

Group: Controls

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Supersedes: IM 703-3

MicroTech® II**Applied Rooftop Unit Controller and
Self-Contained Unit Controller****BACnet® Communication Module – BACnet/IP****NOTICE**

Use this manual to physically install the Daikin MicroTech II Communication Module into the rooftop unit controller and connect the rooftop unit controller to your network. Use the appropriate Daikin Engineering Data (ED), known as the Protocol Information document, to integrate the unit into your network. The Protocol Information document contains addressing details, BACnet® protocol information, and a list of the data points available to the network. See the Reference Documents section of this manual for Protocol Information document numbers. MicroTech II control integration literature is available from your local Daikin Applied sales representative and www.DaikinApplied.com.



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Revision History

IM 703		Initial release
IM 703-1		
IM 703-2		
IM 703-3	November 2004	
IM 703-4	August 2007	Updated IP router address on Table 1 & formatting updates.

Reference Documents

Number	Company	Title	Source
IM696	Daikin Applied	MicroTech II Applied Rooftop Unit Controller Installation Manual	www.DaikinApplied.com
OM137	Daikin Applied	MicroTech II Applied Rooftop Discharge Air Controller Operation Manual	www.DaikinApplied.com
OM138	Daikin Applied	MicroTech II Applied Rooftop Space Comfort Controller Operation Manual	www.DaikinApplied.com
IM710	Daikin Applied	MicroTech II Vertical Self-Contained Unit Controller Installation Manual	www.DaikinApplied.com
OM711	Daikin Applied	MicroTech II Vertical Self-Contained Discharge Air Controller Operation Manual	www.DaikinApplied.com
OM712	Daikin Applied	MicroTech II Vertical Self-Contained Space Comfort Controller Operation Manual	www.DaikinApplied.com
ED15060	Daikin Applied	MicroTech II Protocol Information Data for Daikin Applied Applied Rooftop Units	www.DaikinApplied.com
ED15061	Daikin Applied	MicroTech II Protocol Information Data for Daikin Applied Self-Contained Units	www.DaikinApplied.com

Limited Warranty

Consult your local Daikin Representative for warranty details. Refer to Form 933-43285Y. To find your local Daikin Representative, go to www.DaikinApplied.com.

Notice

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Introduction

Recognize Safety Symbols, Words and Labels

The following symbols and labels are used throughout this manual to indicate immediate or potential hazards. It is the owner and installer's responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of property damage and/or product damage, serious personal injury or death. Improper installation, operation and maintenance can void the warranty.

CAUTION

Hazards or unsafe practice **CAN** result in property damage, product damage, severe personal injury and or death.

NOTICE

Hazards or unsafe practices, which CAN result in property, damage, product damage, and or personal injury.

General Information

This manual contains the information you need to install the MicroTech II® Communication Module for BACnet® IP on a MicroTech II rooftop or self-contained unit controller and integrate it into a BACnet network.

WARNING

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

This equipment must be properly grounded. Connections and service to the MicroTech II control panel must be performed only by personnel who are knowledgeable in the operation of the equipment being controlled.

CAUTION

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

NOTICE

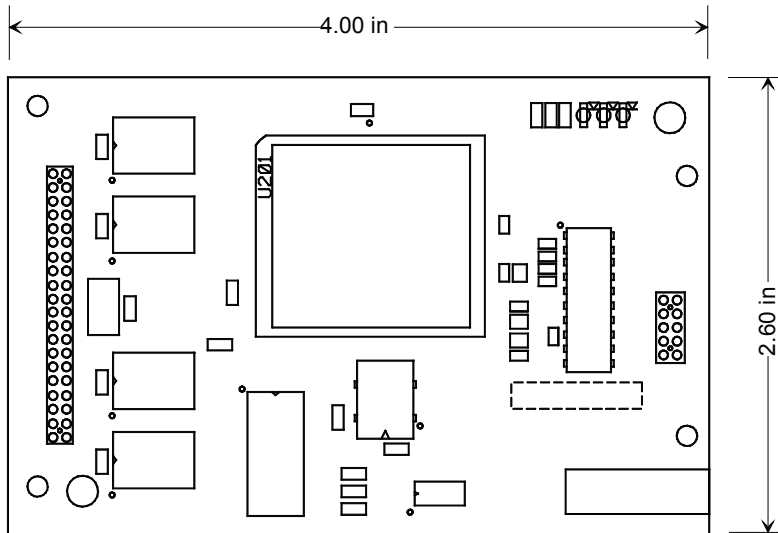
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of 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 Applied disclaims any liability resulting from any interference or for the correction thereof.**

Description

A MicroTech II BACnet/IP Communication Module incorporates a MicroTech II unit controller into a BACnet Local Area Network (LAN). It supports BACnet over Ethernet (10Base-T) and is the interface to the Building Automation Network using BACnet objects.

The BACnet/IP Communication Module is a printed circuit board that plugs into the MicroTech II unit controller. Figure 1 shows an outline drawing of the BACnet/IP Communication Module.

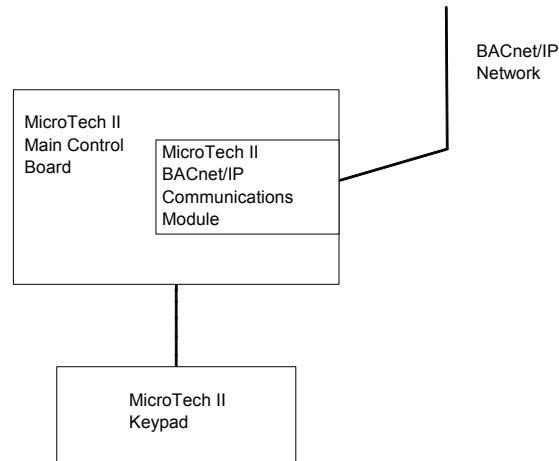
Figure 1. BACnet/IP Communication Module



Application

The BACnet/IP Communication Module connects the MicroTech II rooftop or self-contained unit controller to the building automation system (BAS) on a BACnet Local Area Network. It is the interface adapter for the exchange of BACnet objects between the network and the unit controller. Figure 2 shows the BACnet/IP Communication Module and unit controller integrates into a BAS.

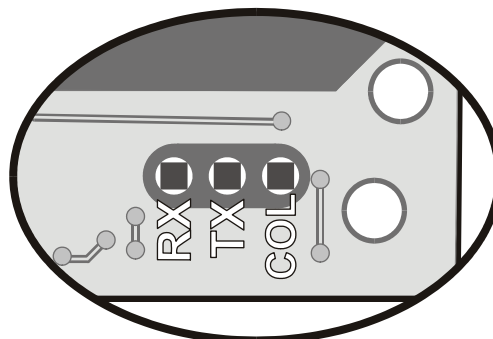
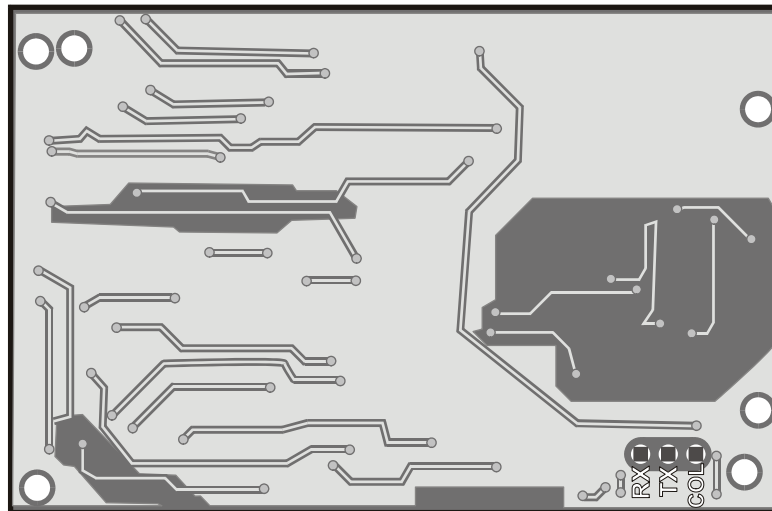
Figure 2. Building Automation System



Component Data

Figure 3 shows the location of the major components of the BACnet/IP Communication Module.

Figure 3. BACnet/IP Communication Module Major Components



Light Emitting Diodes (LEDs)

The BACnet/IP Communication Module has three LEDs to indicate communication activity and status of the communication module.

LED	Function
RX	Lights when the communications module is receiving data
TX	Lights when the communications module is transmitting data
COL	Lights when there is a collision on the BACnet network

Headers

The two headers on the component side of the communications module connect the unit controller to the BACnet/IP Communication Module through two sets of connector pins on the main control board.

Installation and Network Connection

General

A BACnet/IP Communication Module can be factory or field-installed and can be purchased by itself or as a kit. The BACnet/IP Communication Module and this installation manual are available as a kit (see the Replacement Parts section for details). The following section describes how to install a new BACnet/IP Communication Module or replace an existing module. It also describes how to connect the BACnet/IP Communication Module to the BACnet network.

Required Equipment

Field installation/replacement and network connection requires the following:

- A BACnet/IP Communication Module
- Straight-through ethernet cable connected to a hub

Installing a new BACnet/IP Communication Module

1. Remove power from the unit controller.
2. Locate the two empty connectors and four standoffs for the BACnet/IP Communication Module on the unit controller (see Figure 4.)
3. Orient the BACnet/IP Communication Module so that the circuit side faces out (i.e., the component side faces down). Align the BACnet/IP Communication Module so that the connector pins on the unit controller's main control board can penetrate the headers on the component side of the communications module (see Figure 5.)
4. Push the BACnet/IP Communication Module onto the connector pins and standoffs until you hear the faint click of the locking standoffs securing the module in place.

Connecting the BACnet/IP Communication Module to the Network: Applied Rooftop Units

1. Connect the BACnet/IP Communications Module to the network (see Figure 6.)
2. Route the network cable through an opening in the bottom of the cabinet, up the cable raceway, across the shelf below the unit controller, and up to the unit controller's main control board (see Figure 7).
3. Plug the network cable into the RJ45 jack on the unit controller.

Connecting the BACnet/IP Communication Module to the Network: Self-Contained Units

1. Connect the BACnet/IP Communication Module to the network (see Figure 6.)
2. Route the network cable through an opening in the cabinet to the unit controller's main control board (see Figure 8.) Each corner post has knockouts for easy access.
3. Plug the network cable into the RJ45 jack on the unit controller.
4. Apply power to the unit controller.

Replacing a BACnet/IP Communication Module

Follow the steps below to replace a BACnet/IP Communication Module on a rooftop or self-contained unit controller:

1. Remove power from the unit controller.
2. Locate the four standoffs for the BACnet/IP Communication Module in the unit controller's main control board (see Figure 4.)
3. Use a pliers or screwdriver to depress the barb on one standoff and gently pull the corner of BACnet/IP Communication Module over the barb. Do not bend the BACnet/IP Communication Module or misalign the connector pins.
4. Proceed to the other three corners, remove the BACnet/IP Communication Module from each standoff, and pull the module over the standoffs.
5. Gently lift the BACnet/IP Communication Module from the unit controller.
6. Orient the replacement BACnet/IP Communication Module so that the circuit side faces out (i.e., the component side faces down). Align the BACnet/IP Communication Module so that the connector pins on the unit controller can penetrate the headers on the component side of the BACnet/IP Communication Module (see Figure 5.)

7. Push the BACnet/IP Communication Module onto the connector pins and standoffs until you hear the faint click of the locking standoffs securing the module in place.

Connecting the BACnet/IP Communication Module to the Network

1. Connect the BACnet/IP Communication Module to the network (see Figure 6.)
2. Verify that the network cable is plugged into the RJ45 jack on the unit controller.
3. Apply power to the unit controller.

Figure 4. BACnet/IP Communication Module Main Control Board

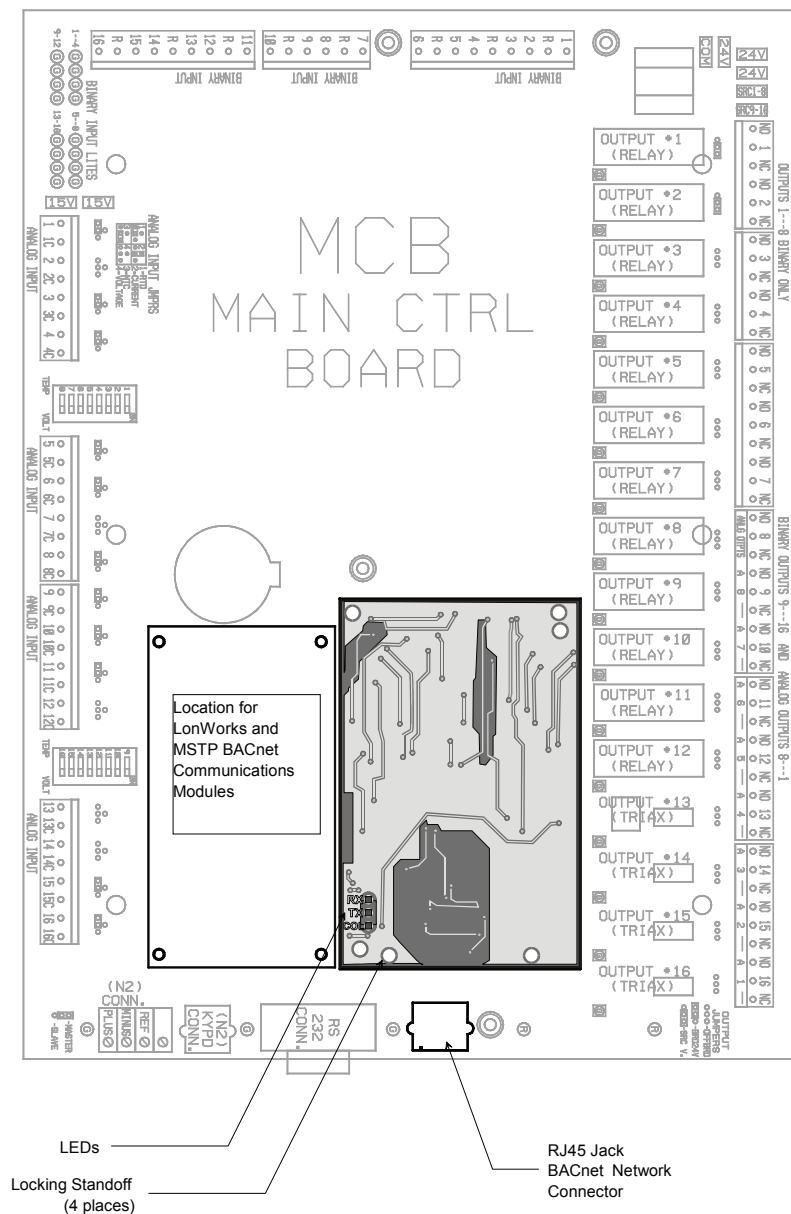


Figure 5. Mount BACnet/IP Communication Module

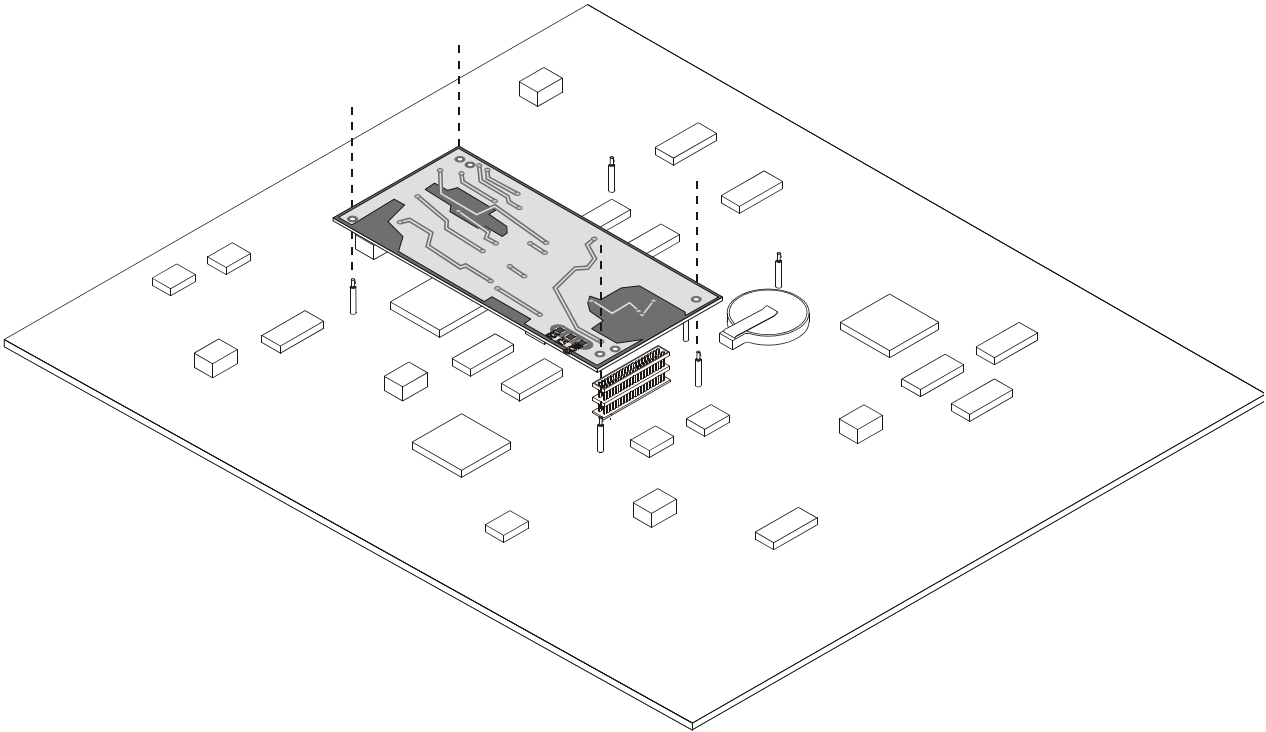


Figure 6. BACnet/IP Connection Schematic Diagram

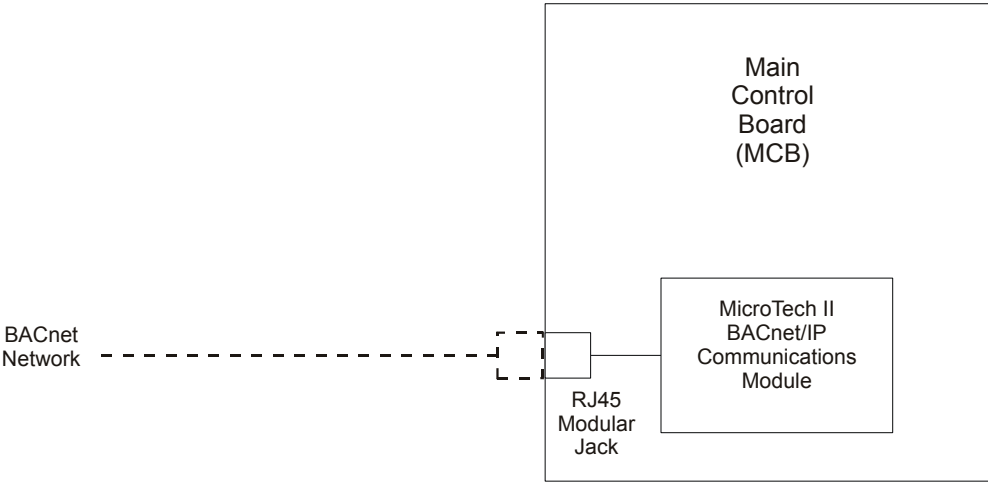


Figure 7. BACnet Network Cable Routing for Applied Rooftop Units

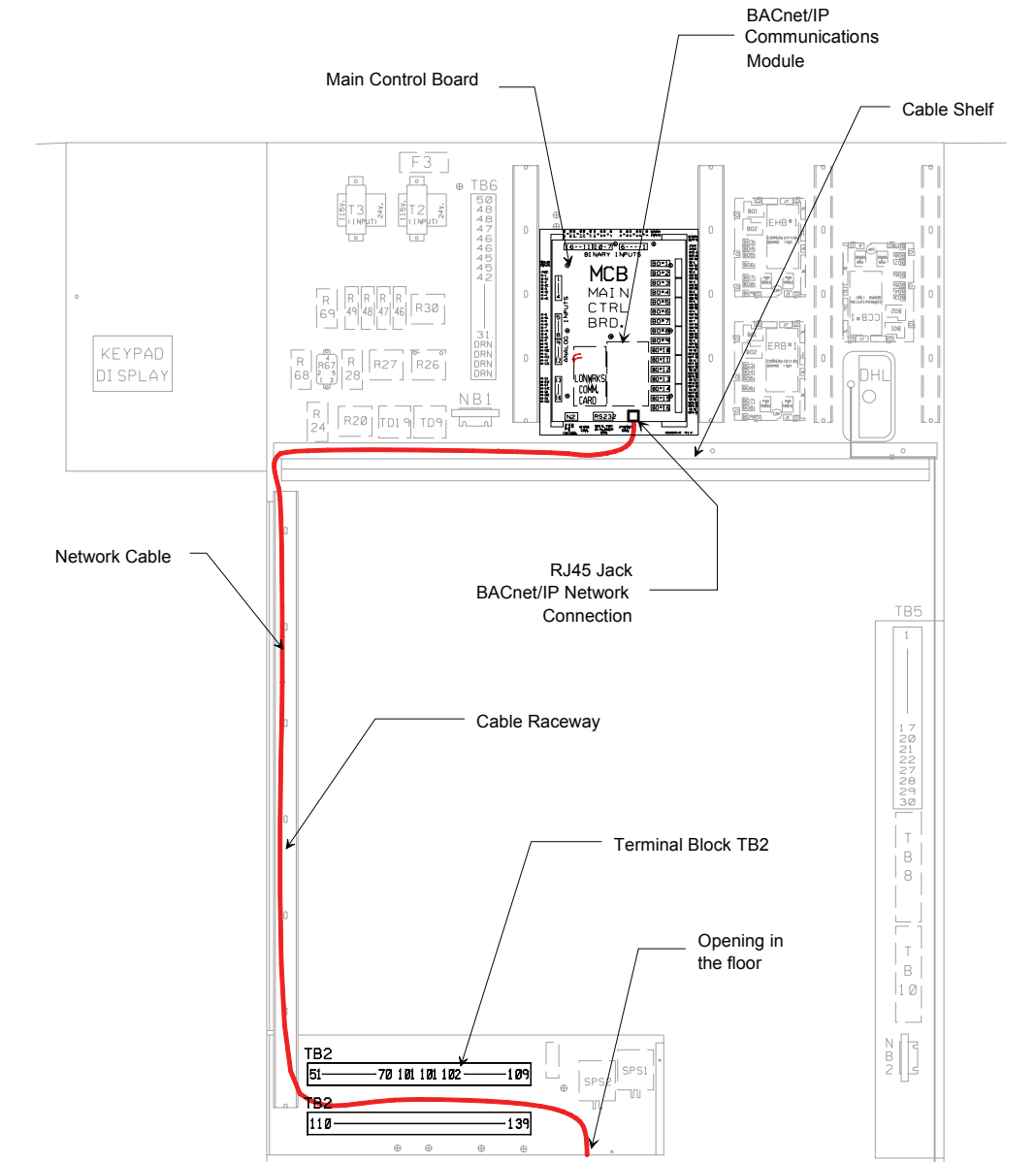
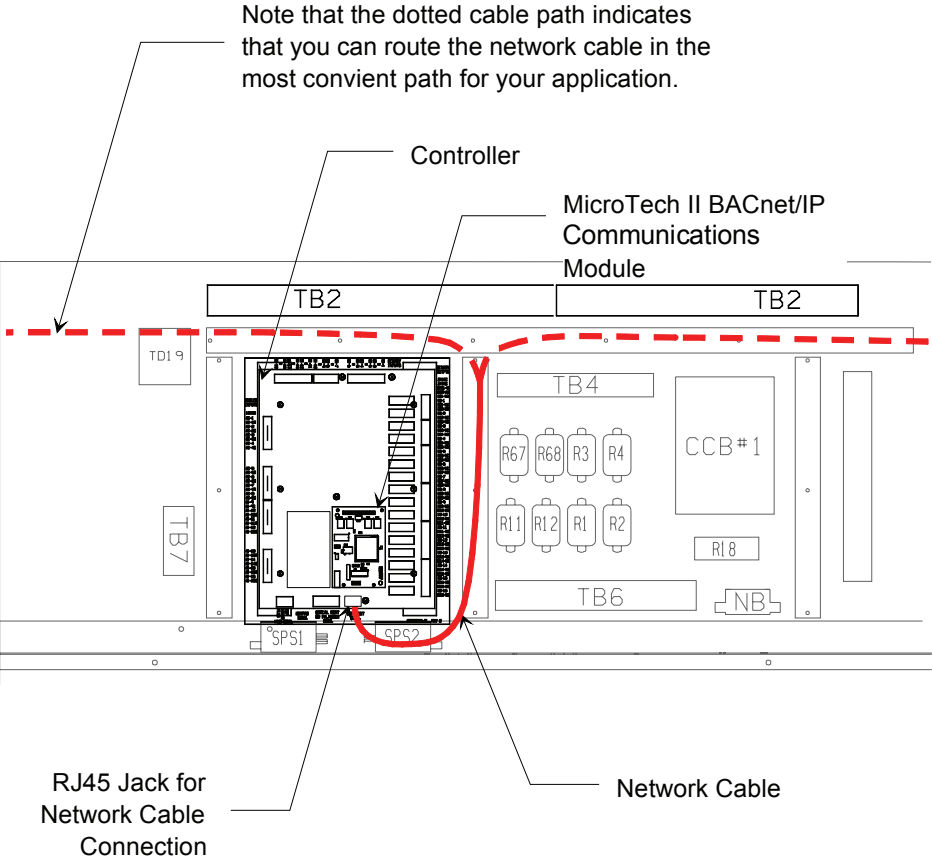


Figure 8. Network Cable Routing - Self-Contained Unit



Integration

Integrating the BACnet/IP Communication Module into a BAS involves three steps:

- Connecting the rooftop or self-contained unit controller to the network
- Addressing and establishing communications with the unit controller
- Configuring the unit controller

Network Connection

After inserting the BACnet/IP Communication Module to the MicroTech II unit controller, connect the MicroTech II unit controller into the BACnet network (see Installation and Network Connection section for details).

Addressing and Establishing Communications

There are three parameters that must be configured properly to establish communication between unit controller and the BACnet IP network:

- BACnet/IP Address
- IP Subnet Mask
- IP Router Address

BACnet/IP Address

The BACnet/IP (B/IP) address of the unit controller in a BACnet/IP network consists of the four-octet IP address followed by the two-octet UDP (User Datagram Protocol) port number. The BACnet/IP address is a six-octet value analogous to a MAC address. The unit controller default UDP port number is 47808 (BAC0 in hexadecimal). The BACnet/IP Address must be unique in the BACnet network.

IP Subnet Mask

The device object of the unit controller contains an IP Subnet Mask (default is 255.255.0.0) and a unique IP address. The controller does not support DHCP (Dynamic Host Configuration Protocol) IP addressing.

IP Router Address

An IP Router is used for sending IP messages to and from the BACnet/IP subnets and may or may not be installed on the network. If a router is installed, see your system integrator for additional information regarding BACnet IP Router addressing.

Dedicated BACnet Networks

The unit controller can be incorporated into a BACnet network dedicated to BACnet devices only or a BACnet network shared with BACnet devices and other devices. For a BACnet network dedicated to BACnet devices only, the unit controller default IP Address and IP Subnet may be used. The default IP Address is 172.16.83.46 and Subnet Mask is 255.255.0.0. The current value of the IP Address property can be read from the device object using Daikin MicroTech II ServiceTools® software or another BACnet device.

To set the IP Address of other BACnet/IP devices (workstations, routers, controllers) in the dedicated BACnet network, select IP Addresses with the first two octets the same as the IP Address of the unit controller and the third and fourth octets close to the third and fourth octets of the unit controller IP Address. For example, assign the IP Address of the workstation to 172.16.85.65 for a controller using the default IP Address of 172.16.83.46. Use the same IP Subnet Mask in the workstation as in the controller (255.255.0.0).

Shared BACnet Networks

Integrating the unit controller into a shared BACnet LAN requires close cooperation with the network administrator of the shared BACnet network. The steps to follow are:

- Obtain the IP Subnet Mask of the network
- Obtain static IP Addresses for all rooftop or self-contained unit controllers
- Obtain the IP Router Address (if applicable)
- Write the IP Address, IP Subnet Mask, and IP Router Address to the device object properties in the rooftop or self-contained unit controller

The default BACnet/IP Network Address in the rooftop or self-contained unit controller is 1001. The Network Address must be unique for each BACnet network segment. All BACnet/IP devices on all BACnet segments must have the same

BACnet/IP Network Address. This is the Network Address property of the device object of the MicroTech II Unit Controller. See Configuring the Unit Controller below for details regarding setting and changing network communication parameters.

Access to Properties

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

Configuring the Unit Controller

All Rooftop and Self-contained unit controllers are loaded with software and configured at the factory for stand-alone operation. The unit is ready to operate with default set point parameters that can be changed with the unit's keypad/display or via a network signal. Refer to the appropriate operation manual for the default values and keypad/display operating instructions. Refer to the appropriate MicroTech II Protocol Information documents for descriptions of the available network variables (see Reference Documents section).

There are 12 communication parameters involved in setting up the unit controller for proper communication with the various communication module options (BACnet IP, BACnet MS/TP or LONWORKS®). These parameters are set differently by the factory depending on which communication module is ordered and shipped with the unit. Table 1 below lists the four possible sets of default parameter settings. Not all the parameters apply to all the communication module options. The entries in the table that are shown in **bold** font apply to a particular communication module option.

Factory-Installed BACnet/IP Communication Modules

If the rooftop or self-contained unit controller is equipped with a factory-installed BACnet/IP Communication Module, the controller is pre-configured with the values shown in Table 1. These parameters do not require field modification.

Field-Installed BACnet/IP Communication Modules

A BACnet/IP Communication Module can be added to a rooftop or self-contained unit controller in the field for these reasons:

1. The unit did not originally ship with a communication module.
2. The unit originally shipped with a LONWORKS Communication Module but requires replacement with a BACnet Communication Module. Refer to Table 1 to determine whether or not changes are required to communication setup parameters.
3. The BACnet/IP Communication Module that shipped with the unit requires replacement

Note: Daikin MicroTech II ServiceTools® software is required to modify these parameters. Call the Daikin Controls Customer Support group at 866-4MCQUAY for more information.

Table 1. Factory Communication Setup Parameter Settings

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

Important Notes

1. The MSTP MAC Address is not adjustable from MicroTech II ServiceTools software; it is set via the dip-switch block on the MSTP communication module.
2. The Device Instance Number is factory set equal to the last six significant digits of the 18 digit number on the barcode label on the unit's main control board (MCB). For example if the last six digits are 043.066, then the Device Instance Number is set to 43066. Whether or not this parameter is use by the system integrator, it must be set to a unique value from all other controllers in the network.
3. The Max APDU Length parameter should not be set higher than 1024 for BACnet/IP or 501 for BACnet MSTP.
4. The Xs in Device Object Name are factory set equal to the last nine digits of the 18 digit number on the bar-code label on the units main control board (MCB). For example if the last nine digits are 000.043.066, then the Device Object Name is set to MTII RTUC 000043066 for an applied rooftop unit or MTII SCUC 000043066 for a vertical self-contained unit. Whether or not this parameter is use by the system integrator, it must be set to a unique value from all other controllers in the network.

Service Information

Troubleshooting

If you can control the unit from its keypad, but you are not able to communicate with unit via the network:

- Check the network communication parameters in the controller for proper settings. Refer to the Configuring the Unit Controller section for details.
- Check the network wiring.
- Check communications. Refer to the Addressing and Establishing Communications section for details.
- Use the standard TCP/IP suite of protocols to check your connectivity with other devices. For example, type “ping <IP address of the BACnet/IP Communication Module>”. If you get a response from that IP address, you are connected to the BACnet/IP Communications Module.
- Use the Transmit LED to determine whether data is reaching the output connector; use the Receive LED to determine whether any responses are being received.

If the BACnet/IP Communication Module still does not respond, contact Daikin Controls Customer Support at 866-4MCQUAY (866-462-7829).

Replacement Parts

Contact the Daikin Parts group at 763-553-5451 for replacement parts.

Description	Part Number
MicroTech II BACnet/IP Communication Module kit (kit includes module and IM 703)	090016701

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