User Manual

Allen-Bradley

PowerFlex 20-750-BNETIP BACnet/IP Option Module

Firmware Revision Number 1.xxx

Allen-Bradley • Rockwell Software

Rockwell Automation

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

This manual contains new and updated information.

New and Updated Information

This table contains the changes made to this revision.

Topic	Page
In Chapter 4, Table 3 in the first row AI0, corrected the drive parameter number from '60' to '260'.	40
In Appendix D in the Segmentation Capability section, added a new checked box for 'Segmented response accepted'. This new functionality is provided with firmware revision 1.003.	74

Notes:

BACnet Protocol Implementation Conformance Statement

Appendix D

Glossary

Index

This manual provides information about the 20-750-BNETIP BACnet/IP option module for network communication and how to use the module with PowerFlex® 750-Series drives.

Conventions Used in This Manual

The following conventions are used throughout this manual:

- Parameter names are shown in the format *Device* **Parameter xx -** [*] or *Host* **Parameter xx -** [*]. The xx represents the parameter number. The * represents the parameter name—for example *Device* **Parameter 01 - [Port Number]**.
- The firmware revision number (FRN) is displayed as FRN *X.xxx*, where '*X*' is the major revision number and '*xxx*' is the minor revision number.
- The dialog box images in this manual resulted from using DriveExplorer Full software, version 6.02.99. Different versions of the software may have dialog boxes that vary in appearance, and differences in procedures.

Rockwell Automation Support

Rockwell Automation offers support services worldwide, with over 75 sales and support offices, over 500 authorized distributors, and over 250 authorized systems integrators located through the United States alone. In addition, Rockwell Automation representatives are in every major country in the world.

Local Product Support

Contact your local Rockwell Automation representative for the following:

- Sales and order support
- Product technical training
- Warranty support
- Support service agreements

Technical Product Assistance

For technical assistance, please review the information in Chapter 5, Troubleshooting, first. If you still have problems, then access the Allen-Bradley Technical Support website at http://www.ab.com/support/abdrives or contact Rockwell Automation.

Additional Resources

Resource	Description
Network Communication Option Module Installation Instructions, publication 750COM-IN002	Information on the installation of PowerFlex 750-Series Network Communication modules.
TIA/EIA Standard PDF for CAT5e Ethernet cable at http://www.nag.ru/goodies/tia/TIA-EIA-568-B.1.pdf and Allen-Bradley product website for Robotic cable at http://ab.rockwellautomation.com/	Information about CAT5e Ethernet cable and Robotic cable.
Connected Components Workbench website http://www.ab.com/support/abdrives/webupdate/software.html, and online help (1)	Information on the Connected Components Workbench™ software tool—and includes a link for **free** software download.
DriveExplorer website http://www.ab.com/drives/driveexplorer, and online help (1)	Information on using the DriveExplorer™ software tool.
DriveExecutive website http://www.ab.com/drives/drivetools, and online help (1)	Information on using the DriveExecutive™ software tool.
PowerFlex 750-Series AC Drives Installation Instructions, publication 750-IN001	Information on installing, programming, and technical data of PowerFlex® 750-Series drives.
PowerFlex 750-Series AC Drives Programming Manual, publication 750-PM001	
PowerFlex 750-Series AC Drives Technical Data, publication 750-TD001	
PowerFlex 20-HIM-A6/-C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001	Information on the installation and use of PowerFlex 20-HIM-A6 or 20-HIM-C6S HIMs.

(1) The online help is installed with the software.

You can view or download publications at http://www.rockwellautomation.com/literature. To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.

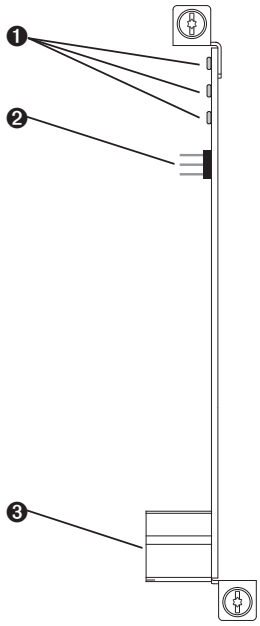
To find your local Rockwell Automation distributor or sales representative, visit http://www.rockwellautomation.com/locations.

For information, such as firmware updates or answers to drive-related questions, go to the Drives Service & Support website at http://www.ab.com/support/abdrives and click the Downloads or Knowledgebase link.

Getting Started

The 20-750-BNETIP option module is intended for installation into a PowerFlex 750-Series drive and is used for network communication.

Components



Item	Part	Description
1	Status Indicators	Three status indicators that indicate the status of the option module and network communication. See Chapter 5, Troubleshooting.
2	IP Address Selection Jumper	Sets the source used for the network address. See Setting the IP Address Selection Jumper on page 18.
3	Ethernet Connector	RJ45 connector for the Ethernet network cable.

Features

The features of the option module include the following:

- Captive screws to secure and ground the option module to the drive.
- An IP Address Selection Jumper to set the source of the network address for the option module before applying power to the drive. The network address can come from the default network address of the option module, a DHCP server, or the option module parameter values.
- Compatibility with the following configuration tools to configure the option module and host drive:
  - PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM (Human Interface Module) on the drive, if available
  - Connected Components Workbench software, version 1.02 or later
  - DriveExplorer software, version 6.01 or later
  - DriveExecutive software, version 5.01or later
  - Third party BACnet controlling and monitoring tools
- Status indicators that report the status of the option module and network communication. They are visible when the drive cover is removed.
- Read/write access for parameters, where parameter values can be configured and monitored over the network.
- User-defined fault actions to determine how the option module and its connected host drive respond to the following:
  - I/O messaging communication disruptions (Comm Flt Action)
  - Controllers in Idle mode (Idle Flt Action)
- Web pages, viewed by using a web browser, that show information about the option module, its host drive, and DPI devices connected to the drive.
- Configurable e-mail messaging to desired addresses when selected drive faults occur and/or are cleared, and/or when the option module takes a communication or idle fault action.

Understanding Parameter Types

The option module has two types of parameters:

- *Device* parameters are used to configure the option module to operate on the network.
- *Host* parameters are used to configure the option module's fault actions with the drive.

You can view option module *Device* parameters and *Host* parameters with any of the following drive configuration tools:

- PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM—use the 4 or 6 key to scroll to the drive port in which the module resides, press the (Folders) key, and use the 4 or 6 key to scroll to the DEV PARAM or HOST PARAM folder.
- Connected Components Workbench software—click the tab for the option module at the bottom of the window, click the Parameters icon in the tool bar, and click the *Device* or *Host* Parameters tab.
- DriveExplorer software—find the option module in the treeview and open its Parameters folder.
- DriveExecutive software—find the option module in the treeview, expand the module in the tree, and open its Parameters folder.

Compatible Products

At the time of publication, the option module is compatible with the following products:

- PowerFlex 753 drives (all firmware revisions)
- PowerFlex 755 drives (all firmware revisions)

Required Equipment

Some of the equipment that is required for use with the option module is shipped with the module, but some you must supply yourself.

Equipment Shipped with the Option Module

When you unpack the option module, verify that the package includes the following:

- ❑ One 20-750-BNETIP BACnet/IP Option Module
- ❑ One Network Communication Option Module Installation Instructions, publication 750COM-IN002

User-Supplied Equipment

To install and configure the option module, you must supply the following:

- ❑ A small screwdriver
- ❑ Ethernet Cable

- ❑ Drive and option module configuration tool, such as the following:
  - PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM
  - Connected Components Workbench software, version 1.02 or later

    Connected Components Workbench is the recommended stand-alone software tool for use with PowerFlex drives. You can obtain a **free copy** by:
    - Internet download at http://www.ab.com/support/abdrives/webupdate/software.html
    - Requesting a DVD at http://www.ab.com/onecontact/controllers/micro800/

    Your local distributor may also have copies of the DVD available.

    Connected Components Workbench software cannot be used to configure SCANport-based drives or Bulletin 160 drives.
  - DriveExplorer software, version 6.01 or later

    This software tool has been discontinued and is now available as **freeware** at http://www.ab.com/support/abdrives/webupdate/software.html. There are no plans to provide future updates to this tool and the download is being provided 'as-is' for users that lost their DriveExplorer CD, or need to configure legacy products not supported by Connected Components Workbench software.
  - DriveExecutive software, version 5.01 or later

    A Lite version of DriveExecutive software ships with RSLogix 5000, RSNetworx MD, FactoryTalk AssetCentre, and IntelliCENTER software. All other versions are purchasable items:
    - 9303-4DTE01ENE Drive Executive software
    - 9303-4DTS01ENE DriveTools SP Suite (includes DriveExecutive and DriveObserver software)
    - 9303-4DTE2S01ENE DriveExecutive software upgrade to DriveTools SP Suite (adds DriveObserver software)

    DriveExecutive software updates (patches, and so forth) can be obtained at http://www.ab.com/support/abdrives/webupdate/software.html. It is highly recommended that you periodically check for and install the latest update.
  - Third party network configuration software such as ORCAview
- ❑ A computer connection to the BACnet network

Safety Precautions

Please read the following safety precautions carefully.

ATTENTION: Risk of injury or death exists. The PowerFlex drive may contain high voltages that can cause injury or death. Remove all power from the PowerFlex drive, and then verify power has been discharged before installing or removing an option module.

ATTENTION: Risk of injury or equipment damage exists. Only personnel familiar with drive and power products and the associated machinery should plan or implement the installation, startup, configuration, and subsequent maintenance of the drive using the option module. Failure to comply can result in injury and/or equipment damage.

ATTENTION: Risk of equipment damage exists. The option module contains electrostatic discharge (ESD) sensitive parts that can be damaged if you do not follow ESD control procedures. Static control precautions are required when handling the option module. If you are unfamiliar with static control procedures, see Guarding Against Electrostatic Damage, publication 8000-4.5.2.

ATTENTION: Risk of injury or equipment damage exists. If the option module is transmitting control I/O to the drive, the drive can fault when you reset the option module. Determine how your drive will respond before resetting the module.

ATTENTION: Risk of injury or equipment damage exists. *Host* **Parameters 33 - [Comm Flt Action]** and **34 - [Idle Flt Action]** let you determine the action of the option module and connected drive if I/O communication is disrupted, the controller is idle, or messaging for drive control is disrupted. By default, these parameters fault the drive. You can configure these parameters so that the drive continues to run, however, precautions must be taken to verify that the settings of these parameters do not create a risk of injury or equipment damage. When commissioning the drive, verify that your system responds correctly to various situations (for example, a disconnected cable or a controller in idle state).

ATTENTION: Risk of injury or equipment damage exists. When a system is configured for the first time, there can be unintended or incorrect machine motion. Disconnect the motor from the machine or process during initial system testing.

ATTENTION: Risk of injury or equipment damage exists. The examples in this publication are intended solely for purposes of example. There are many variables and requirements with any application. Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use of the examples shown in this publication.

Quick Start

This section is provided to help experienced users quickly start using the option module. If you are unsure how to complete a step, see the referenced chapter.

Step	Action	See
1	Review the safety precautions for the option module.	Throughout this manual
2	Verify that the PowerFlex drive is properly installed.	PowerFlex 750-Series AC Drive Installation Instructions, publication 750-IN001
3	Install the option module. a. Verify that the PowerFlex drive is not powered. b. Set the source for the option module network address with the IP Address Selection Jumper (Figure 1 on page 18). c. Insert the option module in drive Port 4, 5, or 6. d. Use the captive screws to secure and ground the option module to the drive. e. Connect the option module to the network with an Ethernet cable (and RJ45 connector).	Network Communication Option Card Installation Instructions, publication 750COM-IN002, and Chapter 2, Installing the Option Module
4	Apply power to the option module. a. Verify that the option module is installed correctly. The option module receives power from the drive. b. Apply power to the drive. The status indicators should be green. If they flash red, there is a problem. See Chapter 5, Troubleshooting. c. Configure and verify key drive parameters.	Chapter 2, Installing the Option Module
5	Configure the option module for your application. Set option module parameters for the following functions as required by your application: • Network Address • Fault actions	Chapter 3, Configuring the Option Module
6	Configure BACnet Objects. Use a controller configuration tool, such as ORCAview, that enables you to control the option module and connected drive using BACnet Objects.	Chapter 4, Using BACnet Services and Objects

Installing the Option Module

This chapter provides instructions for installing the option module in a PowerFlex 750-Series drive.

Preparing for an Installation

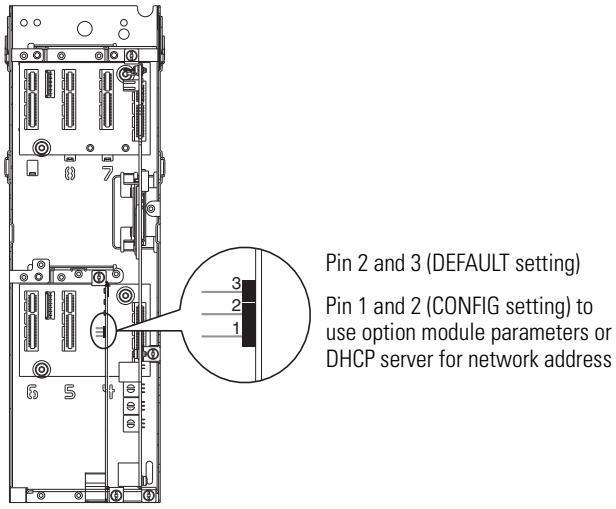
Before installing the option module, verify that you have all required equipment. See Required Equipment on page 13.

ATTENTION: Risk of equipment damage exists. The option module contains electrostatic discharge (ESD) sensitive parts that can be damaged if you do not follow ESD control procedures. Static control precautions are required when handling the option module. If you are unfamiliar with static control procedures, see Guarding Against Electrostatic Damage, publication 8000-4.5.2.

Setting the IP Address Selection Jumper

The IP Address Selection Jumper (Figure 1) determines the source of the network address for the option module.

Figure 1 - Setting the IP Address Selection Jumper



Using Default Network Address

When the jumper is on Pins 2 and 3 and *Device* **Parameter 16 - [DHCP]** is set to '0' (Disabled), the following default network address is used:

- IP Address 192.168.0.1
- Subnet Mask 255.255.255.0
- Gateway 192.168.0.1

Using DHCP Server

When the jumper is on Pins 1 and 2 and *Device* **Parameter 16 - [DHCP]** is set to '1' (Enabled), the network address is configured from a DHCP server. To set an IP address using a DHCP server, do the following.

1. Set *Device* **Parameter 16 - [DHCP]** to '1' (Enabled) to select the DHCP server as the source for the IP address.
2. Reset the option module; see Resetting the Option Module on page 33, so it can get the new IP address from the DHCP server.

Using Option Module Parameters

When the jumper is on Pins 1 and 2—or there is no jumper—and *Device* **Parameter 16 - [DHCP]** is set to '0' (Disabled), the network address is configured with option module parameters.

Connecting the Option Module to the Drive

IMPORTANT Remove power from the drive before installing the option module in the drive control pod.

Install the option module in the PowerFlex 750-Series drive control pod in Port 4, 5, or 6. For more installation details, see the Network Communication Option Module Installation Instructions, publication 750COM-IN002, provided with the option module. See Figure 1 for an example of the option module installed in the drive.

IMPORTANT After inserting the option module into drive Port 4, 5, or 6, make sure to tighten the module screws to the pod mounting bracket to properly ground the module to the drive. Torque both screws to 0.45…0.67 N•m (4.0…6.0 lb•in).

Connecting the Option Module to the Network

ATTENTION: Risk of injury or death exists. The PowerFlex drive may contain high voltages that can cause injury or death. Remove power from the drive, and then verify power has been discharged before connecting the option module to the network.

1. Remove power from the drive.
2. Remove the drive cover and lift up the drive HIM bezel to its open position to access the drive control pod.
3. Use static control precautions.
4. Connect one end of the Ethernet cable to the network.
5. Route the other end of the Ethernet cable through the bottom of the drive, and insert its RJ45 male connector into the mating Ethernet connector of the option module.

Applying Power

ATTENTION: Risk of equipment damage, injury, or death exists. Unpredictable operation can occur if you fail to verify that parameter settings are compatible with your application. Verify that settings are compatible with your application before applying power to the drive.

Apply power to the drive. The option module receives its power from the drive. When you apply power to the option module for the first time, its topmost 'PORT' status indicator should be steady green or flashing green after an initialization. If it is red, there is a problem. See Chapter 5, Troubleshooting.

Start-Up Status Indications

After power has been applied, the drive STS (status) indicator can be viewed on front of the drive and the option module status indicators can be viewed with the drive cover open or removed (Figure 2). Possible start-up status indications are shown in Table 1.

Figure 2 - Drive and Option Module Status Indicators

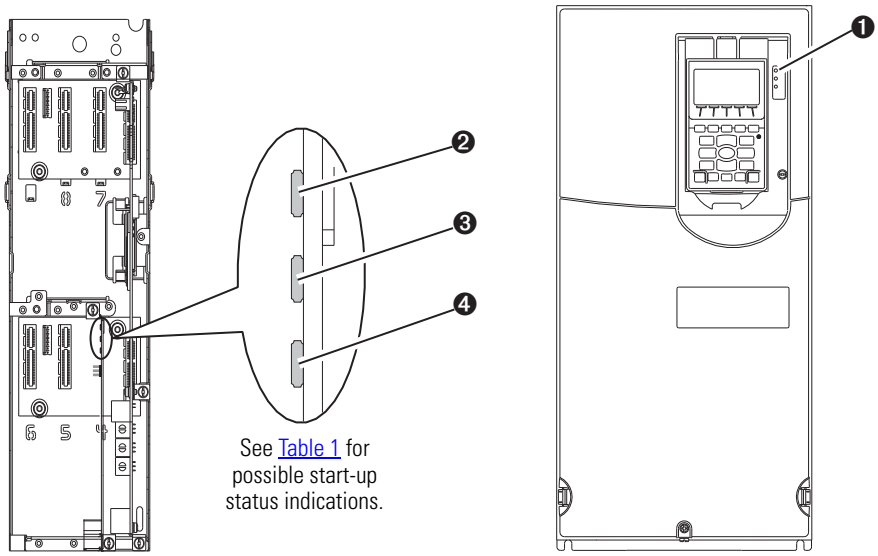


Table 1 - Drive and Option Module Start-Up Status Indications

Item	Name	Color	Status	Description
			Drive STS Indicator	
❶	STS (Status)	Green	Flashing	Drive ready but not running, and no faults are present.
			Steady	Drive running, no faults are present.
		Yellow	Flashing	When running, a type 2 (non-configurable alarm condition exists – drive continues to run. When stopped, a start inhibit condition exists and the drive cannot be started (see drive parameter 933 - [Start Inhibits]).
			Steady	A type 1 (user configurable) alarm condition exists, but the drive continues to run.
		Red	Flashing	A major fault has occurred. Drive will stop. Drive cannot be started until fault condition is cleared.
			Steady	A non-resettable fault has occurred.
		Red/Yellow	Flashing Alternately	A minor fault has occurred. Use drive parameter 950 - [Minor Flt Config] to enable. If not enabled, acts like a major fault. When running, the drive continues to run. System is brought to a stop under system control. The fault must be cleared to continue.
		Yellow/Green	Flashing Alternately	When running, a type 1 alarm exists.
		Green/Red	Flashing Alternately	Drive firmware is updating.
			Option Module Status Indicators	
❷	PORT	—	Off	The option module is not powered or connected properly to the drive.
		Red	Flashing	The option module is not receiving any communication from the drive.
			Steady	The option module detected a duplicate or invalid port ID.
		Green	Flashing	Normal operation. The option module is establishing communication with drive. It will turn steady green or red.
			Steady	Normal operation. The option module is properly connected and communicating with the drive.
		Orange	Steady	The brand of the option module and drive do not match.
❸	MOD	—	Off	The option module is not powered or connected properly to the drive.
		Red	Flashing	The option module has failed the firmware test or a firmware update is in progress.
			Steady	The option module has failed the hardware test.
		Green	Flashing	Normal operation. The option module is operating but is not transferring I/O data to a controller.
			Steady	Normal operation. The option module is operating and transferring I/O data to a controller.
❹	NET A	—	Off	The option module is not powered or connected properly to the network. The link is inactive.
		Red	Flashing	Any error in packet validation and/or execution is considered a network configuration error.
			Steady	Any failure in self-test on the external Ethernet controller is considered a network controller error.
		Green	Steady	Normal operation. The option module is properly connected and communicating on the network.

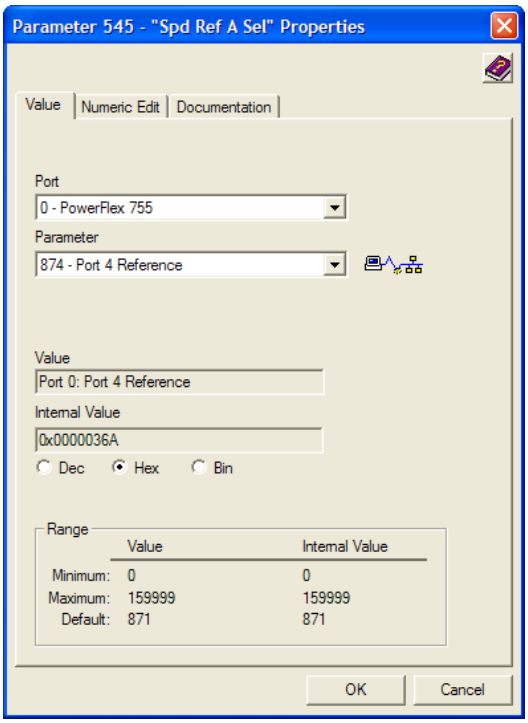
After verifying correct operation, swing down the drive HIM bezel to its closed position and install the drive cover. For more details on status indicator operation, see page 44 and page 45.

Configuring and Verifying Key Drive Parameters

The PowerFlex 750-Series drive can be separately configured for the control and Reference functions in various combinations. For example, you could set the drive to have its control come from a peripheral or terminal block with the Reference coming from the network. Or you could configure the drive to have its control come from the network with the Reference coming from another peripheral or terminal block. Or you could set the drive to have both its control and Reference come from the network.

The following steps in this section assume that the drive will receive the Logic Command and Reference from the network.

1. Verify that drive Parameter 301 - [Access Level] is set to '1' (Advanced) or '2' (Expert) to access the required parameters in this procedure.
2. Use drive Parameter 545 - [Speed Ref A Sel] to set the drive speed Reference.
   a. Set the Port field to '0' as shown below.



   b. Set the Parameter field to point to the port (slot) in which the option module is installed (for example, Port 4 Reference).

      The number '874' in the Parameter field of the example dialog box above is the parameter in the drive that points to the port.
3. Verify that drive Parameter 930 - [Speed Ref Source] is reporting that the source of the Reference to the drive (Port 0) is the port in which the option module is installed (for example, Port 4 Reference).

This ensures that any Reference commanded from the network can be monitored by using drive Parameter 002 - [Commanded SpdRef]. If a problem occurs, this verification step provides the diagnostic capability to determine whether the drive/option module or the network is the cause.

4. If hard-wired discrete digital inputs are not used to control the drive, verify that all unused digital input drive parameters are set to '0' (Not Used).

Commissioning the Option Module

To commission the option module, you must set a unique network node address. See the Glossary for details about IP addresses. Also, see Setting the IP Address Selection Jumper on page 18 for details on selecting the source (default address, from a DHCP server, or from option module parameters) for the network address.

IMPORTANT New settings for some option module parameters (for example *Device* **Parameters 04 - [IP Addr Cfg 1]** through **07 - [IP Addr Cfg 4]**) are recognized only when power is applied to the option module or it is reset. After you change parameter settings, cycle power or reset the option module.

Notes:

Configuring the Option Module

This chapter provides instructions and information for setting the parameters to configure the option module.

For a list of parameters, see Appendix B, Option Module Parameters. For definitions of terms in this chapter, see the Glossary.

Configuration Tools

The option module stores parameters and other information in its own nonvolatile storage (NVS) memory. You must, therefore, access the option module to view and edit its parameters. The following tools can be used to access the option module parameters.

Tool	See
PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM	page 26
Connected Components Workbench software, version 1.02 or later	http://www.ab.com/support/abdrives/webupdate/software.html, or online help (installed with the software)
DriveExplorer software, version 6.01 or later	http://www.ab.com/drives/driveexplorer, or online help (installed with the software)
DriveExecutive software, version 5.01 or later	http://www.ab.com/drives/drivetools, or online help (installed with the software)

IMPORTANT For the HIM screens shown throughout this chapter, the option module was installed in drive Port 4. If your option module is installed in a different drive port, that port would appear instead of Port 4.

Using the PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM to Access Parameters

If your drive has an enhanced PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM, it can be used to access parameters in the option module.

1. Display the Status screen, which is shown on HIM powerup.
2. Use the 4 ◄ or ► 6 key to scroll to the Port in which the option module is installed.
3. Press the PAR# *soft key* to display the Jump to Param # entry pop-up box.
4. Use the numeric keys to enter the desired parameter number, or use the ▲ or ▼ *soft key* to scroll to the desired parameter number.

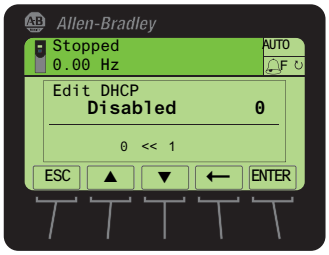
For details on viewing and editing parameters, see the PowerFlex 20-HIM-A6/-C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001.

Setting the Option Module Address Using Parameters

By default, the option module is provided with the IP address 192.168.0.1, subnet mask 255.255.255.0, and gateway address 192.168.0.1. If you want to set these attributes using the option module parameters, you must first disable DHCP and then set the associated option module parameters as described in the following subsections.

Disable the DHCP Feature

1. Set the value of *Device* **Parameter 16 - [DHCP]** to '0' (Disabled).



Value	Setting
0	Disabled
1	Enabled (Default)

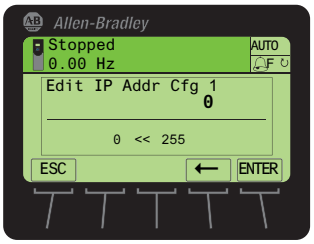
2. Reset the option module; see Resetting the Option Module on page 33.

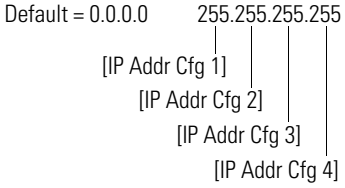
After disabling the DHCP feature, you can then configure the IP address, subnet mask, and gateway address using option module parameters.

Set the IP Address

1. Verify that *Device* **Parameter 16 - [DHCP]** is set to '0' (Disabled).

2. Set the value of *Device* **Parameters 04 - [IP Addr Cfg 1]** through **07 - [IP Addr Cfg 4]** to a unique IP address.

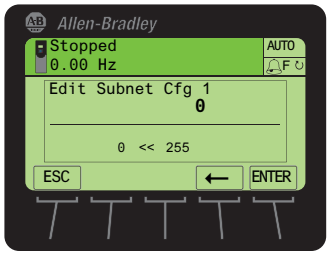


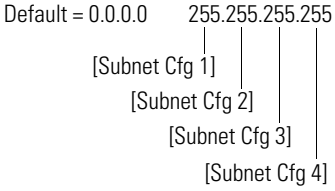


3. Reset the option module; see Resetting the Option Module on page 33.

Set the Subnet Mask

1. Verify that *Device* **Parameter 16 - [DHCP]** is set to '0' (Disabled).
2. Set the value of *Device* **Parameters 08 - [Subnet Cfg 1]** through **11 - [Subnet Cfg 4]** to the desired value for the subnet mask.

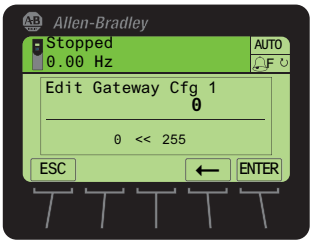


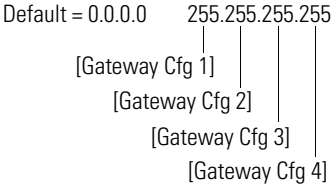


3. Reset the option module; see Resetting the Option Module on page 33.

Set the Gateway Address

1. Verify that *Device* **Parameter 16 - [DHCP]** is set to '0' (Disabled).
2. Set the value of *Device* **Parameters 12 - [Gateway Cfg 1]** through **15 - [Gateway Cfg 4]** to the IP address of the gateway device.





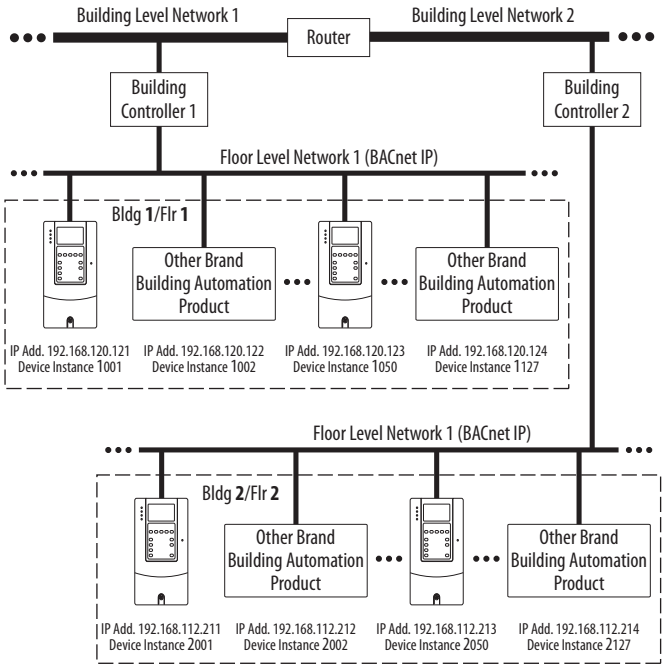
3. Reset the option module; see Resetting the Option Module on page 33.

Setting the Device Instance

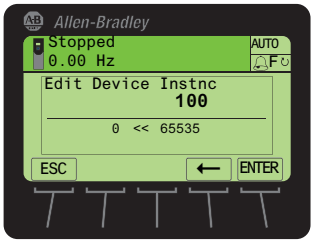
A BACnet Device Instance number is used to identify a BACnet device over the BACnet network. A Device Instance number must be unique across all subnets and routed links.

The Device Instance number could be configured depending upon the adopted network strategy. For example Figure 3 shows a Building level network having two individual floor networks through a router which allows devices on each network to share the same IP address. Each device on the network in this example has a unique Device Instance number consisting of 4 digits. The first digit represents the Building or Floor number. The last 3 digits represent the fourth octet of the device's IP address.

Figure 3 - Building Automation Network Example



1. Set the value of *Device* **Parameter 18 – [Device Instnc]** to a unique Device Instance number.

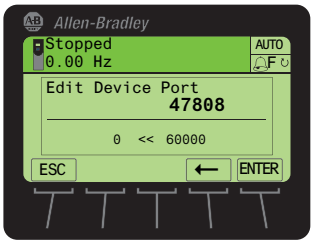


   This Device Instance number should not be repeated within a BACnet network. By default, the Device Instance number is set to 100.

2. Reset the option module; see Resetting the Option Module on page 33 so that the new Device Instance number takes effect.

Setting the Device Port

Setting the Device Port enables BACnet messaging to be sent and received by the option module over the BACnet/IP network. Set *Device* **Parameter 19 - [Device Port]** to a value suitable for your application. By default, it is set to 47808.



Setting a Fault Action

By default, when communication is disrupted (for example, the network cable is disconnected) or the controller is idle, the drive responds by faulting if it is using I/O from the network. You can configure a different response to these faults:

- Disrupted I/O communication by using *Host* **Parameter 33 - [Comm Flt Action]**.
- An idle controller by using *Host* **Parameter 34 - [Idle Flt Action]**.

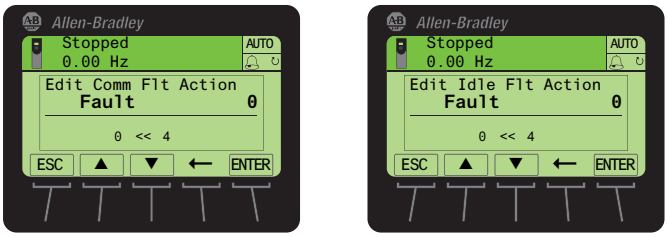
ATTENTION: Risk of injury or equipment damage exists. *Host* **Parameters 33 - [Comm Flt Action]** and **34 - [Idle Flt Action]** let you determine the action of the option module and connected drive if communication is disrupted or the controller is idle. By default, these parameters fault the drive. You can configure these parameters so that the drive continues to run, however, precautions must be taken to verify that the settings of these parameters do not create a risk of injury or equipment damage. When commissioning the drive, verify that your system responds correctly to various situations (for example, a disconnected network cable or controller in idle state).

Changing the Fault Action

Set the values of *Host* **Parameters 33 - [Comm Flt Action]** and **34 - [Idle Flt Action]** to an action that meets your application requirements.

Value	Action	Description
0	Fault	The drive is faulted and stopped. (Default).
1	Stop	The drive is stopped, but not faulted.
2	Zero Data	The drive is sent '0' values for data. This does not command a stop.
3	Hold Last	The drive continues in its present state.
4	Send Flt Cfg	The drive is sent the data that you set in the fault configuration parameters (*Host* **Parameters 37 - [Flt Cfg Logic]** and **38 - [Flt Cfg Ref]**).

Figure 4 - Edit Fault Action HIM Screens



Changes to these parameters take effect immediately. A reset is not required.

If communication is disrupted and then is re-established, the drive will automatically receive commands over the network again.

Setting the Fault Configuration Parameters

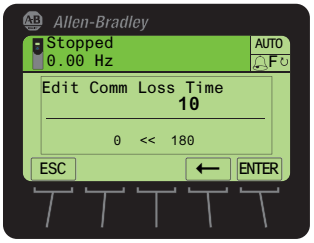
When setting *Host* **Parameters 33 - [Comm Flt Action]** and **34 - [Idle Flt Action]** to 'Send Flt Cfg', the values in the following parameters are sent to the drive after a communication fault and/or idle fault occurs. You must set these parameters to values required by your application.

Option Module *Host* Parameter	Description
Parameter 37 - [Flt Cfg Logic]	A 32-bit value sent to the drive for Logic Command.
Parameter 38 - [Flt Cfg Ref]	A 32-bit REAL (floating point) value sent to the drive for Reference.

Changes to these parameters take effect immediately. A reset is not required.

Setting the Comm Loss Time

Set *Device* **Parameter 17 - [Comm Loss Time]** to a communication loss timeout period suitable for your application.



By default, the timeout is set to 10 seconds. This value can be increased or decreased. Alternatively, the value can be set to zero (0) to disable this timeout feature so that the option module does not detect a communication loss.

ATTENTION: Risk of injury or equipment damage exists. *Device* **Parameter 17 - [Comm Loss Time]** lets you determine how long it will take the option module to detect a network communication loss. By default, this parameter sets the timeout to ten (10) seconds. You can set it so that the duration is shorter, longer, or disabled. When set to disabled, this also disables *Host* **Parameter 33 - [Comm Flt Action].** Therefore, a communication fault action will be ignored. Take precautions to verify that the setting does not create a risk of injury or equipment damage. When commissioning the drive, verify that your system responds correctly to various situations (for example, a disconnected cable).

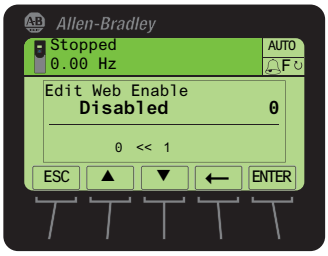
Changes to this parameter take effect immediately. A reset is not required.

Setting Web Page Access

By using a web browser to access the IP address set for the option module, you can view the option module web pages for information about the module, the drive, and other DPI devices connected to the drive, such as HIMs or converters.

By default, the option module web pages are disabled. To enable the option module web pages, do the following.

1. Set *Device* **Parameter 26 - [Web Enable]** to '1' (Enabled).



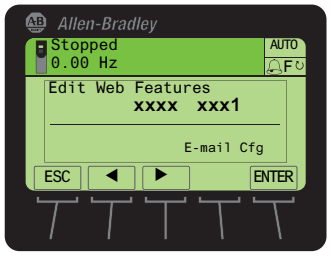
Value	Description
0	Disabled (Default)
1	Enabled

2. Reset the option module; see Resetting the Option Module on page 33 so that the change takes effect.

For more details on the option module web pages, see Chapter 6, Viewing Option Module Web Pages.

The option module can be configured to automatically send e-mail messages to desired addresses when selected drive faults occur and/or are cleared, and/or when the option module takes a communication or idle fault action.

Bit 0 of Device **Parameter 27 - [Web Features]** is used to protect the configured settings for e-mail messaging. By default, settings are not protected and the user can make changes. To protect the configured settings, set the value of E-mail Cfg Bit 0 to '0' (Disabled). You can unprotect the configuration by changing Bit 0 back to '1' (Enabled). E-mail messaging will always remain active regardless of whether or not its settings are protected—unless e-mail messaging was **never** configured. For more information about configuring option module e-mail messaging or to stop e-mail messages, see Configure E-mail Notification Web Page on page 56.



Bit	Description
0	E-mail Cfg (Default = 1 = Enabled)
1...7	Not Used

Bit 0 is the right-most bit. In the example above, it equals '1' (Enabled).

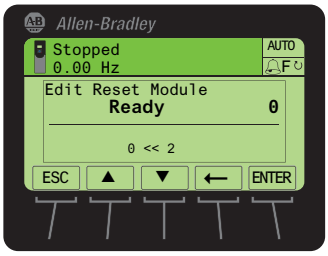
Changes to this parameter take effect immediately. A reset is not required.

Resetting the Option Module

Changes to the jumper setting and some option module parameters require you to reset the option module before the new settings take effect. You can reset the option module by power cycling the drive or by using *Device* **Parameter 03 - [Reset Module].**

ATTENTION: Risk of injury or equipment damage exists. If the option module is transmitting control I/O to the drive, the drive can fault when you reset the option module. Determine how your drive will respond before resetting the option module.

Set *Device* **Parameter 03 - [Reset Module]** to '1' (Reset Module).



Value	Description
0	Ready (Default)
1	Reset Module
2	Set Defaults

When you enter '1' (Reset Module), the option module is immediately reset. An alternate method to reset the module is by power cycling the drive. When you enter '2' (Set Defaults), the option module sets **all** of its *Device* **and** *Host* parameters to their factory default values. (This is the same as pressing the ALL *soft key* when using the MEMORY folder method described in Restoring Option Module Parameters to Factory Defaults on page 34).

IMPORTANT When performing a Set Defaults, the drive may detect a conflict and then not allow this function to occur. If this happens, first resolve the conflict and then repeat a Set Defaults action. Common reasons for a conflict include a drive running or a controller (master) in Run mode.

After performing a Set Defaults, you must enter '1' (Reset Module) or power cycle the drive so that the new values take effect. Thereafter, this parameter is restored to a value of '0' (Ready).

TIP If your application allows, you can also reset the option module by cycling power to the drive (resetting the drive) or by using the HIM's Reset Device function located in the drive's DIAGNOSTIC folder.

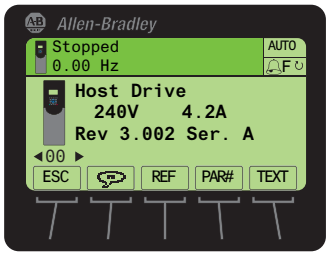
Restoring Option Module Parameters to Factory Defaults

As an alternate reset method, you can restore the option module parameters by using a MEMORY folder menu item instead of using *Device* **Parameter 03 - [Reset Module]** described in Resetting the Option Module on page 33. The MEMORY folder method provides two ways to restore the option module *Device* **and** *Host* parameters:

- ALL—restores ALL option module *Device* and *Host* parameters to their factory default values.
- MOST—restores MOST option module *Device* and *Host* parameters—except the following parameters which are used for network setup:
  - *Device* **Parameters 04** through **07 - [IP Addr Cfg 1-4]**
  - *Device* **Parameters 08** through **11 - [Subnet Cfg 1-4]**
  - *Device* **Parameters 12** through **15 - [Gateway Cfg 1-4]**
  - *Device* **Parameter 16 - [DHCP]**

Follow these steps to restore option module *Device* and *Host* parameters to their factory default values.

1. Access the Status screen, which is displayed on HIM powerup.



2. Use the 4 or 6 key to scroll to the Port in which the option module is installed.
3. Press the key to display its last-viewed folder.
4. Use the 4 or 6 key to scroll to the MEMORY folder.
5. Use the 2 or 8 key to select **Set Defaults**.
6. Press the 5 (Enter) key to display the Set Defaults pop-up box.
7. Press the 5 (Enter) key again to display the warning pop-up box to reset *Device* and *Host* parameters to their factory default values.
8. Press the MOST *soft key* to restore MOST *Device* and *Host* parameters to factory defaults, or press the ALL *soft key* to restore ALL parameters. Or press the ESC *soft key* to cancel.

IMPORTANT When performing a Set Defaults, the drive may detect a conflict and then not allow this function to occur. If this happens, first resolve the conflict and then repeat this Set Defaults procedure. Common reasons for a conflict include a drive running or a controller (master) in Run mode.

9. Reset the option module using *Device* **Parameter 03 - [Reset Module]** or by cycling power to the drive so that the restored parameters take effect.

Viewing the Option Module Status Using Parameters

The following parameter provides information about the status of the option module. You can view this parameter at any time.

Module *Device* Parameter	Description
02 - [Net Addr Src]	Displays the source from which the option module network address is taken. It is either '0' (Parameters) or '1' (Default) which uses the following defaults: • IP Address 192.168.0.1 • Subnet Mask 255.255.255.0 • Gateway Address 192.168.0.1

Updating the Option Module Firmware

The option module firmware can be updated over the network or serially through a direct connection from a computer to the drive using a 1203-USB or 1203-SSS serial converter.

When updating firmware over the network, you can use the Allen-Bradley ControlFLASH software tool, the built-in update capability of DriveExplorer Lite or Full software, or the built-in update capability of DriveExecutive software.

When updating firmware through a direct serial connection from a computer to a drive, you can use the same Allen-Bradley software tools described above, or you can use HyperTerminal software set to the X-modem protocol.

To obtain a firmware update for this option module, go to http://www.ab.com/support/abdrives/webupdate. This website contains all firmware update files and associated Release Notes that describe the following items:

- Firmware update enhancements and anomalies
- How to determine the existing firmware revision
- How to update the firmware using ControlFLASH, DriveExplorer, or DriveExecutive software.

Notes:

Using BACnet Services and Objects

This chapter provides information about controlling and monitoring a PowerFlex 750-Series drive using BACnet objects.

BACnet Services

BACnet services are used for exchanging data with a device over BACnet protocol. A BACnet server offers a set of services, which can be viewed as a set of messages (request or response). The option module supports these BACnet services.

Object Access Services

Object Access Services is a set of services that are used to read and write the values of parameters for the PowerFlex 750-Series drive and option module that are represented by BACnet objects.

The option module supports the following Object Access Services:

- Read Property Service
- Write Property Service
- Read Property Multiple Service
- Write Property Multiple Service

Remote Device Management Services

Remote Device Management Services provide services that are used to access details of the option module, other devices on the network, configuration of communication settings, resetting the option module, and so forth.

These are the services supported by the option module:

- Who-Has and I-Have Services
- Who-Is and I-Am Services

The table below provides a brief description of these services.

Table 2 - BACnet Services Supported by the Option Module

Property Type	Name	Description
Object Access Services	Read Property Service	This service is used to read parameter values represented by BACnet objects for the PowerFlex 750-Series drive or option module.
	Write Property Service	This service is used to write values to parameters represented by BACnet objects for the PowerFlex 750-Series drive or option module.
	Read Property Multiple Service	This service is used to read multiple parameter values represented by BACnet objects for the PowerFlex 750-Series drive or option module.
	Write Property Multiple Service	This service is used to write values to multiple parameters represented by BACnet objects for the PowerFlex 750-Series drive or option module.
Remote Device Management Services	Who-Has and I-Have Services	Who-Has service is a request to identify an object specified by the object identifier or object name. I-Have service is a response to respond to Who-Has service requests.
	Who-Is and I-Am Services	Who-Is service is used to determine the device object identifier, the network address, or both, for all BACnet devices on the network. I-Am service is used to respond to Who-Is service requests. It is independent to Who-Is service and may be issued at any time. It is also used to broadcast the existence of the option module, or all BACnet devices on the network.

Understanding BACnet Objects

BACnet devices are controlled and monitored by the use of several objects. The BACnet controller performs read and write services to these objects, and the option module translates the data between these objects and the PowerFlex 750-Series drive.

When a read or write service occurs to a specific object, data in that object is refreshed from or transferred to the drive.

These are the BACnet object types supported by the option module:

- Analog Input (AI)
- Analog Output (AO)
- Analog Value (AV)
- Binary Input (BI)
- Binary Output (BO)
- Binary Value (BV)

Basic Drive Operation on the Network

This section describes how to operate a drive on the network using a combination of BACnet object types for basic control.

ATTENTION: Control information written to the option module by a BACnet controller is volatile. That is, it will be erased by an option module reset or power cycle. For example, if a BACnet controller writes to a Binary Output (BO) object to energize an output relay on the drive and then that drive is reset or power cycled, the drive returns the relay to its default (de-energized) state. The option module does not attempt to restore the relay to the energized state unless a BACnet controller writes to it again.

Basic Drive Control (Start/Stop)

Write a speed reference value (in %) to the Reference 1 Analog Value object (AV0) Present Value property.

1. To start the drive, write a value of '1' to the Run/Stop Binary Value object (BV10) Present Value property.
2. To stop the drive, write a value of '0' (zero) to the Run/Stop Binary Value object (BV10) Present Value property.

Using an Alternate Speed Reference

Follow these steps to assign an alternate speed reference to the drive.

1. Write a speed reference value (in %) to the Reference 2 Analog Value object (AV1) Present Value property.
2. Write a value of '1' to the Ref2/Ref1 Binary Value object (BV12) Present Value property.

Changing Motor Rotation Direction

To command a reverse direction of motor rotation when the drive is running, write a value of '1' to the Rev/Fwd Binary Value object (BV11) Present Value property. To command a forward direction when the drive is running, write a value of '0' (zero) to the Rev/Fwd Binary Value object (BV11) Present Value property.

Clearing a Drive Fault

To clear a drive fault, write a value of '1' to the Clear Faults Binary Value object (BV13) Present Value property.

Supported BACnet Objects

The type of drive used on the network determines the specific BACnet objects that are supported. See Table 3 for descriptions of the BACnet objects and the drives supporting those objects.

Table 3 - BACnet Object Descriptions and Supported Drives

Object	Name	Use this Object to...	Drive Parameter Number	PowerFlex 750-Series Drive	
				753	755
Analog Input (AI) Objects					
AI0	Analog Input 1 (%)	Read the value of Analog Input 1 (voltage or current) on the drive's I/O terminal block.	260	✔	—
Analog Output (AO) Objects					
AO0	Analog Output 1 (%)	Read/write the value of Analog Output on the drive's I/O terminal block.	276	✔	—
Analog Value (AV) Objects					
AV0	Speed Reference A	Read/write the Speed Reference A.	—	✔	✔
AV1	Speed Reference B	Read/write the Speed Reference B.	—	✔	✔
AV2	Output Frequency (Hz)	Read the drive's output frequency.	1	✔	✔
AV3	Output Current (Amps)	Read the drive's output current.	7	✔	✔
AV4	Output Voltage (VAC)	Read the drive's output voltage.	8	✔	✔
AV5	Output Power (kW)	Read the drive's output power.	9	✔	✔
AV6	Output Energy (kWh)	Read/write the drive's accumulated output energy.	14	✔	✔
		Important: When writing, this object accepts only a value of '0' (zero).		✔	✔
AV7	Output Energy 2 (MWh)	Read/write the drive's accumulated Output energy in terms of MWh. **Important:** When writing, this object accepts only a value of '0' (zero).	13	✔	✔
AV8	DC Bus Voltage (VDC)	Read the drive's DC bus voltage.	11	✔	✔
AV9	Drive Temp (°C)	Read the drive's temperature.	944	✔	✔
AV10	Reserved	—	—	—	—
AV11	Run Time (Hours)	Read/write the drive's accumulated run time.	15	✔	✔
		Important: When writing, this object accepts only a value of '0' (zero).		✔	✔
AV12	Fault 1	Read the code for the drive's most recent fault.	DPI Fault Object	✔	✔
AV13	Fault 2	Read the code for the drive's second most recent fault.	DPI Fault Object	✔	✔
AV14	Fault 3	Read the code for the drive's third most recent fault.	DPI Fault Object	✔	✔
AV15	Accel Time 1 (Sec)	Read/write the drive's Accel Time 1 setting.	535	✔	✔
AV16	Accel Time 2 (Sec)	Read/write the drive's Accel Time 2 setting.	536	✔	✔
AV17	Decel Time 1 (Sec)	Read/write the drive's Decel Time 1 setting.	537	✔	✔
AV18	Decel Time 2 (Sec)	Read/write the drive's Decel Time 2 setting.	538	✔	✔
AV19	Reference 1 (%)	Read/write the Reference 1.	545	✔	✔
AV20	Reference 2 (%)	Read/write the Reference 2.	550	✔	✔

Table 3 - BACnet Object Descriptions and Supported Drives (Continued)

Object	Name	Use this Object to...	Drive Parameter Number	PowerFlex 750-Series Drive	
				753	755
AV21	Mailbox1 Param	Read/write any drive parameter. To read a drive parameter, write the number for the desired parameter to the Mailbox Param object, and then read the Mailbox value object. To write a drive parameter, write the number for the desired parameter to the Mailbox Param object, and then write the desired value to the Mailbox Value object.	—	✔	✔
AV22	Mailbox1 Value		—	✔	✔
AV23	Mailbox2 Param		—	✔	✔
AV24	Mailbox2 Value		—	✔	✔
AV25	Mailbox3 Param		—	✔	✔
AV26	Mailbox3 Value		—	✔	✔
AV27	Mailbox4 Param		—	✔	✔
AV28	Mailbox4 Value		—	✔	✔
AV29	Mailbox5 Param		—	✔	✔
AV30	Mailbox5 Value		—	✔	✔
AV31	Mailbox6 Param		—	✔	✔
AV32	Mailbox6 Value		—	✔	✔
AV33	Mailbox7 Param		—	✔	✔
AV34	Mailbox7 Value		—	✔	✔
AV35	Mailbox8 Param		—	✔	✔
AV36	Mailbox8 Value		—	✔	✔
Binary Input (BI) Objects					
BI0	Digital Input 0	Read the state of Digital Input 0 on the drive's OBJECTS terminal block.	220 (Bit 0)	✔	✔
B11	Digital Input 1	Read the state of Digital Input 1 on the drive's OBJECTS terminal block.	220 (Bit 1)	✔	—
BI2	Digital Input 2	Read the state of Digital Input 2 on the drive's OBJECTS terminal block.	220 (Bit 2)	✔	—
Binary Output (BO) Objects					
BO0	Output Relay 0	Read/write the state of Output Relay 0	227	✔	—
Binary Value (BV) Objects					
BV0	RUN Ready	Read the drive's RUN Ready status.	Logic Status Word, Bit 0	✔	✔
BV1	Active	Read the drive's Active status, which is enabled if the drive is running.	Logic Status Word, Bit 1	✔	✔
BV2	Forward/Reverse	Read the drive's Actual Direction status, which is active if the drive is running.	Logic Status Word, Bit 3	✔	✔
BV3	Fault	Read the drive's Fault status, which is active if the drive is faulted.	Logic Status, Word, Bit 7	✔	✔
BV4	Alarm	Read the drive's Alarm status, which is active if the drive has an alarm.	Logic Status Word, Bit 6	✔	✔
BV5	At Setpt Spd	Read the drive's Setpd Spd status, which is enabled if the drive is running at the specified speed reference.	Logic Status Word, Bit 8	✔	✔
BV6	Manual Active	Read the drive's Manual Mode setting. 0 = Manual Mode Not Active; 1 = Manual Mode Active	Logic Status Word, Bit 9	✔	✔

Table 3 - BACnet Object Descriptions and Supported Drives (Continued)

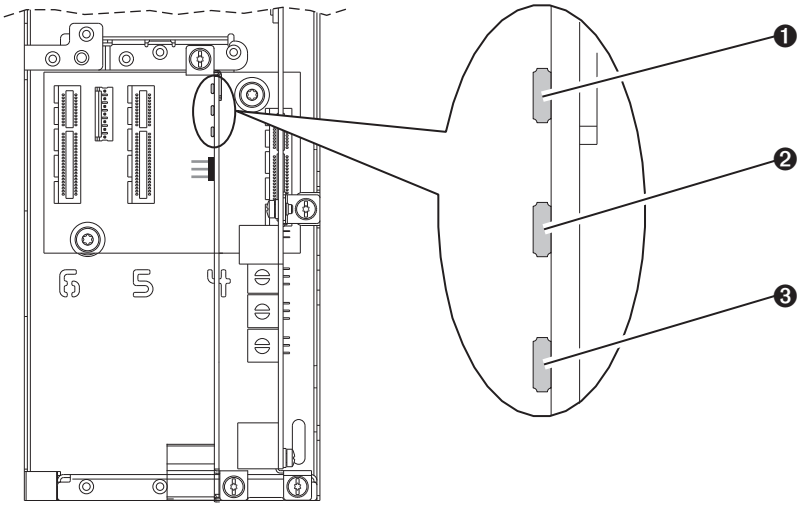
Object	Name	Use this Object to...	Drive Parameter Number	PowerFlex 750-Series Drive	
				753	755
BV10	Run/Stop	Read/write the drive's Run/Stop command. Turn on this object to start the drive/turn off bit to stop the drive.	Logic Command Word, Bit 18	✔	✔
BV11	Rev/Fwd	Read/write the drive's Rev/Fwd command. Turn on this object to command the reverse direction when the drive is running. Turn off this object to command Forward.	Logic Command Word, Bits 4 and 5	✔	✔
BV12	Ref2/Ref1	Read/write the drive's Ref2/Ref1 command. Turn on this object to select the Reference 2 instance of the AV object as the drive's speed reference. Turn off this object to select Reference 1.	Logic Command Word, Bits 12, 13, and 14	✔	✔
BV13	Clear Faults	Read/write the drive's Clear Faults command. Turn on this object to clear the drive fault. Turning off this object does nothing.	Logic Command Word, Bit 3	✔	✔
BV14	Auto/Manual	Read/write the drive's Auto/Manual setting. 0 = Not manual; 1 = Manual	Logic Command Word, Bit 6	✔	✔

Troubleshooting

This chapter provides information for diagnosing and troubleshooting potential problems with the option module and network.

Understanding the Status Indicators

The option module has three status indicators. They can be viewed with the drive cover removed.



Item	Status Indicator	Description	Page
❶	PORT	DPI Connection Status	44
❷	MOD	Option Module Status	44
❸	NET A	BACnet Status	45

PORT Status Indicator

This red/green bicolor LED indicates the status of the option module's connection to the drive as shown in the table below.

Status	Cause	Corrective Action
Off	The option module is not powered or is not properly connected to the drive.	• Securely connect and ground the option module to the drive by fully inserting it into the drive port and tightening its two captive screws to the recommended torque. • Apply power to the drive.
Flashing Red	The option module is not receiving any communication from the drive.	• Verify that the option module is properly inserted in the drive port. • Cycle power to the drive.
Steady Red	The option module detected a duplicate or invalid port ID.	**Important:** Cycle power to the drive after securely connecting and grounding the option module to the drive by fully inserting it into the drive port and tightening its two captive screws to the recommended torque.
Flashing Green	The option module is establishing communication with the drive.	No action required. This status indicator will turn steady green or red.
Steady Green	The option module is properly connected and communicating with the drive.	No action required.
Steady Orange	The brand of the option module and drive do not match.	Connect the option module to a compatible product of the same brand (an Allen-Bradley PowerFlex 750-Series drive).

MOD Status Indicator

This red/green bicolor LED indicates the status of the option module as shown in the table below.

Status	Cause	Corrective Action
Off	The option module is not powered or is not properly connected to the drive.	• Securely connect and ground the option module to the drive by fully inserting it into the drive port and tightening its two captive screws to the recommended torque. • Apply power to the drive and network.
Flashing Red	The option module has failed the firmware test.	• Cycle power to the drive. Parameter settings may have been changed. • Clear faults in the option module. • If cycling power does not correct the problem, the option module parameter settings may have been corrupted. Reset defaults and reconfigure the option module. • If resetting defaults does not correct the problem, update the option module with the latest firmware revision.
Steady Red	The option module has failed the hardware test.	• Cycle power to the drive. • Replace the option module.
Flashing Green	The option module is operating normally, but is not transferring BACnet data.	• Place the Client in RUN mode. • Configure the option module for the program in the controller. • Program the controller to recognize and transmit BACnet data to the option module. • Normal behavior if no communication is taking place.
Steady Green	The option module is operating and is transferring BACnet data to the controller.	No action required.

NET A Status Indicator

This red/green bicolor LED indicates the status of the network connection to the option module as shown in the table below.

Status	Cause	Corrective Actions
Off	The option module is not powered or is not properly connected to the network. The link is inactive.	• Securely connect the option module to the drive and connect it to the network with a CAT5 cable. • Correctly connect the network cable to the option module's RJ45 Ethernet connector. • Apply power to the drive.
Flashing Red	Any error in packet validation and/or execution is considered a network configuration error.	Re-configure the option module.
Steady Red	Any failure in self-test on the external Ethernet controller is considered a network controller error.	• Cycle power to the drive. • Re-configure the BACnet Client.
Steady Green	The option module is properly connected and communicating on the network.	No action required.

Viewing Option Module Diagnostic Items

If you encounter unexpected communications problems, the option module's diagnostic items may help you or Rockwell Automation personnel troubleshoot the problem. Option module diagnostic items can be viewed with any of these drive configuration tools:

- PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM
- Connected Components Workbench software, version 1.02 or later
- DriveExplorer software, version 6.01 or later
- DriveExecutive software, version 5.01 or later

For details on viewing diagnostic items using the HIM, see the PowerFlex 20-HIM-A6/-C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001.

Table 4 - Option Module Diagnostic Items

No.	Name	Description
1	Common Logic Cmd	The present value of the Common Logic Command being transmitted to the drive by this option module.
2	Prod Logic Cmd	The present value of the Product Logic Command being transmitted to the drive by this option module.
3	Reference	The present value of the Reference being transmitted to the drive by this option module.
4	Common Logic Sts	The present value of the Common Logic Status being received from the drive by this option module.
5	Prod Logic Sts	The present value of the Product Logic Status being received from the drive by this option module.
6	Feedback	The present value of the Feedback being received from the drive by this option module.
7	DPI Rx Errs	The present value of the DPI CAN Receive error counter register.
8	DPI Rx Errs Max	The maximum value of the DPI CAN Receive error counter register.
9	DPI Tx Errs	The present value of the DPI CAN Transmit error counter register.
10	DPI Tx Errs Max	The maximum value of the DPI CAN Transmit error counter register.
11	Boot Flash Count	The number of times the boot firmware in this option module has been updated.
12	App Flash Count	The number of times the application firmware in this option module has been updated.

Table 4 - Option Module Diagnostic Items (Continued)

No.	Name	Description
13 14 15 16 17 18	HW Addr 1 HW Addr 2 HW Addr 3 HW Addr 4 HW Addr 5 HW Addr 6	Decimal value of each byte in the option module's Ethernet hardware address. 255:255:255:255:255:255 [HW Addr 1] [HW Addr 2] [HW Addr 3] [HW Addr 4] HW Addr 5] [HW Addr 6]
19	Net Rx Pckt	The number of packets received from the network.
20	Net Rx Err	The present value of error packets received from the network.
21	Net Rx Terr	The total number of error packets received from the network.
22	Net Tx Pckt	The number of packets transmitted by the option module.
23	Net Tx Err	The present value of error packets transmitted by the option module.
24	Net Tx Terr	A count of the total number of transmitted error packets by the option module.
25	BACnet Rx Err	The present value of BACnet error packets received from the network.
26 27 28 29	IP Addr Act 1 IP Addr Act 2 IP Addr Act 3 IP Addr Act 4	Value of each byte in the option module's present IP address. A value of '0' appears if the option module does not currently have an IP address. 255.255.255.255 [IP Addr Act 1] [IP Addr Act 2] [IP Addr Act 3] [IP Addr Act 4]
30 31 32 33	Subnet Act 1 Subnet Act 2 Subnet Act 3 Subnet Act 4	Value of each byte in the option module's present subnet mask. A value of '0' appears if the option module does not currently have a subnet mask. 255.255.255.255 [Subnet Act 1] [Subnet Act 2] [Subnet Act 3] [Subnet Act 4]
34 35 36 37	Gateway Act 1 Gateway Act 2 Gateway Act 3 Gateway Act 4	Value of each byte in the option module's present gateway address. A value of '0' appears if the option module does not currently have a gateway address. 255.255.255.255 [Gateway Act 1] [Gateway Act 2] [Gateway Act 3] [Gateway Act 4]

Viewing and Clearing Events

The option module has an event queue to record significant events that occur in the operation of the module. When such an event occurs, an entry consisting of the event's numeric code and a timestamp is put into the event queue. You can view the event queue with any of these drive configuration tools:

- PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM
- Connected Components Workbench software, version 1.02 or later
- DriveExplorer software, version 6.01 or later
- DriveExecutive software, version 5.01 or later)

For details on viewing and clearing events using the HIM, see the PowerFlex 20-HIM-A6/-C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001.

The event queue can contain up to 32 entries, which are stored in an EEPROM chip—making the event queue nonvolatile. Eventually the event queue will become full, since its contents are retained through option module power cycles and resets. At that point, a new entry replaces the oldest entry. Only an event queue clear operation or the corruption of the EEPROM group containing the event queue will clear the event queue contents. In the latter case, the option module will not generate a fault to indicate that the event queue was corrupted.

Resetting the option module to defaults has no effect on the event queue, other than to log a Code 58 'Module Defaulted' event.

Many events in the event queue occur under normal operation. If you encounter unexpected communications problems, the events may help you or Allen-Bradley personnel troubleshoot the problem. The following events may appear in the event queue.

Table 5 - Option Module Events

Code	Event Text	Description
Option Module Events		
1	No Event	Text displayed in an empty event queue entry.
2	Device Power Up	Power was applied to the option module.
3	Device Reset	The option module was reset.
4	EEPROM CRC Error	The EEPROM checksum/CRC is incorrect, which limits option module functionality. Default parameter values must be loaded to clear this condition.
5	App Updated	The option module application firmware was updated.
6	Boot Updated	The option module boot firmware was updated.
7	Watchdog Timeout	The software watchdog detected a failure and reset the option module.
DPI Events		
8	DPI Bus Off	A bus-off condition was detected on DPI. This event may be caused by noise.
9	DPI Ping Timeout	A ping message was not received on DPI within the specified time.
10	DPI Port Invalid	The Option Module was not connected to a valid port on a DPI product.
11	DPI Port Changed	The DPI port changed after startup.

Table 5 - Option Module Events (Continued)

Code	Event Text	Description
12	DPI Host Reset	The drive sent a reset event message.
13	DPI Baud 125kbps	The option module detected that the drive was communicating at 125 Kbps.
14	DPI Baud 500kbps	The option module detected that the drive was communicating at 500 Kbps.
15	DPI Host Invalid	The option module was connected to an incompatible product.
16	DPI Dup Port	Another peripheral with the same port number is already in use.
17	DPI Type 0 Logon	The option module has logged in for Type 0 control.
18	DPI Type 0 Time	The option module has not received a Type 0 status message within the specified time.
19	DPI DL Logon	The option module has logged into a Datalink.
20	DPI DL Error	The drive rejected an attempt to log in to a Datalink because the Datalink is not supported or is used by another peripheral.
21	DPI DL Time	The option module has not received a Datalink message within the specified time.
22	DPI Ctrl Disable	The option module has sent a 'Soft Control Disable' command to the drive.
23	DPI Ctrl Enable	The option module has sent a 'Soft Control Enable' command to the drive.
24	DPI Msg Timeout	A Client-Server message sent by the option module was not completed within 1 second.
25	DPI Manual Reset	The option module was reset by changing its Reset Module parameter.
SI Events		
26	SI Online	The option module has logged into the Serial Interface Communications.
27	SI Logon Error	The option module failed to log into the Serial Interface.
28	SI Comm Fault	The Serial Interface Communications has faulted.
Network Events		
29	Net Link Up	A network link was available for the option module.
30	Net Link Down	The network link was removed from the option module.
31	Net Dup Address	The option module uses the same address as another device on the network.
32	Net Comm Fault	The option module detected a communications fault on the network.
33	Net Sent Reset	The option module received a reset from the network.
34	Net IO Close	An I/O connection from the network to the option module was closed.
35	Net Idle Fault	The option module received 'idle' packets from the network.
36	Net IO Open	An I/O connection from the network to the option module has been opened.
37	Net IO Timeout	An I/O connection from the network to the option module has timed out.
38	Net IO Size Err	The option module received an incorrectly sized I/O packet.
39	PCCC IO Close	The device sending PCCC Control messages to the option module has set the PCCC Control Timeout to zero.
40	PCCC IO Open	The option module has begun receiving PCCC control messages (the PCCC Control Timeout was previously set to a non-zero value).
41	PCCC IO Timeout	The option module has not received a PCCC Control message for longer than the PCCC Control Timeout.
42	Msg Ctrl Open	The timeout attribute in either the CIP Register or Assembly object was written with a non-zero value, allowing control messages to be sent to the option module.
43	Msg Ctrl Close	The timeout attribute in either the CIP Register or Assembly object was written with a zero value, disallowing control messages to be sent to the option module.
44	Msg Ctrl Timeout	The timeout attribute in either the CIP Register or Assembly object elapsed between accesses of those objects.
45	Peer IO Open	The option module received the first Peer I/O message.

Table 5 - Option Module Events (Continued)

Code	Event Text	Description
46	Peer IO Timeout	The option module has not received a Peer I/O message for longer than the Peer I/O Timeout.
47-54	Reserved	—
55	DHCP Response	The option module received a response to its DHCP request.
56	Email Failed	The option module encountered an error attempting to send a requested e-mail message.
57	Option Card Flt	Internal option module faults.
58	Module Defaulted	The option module has been set to defaults.
59	No MAC Addr	A MAC address has not been assigned, or the MAC address is invalid.

Notes:

Viewing Option Module Web Pages

This chapter provides instructions on how to monitor the PowerFlex 750-Series drive and its BACnet/IP option module by using the module's web interface.

Future enhancements may result in option module web pages that look different than the examples shown in this chapter.

Enabling the Option Module Web Pages

After the option module is configured and operating, you can view its web pages. They present information about the module, the drive to which it is connected, and the other DPI devices connected to the drive such as a HIM.

By default the option module web pages are disabled. To enable the option module web pages, set *Device* **Parameter 26 - [Web Enable]** to '1' (Enabled) and then reset the option module for the change to take effect.

Viewing the Web Pages

The option module can be configured to automatically send e-mail messages to desired addresses when selected drive faults occur and/or are cleared, and/or when the option module takes a communication or idle fault action.

Bit 0 of *Device* **Parameter 27 - [Web Features]** can be used to protect the configured settings. For more details, see Configure E-mail Notification Web Page on page 56.

1. On a computer with access to the BACnet network on which the drive/option module is installed, launch a web browser such as Microsoft™ Internet Explorer, version 5.0 or later.

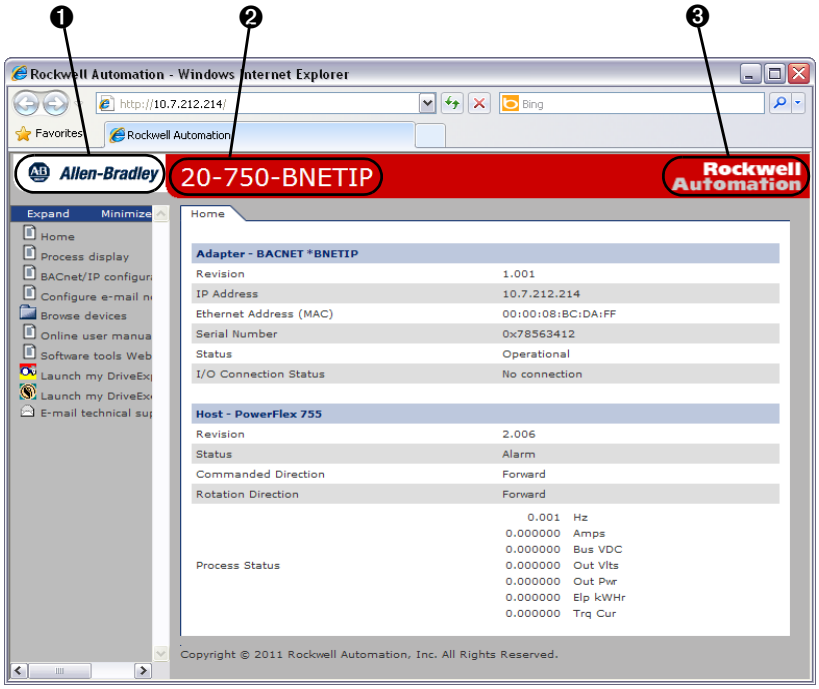
   The computer can access the option module web pages if it is connected to:
   - The same network as the drive/option module.
   - A network with access to the drive/option module's network via a gateway device (for example, a router).

2. In the Address box, type the IP address of the option module.
3. Press ENTER.

   The option module web Home Page (Figure 5) appears.

IMPORTANT	Using the browser's View menu, choose Refresh to always re-display the option module Home Page while viewing any of the module's other web pages.

Figure 5 - Option Module Web Home Page Example



Title Bar on Option Module Web Pages

The title bar appears on the option module Home Page and all of the module's other web pages. The title bar consists of three elements as shown in Figure 5.

Title Bar Element	Description
❶ Allen-Bradley logo	This logo is a hyperlink. Click it to view the ab.com web Home Page.
❷ Option Module Title	Shows the option module type or user-configured title.
❸ Rockwell Automation logo	This logo is a hyperlink. Click it to view the Rockwell Automation web Home Page.

Navigation Pane on Option Module Web Pages

The navigation pane appears on the left side of the option module Home Page and all of the module's other web pages. The navigation pane consists of links and link folders which can be expanded or minimized. The following table shows all navigation pane links and link folders.

Navigation Pane Link/ Folder	Description
Home link	Click this link to view the module's Home Page (Figure 5).
Process display link	Click this link to view the host drive's Process Display pop-up dialog box (Figure 6).
BACnet/IP configuration link	Click this link to view the module's BACnet/IP Configuration web page showing information about the BACnet/IP configuration, such as the module's IP address, subnet mask, gateway address, and so forth. Figure 7 shows an example BACnet/IP Configuration web page.
Configure e-mail notification link	Click this link to view the module's Configure E-mail Notification web page (Figure 8) to configure the option module to send automatic e-mail messages. An example e-mail message is shown in Figure 11.
Browse devices folder	Click this folder to expand and view the Port folders for all present devices, including the drive, option module, and other devices connected to the drive such as a HIM.
Port x folders	Click a respective Port folder to expand and view its device's various links which take you to related information pages. For Port 0 (PowerFlex 750-Series drive) example information pages, see Figure 12, Figure 13, and Figure 14.
Online user manuals link	Click this link to view Rockwell Automation's web page with documentation for drives and other devices.
Software tools Web site link	Click this link to view Allen-Bradley's web page with information about software tools such as DriveExplorer and DriveExecutive.
Launch my DriveExplorer software link	Click this link to launch the DriveExplorer software already installed on your computer.
Launch my DriveExecutive software link	Click this link to launch the DriveExecutive software already installed on your computer.
E-mail technical support link	Click this link to view a new e-mail message dialog box to send a message to the Allen-Bradley Technical Support Team.

Information on Option Module Home Page

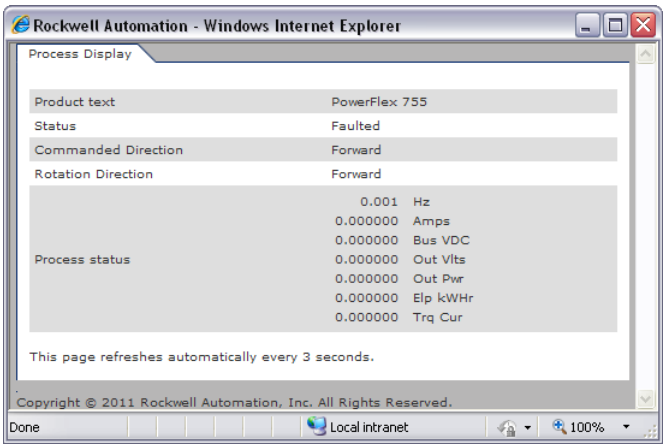
The option module Home Page displays the following information for the host PowerFlex 750-Series drive and its BACnet/IP option module.

Device	Information	
20-750-BNETIP Option Module	• Revision • IP Address • Ethernet Address (MAC)	• Serial Number • Status • I/O Connection Status
Host PowerFlex 750-Series drive	• Revision • Status • Commanded Direction	• Rotation Direction • Process Status

Process Display Pop-up Dialog Box

The Process Display pop-up dialog box dynamically shows the host drive's information. To view this dialog box, click the 'Process display' link in the navigation pane.

Figure 6 - Example of Process Display Pop-up Dialog Box

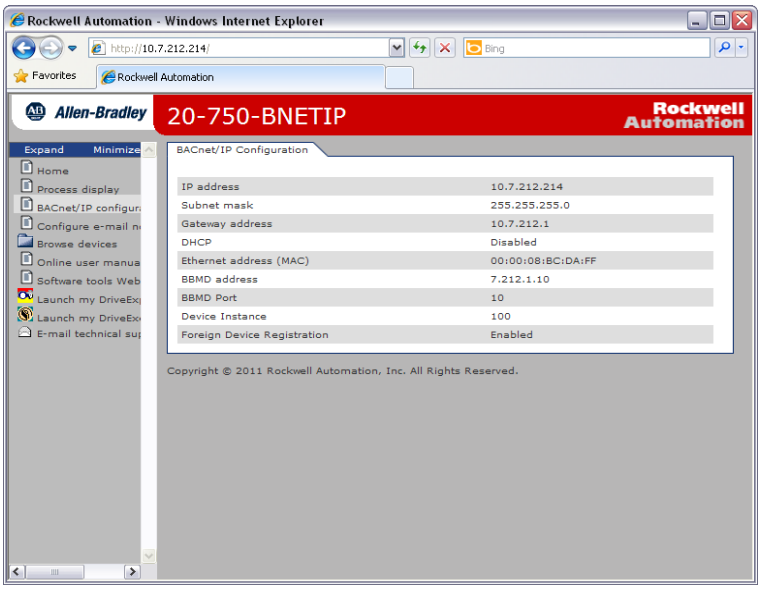


Information	Description
Product Text	Description of host drive.
Status	Status of host drive.
Commanded Direction	Commanded direction of host drive.
Rotation Direction	Rotation direction of host drive.
Process Status 1st Line	Dynamic value of the host drive feedback parameter. This parameter is not selectable.
Lines 2 through 7	Dynamic value of each default-displayed host drive parameter. The displayed drive parameters for lines 2 through 7 are selectable by using a HIM, or another drive configuration tool such as Connected Components Workbench, DriveExecutive, or DriveExplorer software.

BACnet/IP Configuration Web Page

The BACnet/IP Configuration web page provides information about the option module's Ethernet settings and network activities. To view this web page, click the 'BACnet/IP configuration' link (highlighted in Figure 7) in the navigation pane.

Figure 7 - Example of BACnet/IP Configuration Web Page

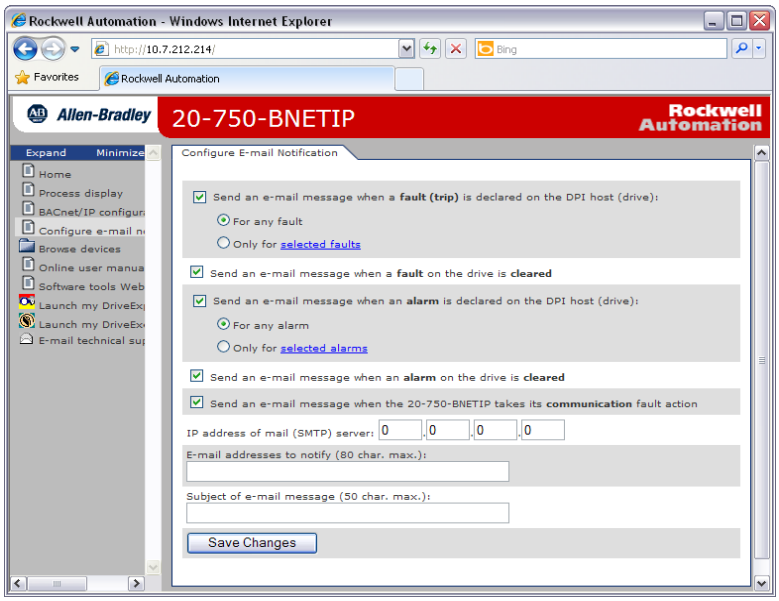


Information	Description
IP address	IP address of the option module.
Subnet mask	Subnet mask for the option module's network.
Gateway address	Address for the gateway device on the option module's network.
DHCP	Shows status for DHCP, which may be used to configure the option module's network information.
Ethernet address (MAC)	Hardware address for the option module.
BBMD address	IP address of the BBMD device.
BBMD Port	Port address of the BBMD device.
Device Instance	Instance number of the option module on the BACnet network.
Foreign Device Registration	Status of foreign device, which may be used to configure the Foreign device on the BACnet network.

Configure E-mail Notification Web Page

The Configure E-mail Notification web page contains selections and data fields for configuring the option module to automatically send email messages to desired addresses when selected types of events occur. To view this web page, click the 'Configure e-mail' link (highlighted in Figure 8) in the navigation pane.

Figure 8 - Example of Configure E-mail Notification Web Page



By default, settings are not protected. After configuration, settings can be protected by using *Device* **Parameter 27 - [Web Features]** to set E-mail Cfg Bit 0 value to '0' (Disabled). To change a protected configuration, it must first be unprotected by setting the E-mail Cfg Bit 0 value back to '1' (Enabled).

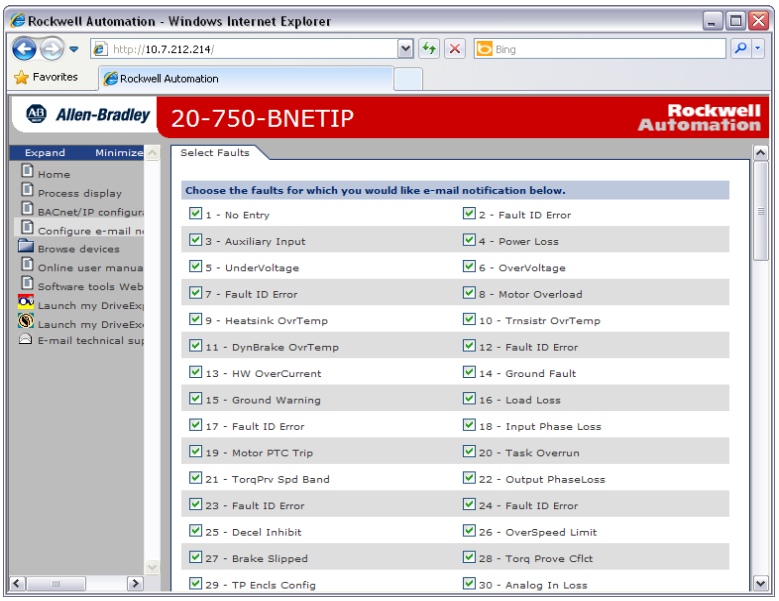
To configure e-mail notification, perform the following steps.

1. Click the desired 'Send an e-mail message when' check boxes you want to occur that will send e-mail notification.

   If you want email notification only when selected faults/alarms occur:

   a. Click the respective fault and/or alarm radio buttons.
   b. Click the 'selected faults' link and/or 'selected alarms' link.
   c. Click the desired fault/alarm check boxes.
   d. Click **Save Changes**.
   e. Click the 'Back to E-mail Configuration Page' link.

Figure 9 - Example of Selected Faults for E-mail Notification Configuration Page



2. Type the following information in their respective boxes.

Information Field	Description
'IP address of…'	Type in the address of the mail server that will be used to deliver the email messages. (When the IP address is unknown, read the TIP shown below this table to determine the mail server address.)
'E-mail addresses to notify…'	Type in addresses to where you want email messages to be sent. Multiple addresses can be used, but they must be separated by commas (comma delimited).
'Subject of e-mail message…'	Type in the desired subject text for the email message.

TIP If the IP address of the email server is unknown, you can contact your IT department or use the following DOS command instructions to find its IP address.

a. From the Start menu on the Windows task bar, choose Run to display the Run dialog box.

b. In the Run dialog box Open field, type 'cmd'.

c. Click OK to display the DOS dialog box.

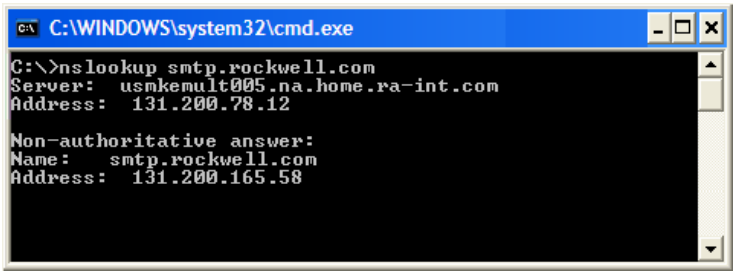
d. On the c:\> command line, type 'nslookup [name of e-mail server].'

The entry 'c:\> nslookup smtp.company.com' is an example.

e. Press Enter to display the e-mail server IP address (Figure 10).

f. Type the second (bottom) IP address shown in the DOS dialog box (for this example, 131.200.165.58) into the E-mail Notification web page (Figure 8).

Figure 10 - DOS Dialog Box Example Showing Email Server IP Address

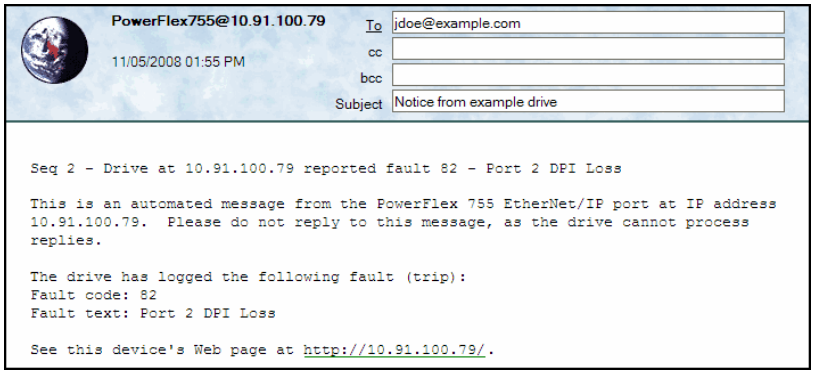


3. Click Save Changes.

IMPORTANT After configuring E-mail Notification, we recommend protecting the settings. Otherwise the configuration can be changed anytime the web page is accessed with a browser. To protect the settings, use *Device* **Parameter 27 - [Web Features]** to set E-mail Cfg Bit 0 value to '0' (Disabled).

The figure below shows an example email message automatically sent by the option module in response to selected events.

Figure 11 - Example of Email Message Sent by the Option Module



TIP To stop email messages, uncheck all of the 'Send an e-mail message when…' boxes.

Disabling the option module web pages by setting *Device* **Parameter 26 - [Web Enable]** to '0' (Disabled) will **not stop** the option module from sending email messages.

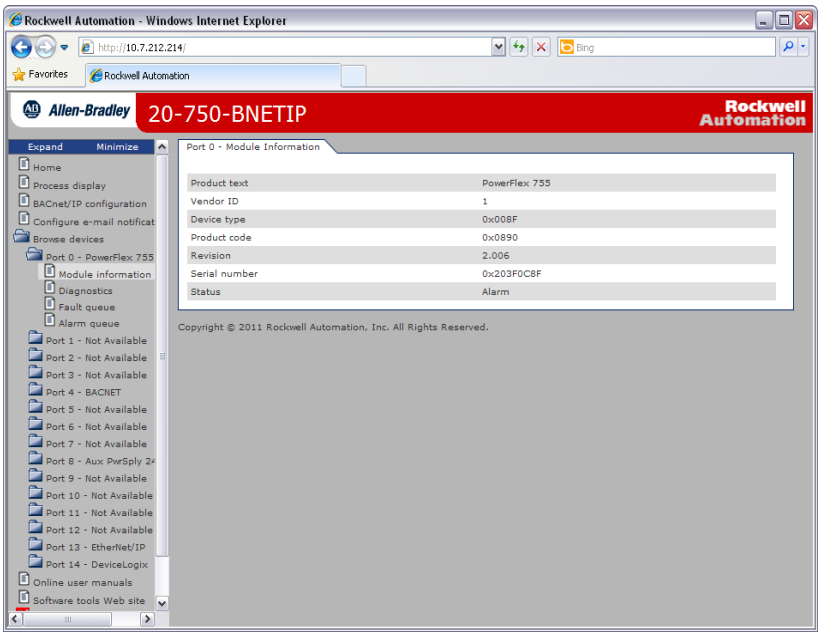
Device Information Pages

Device information pages are viewed by clicking on the respective links in the navigation pane.

Web Page	Description
Module Information	Shows module information for the respective Port device. For example, Figure 12 shows module information for the Port 0 device (host drive).
Diagnostic Items	Shows diagnostic item information for the respective Port device. For example, Figure 13 shows diagnostic items for the Port 0 device (host drive).
Fault Queue	Shows fault queue information for the respective Port device. For example, Figure 14 shows the fault queue for the Port 0 device (host drive).
Alarm Queue	Shows alarm queue information for the respective Port device. For example, Figure 15 shows the alarm queue for the Port 0 device (host drive).
Event Queue (1)	Shows event queue information for the respective Port device. For example, Figure 16 shows the event queue for the Port 4 device (BACnet/IP option module).

(1) Information shown only when supported by the device.

Figure 12 - Example of Port 0 (PowerFlex 750-Series Drive) Module Information Page



Information	Description
Product text	Text identifying the device
Vendor ID	1 = Allen-Bradley
Device type	0x008F (143 decimal)
Product code	Code for the product name and its rating
Revision	Firmware revision used by the device
Serial number	Serial number of the device
Status	Operating status of the device (for example, Alarm)

Figure 13 - Example of Port 0 (PowerFlex 750-Series Drive) Diagnostic Items Page

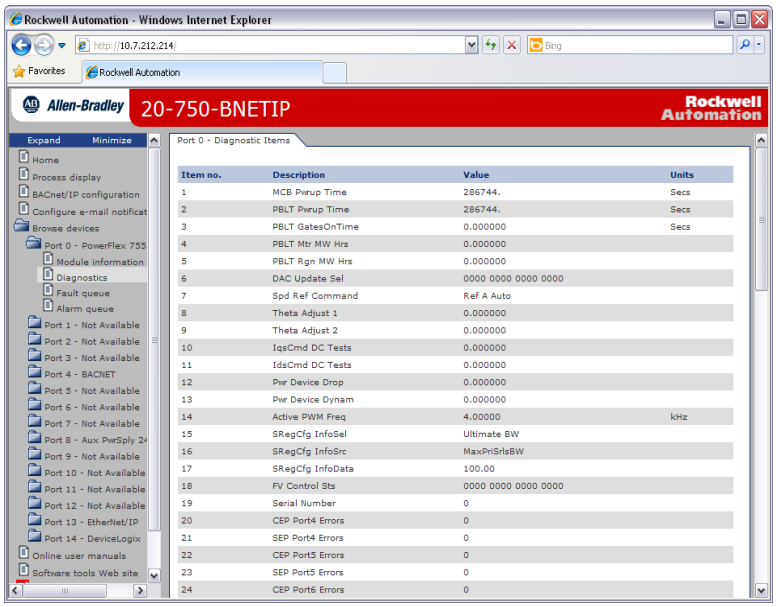


Figure 14 - Example of Port 0 (PowerFlex 750-Series Drive) Fault Queue Page

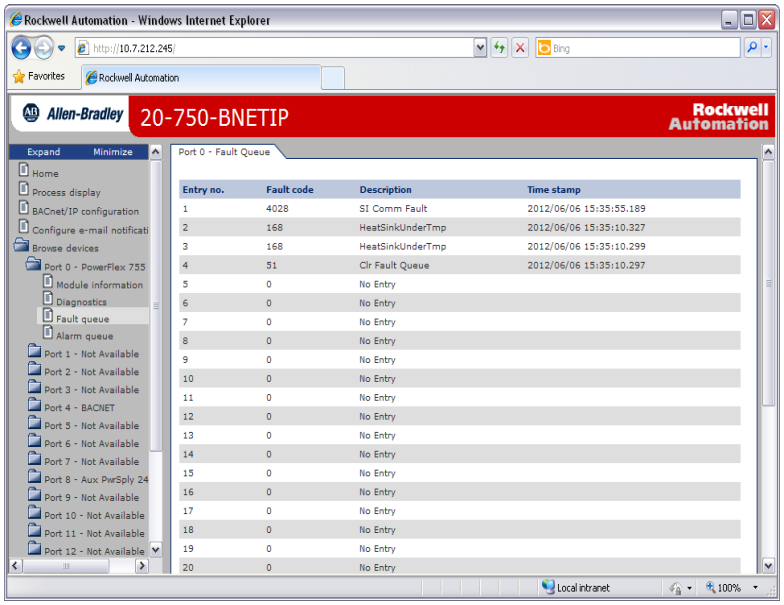


Figure 15 - Example of Port 0 (PowerFlex 750-Series Drive) Alarm Queue Page

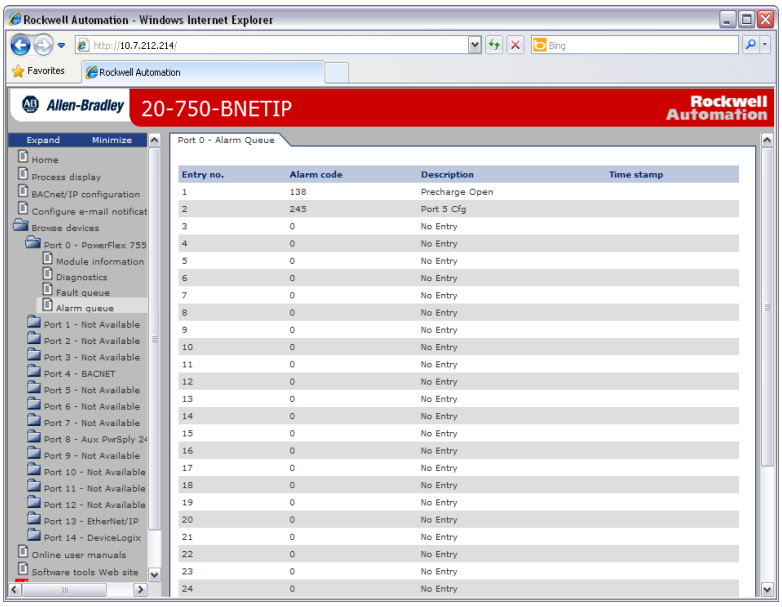
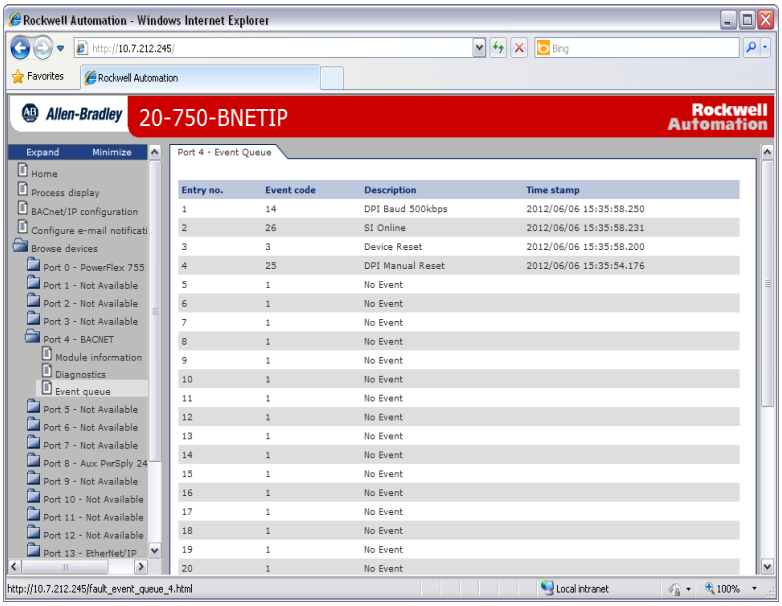


Figure 16 shows an example event queue page for the Port 4 device (BNET/IP option module).

Figure 16 - Example of Port 4 (20-750-BNETIP Option Module) Event Queue Page



Notes:

Specifications

This appendix presents the specifications for the option module.

Communication

Network	
Protocol	BACnet/IP
Data Rates	10/100 Mbps
Media	Ethernet cable with RJ45 connector
Drive	
Protocol	DPI
Data Rates	500 Kbps

Electrical

Consumption	
Drive	250 mA at 14 VDC supplied by the host drive
Network	None

Mechanical

Dimensions	
Height	16 mm (0.63 inches)
Length	130 mm (5.12 inches)
Width	83 mm (3.27 inches)
Weight	60 g (2 oz.)

Environmental

Temperature Operating Storage	 -5…65 °C (30…149 °F) -40…85 °C (-40…185 °F)
Relative Humidity Operating Non-operating	 5…80% non-condensing 5…95% non-condensing
Shock (Operating)	15 g peak acceleration
Vibration Operating Non-Operating	 2 g at 55...512 Hz 5 g at 5 Hz...2 kHz
Atmosphere	**Important:** The option module **must not** be installed in an area where the ambient atmosphere contains volatile or corrosive gas, vapors or dust. If the option module is not going to be installed for a period of time, it must be stored in an area where it will not be exposed to a corrosive atmosphere.

Regulatory Compliance

Certification	Specification
BTL	SSPC135
UL	UL508C
cUL	CAN/ CSA C22.2 No.14-M91
CE	EN 61800-3
C-Tick	EN 61800-3

NOTE: This is a product of category C2 according to IEC 61800-3. In a domestic environment this product may cause radio interference in which case supplementary mitigation measures may be required.

Option Module Parameters

This appendix provides information about the option module parameters.

Parameter Types

The option module has two types of parameters:

- *Device* parameters are used to configure the option module to operate on the network.
- *Host* parameters are used to configure the option module's various fault actions with the drive.

You can view option module *Device* and *Host* parameters with any of the following drive configuration tools:

- PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM—use the 4 or 6 key to scroll to the drive port in which the module resides, press the (Folders) key, and use the 4 or 6 key to scroll to the DEV PARAM or HOST PARAM folder.
- Connected Components Workbench software—click the tab for the option module at the bottom of the window, click the Parameters icon in the tool bar, and click the *Device* or *Host* Parameters tab.
- DriveExplorer software—find the option module in the treeview and open its Parameters folder.
- DriveExecutive software—find the option module in the treeview, expand the module in the tree, and open its Parameters folder.

About Parameter Numbers

Each parameter set is independently and consecutively numbered.

Configuration Tool	Numbering Scheme
• HIM • Connected Components Workbench software • DriveExplorer software • DriveExecutive software	*Device* parameters begin with parameter 01 (*Device* **Parameter 01 - [Port Number]**). *Host* parameters begin with parameter 33 (*Host* **Parameter 33 - [Comm Flt Action]**).

How Parameters Are Organized

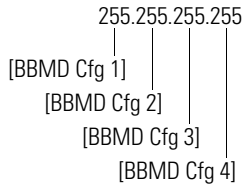
The *Device* Parameters and *Host* Parameters are separately displayed in a **Numbered List** view order.

IMPORTANT The 20-750-BNETIP Option Module does not support all *Host* parameters that appear in the configuration tool. A list of supported *Host* parameters is provided later in this appendix.

Device Parameters

Parameter No.	Name and Description	Details	
01	**[Port Number]** Displays the drive port into which the option module is installed. Typically, this is Port 4, 5, or 6.	Minimum: Maximum: Type:	4 6 Read Only
02	**[Net Addr Src]** Displays the source from which the option module's node address is taken.	Values: Type:	0 = Parameters 1 = Default Read Only
03	**[Reset Module]** No action if set to '0' (Ready). Resets the option module if set to '1' (Reset Module). Restores the option module to its factory default settings if set to '2' (Set Defaults). This parameter is a command. It will be reset to '0' (Ready) after the command has been performed. When performing a Set Defaults, the drive may detect a conflict. If this occurs, the drive will not allow a Set Defaults action. You must resolve the conflict before attempting a Set Defaults action for the option module. **ATTENTION:** Risk of injury or equipment damage exists. If the option module is transmitting I/O that controls the drive, the drive can fault when you reset the option module. Determine how your drive will respond before resetting the option module.	Default: Values: Type: Reset Required:	0 = Ready 0 = Ready 1 = Reset Module 2 = Set Default Read/Write No

Parameter No.	Name and Description	Details
04 05 06 07	**[IP Addr Cfg 1]** **[IP Addr Cfg 2]** **[IP Addr Cfg 3]** **[IP Addr Cfg 4]** Sets the IP address bytes for the option module's network address when the IP Address Selection Jumper (Figure 1 on page 18) is set on Pins 1 and 2—or the jumper is missing. 255.255.255.255 [IP Addr Cfg 1] [IP Addr Cfg 2] [IP Addr Cfg 3] [IP Addr Cfg 4] **Important**: To set the IP address using these parameters, *Device* **Parameter 16 - [DHCP]** must be set to '0' (Disabled).	Default: 192 Default: 168 Default: 0 Default: 1 Minimum: 0 Maximum: 255 Type: Read/Write Reset Required: Yes
08 09 10 11	**[Subnet Cfg 1]** **[Subnet Cfg 2]** **[Subnet Cfg 3]** **[Subnet Cfg 4]** Sets the subnet mask bytes for the option module's network address. 255.255.255.255 [Subnet Cfg 1] [Subnet Cfg 2] [Subnet Cfg 3] [Subnet Cfg 4] **Important:** To set the subnet mask using these parameters, *Device* **Parameter 16 - [DHCP]** must be set to '0' (Disabled).	Default: 255 Default: 255 Default: 255 Default: 0 Minimum: 0 Maximum: 255 Type: Read/Write Reset Required: Yes
12 13 14 15	**[Gateway Cfg 1]** **[Gateway Cfg 2]** **[Gateway Cfg 3]** **[Gateway Cfg 4]** Sets the gateway address bytes for the option module's network address. 255.255.255.255 [Gateway Cfg 1] [Gateway Cfg 2] [Gateway Cfg 3] [Gateway Cfg 4] **Important:** To set the gateway address using these parameters, *Device* **Parameter 16 - [DHCP]** must be set to '0' (Disabled).	Default: 192 Default: 168 Default: 0 Default: 1 Minimum: 0 Maximum: 255 Type: Read/Write Reset Required: Yes

Parameter No.	Name and Description	Details
16	**[DHCP]** Enables/disables the Dynamic Host Configuration Protocol server for setting the IP address of the option module.	Default: 0 = Disabled Values: 0 = Disabled 1 = Enabled Type: Read/Write Reset Required: Yes
17	**[Comm Loss Time]** Sets the communication loss timeout period in seconds. The value zero (0) disables this function.	Default: 10 seconds Minimum: 0 seconds Maximum: 180 seconds Type: Read/Write Reset Required: No
18	**[Device Instnc]** Sets the Device Instance number used by the option module on the BACnet network.	Default: 100 Minimum: 0 Maximum: 65535 Type: Read/Write Reset Required: Yes
19	**[Device Port]** Sets the network node Device Port for the option module to enable BACnet messaging to be sent and received over the BACnet/IP network.	Default: 47808 Minimum: 0 Maximum: 60000 Type: Read/Write Reset Required: Yes
20	**[BBMD Port Number]** Sets the Port number for BACnet Broadcast Management Device connection.	Default: 47808 Minimum: 0 Maximum: 60000 Type: Read/Write Reset Required: Yes
21 22 23 24	**[BBMD Cfg 1]** **[BBMD Cfg 2]** **[BBMD Cfg 3]** **[BBMD Cfg 4]** Sets the bytes in the IP Address of the BACnet Broadcast Management Device.  	Default: 0 Default: 0 Default: 0 Default: 0 Minimum: 0 Maximum: 255 Type: Read/Write Reset Required: Yes

ATTENTION: Risk of injury or equipment damage exists. *Device* **Parameter 17 - [Comm Loss Time]** lets you determine how long it will take the option module to detect a network communication loss. By default, this parameter sets the timeout to ten (10) seconds. You can set it so that the duration is shorter, longer, or disabled. When set to disabled, this also disables *Host* **Parameter 33 - [Comm Flt Action]**. Therefore, a communication fault action will be ignored. Take precautions to verify that the setting does not create a risk of injury or equipment damage. When commissioning the drive, verify that your system responds correctly to various situations (for example, a disconnected cable).

Parameter No.	Name and Description	Details
25	**[Foreign Device]** Enables/disables the Foreign Device Registration.	Default: 0 = Disable Values: 0 = Disable 1 = Enable Type: Read/Write Reset Required: Yes
26	**[Web Enable]** Enables/disables the option module web pages.	Default: 0 = Disabled Values: 0 = Disabled 1 = Enabled Type: Read/Write Reset Required: Yes
27	**[Web Features]** Enables/disables the web-configurable e-mail notification feature.	Type: Read/Write Reset Required: No

Bit Definition	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	E-mail Cfg
Default	x	x	x	x	x	x	x	1
Bit	7	6	5	4	3	2	1	0

0 = Disabled
1 = Enabled
x = Reserved

Host Parameters

Parameter No.	Name and Description	Details
33	**[Comm Flt Action]** Sets the action that the option module and drive will take if the option module detects that I/O communication has been disrupted. This setting is effective only if I/O that controls the drive is transmitted through the option module. When communication is re-established, the drive will automatically receive commands over the network again.	Default: 0 = Fault Values: 0 = Fault 1 = Stop 2 = Zero Data 3 = Hold Last 4 = Send Flt Cfg Type: Read/Write Reset Required: No

ATTENTION: Risk of injury or equipment damage exists. *Host* **Parameter 33 - [Comm Flt Action]** lets you determine the action of the option module and connected drive if I/O communication is disrupted. By default, this parameter faults the drive. You can configure this parameter so that the drive continues to run, however, take precautions to verify that the setting of this parameter does not create a risk of injury or equipment damage. When commissioning the drive, verify that your system responds correctly to various situations (for example, a disconnected cable).

Parameter No.	Name and Description	Details
34	**[Idle Flt Action]** Sets the action that the option module and drive will take if the option module detects that the controller is in program mode or faulted. This setting is effective only if I/O that controls the drive is transmitted through the option module. When the controller is put back in Run mode, the drive will automatically receive commands over the network again. **ATTENTION:** Risk of injury or equipment damage exists. *Host* **Parameter 34 - [Idle Flt Action]** lets you determine the action of the option module and connected drive when the controller is idle. By default, this parameter faults the drive. You can configure this parameter so that the drive continues to run, however, take precautions to verify that the setting of this parameter does not create a risk of injury or equipment damage. When commissioning the drive, verify that your system responds correctly to various situations (for example, a controller in idle state).	Default: 0 = Fault Values: 0 = Fault 1 = Stop 2 = Zero Data 3 = Hold Last 4 = Send Flt Cfg Type: Read/Write Reset Required: No
35	**Reserved**	
36	**Reserved**	
37	**[Flt Cfg Logic]** Sets the Logic Command data that is sent to the drive if any of the following is true: • *Host* **Parameter 33 - [Comm Flt Action]** is set to '4' (Send Flt Cfg) and I/O communication is disrupted. • *Host* **Parameter 34 - [Idle Flt Action]** is set to '4' (Send Flt Cfg) and the controller is idle. **Important:** The bit definitions in the Logic Command word for PowerFlex 750-Series drives are shown in Appendix C.	Default: 0000 0000 0000 0000 0000 0000 0000 0000 Minimum: 0000 0000 0000 0000 0000 0000 0000 0000 Maximum: 1111 1111 1111 1111 1111 1111 1111 1111 Type: Read/Write Reset Required: No
38	**[Flt Cfg Ref]** Sets the Reference data that is sent to the drive if any of the following is true: • *Host* **Parameter 33 - [Comm Flt Action]** is set to '4' (Send Flt Cfg) and I/O communication is disrupted. • *Host* **Parameter 34 - [Idle Flt Action]** is set to '4' (Send Flt Cfg) and the controller is idle.	Default: 0 Minimum: -3.40282×10^{38} Maximum: 3.40282×10^{38} Type: Read/Write Reset Required: No

Logic Command/Status Words: PowerFlex 750-Series Drives

This appendix presents the definitions of the Logic Command and Logic Status words that are used for PowerFlex 750-Series drives.

Logic Command Word

Logic Bits																													
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Command	Description
																															x	Normal Stop	0 = Not Normal Stop 1 = Normal Stop
																														x		Start [1]	0 = Not Start 1 = Start
																													x			Jog 1 [2]	0 = Not Jog 1 (Par. 556) 1 = Jog 1
																												x				Clear Fault [3]	0 = Not Clear Fault 1 = Clear Fault
																										x	x					Unipolar Direction	00 = No Command 01 = Forward Command 10 = Reverse Command 11 = Hold Direction Control
																									x							Manual	0 = Not Manual 1 = Manual
																								x								Reserved	
																						x	x									Accel Time	00 = No Command 01 = Use Accel Time 1 (Par. 535) 10 = Use Accel Time 2 (Par. 536) 11 = Use Present Time
																				x	x											Decel Time	00 = No Command 01 = Use Decel Time 1 (Par. 537) 10 = Use Decel Time 2 (Par. 538) 11 = Use Present Time
																			x													Ref Select 1	000 = No Command 001 = Ref A Select (Par. 545) 010 = Ref B Select (Par. 550) 011 = Preset 3 (Par. 573) 100 = Preset 4 (Par. 574) 101 = Preset 5 (Par. 575) 110 = Preset 6 (Par. 576) 111 = Preset 7 (Par. 577)
																		x														Ref Select 2	
																	x															Ref Select 3	
																x																Reserved	
															x																	Coast Stop	0 = Not Coast to Stop 1 = Coast to Stop
														x																		Current Limit Stop	0 = Not Current Limit Stop 1 = Current Limit Stop
													x																			Run [4]	0 = Not Run 1 = Run
												x																				Jog 2 [2]	0 = Not Jog 2 (Par. 557) 1 = Jog 2
											x																					Reserved	
										x																						Reserved	
									x																							Reserved	
								x																								Reserved	
							x																									Reserved	
						x																										Reserved	
					x																											Reserved	
				x																												Reserved	
			x																													Reserved	
		x																														Reserved	
	x																															Reserved	
x																																Reserved	

(1) A Not Stop condition (logic bit 0 = 0) must first be present before a 1 = Start condition will start the drive.

(2) A Not Stop condition (logic bit 0 = 0) must first be present before a 1 = Jog 1/Jog 2 condition will jog the drive. A transition to a '0' will stop the drive.

(3) To perform this command, the value must switch from '0' to '1'.

(4) A Not Stop condition (logic bit 0 = 0) must first be present before a 1 = Run condition will run the drive. A transition to a '0' will stop the drive.

Logic Status Word

Logic Bits																															
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Command	Description
																															x	Run Ready	0 = Not Ready to Run 1 = Ready to Run
																														x		Active	0 = Not Active 1 = Active
																													x			Command Direction	0 = Reverse 1 = Forward
																												x				Actual Direction	0 = Reverse 1 = Forward
																											x					Accelerating	0 = Not Accelerating 1 = Accelerating
																										x						Decelerating	0 = Not Decelerating 1 = Decelerating
																									x							Alarm	0 = No Alarm (Par. 959 and 960) 1 = Alarm
																								x								Fault	0 = No Fault (Par. 952 and 953) 1 = Fault
																							x									At Setpt Spd	0 = Not at Setpoint Speed 1 = At Setpoint Speed
																						x										Manual	0 = Manual Mode Not Active 1 = Manual Mode Active
																					x											Spd Ref ID 0	00000 = Reserved 00001 = Auto Ref A (Par. 545) 00010 = Auto Ref B (Par. 550) 00011 = Auto Preset Speed 3 (Par. 573) 00100 = Auto Preset Speed 4 (Par. 574) 00101 = Auto Preset Speed 5 (Par. 575) 00110 = Auto Preset Speed 6 (Par. 576) 00111 = Auto Preset Speed 7 (Par. 577) 01000 = Reserved 01001 = Reserved 01010 = Reserved 01011 = Reserved 01100 = Reserved 01101 = Reserved 01110 = Reserved 01111 = Reserved 10000 = Man Port 0 10001 = Man Port 1 10010 = Man Port 2 10011 = Man Port 3 10100 = Man Port 4 10101 = Man Port 5 10110 = Man Port 6 10111 = Reserved 11000 = Reserved 11001 = Reserved 11010 = Reserved 11011 = Reserved 11100 = Reserved 11101 = Man Port 13 (embedded ENET) 11110 = Man Port 14 (Drive Logix) 11111 = Alternate Man Ref Sel
																				x												Spd Ref ID 1	
																			x													Spd Ref ID 2	
																		x														Spd Ref ID 3	
																	x															Spd Ref ID 4	
																x																Reserved	
															x																	Running	0 = Not Running 1 = Running
														x																		Jogging	0 = Not Jogging (Par. 556 and 557) 1 = Jogging
													x																			Stopping	0 = Not Stopping 1 = Stopping
												x																				DC Brake	0 = Not DC Brake 1 = DC Brake
											x																					DB Active	0 = Not Dynamic Brake Active 1 = Dynamic Brake Active
										x																						Speed Mode	0 = Not Speed Mode (Par. 309) 1 = Speed Mode
									x																							Position Mode	0 = Not Position Mode (Par. 309) 1 = Position Mode
								x																								Torque Mode	0 = Not Torque Mode (Par. 309) 1 = Torque Mode
							x																									At Zero Speed	0 = Not at Zero Speed 1 =At Zero Speed
						x																										At Home	0 = Not at Home 1 = At Home
					x																											At Limit	0 = Not at Limit 1 = At Limit
				x																												Current Limit	0 = Not at Current Limit 1 = At Current Limit
			x																													Bus Freq Reg	0 = Not Bus Freq Reg 1 = Bus Freq Reg
		x																														Enable On	0 = Not Enable On 1 = Enable On
	x																															Motor Overload	0 = Not Motor Overload 1 = Motor Overload
x																																Regen	0 = Not Regen 1= Regen

BACnet Protocol Implementation Conformance Statement

Date:	January 20, 2012
Vendor Name:	Rockwell Automation
Product Name:	PowerFlex 750-Series AC Drives
Product Model Number:	20-750-BNETIP
Applications Software Version:	1.001
Firmware Revision:	1.001.17
BACnet Protocol Revision:	11

Product Description

DPI to BACnet IP communication Adapter for PowerFlex 750-Series drives.

BACnet Standardized Device Profile (Annex L)

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

List all BACnet Interoperability Building Blocks Supported (Annex K)

Data Sharing

- ☑ Data Sharing - Read Property-B (DS-RP-B)
- ☑ Data Sharing - Write Property-B (DS-WP-B)
- ☑ Data Sharing - Read Property Multiple-B (DS-RPM-B)
- ☑ Data Sharing - Write Property Multiple-B (DS-WPM-B)

Device Management

- ☑ Device Management - Dynamic Device Binding-B (DM-DDB-B)
- ☑ Device Management - Dynamic Object Binding-B (DM-DOB-B)
- ☑ Device Management - Device Communication Control-B (DM-DCC-B)
- ☑ Device Management - Re-initialize Device-B (DM-RD-B)

Segmentation Capability

- ☐ Able to transmit segmented messages
- ☐ Able to receive segmented messages
- ☑ Segmented response accepted

Standard Object Types Supported

The table below lists the object types supported by the Option Module. Dynamic object creation and deletion is not supported. The property access rules use the following key:

R = Read Only; the property is supported for this object type
W = Read/Write; the property is supported for this object type
C = Commandable; the property is supported for this object type

Property	Analog Input	Analog Output	Analog Value	Binary Input	Binary Output	Binary Value	Device
APDU Timeout							R
Application Software Version							R
Database Revision							R
Description							
Device Address Binding							R
Event State	R	R	R	R	R	R	
Firmware Revision							R
Location							
Max APDU Length Accepted							R
Max Info Frames							
Max Master							
Model Name							R
Number of APDU Retries							R
Object Identifier	R	R	R	R	R	R	R
Object List							R
Object Name	R	R	R	R	R	R	W (2)
Object Type	R	R	R	R	R	R	R
Out of Service	W	W	W	W	W	W	
Polarity				R	R	R	
Present Value	W (1)	C	W (1)	W (1)	C	W (1)	
Priority Array		R			R		
Protocol Object Types Supported							R
Protocol Revision							R
Protocol Services Supported							R
Protocol Version							R
Relinquish Default		R			R		
Segmentation Supported							R
Status Flags	R	R	R	R	R	R	
System Status							
Units	R	R	R				
Vendor Identifier							R
Vendor Name							R

(1) This property is writable when Out of Service is enabled.
(2) This property will accept a maximum of 20 characters when written.

Data Link Layer Options

- ☑ BACnet IP, (Annex J)
- ☐ BACnet IP, (Annex J), Foreign Device
- ☐ ISO 8802-3, Ethernet (Clause 7)
- ☐ ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ☐ ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s) _____
- ☐ MS/TP master (Clause 9), baud rate(s): _____
- ☐ MS/TP slave (Clause 9), baud rate(s): _____
- ☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____
- ☐ Point-To-Point, modem, (Clause 10), baud rate(s): _____
- ☐ LonTalk, (Clause 11), medium: _____
- ☐ BACnet/ZigBee (ANNEX O)
- ☐ Other: _____

Device Address Binding

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) ☐ Yes ☑ No

Networking Options

- ☐ Router, Clause 6 - List all routing configurations, for example, ARCNET-Ethernet, Ethernet-MS/TP, and so forth.
- ☐ Annex H, BACnet Tunneling Router over IP
- ☐ BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by Foreign Devices? ☐ Yes ☐ No
Does the BBMD support network address translation? ☐ Yes ☐ No

Network Security Options

- ☑ Non-secure Device - is capable of operating without BACnet Network Security
- ☐ Secure Device - is capable of using BACnet Network Security (NS-SD BIBB)
  - ☐ Multiple Application-Specific Keys
  - ☐ Supports encryption (NS-ED BIBB)
  - ☐ Key Server (NS-KS BIBB)

Character Sets Supported

☑ ISO 10646 (UTF-8)	☐ IBM™/Microsoft™ DBCS	☐ ISO 8859-1
☐ ISO 10646 (UCS-2)	☐ ISO 10646 (UCS-4)	☐ JIS X 0208

BACnet/IP BACnet is a data communication protocol for building automation and control networks. BACnet/IP is a specific type of BACnet network which allows the protocol to use TCP/IP networks.

BACnet Object Any object whose properties are accessible through BACnet regardless of its particular function within the device in which it resides. Services for BACnet objects are used to access the data of PowerFlex 750-Series drives and its connected 20-750-BNETIP option module.

BBMD (BACnet Broadcast Management Device) BACnet uses IP broadcasts to locate and communicate with other BACnet devices. These broadcasts are normally blocked by IP routers. The BACnet specification outlines a method of using a BACnet Broadcast Management Device (BBMD) that receives broadcast messages on one subnet and forwards them to another subnet.

Bus Off A condition that occurs when an abnormal rate of errors is detected in a device. The bus off device cannot receive or transmit messages on the network. This condition is often caused by corruption of the network data signals due to noise or data rate mismatch.

Connected Components Workbench Software The recommended tool for monitoring and configuring Allen-Bradley products and network communication adapters. It can be used on computers running various Microsoft Windows operating systems. You can obtain a **free copy** of Connected Components Workbench software at http://www.ab.com/support/abdrives/webupdate/software.html.

ControlFLASH Software A **free** software tool used to electronically update the firmware of Allen-Bradley products and network communication adapters. ControlFLASH software is downloaded automatically when the firmware revision file for the product being updated is downloaded from the Allen-Bradley updates website to your computer.

Device Instance Number BACnet Device instance is used to identify a BACnet device over the BACnet network. Device instance is unique across all subnets and routed links.

DHCP (Dynamic Host Configuration Protocol) DHCP lets the option module configure itself dynamically at restart if the network has a DHCP server. The DHCP server assigns the option module a preconfigured IP address, a subnet mask, and a gateway address; therefore, you do not have to configure these with the parameters in the option module. DHCP can make it easier to administer a BACnet network. A **free version** of the Rockwell Software BOOTP-DHCP server can be obtained at http://www.software.rockwell.com/support/download/detail.cfm?ID=3390.

DriveExplorer Software A tool for monitoring and configuring Allen-Bradley products and network communication option modules. It can be used on computers running various Microsoft Windows operating systems. DriveExplorer software, version 6.xx or later, can be used to configure this adapter and connected drive. This software tool has been discontinued and is now available as **freeware** at http://

www.ab.com/support/abdrives/webupdate/software.html. There are no plans to provide future updates to this tool and the download is being provided 'as-is' for users that lost their DriveExplorer CD, or need to configure legacy products not supported by Connected Components Workbench software.

DriveTools SP Software A software suite designed for running on various Microsoft Windows operating systems. This software suite provides a family of tools, including DriveExecutive software (version 3.01 or later), that you can use to program, monitor, control, troubleshoot, and maintain Allen-Bradley products. DriveTools SP software, version 1.01 or later, can be used with PowerFlex 750-Series, PowerFlex 7-Class, and PowerFlex 4-Class drives, and also legacy drives that implement a SCANport communication interface. Information about DriveTools SP software can be obtained at http://www.ab.com/drives/drivetools.

Fault Action A fault action determines how the option module and connected drive act when a communication fault (for example, a disconnected cable) occurs or when the controller is switched out of run mode. The former uses a communication fault action, and the latter uses an idle fault action.

Fault Configuration When communication is disrupted (for example, a cable is disconnected), the option module and PowerFlex drive can respond with a user-defined fault configuration. The user sets the data that is sent to the drive using specific fault configuration parameters in the option module. When a fault action parameter is set to use the fault configuration data and a fault occurs, the data from these parameters is sent as the Logic Command and/or Reference.

Foreign Device A BACnet device that has an IP subnet address different from those comprising a BACnet/IP network which the device seeks to join. The foreign device may be a full/part time node on the foreign subnet.

Gateway A device on a network that connects an individual network to a system of networks. When a node needs to communicate with a node on another network, a gateway transfers the data between the two networks. You need to configure the address for the gateway device in the option module if you want the option module to communicate with devices that are not on its network.

Hardware Address Each Ethernet device has a unique hardware address (sometimes called a MAC address) that is 48 bits. The address appears as six digits separated by colons (for example, xx:xx:xx:xx:xx:xx). Each digit has a value between 0 and 255 (0x00 and 0xFF). This address is assigned in the hardware and cannot be changed. It is required to identify the device if you are using a DHCP server.

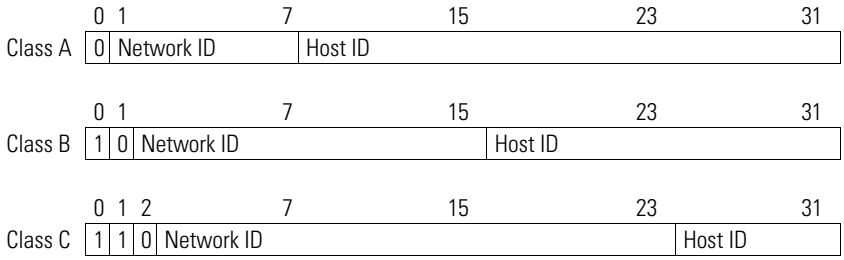
HIM (Human Interface Module) A device that can be used to configure and control a drive. The Power Flex 20-HIM-A6 or 20-HIM-C6S HIM can be used to configure Power Flex 750-Series drives and their connected peripherals.

Hold Last When communication is disrupted (for example, a cable is disconnected), the option module and PowerFlex drive can respond by holding last. Hold last results in the drive receiving the last data received via the network connection before the disruption. If the drive was running and using the Reference from the option module, it will continue to run at the same Reference.

Idle Action An idle action determines how the option module and connected drive act when the controller is switched out of run mode.

IP Addresses A unique IP address identifies each node on the BACnet/IP network. An IP address consists of 32 bits that are divided into four segments of one byte each. It appears as four decimal integers separated by periods (xxx.xxx.xxx.xxx). Each 'xxx' can have a decimal value from 0 to 255. For example, an IP address could be 192.168.0.1.

An IP address has two parts: a network ID and a host ID. The class of network determines the format of the address.



The number of devices on your BACnet/IP network will vary depending on the number of bytes that are used for the network address. In many cases you are given a network with a Class C address, in which the first three bytes contain the network address (subnet mask = 255.255.255.0). This leaves 8 bits or 256 addresses on your network. Because two addresses are reserved for special uses (0 is an address for the network usually used by the router, and 255 is an address for broadcast messages to all network devices), you have 254 addresses to use on a Class C address block.

To ensure that each device on the network has a unique address, contact your network administrator or Internet Service Provider for unique fixed IP addresses. You can then set the unique IP address for the option module with a DHCP server, or by manually configuring parameters in the option module. The option module reads the values of these parameters only at powerup.

Logic Command/Logic Status

The Logic Command is used to control the PowerFlex 750-Series drive (for example, start, stop, and direction). BACnet objects can be used to control the parameters of a PowerFlex 750-Series drive. For example, BV10 is used to change the operating state (RUN/STOP) of the drive. For a definition of BACnet objects, see Chapter 4.

The Logic Status is used to monitor the PowerFlex 750-Series drive (for example, operating state and motor direction). BACnet objects can be used to monitor the parameters of a PowerFlex 750-Series drive. For example, BV0 is used to monitor the operating state (RUN Ready) of the drive. For a definition of BACnet objects, see Chapter 4.

NVS (Nonvolatile Storage)

NVS is the permanent memory of a device. Devices such as the option module and drive store parameters and other information in NVS so that they are not lost when the device loses power. NVS is sometimes called 'EEPROM'.

Option Module

Devices such as drives, controllers, and computers usually require a network communication option module to provide a communication interface between them and a network such as BACnet/IP. An option module reads data on the network and transmits it to the connected device. It also reads data in the device and transmits it to the network.

The 20-750-BNETIP BACnet/IP option module connects PowerFlex 750-Series drives to a BACnet network. Option modules are sometimes also called 'adapters', 'cards', 'embedded communication options', or 'peripherals'. On PowerFlex 750-Series drives, option modules can also be I/O modules, encoder modules, safety modules, and so forth.

PCCC (Programmable Controller Communications Command)

PCCC is the protocol used by some controllers to communicate with devices on a network. Some software products (for example, DriveExplorer and DriveExecutive software) also use PCCC to communicate.

Ping

A message that is sent by a DPI product to its peripheral devices. Pings are used to gather data about the product, including whether it can receive messages and if they can log in for control.

PowerFlex 750-Series (Architecture Class) Drives

Allen-Bradley PowerFlex 750-Series drives are part of the PowerFlex 7-Class family of drives.

Reference/Feedback

The Reference is used to send a setpoint (for example, speed, frequency, and torque) to the drive. It consists of one 32-bit word of output to the option module from the network.

Feedback is used to monitor the speed of the drive. It consists of one 32-bit word of input from the option module to the network.

SI (Serial Interface)

A next generation communication interface used by various Allen-Bradley drives, such as PowerFlex 750-Series drives.

Status Indicators LEDs that are used to report the status of the option module, network, and drive. They are on the option module and can be viewed when the drive is powered and its cover is removed.

Stop Action When communication is disrupted (for example, a cable is disconnected), the option module and drive can respond with a stop action. A stop action results in the drive receiving zero as values for Logic Command and Reference data. If the drive was running and using the Reference from the option module, it will stay running but at zero Reference.

Subnet Mask An extension to the IP addressing scheme that lets you use a single network ID for multiple physical networks. A bit mask identifies the part of the address that specifies the network and the part of the address that specifies the unique node on the network. A '1' in the subnet mask indicates the bit is used to specify the network. A '0' in the subnet mask indicates that the bit is used to specify the node.

For example, a subnet mask on a network may appear as follows: 11111111 11111111 11111111 11000000 (255.255.255.192). This mask indicates that 26 bits are used to identify the network and 6 bits are used to identify devices on each network. Instead of a single physical Class C network with 254 devices, this subnet mask divides it into four networks with up to 62 devices each.

Update The process of updating firmware in a device. The option module can be updated using various Allen-Bradley software tools. See Updating the Option Module Firmware on page 35 for more information.

Zero Data When communication is disrupted (for example, a cable is disconnected), the option module and drive can respond with zero data. Zero data results in the drive receiving zero as values for Logic Command and Reference data. If the drive was running and using the Reference from the option module, it will stay running but at zero Reference.

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Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative.

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Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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