



Installation and Maintenance Manual

IM 928-8

Group: Controls

Part Number: 910387320

Date: April 2022

BACnet® MS/TP Communication Module for MicroTech® III Water Source Heat Pump Unit Controllers

Models:

GSH/GSV, GTH/GTV, GCV SmartSource® Single and Two Stage
Compressor

CCH/CCW, LVC/LVW, MHC/MHW, VFC/VFW, VHC/VHF Enfinity® Single
Stage Compressor

CCH/CCW and LVC/LVW Enfinity® Large Two Compressor



Introduction	3	Network Configuration	8
General Information	3	Unit Controller Configuration	8
Hazardous Information Messages	3	Network Addressing and Commissioning	8
Revision History	3	Addressing Method 1 - Manual	9
Reference Documents	3	Addressing Method 2 – Manual plus Serial Terminal Device	9
Notice	3	Addressing Method 3 – Auto Addressing	9
General Information	4	Addressing Method 4 – Auto Addressing using Network Variables	10
Description	4	Description of Network Variables AV412 & AV411	11
Application	4	Configuration Settings	11
Components	4	S3 Address Switch	12
Diagnostic Light Emitting Diodes (LEDs)	4	Verifying the Network Address Using the Wink Command	13
BACnet MS/TP Network Connector (P3)	4	Restoring Default Values	13
BACnet Pushbuttons	4	Service Information	14
Connection Ports	4	Troubleshooting	14
Physical Address Switch	4	Parts	14
Installation	5	Technical Support	14
8-Pin SPI Header	5	MicroTech III Software Compatibility	15
Network Transceiver	5	Appendix: BACnet Configuration Menu	16
Jumper J2	5	BACnet Configuration Menu	16
Installation and Mounting	5	BACnet Device Properties	16
Field Installation Kit	5	BACnet MS/TP Settings	16
Installing a new Communication Module	5	Accessing the BACnet Configuration Menu	16
Replacing a Communication Module	6		

This manual contains the information you need to install and configure the BACnet® communication module on the MicroTech® III WSHP unit controller. It is intended for technicians or other qualified personnel who are familiar with standard BACnet terminology and concepts. For technical support, contact the Daikin Applied Controls Support Group at (866) 462-7829.

Revision History

IM 928-8	Apr 2022	Removed references to EWT sensor and replaced with LWT, changed field kit sensor options to match IM 956. Added IM 956 to Reference Documents. Also see p.5 and Service Information, p.14. Changed part number on front cover.
IM 928-7	Oct 2020	Reformatted branding. Part number corrections and addition of Software Compatibility tables to Service Information section. Changed PN on cover to 910322282 .General usability updates.
IM 928-6	Jan 2017	Added Part Number 910196129 to front cover
IM 928-5	Feb 2016	Added transceiver electrical specs, part numbers, and formatting updates.
IM 928-4	Nov 2013	Added automatic addressing features for WSHP Enfinity® v3.0 and newer only as well as all SmartSource® models. Updated Daikin Applied logo and associated references.
IM 928-3	May 2012	Updated Table 3 for SmartSource models. Updated logo and associated references. Minor formatting changes. Added not under Fig 4 to clarify wiring requirements.
IM 928-2	Mar 2011	Added Wink command to Integration section. Removed typo from Instance Number. Added 19200 to Baud Rates. Removed references to MS/TP Network Number. Added dip switch and Important Notes information.
IM 928-1	Jul 2009	Parts list update.
IM 928	Feb 2009	Initial release.

Reference Documents

Number	Company	Title	Source
ANSI/ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers	A Data Communication Protocol for Building Automation and Control Networks	www.ashrae.org
ED 15103	Daikin Applied	MicroTech III WSHP Unit Controller Protocol Information Manual	www.DaikinApplied.com
IM 956		Temperature Sensors for Units with MicroTech III Unit Controller and LonWorks or BACnet Communication Module	
OM 931		MicroTech III WSHP Unit Controller Operation Manual	
OM 1085		MicroTech III WSHP Unit Controller Download and Configuration	
OM 1254		System Manager Operation and Maintenance Manual	
OM 1149		MicroTech III WSHP SmartSource (Series2) Unit Controller Operation and Maintenance Manual	
OM 1239		MicroTech III WSHP Enfinity Large Two Compressor Unit Controller Operation and Maintenance Manual	

Hazard Identification Messages

CAUTION

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

DANGER

Improper installation or maintenance can cause equipment damage or personal injury.

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

WARNING

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

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

NOTICE

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense. Daikin disclaims any liability resulting from any interference or for the correction thereof.

Notice

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Description

The BACnet communication module is a printed circuit board that mounts directly to the unit controller (baseboard) with four standoffs. The BACnet communication module has application software that enables the unit controller to pass parameters using the BACnet MS/TP protocol.

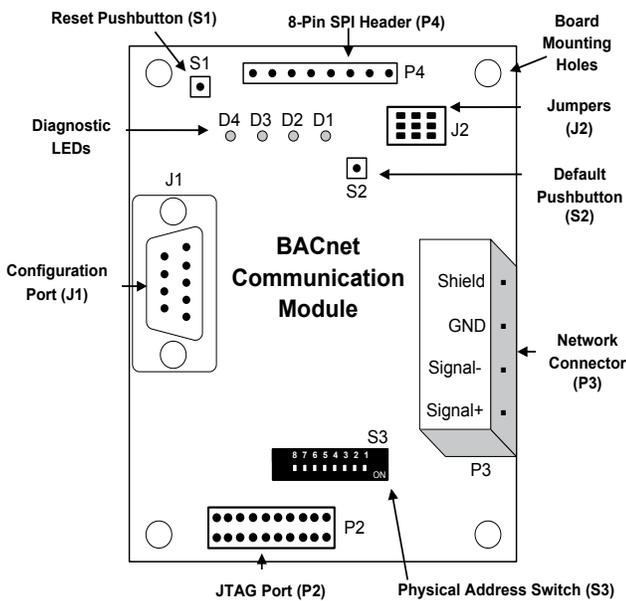
Application

The BACnet communication module enables the unit controller to pass objects between the unit controller and the network. It supports the BACnet MS/TP (EIA 485) data link layer physical layer. Refer to the applicable MicroTech III WSHP Unit Controller Operation and Maintenance manual (www.DaikinApplied.com)

Components

The following section describes the key physical components of the communication module and their functions. The communication module is a rectangular printed circuit board that plugs on the top side of the unit controller baseboard. It has four LED indicators, a network connector, two pushbuttons, a physical address switch, SPI header, jumper header, network transceiver, and connection ports. **Figure 1** shows the major components and their locations.

Figure 1: BACnet Communication Module



Diagnostic Light Emitting Diodes (LEDs)

The communication module has four LEDs to indicate communication activity and status.

LED	Function	Description
D1	Program Running	Flashes with software application main loop activity
D2	SPI Message Transmit	Flashes with SPI communications with unit controller
D3	MS/TP Transmit	Flashes when transmitting an MS/TP message
D4	MS/TP Receive	Flashes when receiving an MS/TP message

BACnet MS/TP Network Connector (P3)

The P3 connector is the 4-pin port that integrates the communication module to the BACnet network.

Pin	Designation	Function
1	+	Non-inverting signal input
2	-	Inverting signal input
3	GND	Reference used where isolated device requires a reference
4	Shield	Shield (isolated terminal for connection of shields)

BACnet Pushbuttons

The S1 and S2 pushbuttons are used to restore the communication module to previous settings or to default parameters.

Switch	Designation	Function
S1	Reset	Resets the communication module
S2	Default	Resets the communication module to default parameters

Connection Ports

The J1 and P2-P4 ports are used to configure, program, and connect the communication module to the WSHP unit controller.

Plugs	Function
J1	Configures the communication module
P2	Programs the communication module
P3	BACnet MS/TP network connection port
P4	8-pin header plug that connects the communication module to the unit controller

Physical Address Switch

The physical Address Switch, S3, is used to determine the MAC address of the communication module. Valid physical switch values are 0-127 for manual addressing and 255 for auto-addressing (See [Network Addressing and Commissioning](#)).

8-Pin SPI Header

P4 is an 8-pin serial peripheral interface (SPI) connection port on the back side of the communication module. It matches up to the 8-pin header on the WSHP unit controller.

Network Transceiver

The EIA-485 network transceiver has the following electrical specifications:

- Unit Loading: 68kΩ receiver input impedance (¼ unit load) that allows up to 128 node connections
- ESD Protection: 8kV ESD protection on driver outputs and receiver inputs
- Safety: Fail-safe feature defaults to a high output state when the receiver inputs are open or shorted

Jumper J2

Jumper J2 is used for internal development and testing purposes. It can also be used to erase the programming logic in the microprocessor. Contact the Controls Customer Support Group at 866-462-7829 prior to accessing the J2 jumper.

The communication module may already be attached to the unit controller or it can be installed and configured in the field. The following section describes how to install a new communication module or replace an existing module. It also describes how to connect the communication module to a BACnet network.

The communication module mounts on the WSHP unit controller with connector pins. It is held in place with four plastic locking standoffs. The communication module joins with the BACnet network at the connector plug, P3 (Figure 1).

Installation and Mounting

This section describes how to field install a new BACnet communication module or replace an existing module on the unit controller.

 **DANGER**

The terminals on the WSHP unit controller are high voltage. Disconnect power to avoid electrical shock potential, which will result in death or serious injury.

 **DANGER**

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment must be properly grounded. Connections and service to the unit controller must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

Field Installation Kit

The BACnet MS/TP communication module field-installed kit ships with the following items:

- BACnet MS/TP communication module
- Four plastic stand-offs
- Four-pin network connector (attached to the communication module). See Figure 3 for wiring schematic
- Flat head screwdriver
- Twisted, shielded network cable (2 or 3-wire, depending on application)
- DAT and RAT temperature sensors, LWT water temperature sensor, and one supply air temperature sensor
- Installation Manual, IM 928

To order a replacement communication module or a field installation kit, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). Note that the network wire is not included in the kit. See Service Information.

Installing a new Communication Module

Follow these steps to install a new communication module on the WSHP unit controller so that it can be incorporated into a BACnet MS/TP network.

1. Disconnect power from the WSHP unit controller
2. Remove the unwired network cable plug-in connector terminal block in P3 (Figure 1).
3. Locate the four standoffs on the communication module.
4. Install the four standoffs on the WSHP unit controller (Figure 2).
5. Orient the communication module so that the side with the components faces out and the connector socket can mate with the 8-pin header on the unit controller.
6. Push the communication module onto the connector pins and standoffs until you hear the faint click of the locking standoffs securing the communication module in place.
7. Connect the network wires into the network plug using a flat head screwdriver.
8. Insert the network cable plug into the communication module PB3 network connector socket.
9. Apply power to the unit controller.
10. Verify correct network wiring (Figure 3).

NOTE: Figure 2 shows where the 8-pin SPI header and P4 plug on the back of the communication module connect it to the unit controller.

NOTE: The communication module software version requires compatibility with the unit controller software version. Refer to the MicroTech III WSHP Unit Controller Operation and Maintenance manual, OM 1085 (www.DaikinApplied.com).

Replacing a Communication Module

Follow these procedures to remove an existing communication module, replace it, and incorporate it into an existing BACnet MS/TP network.

1. Disconnect power from the WSHP unit controller.
2. Record the MAC Address set in Address Switch S3.
3. Remove the network cable plug-in connector terminal block P3 (Figure 1).
4. Locate the four standoffs for the communication module from the unit controller (Figure 2).
5. Depress the barb on one standoff and gently pull the corner of the communication module over the barb. Do not bend the communication module or mis-align the connector pins.
6. Proceed to the other three corners, by carefully removing the communication module from each standoff, and pulling it over the standoffs.
7. Gently lift the communication module from the unit controller.

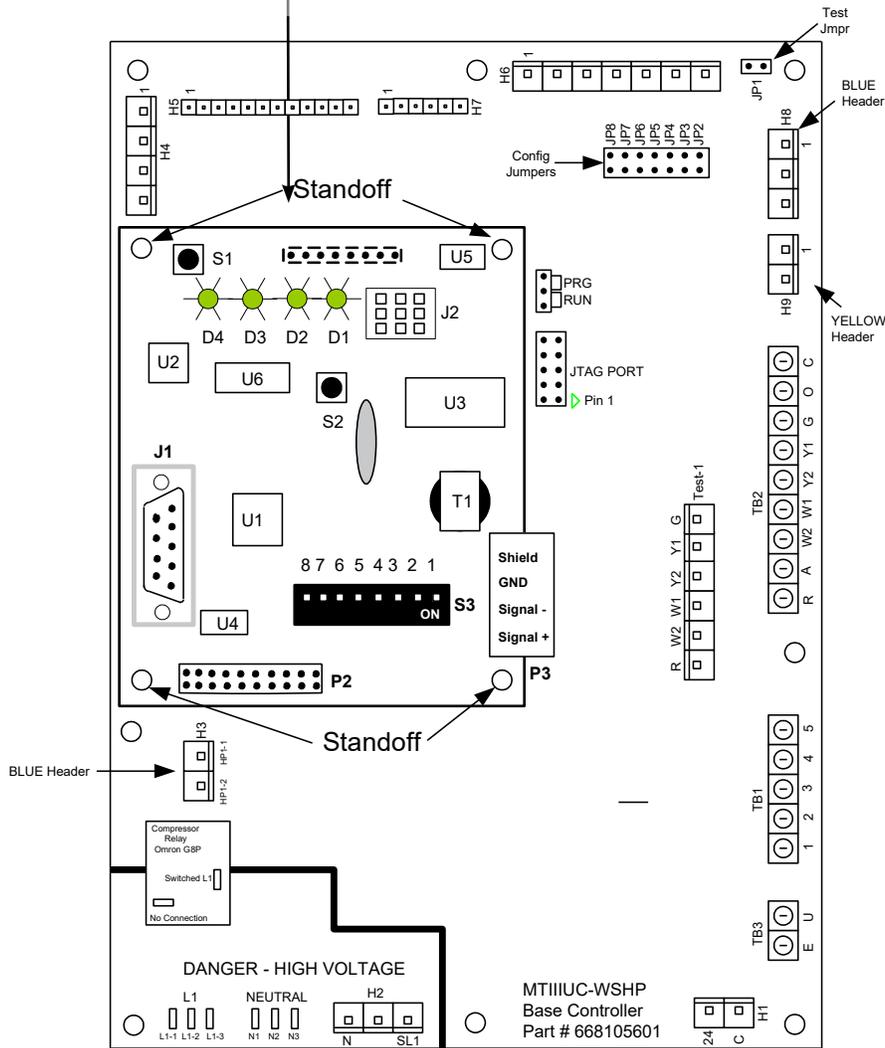
8. Locate the empty connector pins and four standoffs on the unit controller (Figure 2).
9. Orient the communication module so that the side with the components faces out and the connector socket can mate with the 8-pin header on the unit controller.
10. Push the communication module onto the connector pins and standoffs until you hear the faint click of the locking standoffs securing the communication module in place.
11. Insert the network cable plug into the communication module TB1 network connector socket.
12. Apply power to the unit controller.
13. Verify correct network wiring (Figure 3).

NOTE: The communication module software version requires compatibility with the unit controller software version. See [MicroTech III Software Compatibility](#) tables in the [Service Information](#) section.

NOTE: Figure 2 shows where the 8-pin SPI header and P4 plug on the back of the communication module connect it to the unit controller.

Figure 2: BACnet Communication Module Mounted on the WSHP Unit Controller

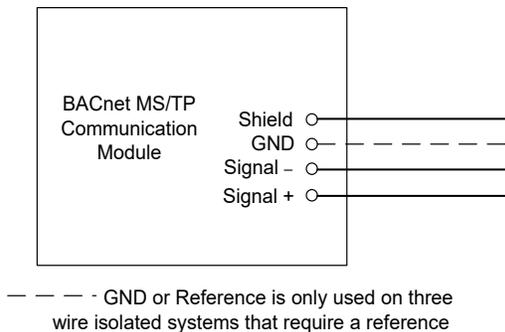
The BACnet communication module connects to the unit controller via the 8-pin SPI header and plug P4 on the back of the communication module.



NOTE: The communication module can function as either a 2-wire device (+ shield) or as a 3-wire device (+ shield). Use of the GND (or reference) terminal on the communication module is optional. The GND terminal can be used to terminate a reference conductor should one exist. Therefore, if a reference conductor does not exist, the GND terminal is not applicable.

Additionally, the shield terminal is also optional. In all EIA-485 networks, the shield should be continuous throughout the entire MS/TP trunk. However, it does not need to be tied together using the shield terminal (for example, wire nuts are frequently used as an alternative). The optional shield terminal is provided for convenience when tying together the segments of the shield.

Figure 3: BACnet MS/TP Network Connection Schematic Diagram



Together, the WSHP unit controller and BACnet communication module are designed to communicate with a Building Automation System (BAS). The following section explains how to configure the essential parameters and establish network communication.

Unit Controller Configuration

Follow these steps to set up the unit controller for addressing and BACnet network configuration:

1. Connect the unit controller to the network by replacing the network cable plug in P3 (Figure 2). The polarity of the signal must be maintained throughout the network. Always connect + to + and - to -.
2. Address the unit controller to establish the primary BACnet parameter settings. Set the physical S3 address switch settings on the communication module (Figure 1). The settings depend on which one of the four addressing methods, as described in the next section, is desired.
3. Configure the unit controller for the remaining network parameters. This step is done at the BAS or with the BACnet configuration menu (Appendix: BACnet Configuration Menu), and is typically the responsibility of the network integrator. Refer to the MicroTech III WSHP Network Integration Guide, ED 15103 (www.DaikinApplied.com) for a comprehensive list of the available BACnet objects and network integration details.
4. Apply power to the unit controller.

Network Addressing and Commissioning

These BACnet parameters require configuration in order for each unit to communicate properly on the network:

- **MAC Address** (must be unique on the MS/TP trunk)
- **Device Instance Number** (must be unique on the network)
 - The Device Instance Number must not be set to 300. The Device Instance Number of 300 is reserved for the “unconfigured” state.
- **Device Name** (must be unique on the network)
- **MS/TP Baud Rate** (must be the same throughout the MS/TP trunk)
- **MS/TP Max Masters** (set to the value of the highest MAC address on the MS/TP trunk). There are four procedures that can be used to set the BACnet addressing parameters for each unit. Initial network setup requires the user to follow only one of these procedures. However, it is possible to use another method at some point in the future, if desired (i.e. if a new unit(s) is added to the network and the user wishes to take advantage of auto-addressing).

Below is a brief overview of the four methods. Table 2 provides default values and other important information for setting network parameters.

1. **Manual** – Physically adjust the 8 dip-switches on the communication module’s S3 address switch to set the MAC Address (0 to 127). The remaining parameters are then automatically determined based on the MAC Address value. Use this method only if it is not necessary to change the baud rate, Device Instance Number, and/or the Device Name default values (Table 2). If any one of these parameters requires configuration, use the Manual plus Serial Terminal Device method.
2. **Manual plus Serial Terminal Device** – Set the MAC Address via the 8 dip-switches, and then use a serial terminal device such as Windows HyperTerminal or PuTTY to adjust remaining parameters (Device Instance Number, Device Name, baud rate, Max Masters, etc).
3. **Auto Addressing** – Confirm that the S3 address switch is set to the default value of 255. Press the Timed Override button on the room sensor for 11 or more seconds to activate the auto-assignment process for setting network parameters (see NOTE).
4. **Auto Addressing using Network Variables** - Confirm that the S3 address switch is set to the default value of 255. Set the analog value (AV412) via the BAS and then press the Timed Override button on the room sensor to activate the auto-assignment process. This method allows the desired System Minimum Device Instance number to be set at the BAS (see NOTE).

NOTE: The auto-addressing feature was designed for units communicating to a Daikin System Manager for Intelligent Systems (IS) controller. However, any BAS can configure a WSHP unit controller for auto-addressing. The auto addressing methods only apply to SmartSource (Series2), Enfinity Large Two-Compressor (SS2C), and Enfinity v3.0 and newer models. See the Daikin System Manager Operation Manual, OM 1254 (www.DaikinApplied.com.)

Device Instance Number. For Example, if the Device Instance Number = 3101007, then the Device Name = MTIIIUC_WSHP_3101007.

Addressing Method 2 – Manual plus Serial Terminal Device

Required Equipment

- Laptop with a serial port
- Serial terminal device application such as HyperTerminal or PuTTY (required for steps 2-4)
- Null modem serial cable for establishing communication between the laptop and the serial terminal device application

Procedure

1. Assign the MAC Address by setting the eight-position S3 address switch on the communication module. See [Figure 1](#) for location of the S3 dip-switch.
2. Change the baud rate, if necessary. The default is 38400 bps as indicated in [Table 2](#). The baud rate can only be modified using a serial terminal device application such as HyperTerminal or PuTTY in conjunction with the BACnet Configuration Menu ([Appendix: BACnet Configuration Menu](#)).
3. The Default Device Instance Number is 3101000 + MAC Address as set by physical S3 address switch. If necessary, the Device Instance Number can be altered to any available valid value using a serial terminal device application such as HyperTerminal or PuTTY (see [Appendix: BACnet Configuration Menu](#)).
4. The Default Device Name is MTIIIUC_WSHP_ + Device Instance Number. If necessary, the Device Name can be modified to any available valid value using a serial terminal device application such as HyperTerminal or PuTTY ([Appendix: BACnet Configuration Menu](#)).

Table 1: BACnet Addressing Options

Parameter	Network Addressing Methods			
	Manual	Manual plus Serial Terminal Device	Auto-Addressing	Auto-Addressing using Network Variables
Baud Rate	38400	9600, 19200, 38400 or 76800	38400	38400
MAC Address	Physical S3 switch setting	Physical S3 switch setting	First available (high to low) starting at 127	First available (high to low) starting at 127
Device Instance Number²	3101000 + MAC Address	3101000 + MAC Address or user-selected	3101000 + MAC Address	AV412 + MAC Address
Device Name	MTIIIUC_WSHP_ + Device Instance ¹	MTIIIUC_WSHP_ + Device Instance or user-selected ¹	MTIIIUC_WSHP_ + Device Instance ¹	MTIIIUC_WSHP_ + Device Instance ¹

¹For example, if the Device Instance = 3101007, then the Device Name = MTIIIUC_WSHP_3101007.

²Device Instance Number of 300 only applies to Enfinity v2.8 and older models. Do not set the Device Instance Number to 300 on any other models because this value is reserved for the "unconfigured" state.

Addressing Method 1 - Manual

Use this method only if the baud rate, Device Instance Number, and/or the Device Name default values do not need to be changed ([Table 2](#)). If any one of these parameters requires configuration, use the Addressing Method #2 - Manual plus Serial Terminal Device procedure.

Required Equipment – N/A

Procedure

1. Assign the MAC Address by setting the eight-position physical S3 address switch on the communication module ([Figure 1](#)). The allowable range is between 0-127. Note that the communication module ships with a default MAC Address of 255. Bit 0 of the address/mode corresponds to switch position 1, and bit 7 of the address/mode corresponds to switch position 8. See [S3 Address Switch](#) for operation of the dipswitch.
2. Verify the default baud rate is 38400 bps.
3. The Device Instance Number is set to 3101000 + MAC Address as determined by the S3 address switch.
4. The Device Name is set to MTIIIUC_WSHP_ +

Addressing Method 3 – Auto Addressing

Required Equipment

- Room Sensor with Timed Override button

Optional Equipment

The following items are required only if it is necessary to change the baud rate, Device Instance Number, and/or the Device Name from their default values as shown in [Table 2](#).

- Laptop with a serial port
- Serial terminal device application such as HyperTerminal or PuTTY
- Null modem serial cable for establishing communication between the laptop and the serial terminal device application.

NOTE: In the unconfigured state (i.e. prior to activating the auto-addressing process as described below), the communication module is connected to the network and is “listening” to network traffic. It is not actively communicating. While in the unconfigured state, it is compiling a set of used MAC Addresses from other devices. The following procedures describe how a room sensor is used to commission the unit controller from an unconfigured state to an active, communicating state on the network.

Procedure

1. Confirm the physical S3 address switches are set to the default value of 255. See [Figure 1](#) for location of the S3 dip-switch.
2. Apply power to the unit controller and verify other devices are available on the network.
3. Allow the communication module a minimum of two minutes to analyze the network traffic so that it can determine which MAC addresses are currently being used by other devices.
4. Press the Timed Override button on the room sensor for 11 or more seconds to activate the auto-assignment process.
5. The communication module is automatically assigned the highest available MAC Address. The assignment process begins at the highest value of 127. If 127 is already taken by another device, it uses the next lowest available address. For example, if 127 and 126 are taken but 125 is free, the communication module is assigned a MAC Address of 125.
6. The default baud rate is 38400 bps as indicated in [Table 2](#). The baud rate can only be changed using a serial terminal device application such as HyperTerminal or PuTTY ([Appendix: BACnet Configuration Menu](#)). The Device Instance Number is assigned a value of 3101000 + MAC Address.
7. The Device Name is assigned a value of MTIIIUC_WSHP_ + Device Instance Number.

Addressing Method 4 – Auto Addressing using Network Variables

This method involves configuring BACnet Analog Value (AV) objects AV412 and AV411 from the BAS. These unique network variables were created for units communicating to a MicroTech Integrated System (MIS) controller, but they can also be used by a network integrator to commission any WSHP unit controller with a communication module.

Required Equipment

- Room sensor with Timed Override button
- BAS – Required for setting network variables, AV412 and AV411

Optional Equipment

The following items are required only if it is necessary to change the baud rate, Device Instance Number, and/or the Device Name from their default values as shown in [Table 2](#).

- Laptop with a serial port
- Serial terminal device application such as HyperTerminal or PuTTY
- Null modem serial cable for establishing communication between the laptop and the serial terminal device application

Procedure

1. Confirm the S3 switch on the communication module is set to the default value of 255.
2. Apply power to the unit controller and verify other devices are available on the network.
3. The default baud rate is 38400 bps as indicated in [Table 2](#). The baud rate can only be changed using a Serial Terminal Device such as HyperTerminal or PuTTY ([Appendix: BACnet Configuration Menu](#)).
4. From the BAS, set AV412 to the new desired System Minimum Device Instance Number (see above for details.)
5. Allow the communication module a minimum of two minutes to analyze the network traffic so that it can determine which MAC addresses are currently being used by other devices.
6. Press the Timed Override button on the room sensor for 11 or more seconds to activate the auto-assignment process.
7. The assignment process begins at the highest value of 127. If 127 is already taken by another device, it uses the next lowest available address. For example, if 127 and 126 are taken but 125 is free, the communication module is assigned a MAC Address of 125.
8. The Device Instance Number is automatically configured to be the System Device Instance Number selected by the user at AV412 + MAC Address (see description above for details.)
9. The Device Name Property is automatically configured to be MTIIIUC_WSHP_ + Device Instance Number.

NOTE: If the Device Instance Number and/or Device Name have been changed from default values via the BAS system or a Serial Terminal Device application, it will no longer be automatically configured. However, restoring the communication module to default values allows auto-configuration to occur (see [Restoring Default Values](#)).

Description of Network Variables AV412 and AV411

During the automatic assignment process, AV412 (the System Minimum Instance number) is added to the MAC Address value to determine the Device Instance Number. After the communication module is commissioned, the MAC address is commandable, or writable, through the BAS using the AV411 object.

AV412 has an ObjectName of SystemMinInstance, the Present Value is writable, and it has a default value of 3101000. During the commissioning process, the present value of AV412 is added to the MAC Address to determine the Device Instance Number.

In order to change the value of AV412 on the communication module in the unconfigured state, the BAS must broadcast a new present value to AV412 using the BACnet service (BIBB – BACnet Interface Building Block) called “Unconfirmed COV” with a ProcessID value of 1. This prevents unauthorized unconfirmed writes, or changes, to AV412. Note that this change affects the AV412 present value for every WSHP communication module on the trunk.

The following is an example of how AV412 can be used in a typical BACnet network with a traditional BAS:

A network has two separate trunks. One trunk uses the default Minimum Instance Number of 3101000. The second trunk is set to a different Minimum Device Instance Number (Example 3102000) via AV412. In this way, the two trunks can each have unique Device Instance Numbers on the network.

The AV411 object is the MAC Address/Address Switch. It is a multi-purpose variable, which means that the ObjectName changes based on the value of the physical S3 address switch on the communication module. When the address switch is set to 255, the AV411 Object Name is MACAddress, the Present Value is commandable via the BAS, and represents the communication module’s MS/TP MAC Address. However, if the address switch is not set to 255, the AV411 Object Name is MACAddressSwitch, Present Value is read-only, and represents the S3 physical address switch setting. Refer to the MicroTech III WSHP Unit Controller Network Integration Guide, ED 15103 (www.DaikinApplied.com).

Configuration Settings

Table 2 describes the BACnet parameters required for network communication.

Table 2: Network Communication Parameter Settings

Parameter	Default Setting	Range/Valid Values	Notes
MS/TP Baud Rate	38400	9600, 19200, 38400, 76800	Manually adjustable only through the J1 configuration port connected to a laptop using a serial connector and terminal device application such as HyperTerminal or PuTTY (Appendix: BACnet Configuration Menu).
MS/TP Max Masters	127	1 to 127	Manually adjustable only through the J1 configuration port connected to a laptop using a serial connector and terminal device application such as HyperTerminal or PuTTY (Appendix: BACnet Configuration Menu).
MS/TP MAC Address	N/A	0 to 127, and 255 Note that 128 to 254 are not valid addresses.	When the physical S3 Address Switch is set to 255 (factory default), the MS/TP MAC Address is dynamically acquired during the commissioning process. Once commissioned, the MAC Address can be adjusted through the BAS using AV411 or through a terminal device application such as HyperTerminal or PuTTY (Appendix: BACnet Configuration Menu). When the physical S3 Address Switch is not set to 255, the static MS/TP MAC Address directly matches the S3 Address Switch value.
System Minimum Instance (AV412)	3101000	0 to 4194303	Writeable only through the network. “Present Value” is used during the commissioning process to determine the Device Instance and Name
Device Instance Number	300	0 to 4194302 300 not allowed, except for WSHP Enfinity v2.8 (PN 2506903) and older.	The commissioning process initializes the Device Instance Number to MAC Address + System Minimum Instance (AV412) or is manually adjustable. BACnet Software Variances: <ul style="list-style-type: none"> • PN 2506903 v2.8 and older use: Instance Number 300 • PN 2506903 v3.0 and newer use: (MAC address + AV412) • PN 2508062 all versions use: (MAC address + AV412) • PN 2508071 all versions use: (MAC address + AV412)
Device Object Name	MTIIIUC_WSHP_0000300	Up to a 17-character Device Object Name	The commissioning process initializes the Device Object Name to “MTIIIUC_WSHP_” + Device Instance Number or is manually adjustable. BACnet Software Variances: <ul style="list-style-type: none"> • PN 2506903 uses MTIIIUC_WSHP_ • PN 2508062 uses MTIIIUC_WSHP_Ser2_ • PN 2508071 uses MTIIIUC_WSHP_SS2C_
Max APDU Length	480	N/A	Fixed value is 480.

Important Notes about Configuration Settings

The address switch (S3) is factory defaulted to 255. The S3 address switch setting determines the mode that is used for establishing the MS/TP MAC Address.

The default setting is the value prior to the commissioning process completion (in other words, when the communication module is in an unconfigured state). The unconfigured state implies that the S3 address switch is set to 255.

The Max APDU Length parameter should not be set higher than 480. This value is not user-adjustable.

S3 Address Switch

The S3 address switch setting determines the mode that is used for establishing the MS/TP MAC Address. Table 3 and Table 4 provide a description of the S3 address switch states, positions and their respective values. Figure 5 gives an example of the dipswitch settings for a common network address.

NOTE: The switches on the actual communication module are numbered: 8, 7, 6, 5, 4, 3, 2, 1 from left to right when the communication module is attached on the unit controller baseboard (Figure 4 and Figure 5). This assumes the unit controller has not been rotated inside of the control enclosure.

Table 3: Explanation of Physical DIP Switch States

Address Switch State	Description
ON	Closed = dipswitch in down position = 1
OFF	Open = dipswitch in up position = 0

Figure 4: BACnet Communication Module Physical Address Switch (S3) – Default Settings to ON (Closed)



Table 4: Address Switch Values When Switch is ON (Closed)

Switch #	Value	Value When Switch is ON (Closed)
1	2 to the zero power	1
2	2 to the 1 st power	2
3	2 to the 2 nd power	4
4	2 to the 3 rd power	8
5	2 to the 4 th power	16
6	2 to the 5 th power	32
7	2 to the 6 th power	64
8	2 to the 7 th power	128

Figure 5: BACnet Communication Module Address Switch (S3) - Example of a Manual Network Address Setting



$$0 + 0 + 4 + 8 + 0 + 0 + 64 + 0 = 76 \text{ (Decimal)}$$

The S3 address switch specifies a numeric value in binary format. Numeric values are always read from the highest significant digit first. Switch #8 is the most significant bit (MSB), and Switch #1 is the least significant bit (LSB) of the binary address switch. The switch positions in the example below result in a numeric value of (MSB) 01001100 (LSB) in binary, and the equivalent of 4C in hexadecimal. This provides an address of 76 decimal. In this example, the S3 address switch is set to 76, so the Device Instance Number is assigned to 3101076 (AV412 = 3101000) and the Device Name is assigned to MTIleeeeeIUC_WSHP_3101076.

Verifying the Network Address Using the Wink Command

The communication module implements a unit identification mode command to the unit controller by using the BACnet "ReinitializeDevice" request, with a Cold or Warm Start request handle, and a password of "wink" (all lower case). The "wink" unit identification function allows verification of an individual unit network address without opening the unit access panels. The Wink command can be used during all operating and non-operating (ex. Alarm) modes except for the following conditions:

- Invalid Equipment Configuration Alarm
- Emergency Shutdown Alarm
- Low Voltage Brownout Mode

Upon receiving a wink command from a network management node, the unit controller exhibits the following identification sequence (all occur simultaneously):

- Room Sensor LED: flashes ON 3 seconds, then OFF 3 seconds for 15 total seconds, unless an alarm condition exists.
- Fan: the fan turns off for 5 seconds then on 5 seconds, then off again for 5 seconds.

Restoring Default Values

It is necessary to restore the communication module default settings under the following conditions:

- When new application software was loaded into the communication module
- When the commissioning process does not work as expected

Follow these steps to set the communication module back to default configuration settings:

1. Confirm that the communication module S3 address switch is set to the desired value. Use values 0 to 127 for manual addressing, and 255 for auto-addressing.
2. Press and hold the S2 Default pushbutton (Figure 1).
3. While holding the S2 switch, press and release the S1 Reset pushbutton. The LEDs should flash once, turn off and turn on one after another (Figure 1).
4. Release the S2 Default pushbutton (once all four LEDs are ON steady) to restore the communication module to default values.

Troubleshooting

If you can control the unit from the room sensor, but not able to communicate with the unit via the MS/TP network:

- Verify the Program Running LED (D1) is flickering.
- Verify the SPI Message Transfer LED (D2) is flickering.
- Verify the MS/TP Transmit LED (D3) is flickering.
- Verify the network (bus) wiring.
- Check the network communication parameters in the BACnet communication module for proper settings.
- Verify the logical MAC Address is unique, and in the valid range of 0 to 127 (Master).
- Verify the Device Instance Number is unique, and in the valid range of 1 to 4194302 (see **NOTE**).
- Verify the Device Object Name is configured, and is unique in the network.
- Verify the MS/TP baud rate matches the network communication data rate
- Verify the MS/TP Max Masters matches the network setting, and in the valid range of 1 to 127.

NOTE: Only Enfinity WSHP v2.8 and older can have the Device Instance number 300. All other versions must *not* be set to Device Instance number 300 because this value is reserved for the unconfigured state.

Parts

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

Description	Part Number
<p>MicroTech III WSHP Enfinity BACnet field installation kit</p> <p>Includes communication module, four stand-offs, 3-pin network connector, DAT and RAT temperature sensors, LWT water temperature sensor, and one supply air temperature sensor</p> <p>For use on units with baseboard controller software PN 2506900xxx. Provide unit serial number or sales order number when ordering</p>	107293071
<p>MicroTech III WSHP Enfinity BACnet replacement module</p> <p>Includes: BACnet module only</p> <p>Provide unit serial number or sales order number and request application software PN 2506903034 (v3.4) or newer when ordering</p>	668105901
<p>MicroTech III WSHP SmartSource BACnet field installation kit</p> <p>Includes communication module, four stand-offs, 3-pin network connector, DAT and RAT temperature sensors, LWT water temperature sensor, and one supply air temperature sensor</p> <p>For use on units with baseboard controller software PN 2508060xxx. Provide unit serial number or sales order number when ordering</p>	910128889
<p>MicroTech III WSHP SmartSource BACnet replacement module</p> <p>Includes: BACnet module only</p> <p>Provide unit serial number or sales order number and request application software PN 2508062064 (v6.4) or newer when ordering</p>	668105901
<p>MicroTech III WSHP Enfinity Large Two Compressor BACnet field installation kit</p> <p>Includes communication module, four stand-offs, 3-pin network connector, DAT and RAT temperature sensors, LWT water temperature sensor, and one supply air temperature sensor</p> <p>For use on units with baseboard controller software PN 2508069xxx. Provide unit serial number or sales order number when ordering</p>	910182237
<p>MicroTech III WSHP Enfinity Large Two Compressor BACnet replacement module</p> <p>BACnet module only</p> <p>Provide unit serial number or sales order number and request application software PN 2508071013 (v1.3) or newer when ordering</p>	668105901

Technical Support

Contact the Daikin Applied Controls Customer Support Group at 866-462-7829 for additional assistance, if necessary.

Refer to MicroTech III WSHP Unit Controller Operation Manual (OM 931) for additional information about unit parameters and modifying unit setpoints. Also refer to the WSHP Unit Controller Software Downloading Procedures and Troubleshooting Guide, (OM 1085) and the MicroTech III WSHP Unit Controller Integration Guide for BACnet objects and other network communication information (www.DaikinApplied.com).

MicroTech III Software Compatibility

Table 5 - Table 7 describe the compatibility among the MicroTech III WSHP unit controllers and BACnet communication module hardware/software versions. Use for general troubleshooting or before ordering a replacement module.

Table 5: BACnet Software for MicroTech III Infinity WSHPs

MicroTech III Infinity WSHP									
BACnet Module Software: 2506903 Hardware: 668105901	Baseboard Software: 2506900 Hardware: 668105601								Baseboard Software: 2508085 Hardware: 668105611
	v2.5	v2.6	v2.7	v2.8	v2.9	v3.0	v3.1	v3.2	v1.0
v2.5 ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes ³	Yes ³	Yes ³
v2.7 ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes ³	Yes ³	Yes ³
v2.8 ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes ³	Yes ³	Yes ³
v3.0 ¹	Yes ²	Yes ²	Yes ²	Yes ²	Yes ²	Yes	Yes ³	Yes ³	Yes ³
v3.1 ¹	Yes ²	Yes ²	Yes ²	Yes ²	Yes ²	Yes	Yes	Yes	Yes
v3.2 ¹	Yes ²	Yes ²	Yes ²	Yes ²	Yes ²	Yes	Yes	Yes	Yes
v3.3 ¹	Yes ²	Yes ²	Yes ²	Yes ²	Yes ²	Yes	Yes	Yes	Yes
v3.4	Yes ²	Yes ²	Yes ²	Yes ²	Yes ²	Yes	Yes	Yes	Yes

¹ BACnet software v3.4 or greater is recommended for optimal network communications performance.

² WSHP unit controller and BACnet software versions are fully compatible. Note that the heat pump number (HP), which is visible at the top of the BACnet Configuration Menu, from the BAS, or other BACnet application, may appear as an invalid number between 0 and 255 when the BACnet software version is newer than the unit controller software version. Although visible, the HP number shown does not impact the unit or network communication performance.

³ Low Entering Water Temperature (EWT) alarm is not supported by the communication module.

Table 6: BACnet Software for MicroTech III SmartSource WSHPs

MicroTech III SmartSource WSHP					
BACnet Module Software: 2508062 Hardware: 668105901	Baseboard Software: 2508060 Hardware: 668105601			Baseboard Software: 2508078 Hardware: 668105611	
	v5.0	v6.0	v6.1	v6.2	v1.0
v5.0 ¹	Yes	Yes	Yes	Yes	Yes
v6.0 ¹	Yes	Yes	Yes	Yes	Yes
v6.1 ¹	Yes	Yes	Yes	Yes	Yes
v6.2 ¹	Yes	Yes	Yes	Yes	Yes
v6.3 ¹	Yes	Yes	Yes	Yes	Yes
v6.4	Yes	Yes	Yes	Yes	Yes

¹ BACnet software v6.4 or greater is recommended for optimal network communication performance.

Table 7: BACnet Software for MicroTech III Infinity Large Two Compressor (SS2C) WSHPs

MicroTech III Infinity WSHP Large Two Compressor (SS2C)				
BACnet Module Software: 2508053 Hardware: 668105901	Baseboard Software: 2508069 Hardware: 668105601			Baseboard Software: 2508088 Hardware: 668105611
	v1.0	v1.1	v1.2	v1.0
v1.0 ¹	Yes	Yes	Yes	Yes
v1.1 ¹	Yes	Yes	Yes	Yes
v1.2 ¹	Yes	Yes	Yes	Yes
v1.3	Yes	Yes	Yes	Yes

¹ BACnet software v1.3 or greater is recommended for optimal network communications performance.

MicroTech III WSHP Unit Model Descriptions

- MicroTech III Infinity WSHP = Single Speed Models MHC/MHW, CCH/CCW (5-Ton or Less), VFC/VFW, LVC/LVW, VHC/VHF
- MicroTech III SmartSource WSHP = Single and Two Speed Compressor Models GSH/GSV, GTH/GTV, GCV
- MicroTech III Infinity WSHP Large Two Compressor (SS2C) = Models CCH/CCW (6-Ton or Greater), LVC/LVW

BACnet Configuration Menu

This section describes how to set BACnet parameters using the BACnet configuration menu. The BACnet configuration menu is accessed using Microsoft Windows® HyperTerminal® or PuTTY. It is assumed that the user is familiar with such an application. Certain parameters are also configured via the BACnet network (BAS). Parameters that can only be accessed using the BACnet configuration menu are noted in this section as well.

The parameters listed below require configuration in order for the communication module to properly integrate to the BACnet network.

BACnet Device Properties

- Device Instance - must be set to a unique value on the BACnet network
- Device Name - must be set to a unique value on the BACnet network
- Location
- Units
- Description

BACnet MS/TP Settings

- MS/TP Baud Rate - must be set to match the speed of the BACnet network. Valid values are 9600, 19200, 38400, or 76800. The baud rate must be set using the BACnet configuration menu.
- MaxMasters - set to the highest address of MS/TP master on the network segment to reduce the MS/TP token traffic and increase response time of the unit controller. MaxMasters can be set from the BAS or from the BACnet configuration menu.
- MAC Address/Address Switch - must be set according to the BACnet network requirements. The MS/TP MAC address can be set from the building automation system or from the BACnet configuration menu only when the physical address switch (S3) is set to 255.

Accessing the BACnet Configuration Menu

The BACnet configuration menu is accessed through the DB-9 serial connector on the communication module (see J1 in Figure 1). Any serial terminal device or application, such as Microsoft Windows HyperTerminal or PuTTY, can be used to view the menu and change the configuration parameters.

Follow these steps to connect to the BACnet configuration menu:

1. Verify that the terminal application communication settings are set to: 19200 bps, 8-data bits, 1-stop bit, no parity, and no flow control.
2. Use a null modem serial cross over cable to connect the computer to the communication module.
3. Once connected, press Enter to display the menu (Figure 6).
4. Change the terminal EIA-232 baud rate, if desired. The baud rate must be set first using the BACnet configuration menu, and then the terminal device or application (Figure 6 and Figure 7).
5. Change the following parameters, if desired: Instance, Name, Location, Description, and Units. Press the S key to save the settings.
6. Verify “Flash write – success” is shown for configuration pages 1 and 2. Otherwise, save the settings again (Figure 8).

Figure 6: BACnet Configuration Menu

```

===== Configuration Menu =====
Daikin Applied - MTIIIUC_WSHP
BACnet FW HP0 v3.4   UnitApp HP0 v3.2
===== SW PN 2506903 =====
  DEVICE
1)Instance ..... 3101127
2)Name ..... MTIIIUC_WSHP_3101127
3)Location .....
4)Description .....
5)Units ..... English

  MS/TP
6) Baudrate ..... 38400
7) MaxMasters .....127
M) MAC Address .....127

  TERMINAL
8) EIA-232 Baudrate ... 19200

B) Backup
R) Restore Configuration
S) Save settings
-----
Enter Selection:
    
```

Figure 7: Terminal Emulator Serial Port Configuration

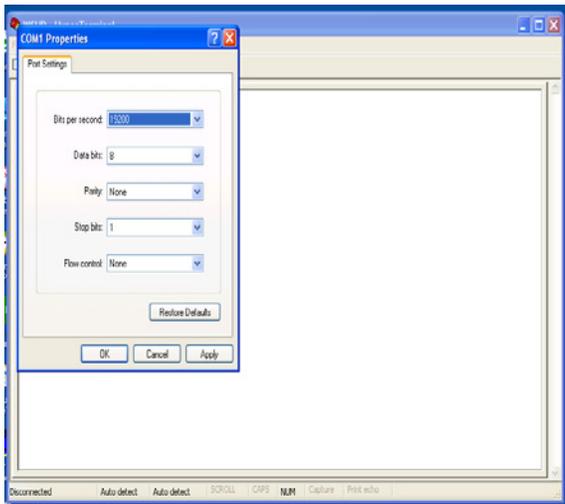
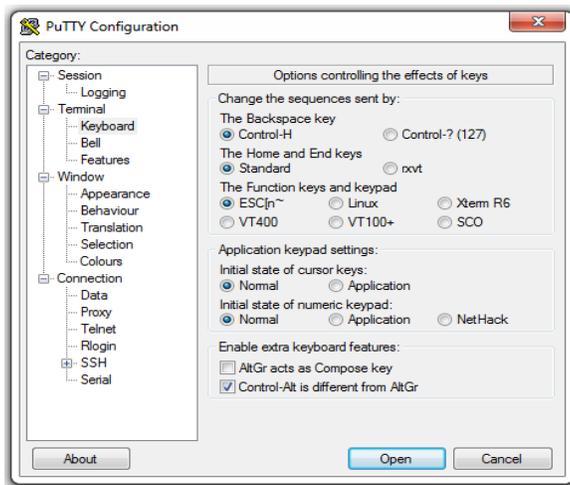


Figure 8: Verifying BACnet Configuration Saved Properly

Saving Configuration Page 1:
 StartAdr 0x13FC00, Size 0x40
 (64) Flash Write-SUCCESS

Saving Configuration Page 2:
 StartAdr 0x13FD00, Size 0x40
 (64) Flash Write-SUCCESS





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