillers only
6. AGZ Single Circuit chillers only
7. Solid State Starter option required. Not available on WMC chillers
8. Should be “No Start - Interlock Switch” on WMC chillers

Number	Alarm Description	Alarm Message	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	WGZ TGZ	AGS	WGS
139	Low Oil Feed Temperature Comp 2	COMP STOP - Oil Feed Temp Low 2	X					
140	Oil Feed Temperature Sensor Fault Comp 1	COMP STOP - OilFeedTmpSensFail 1	X					
141	Oil Feed Temperature Sensor Fault Comp 2	COMP STOP - OilFeedTmpSensFail 2	X					
142	Low Oil Level Circuit 1	COMP STOP - Oil Level Low 1						X
143	Low Oil Level Circuit 2	COMP STOP - Oil Level Low 2						X
144	Low Oil Level Circuit 3	COMP STOP - Oil Level Low 3					X[2]	
146	High Oil Pressure Difference Circuit 1	COMP STOP - Oil Filter DP High 1						X
147	High Oil Pressure Difference Circuit 2	COMP STOP - Oil Filter DP High 2						X
148	High Oil Pressure Difference Circuit 3	COMP STOP - Oil Filter DP High 3					X[2]	
150	Oil Feed Pressure Sensor Fault Comp 1	COMP STOP - OilFeedPrsSensFail 1	X					
151	Oil Feed Pressure Sensor Fault Comp 2	COMP STOP - OilFeedPrsSensFail 2	X					
152	Oil Sump Pressure Sensor Fault Comp 1	COMP STOP - OilSumpPrsSensFail 1	X					
153	Oil Sump Pressure Sensor Fault Comp 2	COMP STOP - OilSumpPrsSensFail 2	X					
154	Oil Sump Temperature Sensor Fault Comp 1	COMP STOP - OilSumpTmpSensFail 1	X					
155	Oil Sump Temperature Sensor Fault Comp 2	COMP STOP - OilSumpTmpSensFail 2	X					
156	Phase Voltage Protection	UNIT STOP - Phase/Voltage Fault		X[6]	X[4]			
157	Starter Fault Compressor 1	COMP STOP - Starter Fault 1	X				X	X
158	Starter Fault Compressor 2	COMP STOP - Starter Fault 2	X				X	X
159	Starter Fault Compressor 3	COMP STOP - Starter Fault 3					X[2]	
161	No Starter Transition Comp 1	COMP STOP - NoStartrTransition 1	X				X[1]	
162	No Starter Transition Comp 2	COMP STOP - NoStartrTransition 2	X				X[1]	
163	No Oil Pressure Start Comp 1	COMP STOP - OilPressLow/Start 1	X					
164	No Oil Pressure Start Comp 2	COMP STOP - OilPressLow/Start 2	X					
165	Low Subcooling Circuit 1	COMP STOP - Subcooling Low 1					X[2]	X
166	Low Subcooling Circuit 2	COMP STOP - Subcooling Low 2					X[2]	X
167	Low Subcooling Circuit 3	COMP STOP - Subcooling Low 3					X[2]	
169	Surge High Suct SH - Running Comp 1	COMP STOP - Suct SH High/Run 1	X					
170	Surge High Suct SH - Running Comp 2	COMP STOP - Suct SH High/Run 2	X					
171	Surge High Suct SH - Starting Comp 1	COMP STOP - Suct SH High/Start 1	X					
172	Surge High Suct SH - Starting Comp 2	COMP STOP - Suct SH High/Start 2	X					
173	Suction Temperature Sensor Fault Circuit 1	COMP STOP - SuctnTmpSensorFail 1	X				X	X
174	Suction Temperature Sensor Fault Circuit 2	COMP STOP - SuctnTmpSensorFail 2	X				X	X
175	Suction Temperature Sensor Fault Circuit 3	COMP STOP - SuctnTmpSensorFail 3					X[2]	
177	Vanes Open No Start Comp 1	NO START - Vanes Open 1	X[8]					
178	Vanes Open No Start Comp 2	NO START - Vanes Open 2	X[8]					
179	Expansion Alarm - FAULT	FAULT (Check Unit for Detail)	X				X	X

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6. AGZ Single Circuit chillers only
7. Solid State Starter option required. Not available on WMC chillers
8. Should be “No Start - Interlock Switch” on WMC chillers

This section contains the Protocol Implementation Conformance Statement (PICS) for the MicroTech II Chiller Unit Controller of Daikin Applied as required by ANSI/ASHRAE Standard 135-2004, BACnet: A Data Communication Protocol for Building Automation and Control Networks.

BACnet Protocol Implementation Conformance Statement

Date:	June 2015
Vendor Name:	Daikin Applied
Product Name:	MicroTech II Chiller Unit Controller
Product Model Number:	MTII Chiller UC
Applications Software Version:	2.00
Firmware Revision:	AmBCM-16 - BmBCM-485-15g
BACnet Protocol Revision:	Version 1 Revision 4

Product Description

The MicroTech II Chiller Unit Controller with optional BACnet Communication Module is a microprocessor-based controller designed to operate Daikin Applied chillers and be integrated into BACnet building automation systems.

BACnet Standardized Device Profile

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

BACnet Interoperability Building Blocks (BIBBs) Supported

BIBB Name	Designation
Data Sharing – ReadProperty – B	DS-RP-B
Data Sharing – ReadPropertyMultiple – B	DS-RPM-B
Data Sharing – WriteProperty – B	DS-WP-B
Data Sharing – WritePropertyMultiple – B	DS-WPM-B
Alarm and Event – Notification Internal – B	AE-N-I-B
Alarm and Event – ACK – B	AE-ACK-B
Alarm and Event – Information – B	AE-INFO-B
Device Management – Dynamic Device Binding – B	DM-DDB-B
Device Management – Dynamic Object Binding – B	DM-DOB-B
Device Management – DeviceCommunicationControl – B	DM-DCC-B
Device Management – TimeSynchronization – B	DM-TS-B
Device Management – UTCTimeSynchronization – B	DM-UTC-B
Device Management – ReinitializeDevice – B	DM-RD-B
Device Management – Restart – B	DM-R-B

Standard Object Types Supported

Object-Type	Creatable	Deleteable	Optional	Writable	Proprietary
Analog Input	☐	☐	Description Reliability		Read_Only[1]
Analog Output	☐	☐	Description Reliability	Relinquish Default	Read_Only[1]
Binary Input	☐	☐	Description Reliability Inactive_Text Active_Text		Read_Only[1]
Binary Value	☐	☐	Description Reliability Inactive_Text Active_Text Priority Array Relinquish Default Profile_Name	Present Value Relinquish Default	Read_Only[1]
Device	☐	☐	Description Location Local_Time Local_Date UTC_Offset Daylight_Savings_Status Max_Master Max_Info_Frames	Location	
Multi-state Input	☐	☐	Description Reliability State_Text		Read_Only[1]
Multi-state Output	☐	☐	Description Reliability State_Text	Relinquish Default	Read_Only[1]

1. Read_Ony is a read only proprietary property used to indicate whether the Present_Value is read-only (0), writeable but not commandable (1) or writeable and commandable (2).

Data Link Layer Options

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

Segmentation Capability

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

Device Address Binding

- ☐ Yes Static Device Binding
- ☒ No

Networking Options

- ☐ Router, Clause 6
  Routing Configurations:
- ☐ Annex H, BACnet Tunneling Router over IP
- ☐ BACnet/IP Broadcast Management Device (BBMD)

Number of BDT entries

Registrations by Foreign Devices? ☐ 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.

Non-BACnet Equipment/Network(s) Support

- ☐ Communication Gateway

Non-BACnet equipment/networks(s):

Use Table 18 to find and access network parameters via the MicroTech II Chiller Unit Controller user interface. Data points are listed alphabetically along with the path(s) to the corresponding keypad menu screen.

Table 18: Chiller Unit Controller Keypad Menu Path

Data Point	Keypad Menu Path	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	AGS	WGZ TGZ	WGS
Active Setpoint	Menu\Set\Unit SPs (3)	X	X		X	X	X
Actual Capacity	No Keypad Equivalent	X	X		X	X	X
Actual RPM	No Keypad Equivalent	X					
Alarm Digital Output	No Keypad Equivalent	X	X	X	X	X	X
Capacity Limit (LONWORKS)	No Keypad Equivalent	X	X	X	X	X	X
Capacity Limit Output	No Keypad Equivalent	X	X	X	X	X	X
Capacity Limit Setpoint	No Keypad Equivalent	X	X	X	X	X	X
Chiller Enable	Menu\Set\Unit SPs (1)	X	X	X	X	X	X
Chiller Enable (LONWORKS)	No Keypad Equivalent	X	X	X	X	X	X
Chiller Limited	No Keypad Equivalent	X	X	X	X	X	X
Chiller Local/Remote	No Keypad Equivalent	X	X	X	X	X	X
Chiller Location	No Keypad Equivalent	X	X	X	X	X	X
Chiller Mode (LONWORKS)	No Keypad Equivalent	X	X		X	X	X
Chiller Mode Output	No Keypad Equivalent	X	X		X	X	X
Chiller Mode Setpoint	Menu\Set\Unit SP (1)	X	X		X	X	X
Chiller ON OFF	Menu\View\Unit\Status	X	X	X	X	X	X
Chiller Power	No Keypad Equivalent	X					
Chiller Status BACnet	No Keypad Equivalent	X	X	X	X	X	X
Chiller Status (LONWORKS)	No Keypad Equivalent	X	X	X	X	X	X
Chiller Type	No Keypad Equivalent	X	X		X	X	X
Clear Alarm	No Keypad Equivalent	X	X		X	X	X
Compressor 2 Active Capacity Limit	No Keypad Equivalent	X					
Compressor 2 VFD Speed	No Keypad Equivalent	X					
Compressor Current	No Keypad Equivalent	X					X
Compressor Discharge Temperature	Menu\View\Comp (5)	X			X		X
Compressor Percent RLA	No Keypad Equivalent	X					X
Compressor Power	No Keypad Equivalent	X					X
Compressor Run Hours	Menu\View\Compressor	X	X	X	X	X	X
Compressor Select	No Keypad Equivalent	X	X	X	X	X	X
Compressor Starts	Menu\View\Compressor	X	X	X	X	X	X
Compressor Status	No Keypad Equivalent	X					
Compressor Suction Line Temperature	Menu\View\Unit\Refrigerant (2)	X			X	X	X
Compressor Voltage	No Keypad Equivalent	X					X
Condenser Entering Water Temperature	Menu\View\Unit\Water	X				X	X
Condenser Flow Switch Status	No Keypad Equivalent	X				X	X
Condenser Leaving Water Temperature	Menu\View\Unit Water	X				X	X
Condenser Pump Run Hours	No Keypad Equivalent	X					
Condenser Refrigerant Pressure	Menu\View\Unit\Refrigerant (1)	X	X	X	X	X	X
Condenser Saturated Refrigerant Temperature	Menu\Unit\Refrigerant (1)	X	X	X	X	X	X
Condenser Water Flow Rate	No Keypad Equivalent	X					X
Condenser Water Pump Status	No Keypad Equivalent	X				X	X
Cool Setpoint	Menu\Set\Unit SPs (3)	X	X		X	X	X
Cool Setpoint (LONWORKS)	No Keypad Equivalent	X	X		X	X	X
Current Alarm (LONWORKS)	Menu\Alarm\Active	X	X	X	X	X	X
Default Values	No Keypad Equivalent	X	X	X	X	X	X
Design RPM	No Keypad Equivalent	X					
Device Object	No Keypad Equivalent	X	X	X	X	X	X
Evaporator Entering Water Temperature	Menu\View\Unit\Water	X			X	X	X
Evaporator Flow Switch Status	No Keypad Equivalent	X	X	X	X	X	X
Evaporator Leaving Water Temperature for Unit	Menu\View\Unit Water OR	X	X		X	X	X
	Menu\View\Comp (2)						

Data Point	Keypad Menu Path	WSC WDC WPV HSC HDC TSC WMC WCC	AGZ	ACZ	AGS	WGZ TGZ	WGS
Evaporator Leaving Water Temperature for Compressor	Menu\View\Comp	X	X		X		
Evaporator Pump Run Hours	No Keypad Equivalent	X					
Evaporator Refrigerant Pressure	Menu\View\Comp (2)	X	X	X	X	X	X
Evaporator Saturated Refrigerant Temperature	Menu\Unit\Refrigerant (1)	X	X	X	X	X	X
Evaporator Water Flow Rate	No Keypad Equivalent	X					
Evaporator Water Pump Status	No Keypad Equivalent	X	X		X	X	X
Fault Alarms, Analog Input Object	No Keypad Equivalent	X	X	X	X	X	X
Fault Alarms, Multi-state Input Object	No Keypad Equivalent	X	X	X	X	X	X
Heat Recovery Entering Water Temperature	No Keypad Equivalent	X					
Heat Recovery Leaving Water Temperature	No Keypad Equivalent	X					
Heat Setpoint	Menu\Set\Unit SPs (3)	X					
Heat Setpoint (LONWORKS)	No Keypad Equivalent	X					
Ice Setpoint	Menu\Set\Unit SPs (3)	X	X		X	X	X
IGV Percentage Open	No Keypad Equivalent	X					
Inverter Temperature	No Keypad Equivalent	X					
Liquid Line Refrigerant Pressure	No Keypad Equivalent				X		
Liquid Line Refrigerant Temperature	Menu\View\Unit\Refrig (2) Liquid Line=	X			X	X	
Maximum RPM	No Keypad Equivalent	X					
Maximum Send Time	No Keypad Equivalent	X	X	X	X	X	X
Minimum RPM	No Keypad Equivalent	X					
Minimum Send Time	No Keypad Equivalent	X	X	X	X	X	X
Motor Cavity Temperature	No Keypad Equivalent	X					
Network Clear Alarm (LONWORKS)	No Keypad Equivalent	X	X		X	X	X
Oil Feed Pressure	Menu\View\Comp (3)	X					
Oil Feed Temperature	Menu\View\Comp (4)	X					
Oil Sump Pressure	No Keypad Equivalent	X					
Oil Sump Temperature	Menu\View\Comp (4)	X					
Outdoor Air Temperature	No Keypad Equivalent		X	X	X		
Power Factor	No Keypad Equivalent						
Problem Alarms, Analog Input Object	No Keypad Equivalent	X	X	X	X	X	X
Problem Alarms, Multi-state Input Object	No Keypad Equivalent	X	X	X	X	X	X
Pump Select	No Keypad Equivalent	X					
Receive Heartbeat	No Keypad Equivalent	X	X	X	X	X	X
Run Enabled	Menu	X	X	X	X	X	X
Warning Alarms, Analog Input Object	No Keypad Equivalent	X	X	X	X	X	X
Warning Alarms, Multi-state Input Object	No Keypad Equivalent	X	X	X	X	X	X

Daikin Applied Training and Development

Now that you have made an investment in modern, efficient Daikin equipment, its care should be a high priority. For training information on all Daikin HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

Warranty

All Daikin equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied representative for warranty details. To find your local Daikin Applied representative, go to www.DaikinApplied.com.

Aftermarket Services

To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

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Products manufactured in an ISO Certified Facility.