User Manual

Allen-Bradley

PowerFlex 20-COMM-L LonWorks Adapter

FRN 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.

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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).

The information below summarizes the changes made to this manual since its last release (January 2003):

Description of Changes	Page
Reformatted document from half size (5.5 x 8.5 in.) to full size (8.5 x 11 in.).	Throughout manual
Revised Figures 2.2 and 2.3 to show PowerFlex 700H and PowerFlex 700S Frames 9 and larger. Added ground tab details in Figure 2.3	

Table of Contents

About This Manual

This manual provides information about the adapter and using it with PowerFlex 7-Class (Architecture-Class) drives. The adapter can be used with other products that support a DPI™ adapter. See the documentation for your product for specific information about how it works with the adapter.

Conventions Used in This Manual

The following conventions are used throughout this manual:

- Parameter names are shown in the format **Parameter xx - [*]**. The xx represents the parameter number. The * represents the parameter name — for example **Parameter 01 - [DPI Port]**.
- Menu commands are shown in bold type face and follow the format **Menu > Command**. For example, if you read ‘Select **File > Open**’, you should click the **File** menu and then click the **Open** command.
- 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.

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 throughout 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, Inc. representative for:

- 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 www.ab.com/support/abdrives or contact Rockwell Automation.

Related Documentation

Resource	Description
PowerFlex 7-Class DPI (Drive Peripheral Interface) Network Communication Adapter Installation Instructions, publication 20COMM-IN004	Information on installing PowerFlex® 20-COMM-x Network Communication Adapters.
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 20-HIM-A3/-A5/-C3S/-C5S HIM Quick Reference, publication 20HIM-QR001	Information on using PowerFlex 20-HIM-A3, 20-HIM-A5, 20-HIM-C3S, and 20-HIM-C5S HIMs.
PowerFlex 20-HIM-A6/C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001	Information on installing and using PowerFlex 20-HIM-A6 and 20-HIM-C6S HIMs.
PowerFlex 70 User Manual, publication 20A-UM001 PowerFlex 70/700 Reference Manual, publication PFLEX-RM001 PowerFlex 70 Enhanced Control and 700 Vector Control Reference Manual, publication PFLEX-RM004	Information on installing and programming PowerFlex 70 standard control and enhanced control drives.
PowerFlex 700 Series A User Manual, publication 20B-UM001 PowerFlex 700 Series B User Manual, publication 20B-UM002 PowerFlex 70/700 Reference Manual, publication PFLEX-RM001 PowerFlex 70 Enhanced Control and 700 Vector Control Reference Manual, publication PFLEX-RM004	Information on installing and programming PowerFlex 700 standard control and vector control Series A drives, and PowerFlex 700 vector control Series B drives.
PowerFlex 700H Installation Instructions, publication PFLEX-IN006 PowerFlex 700H Programming Manual, publication 20C-PM001	Information on installing and programming PowerFlex 700H drives.
PowerFlex 700S w/Phase I Control Installation Manual (Frames 1…6), publication 20D-IN024 PowerFlex 700S w/Phase I Control Installation Manual (Frames 9 and 10), publication PFLEX-IN006 PowerFlex 700S w/Phase I Control User Manual (All Frame Sizes), publication 20D-UM001 PowerFlex 700S w/Phase I Control Reference Manual, publication PFLEX-RM002 PowerFlex 700S w/Phase II Control Installation Manual (Frames 1…6), publication 20D-IN024 PowerFlex 700S w/Phase II Control Installation Manual (Frames 9…14), publication PFLEX-IN006 PowerFlex 700S w/Phase II Control Programming Manual (All Frame Sizes), publication 20D-PM001 PowerFlex 700S w/Phase II Control Reference Manual, publication PFLEX-RM003	Information on installing and programming PowerFlex 700S drives.

Resource	Description
PowerFlex 700L User Manual, publication 20L-UM001	Information on installing and programming PowerFlex 700L Liquid-Cooled AC drives.
PowerFlex 750-Series Drive Installation Instructions, publication 750-IN001 PowerFlex 750-Series Drive Programming Manual, publication 750-PM001 20-750-20COMM and 20-750COMM-F1 Communication Carrier Cards Installation Instructions, publication 750COM-IN001	Information on installing and programming PowerFlex 750-Series AC drives.
PowerFlex Digital DC Drive User Manual, publication 20P-UM001	Information on installing and programming PowerFlex Digital DC drives.
LonMark Layers 1-6 Interoperability Guidelines, Appendix A 'Cable Requirements for the TP/FT-10 Channel' at www.echelon.com	Information on network cabling guidelines.

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

Documentation can be obtained online at http://literature.rockwellautomation.com. 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 on the Downloads or Knowledgebase link.

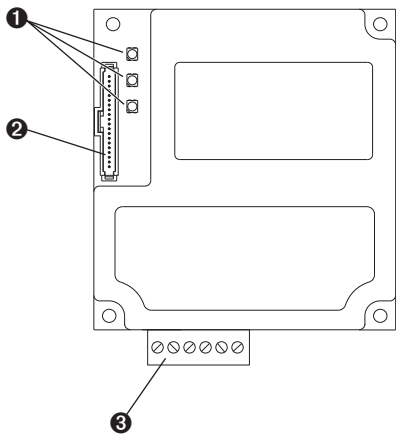
Notes:

Getting Started

The adapter is intended for installation into a PowerFlex 7-Class drive and is used for network communication.

When used with PowerFlex 750-Series drives, the 20-COMM-L adapter must have firmware revision 1.007 or later, and must be installed using the 20-750-20COMM or 20-750-20COMM-F1 Communication Carrier Card. There are operating limitations and this manual does not include information on using the 20-COMM-L adapter with PowerFlex 750-Series drives.

Components



Item	Part	Description
1	Status Indicators	Three status indicators that indicate the status of the DPI, adapter, and network connection. See Chapter 5, Troubleshooting.
2	DPI Connector	A 20-pin, single-row shrouded male header. An Internal Interface cable is connected to this connector and a connector on the drive.
3	Terminal Block	A 6-screw terminal block to connect the LonWorks network cable.

Features

The features of the adapter include the following:

- Typical mounting in a PowerFlex 7-Class drive.
- Captive screws to secure and ground the adapter to the drive.
- Compatibility with various configuration tools to configure the adapter and connected host drive, including the following tools:
  - PowerFlex HIM (Human Interface Module) on the drive, if available
  - Connected Components Workbench software, version 1.02 or later
  - DriveExplorer software, version 2.01 or later
  - DriveExecutive software, version 3.01 or later
- Status indicators that report the status of the drive communications, the adapter, and network. They are visible when the drive cover is open or closed.
- Parameter-configured I/O (Logic Command/Reference and up to four pairs of Datalinks) to accommodate application requirements.
- Support for LonMark Functional Profile: ‘Variable Speed Motor Drive: 6010’.
- Sending and receiving Datalink data.
- Read/write access to monitor/configure parameter values of the drive and connected peripherals over the network.
- User-defined fault actions to determine how the adapter and connected drive respond to the following:
  - I/O messaging communication disruptions (Comm Flt Action)
  - Offline/disable occurrences (Idle Flt Action)
- LonMark conformance tested.
- Access to any PowerFlex drive and its connected peripherals on the network to which the adapter is connected.

Compatible Products

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

- PowerFlex 70 drives with standard or enhanced control
- PowerFlex 700 drives with standard or vector control
- PowerFlex 700H drives
- PowerFlex 700S drives with Phase I or Phase II control
- PowerFlex 700L drives with 700 vector control or 700S control
- PowerFlex 750-Series drives (1)
- PowerFlex Digital DC drives
- SMC™ Flex smart motor controllers
- SMC-50 smart motor controllers

(1) The 20-COMM-L adapter can be used with PowerFlex 750-Series drives, but the adapter must have firmware revision 1.007 or later. Also, the adapter has the following limitations and differences:

- Only the first 16 bits of the Logic Command and Logic Status words are used.
- Only drive Ports 0…6 are supported.
- Controller must be capable of reading/writing 32-bit floating point (REAL) values.
- Speed Reference/Feedback scaling are Hz (or RPM) x 1000 (depending on the setting of drive parameter 300 - [Speed Units].

Please see the PowerFlex 750-Series AC Drives Programming Manual, publication 750-PM001, for drive parameter information.

Required Equipment

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

Equipment Shipped with the Adapter

When you unpack the adapter, verify that the package includes the following:

- ❑ One 20-COMM-L adapter
- ❑ One 2.54 cm (1 in.) long and one 15.24 cm (6 in.) long Internal Interface cable (only one cable is needed to connect the adapter to the drive; for which cable to use, see Figure 2.1 on page 2-2)
- ❑ One 6-screw terminal block (connected to the adapter)
- ❑ Resource files on digital media
- ❑ One PowerFlex 7-Class DPI (Drive Peripheral Interface) Network Communication Adapter Installation Instructions, publication 20COMM-IN004

TIP: When mounting the 20-COMM-L adapter in a PowerFlex 750-Series drive, you must use a 20-750-20COMM or 20-750-20COMM-F1 Communication Carrier Card, publication 750COM-IN001—and the 20-COMM-L adapter must have firmware revision 1.007 or later.

User-Supplied Equipment

To install and configure the adapter, you must supply the following:

- ❑ A small flathead screwdriver
- ❑ Network-specific cable to connect the adapter to the network. See the network-specific documentation for the cable recommendations and requirements.
- ❑ Drive and adapter configuration tool, such as the following:
  - PowerFlex 20-HIM-xx 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 2.01 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 3.01 or later

    A Lite version of DriveExecutive software ships with RSLogix 5000, RSNetWorx MD, FactoryTalk AssetCentre, and ItelliCENTER 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.
- ❑ LonMaker configuration software
- ❑ A computer connection to the LonWorks network

Safety Precautions

Please read the following safety precautions carefully.

ATTENTION: Risk of injury or death exists. The PowerFlex drive can 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 adapter.

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 product using an adapter. Failure to comply may result in injury and/or equipment damage.

ATTENTION: Risk of equipment damage exists. The adapter 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 adapter. 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. DPI or SCANport host products must not be directly connected together using 1202 cables. Unpredictable behavior due to timing and other internal procedures can result if two or more devices are connected this way.

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

ATTENTION: Risk of injury or equipment damage exists. **Parameter 6 - [Comm Flt Action]** lets you determine the action of the adapter and connected drive if I/O communication is disrupted. By default, this parameter faults the drive. You can set 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 or a faulted controller).

ATTENTION: Risk of injury or equipment damage exists. **Parameter 7 - [RcvHrtBeat Time]** lets you determine how long it will take the adapter to detect network communication losses. By default, this parameter sets the time to 120 seconds. You can set it so that the duration is shorter, longer, or disabled. When set to disabled, this also disables **Parameter 6 - [Comm Flt Action]**. Therefore, a communication fault action is 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).

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 adapter. If you are unsure how to complete a step, see the referenced chapter.

Step	Action	See
1	Review the safety precautions for the adapter.	Throughout This Manual
2	Verify that the PowerFlex drive is properly installed.	Drive User Manual
3	Install the adapter. a. Verify that the PowerFlex drive is not powered. b. Connect the adapter to the drive using the Internal Interface cable. c. Use the captive screws to secure and ground the adapter to the drive. d. Connect the adapter to the network using a network cable. **NOTE:** When installing the adapter in a PowerFlex 750-Series drive, see the 20-750-20COMM and 20-750-20COMM-F1 Communication Carrier Cards Installation Instructions, publication 750COM-IN001, supplied with the card.	PowerFlex 7-Class DPI Network Communication Adapter Installation Instructions, publication 20COMM-IN004) and Chapter 2, Installing the Adapter
4	Apply power to the adapter. a. Verify that the adapter is installed correctly. The adapter 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 Adapter
5	Configure the adapter for your application. Set adapter parameters for the following functions as required by your application: • I/O configuration • Fault action	Chapter 3, Configuring the Adapter
6	Set up the network to communicate with the adapter. Use a network tool, such as LonMaker, to configure the adapter on the network.	Chapter 4, Configuring the LonWorks Network

Installing the Adapter

This chapter provides instructions for installing the adapter in a PowerFlex 7-Class drive.

Preparing for an Installation

Before installing the adapter, verify that you have all required equipment. See Required Equipment on page 1-3.

ATTENTION: Risk of equipment damage exists. The adapter 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 adapter. If you are unfamiliar with static control procedures, see Guarding Against Electrostatic Damage, publication 8000-4.5.2.

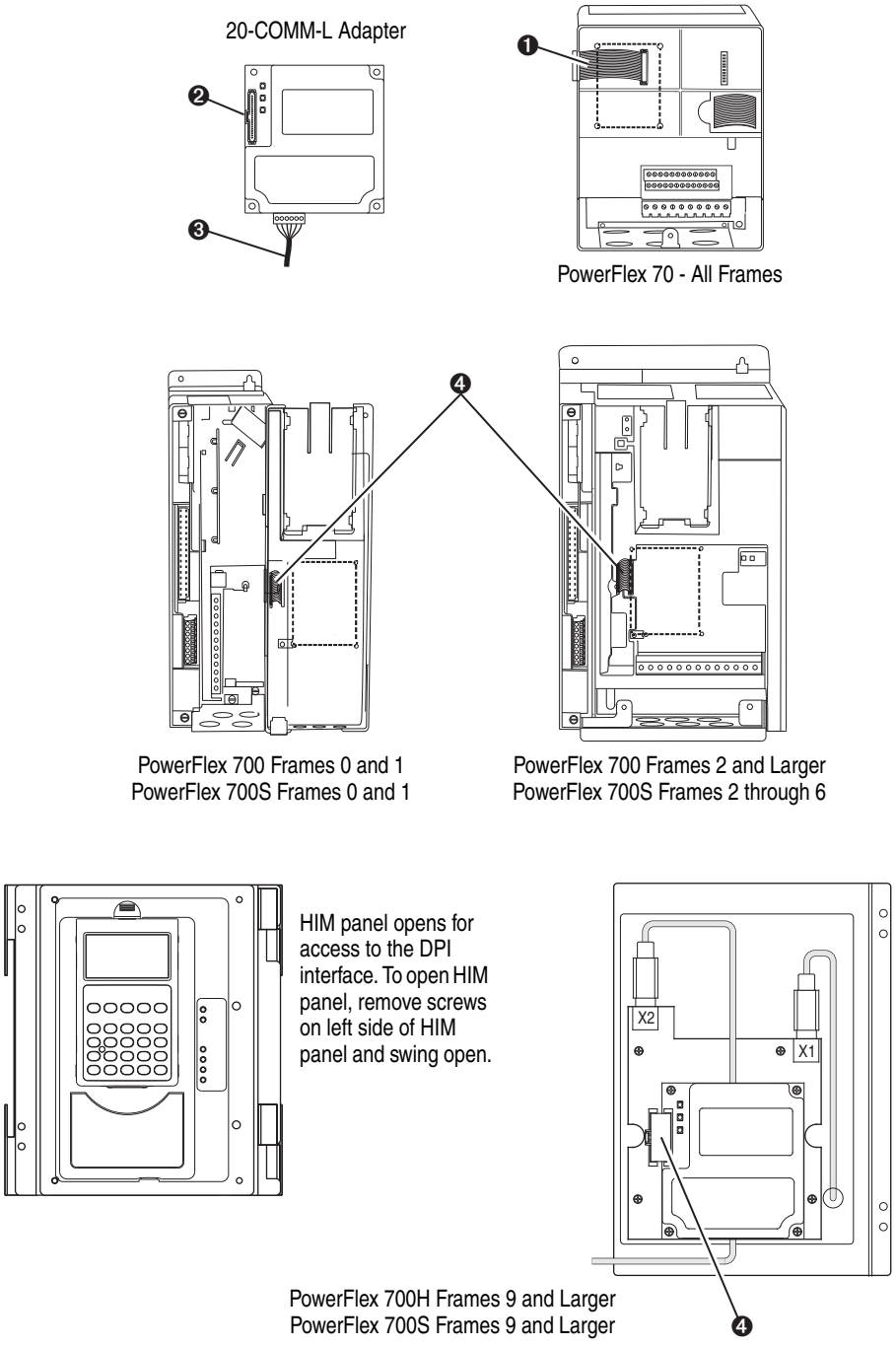
Connecting the Adapter to the Drive

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

1. Remove power from the drive.
2. Use static control precautions.
3. Remove the drive cover or open the drive door.
4. Connect the Internal Interface cable to the DPI port on the drive and then to the DPI connector on the adapter (see Figure 2.1).
5. Secure and ground the adapter to the drive (see Figure 2.2) by doing the following:
   - On a PowerFlex 70 drive, fold the Internal Interface cable behind the adapter and mount the adapter on the drive using the four captive screws.
   - On a PowerFlex 700, PowerFlex 700H or PowerFlex 700S drive, mount the adapter on the drive using the four captive screws.

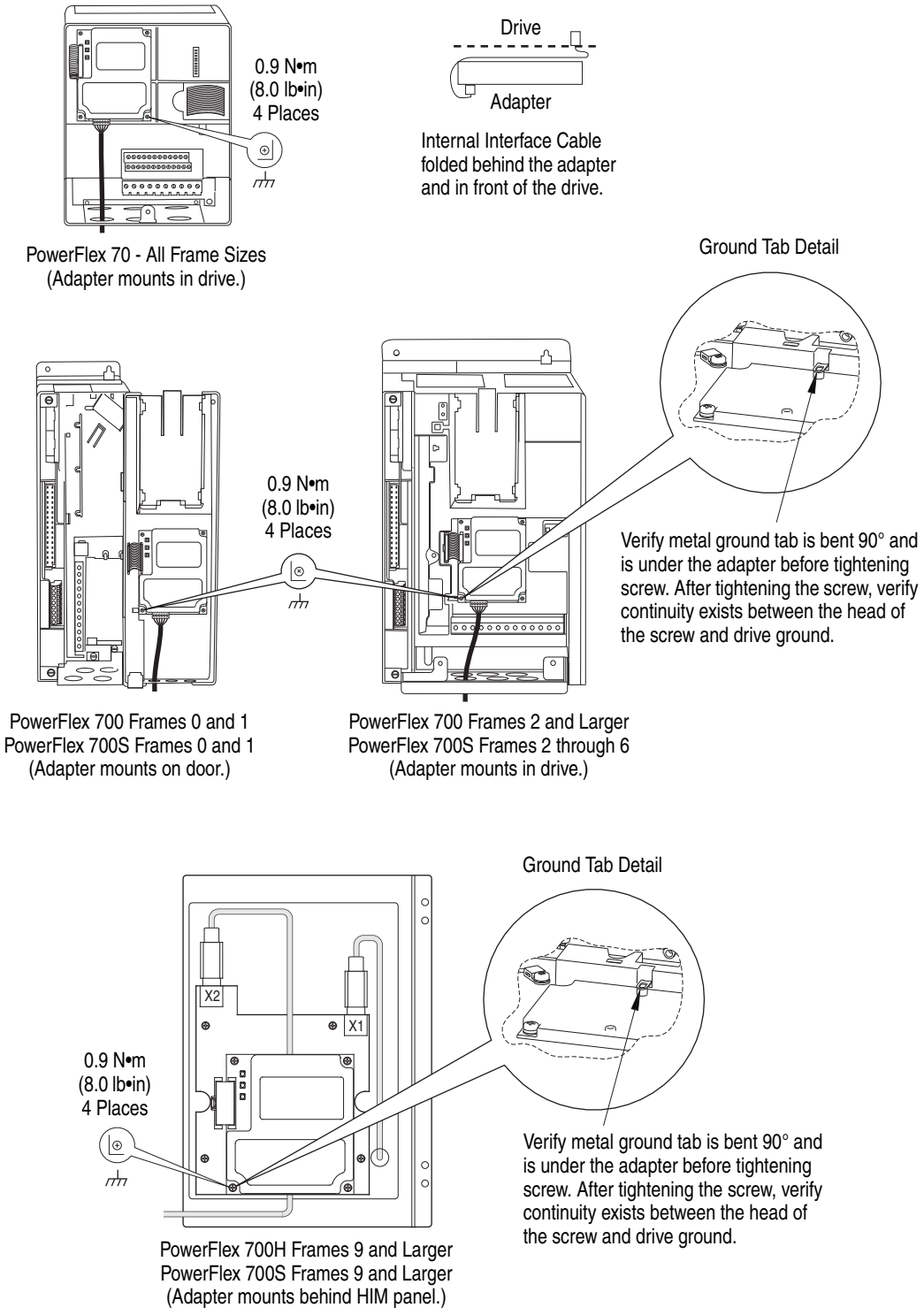
Important: Tighten all screws to properly ground the adapter. Recommended torque is 0.9 N•m (8.0 lb•in).

Figure 2.1 DPI Ports and Internal Interface Cables



Item	Description
❶	15.24 cm (6 in.) Internal Interface cable
❷	DPI Connector
❸	Network cable
❹	2.54 cm (1 in.) Internal Interface cable

Figure 2.2 Mounting and Grounding the Adapter



NOTE: When installing the adapter in a PowerFlex 750-Series drive, see to the 20-750-20COMM and 20-750-20COMM-F1 Communication Carrier Cards Installation Instructions, publication 750COM-IN001, supplied with the card.

Connecting the Adapter to the Network

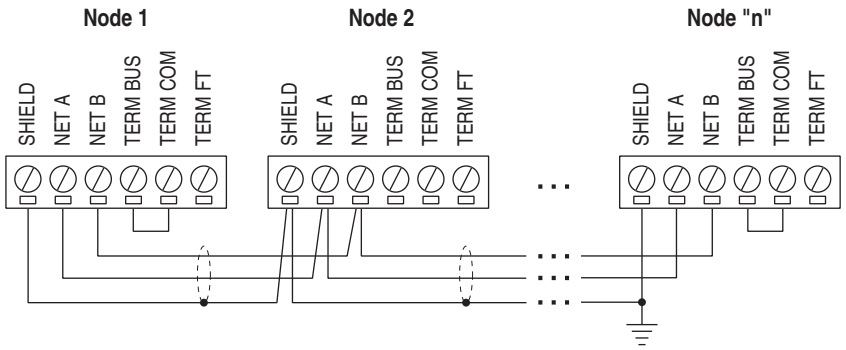
ATTENTION: Risk of injury or death exists. The PowerFlex drive can contain high voltages that can cause injury or death. Remove power from the drive, and then verify power has been discharged before installing or removing the adapter.

1. Remove power from the drive.
2. Use static control precautions.
3. Route the LonWorks cable from the network through the bottom of the PowerFlex drive (see Figure 2.2).

   See the LonMark Layers 1-6 Interoperability Guidelines, Appendix A 'Cable Requirements for the TP/FT-10 Channel' for cable recommendations and requirements.
4. Connect a 6-pin linear plug to the network cable.

   Figure 2.3 shows a wiring example, and terminal names and their functions.

Figure 2.3 Example Wiring of Bus Topology with Shield



Terminal	Name	Function
1	SHIELD (1)	Noise mitigation (2)
2	NET A	Network connection, polarity insensitive
3	NET B	Network connection, polarity insensitive
4	TERM BUS	Connect to TERM COM for termination of Bus (3) topology networks
5	TERM COM	Termination common
6	TERM FT	Connect to TERM COM for termination of Free (4) topology networks

(1) We recommend using shielded network cable. This shield must be grounded at one point on the network using a 470K ohm, 1/4 watt, ≤ 10% metal film resistor.

(2) For noise mitigation, do not run LON trunk lines in close proximity to drive or equipment power distribution feeds.

(3) To terminate a Bus topology network (one termination at each end of the network), connect TERM COM to TERM BUS.

(4) To terminate a Free topology network (one termination per segment), connect TERM COM to TERM FT.

5. Insert the 6-pin linear plug into the mating adapter terminal block.

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.

Install the drive cover or close the drive door, and apply power to the drive. The adapter receives its power from the connected drive. When you apply power to the adapter 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

Status indicators for the drive and communication adapter can be viewed on the front of the drive (Figure 2.4) after power has been applied. Possible start-up status indications are shown in Table 2.A.

Figure 2.4 Drive and Adapter Status Indicators (location on drive may vary)

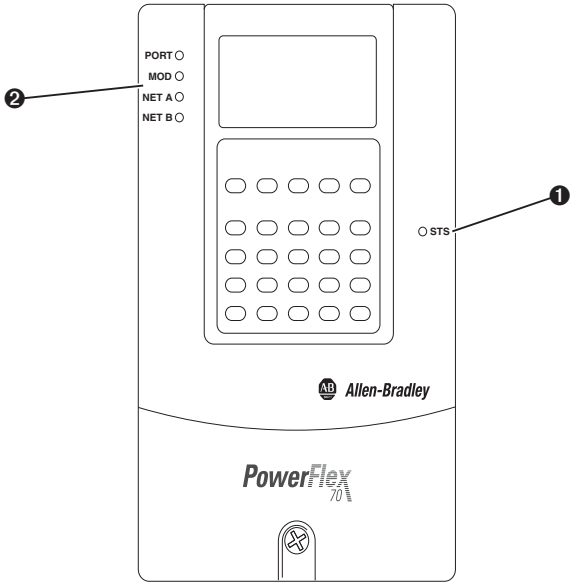


Table 2.A Drive and Adapter Start-Up Status Indications

Item	Name	Color	State	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, drive stopped	An inhibit condition exists – the drive cannot be started. Check drive Parameter 214 - [Start Inhibits].
			Flashing, drive running	An intermittent type 1 alarm condition is occurring. Check drive Parameter 211 - [Drive Alarm 1].
			Steady, drive running	A continuous type 1 alarm condition exists. Check drive Parameter 211 - [Drive Alarm 1].
		Red	Flashing	A fault has occurred.
			Steady	A non-resettable fault has occurred.
Adapter Status Indicators				
❷	PORT	Green	Flashing	Normal operation. The adapter is establishing an I/O connection to the drive. It will turn steady green or red.
			Steady	Normal operation. The adapter is properly connected and communicating with the drive.
	MOD	Green	Flashing	Normal operation. The adapter is operating but is not transferring I/O data to a controller.
			Steady	Normal operation. The adapter is operating and transferring I/O data to a controller.
	NET A	Off	n/a	Normal operation. The adapter/drive node is configured.
		Red	Flashing	WINK command received.
		Green	Flashing	The adapter/drive node is not configured.
			Steady	The adapter/drive node has no application program.
	NET B	—	—	Not used by LonWorks adapter.

For more details on status indicator operation, see page 5-2 and page 5-3.

Configuring and Verifying Key Drive Parameters

The PowerFlex 7-Class 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 set 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. Use drive Parameter 090 - [Speed Ref A Sel] to set the drive speed Reference to ‘22’ (DPI Port 5).
2. If hard-wired discrete digital inputs are not used to control the drive, verify that unused digital input drive Parameters 361 - [Dig In1 Sel] and 362 - [Dig In2 Sel] are set to ‘0’ (Not Used).

3. Verify that drive Parameter 213 - [Speed Ref Source] is reporting that the source of the Reference to the drive is ‘22’ (DPI Port 5).

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

TIP: For PowerFlex 750-Series drives, use drive Parameter 545 - [Speed Ref A Sel] to set the drive speed Reference:

   a. Set the Port field to ‘Port 0 - PowerFlex 75x’.

   b. Set the Parameter field to point to the port in which the 20-COMM-L adapter/20-750-20COMM Communication Carrier Card are installed (for example, ‘876 - Port 6 Reference’).

      The number ‘876’ in the Parameter filed of the example is the parameter in the drive that points to the port.

Notes:

Configuring the Adapter

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

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

Configuration Tools

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

Tool	See
PowerFlex 7-Class HIM	page 3-2
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 2.01 or later	http://www.ab.com/drives/driveexplorer, or DriveExplorer online help (installed with the software)
DriveExecutive software, version 3.01 or later	http://www.ab.com/drives/drivetools, or DriveExecutive online help (installed with the software)

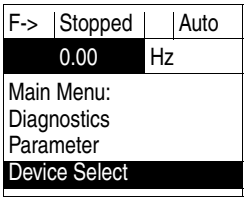
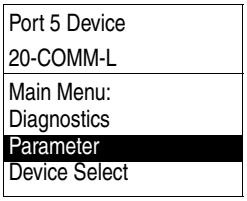
Using the PowerFlex 7-Class HIM to Access Parameters

If your drive has either an LED or LCD HIM (Human Interface Module), it can be used to access parameters in the adapter as shown below. We recommend that you read through the steps for your HIM before performing the sequence. For additional information, see the drive documentation or the PowerFlex 7-Class HIM Quick Reference, publication 20HIM-QR001.

Using an LED HIM

Step	Example Screens
1. Press the ALT key and then the Device Sel (Sel) key to display the Device Screen. 2. Press the ▲ or ▼ key to scroll to the adapter. Letters represent files in the drive, and numbers represent ports. The adapter is usually connected to port 5. 3. Press the ↵ (Enter) key to enter your selection. A parameter database is constructed, and then the first parameter is displayed. 4. Edit the parameters using the same techniques that you use to edit drive parameters.	

Using an LCD HIM

Step	Example Screens
1. In the main menu, press the ▲ or ▼ key to scroll to **Device Select**. 2. Press the ↵ (Enter) key to enter your selection. 3. Press the ▲ or ▼ key to scroll to the adapter (20-COMM-L). 4. Press the ↵ (Enter) key to select the adapter. A parameter database is constructed, and then the main menu for the adapter is displayed. 5. Edit the parameters using the same techniques that you use to edit drive parameters.	 

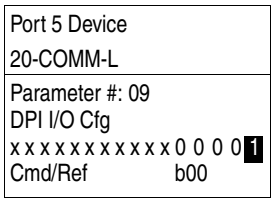
NOTE: All configuration procedures throughout this chapter use the PowerFlex 7-Class LCD HIM to access parameters in the adapter and show example LCD HIM screens.

TIP: When using a PowerFlex 20-HIM-A6 or 20-HIM-C6S HIM, see its User Manual, publication 20HIM-UM001.

Setting the I/O Configuration

The I/O configuration determines the data that is sent to and from the drive. Logic Command/Status, Reference/Feedback, and Datalinks may be enabled or disabled. (Datalinks allow you to read/write directly to parameters in the drive using implicit I/O.) A ‘1’ enables the I/O and a ‘0’ disables the I/O.

1. Set the bits in **Parameter 9 - [DPI I/O Cfg]**.



Bit	Description
0	Logic Command/Reference (Default)
1	Datalink A
2	Datalink B
3	Datalink C
4	Datalink D
5…15	Not Used

   Bit 0 is the right-most bit. It is highlighted above and equals ‘1’.

2. If Logic Command/Reference is enabled, configure the parameters in the drive to accept the Logic Command and Reference from the adapter.

   For example, set Parameter 90 - [Speed Ref A Sel] in a PowerFlex 70 or 700 drive to ‘22’ (DPI Port 5) so that the drive uses the Reference from the adapter. Also, verify that the mask parameters (for example, Parameter 276 - [Logic Mask]) in the drive are configured to receive the desired logic from the adapter. See the documentation for your drive for details.

3. If you enabled one or more Datalinks, configure parameters in the drive to determine the source and destination of data in the Datalinks.

   When using Datalinks, up to 8 drive [Data In xx] parameters (300…307) and/or up to 8 [Data Out xx] parameter (310…317) must be assigned to point to the appropriate drive parameters for your application. Also, verify that the LonWorks adapter is the only adapter using the enabled Datalinks.

4. Reset the adapter (see Resetting the Adapter on page 3-6).

The adapter is ready to receive I/O.

Setting a Communication Fault Action

By default, when I/O communication is disrupted (for example, a cable is disconnected), the drive responds by faulting if it is using I/O from the network. You can configure a different response to the disrupted I/O communication by using **Parameter 6 - [Comm Flt Action]**. The drive will remain in its present state (for example, a running drive will continue to run) until the value in **Parameter 7 - [RcvHrtBeat Time]** has elapsed.

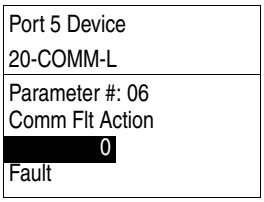
ATTENTION: Risk of injury or equipment damage exists. **Parameter 6 - [Comm Flt Action]** and **Parameter 7 - [RcvHrtBeat Time]** let you determine the action of the adapter and connected drive if I/O communication is disrupted. By default, **Parameter 6 - [Comm Flt Action]** faults the drive. You can set 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).

Changing the Fault Action

1. Set the value of **Parameter 6 - [Comm Flt Action]** to an action that meets your application requirements.

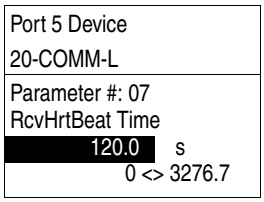
Value	Action (1)	Description
0	Fault	The drive is faulted and stopped. (Default)
1	Stop	The drive is stopped, but not faulted.
2	Zero Data	The drive is sent '0' values for data. This does not command a stop.
3	Hold Last	The drive continues in its present state.
4	Send Flt Cfg	The drive is sent the data that you set in the fault configuration parameters (**Parameters 11 - [Flt Cfg Logic]** through **20 - [Flt Cfg D2 In]**).

(1) An actual action taken requires **Parameter 7 - [RcvHrtBeat Time]** to have a value greater than '0'.



2. Set the value of **Parameter 7 - [RcvHrtBeat Time]** to the desired value.

   A setting of '0' disables the fault action and a value greater than '0' enables the fault action. If nviDrvSpeedStpt is not received by the adapter within the value of **Parameter 7 - [RcvHrtBeat Time]**, the fault action in **Parameter 6 - [Comm Flt Action]** will be taken.



Default = 120.0 s

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

Setting the Fault Configuration Parameters

When setting **Parameter 6 - [Comm Flt Action]** or **8 - [Idle Flt Action]** to 'Send Flt Cfg', the values in the following parameters are sent to the drive after an I/O communication fault and/or idle fault occurs. You must set these parameters to values required by your application.

Parameter	Description
11 - [Flt Cfg Logic]	A 16-bit value sent to the drive for Logic Command.
12 - [Flt Cfg Ref]	A 32-bit value (0…4294967295) sent to the drive as a Reference or Datalink.
13 - [Flt Cfg x1 In] through **20 - [Flt Cfg x2 In]**	**Important:** If the drive uses a 16-bit Reference or 16-bit Datalinks, the most significant word of the value must be set to zero (0) or a fault will occur.

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

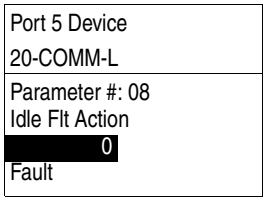
Setting an Idle Fault Action

Parameter 8 - [Idle Flt Action] lets you determine the action of the adapter and connected drive when the node is taken offline.

Changing the Idle Action

Set the value of **Parameter 8 - [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 (**Parameters 11 - [Flt Cfg Logic]** through **20 - [Flt Cfg D2 In]**).



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

Setting the Fault Configuration Parameters

See Setting the Fault Configuration Parameters on page 3-5 for details, which apply to both **Parameter 6 - [Comm Flt Action]** and **Parameter 8 - [Idle Flt Action]**.

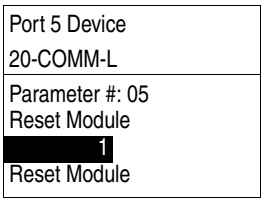
Resetting the Adapter

Changes to some adapter parameters require that you reset the adapter before the new settings take effect. You can reset the adapter by power cycling the drive or by using **Parameter 5 - [Reset Module]**.

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

Set **Parameter 5 - [Reset Module]** to '1' (Reset Module).

Figure 3.1 Example Reset Module LCD HIM Screen



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

When you enter '1' (Reset Module), the adapter will be immediately reset. When you enter '2' (Set Defaults), the adapter will set all adapter parameters to their factory-default values. After performing a Set Defaults, enter '1' (Reset Module) so that the new values take effect. The value of this parameter will be restored to '0' (Ready) after the adapter is reset.

Viewing the Adapter Status Using Parameters

The following parameters provide information about the status of the adapter. You can view these parameters at any time.

Parameter	Description
3 - [Ref/Fdbk Size]	The size of the Reference/Feedback. It will either be 16 bits or 32 bits. It is set in the drive and the adapter automatically uses the correct size.
4 - [Datalink Size]	The size of the Datalinks. It will either be 16 bits or 32 bits. It is set in the drive and the adapter automatically uses the correct size.
10 - [DPI I/O Act]	The Reference/Feedback and Datalinks used by the adapter. This value is the same as **Parameter 9 - [DPI I/O Cfg]** unless the parameter was changed and the adapter was not reset.

Bit Definition	Not Used	Not Used	Not Used	Datalink D	Datalink C	Datalink B	Datalink A	Cmd/Ref
Default	x	x	x	0	0	0	0	1
Bit	7	6	5	4	3	2	1	0

0 = I/O disabled
1 = I/O enabled

Updating the Adapter Firmware

The adapter 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 adapter, 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 firmware using ControlFLASH, DriveExplorer, DriveExecutive, or HyperTerminal software.

Notes:

Configuring the LonWorks Network

This chapter provides information about configuring network variables to access a PowerFlex 7-Class drive over a LonWorks network.

Overview of LonWorks Functionality

A network variable is a data item that a particular device application program expects to get from other devices on a network (an ‘input network variable’) or expects to make available to other devices on a network (an ‘output network variable’). Data exchange on a LonWorks network is handled with Standard Network Variable Types (SNVTs), which represent different types of standard data (for example, temperature, pressure, and voltage).

When a program writes into one of its output network variables, the new value of the network variable is propagated across the network to all nodes with input network variable connected to that output network variable. A network variable can only be bound to another network variable of the same type.

Specific network variables are described in sections Network Variable Inputs (NVIs), Network Variable Outputs (NVOs), and Network Configuration Inputs (NCIs).

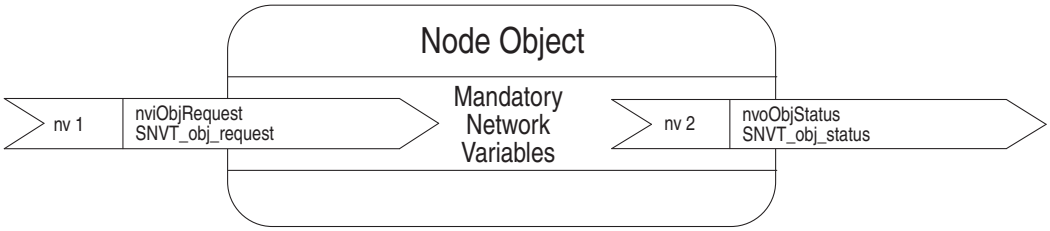
Important: Any changes made with the LCD HIM to a parameter that is also updated by the network will be overwritten when the next network update occurs.

Operating the Drive Using a LonMark Profile

A LonMark profile defines the functional profile for a node communicating with other nodes. The profile specifies which SNVTs (Standard Network Variable Types) and SCPTs (Standard Configuration Property Types) are used, and provides a semantic meaning about the information being communicated.

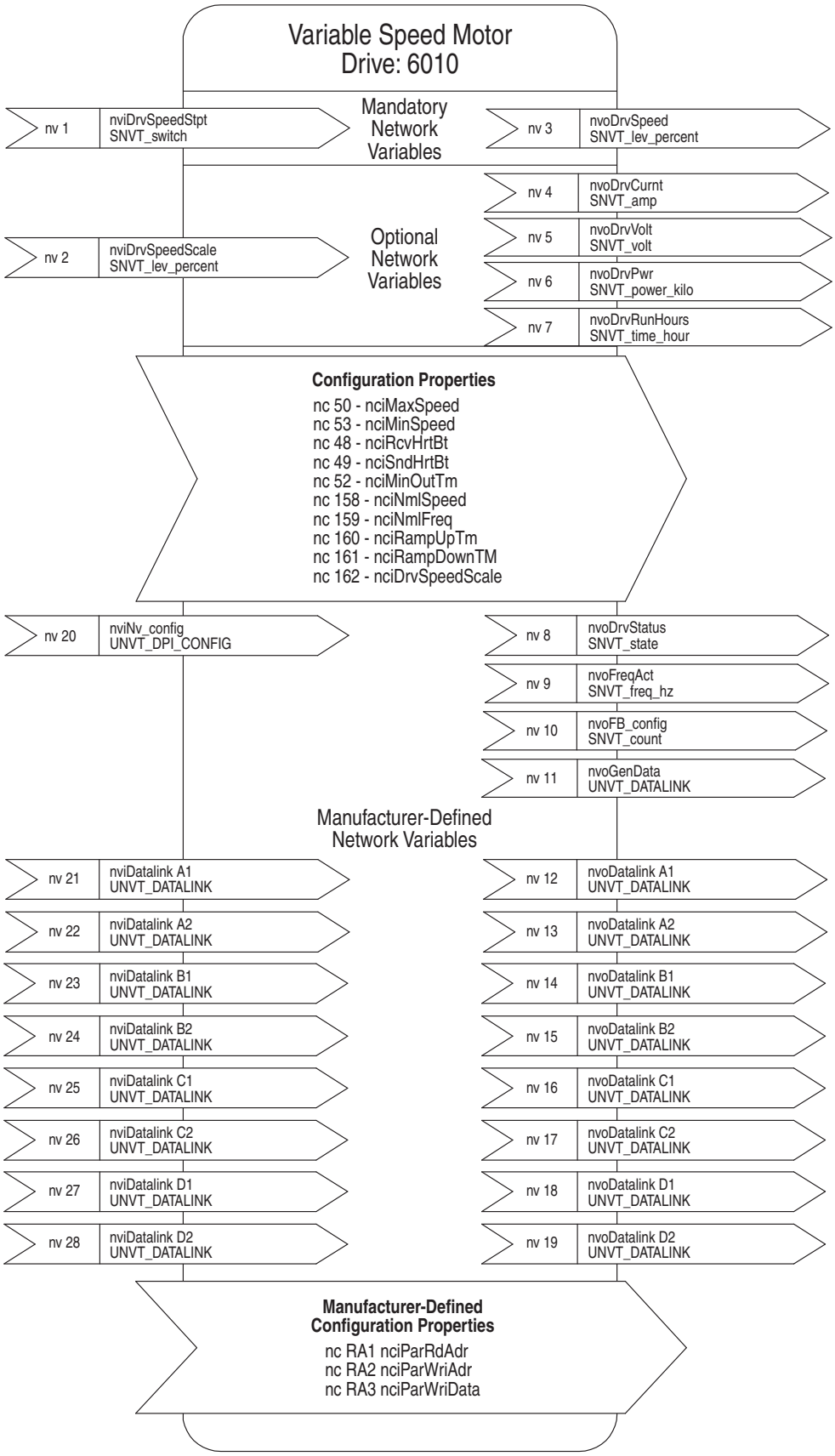
When a profile is implemented in a node, it is called a LonMark object. One node can have several objects implemented. The LonWorks adapter has two objects: a node object and a drive object. The node object is used to control the other objects in a node. See Figure 4.1.

Figure 4.1 Node Object



The drive object is based on a specific LonMark functional profile (‘Variable Speed Motor Drive: 6010’), as shown in Figure 4.2.

Figure 4.2 Drive Object



Node Operations

The following sections describe the basics of node operation.

WINK (What is a WINK?)

WINK is a network command that verifies communication with a node. The NET A status indicator flashes to indicate that a WINK was received. This LED flashes red according to the following sequence:

- 3 fast flashes
- OFF for 1 second

This sequence is repeated 10 times.

If the Node is Offline

If the node is brought offline it does not accept any NVI (Network Variable Inputs) settings or update NVOs (Network Variable Outputs). The adapter uses the setting in **Parameter 8 - [Idle Flt Action]** and issues a command to the drive. NCI (Network Configuration Input) variable updates are accepted but not forwarded to the drive until the node goes online and/or is reset.

If the Node is Online

The node accepts NCI and NVI settings and updates NVOs.

Network Variable Inputs (NVIs)

This section provides descriptions of the Network Variable Inputs.

Node Object Request

Variable: nviObjRequest

Format: SNVT_obj_request

Explanation:

This input enables control commands and updates from the network to specific objects in the node. The identification number for the node is 0 and for the drive object is 1. The request functionality is the same for both objects. The setting of nviObjRequest does not affect the ability of setting drive speed. The status of the node is reported in nvoObjStatus.

Valid Range for Object ID: 0 or 1

Valid Range for Request:

RQ_UPDATE_STATUS updates nvoObjStatus.

RQ_CLEAR_STATUS clears nvoObjStatus.

RQ_CLEAR_ALARM clears a fault in the drive.

RQ_REPORT_MASK reports supported requests in nvoObjStatus.

RQ_NORMAL and RQ_ENABLE are the normal requests when node function is normal.

All other requests are not supported, and any attempt to use them sets the invalid_request bit in nvoObjStatus.

Drive Speed Setpoint

Variable: nviDrvSpeedStpt

Format: SNVT_switch

Explanation:

This network variable input provides a speed reference setpoint. When nviDrvSpeedStpt.state is set to zero, the drive is stopped.

Valid Range:

State	Value	Requested Speed
0	n/a	STOPPED
1	0%	0%
1	0.5…100.0%	0.5…100.0%
1	100.0%	100.0%
0xFF	n/a	AUTO (Default)

Default Value:

Default value is AUTO (state = 0xFF). This value is adapted at power up. This network variable input uses adapter **Parameter 7 - [RcvHrtBeat Time]** if this function is set up for use. The actual drive speed also depends on nviDrvSpeedScale.

Speed Setpoint Scaling

Variable: nviDrvSpeedScale

Format: SNVT_lev_percent

Explanation:

This network variable input provides scaling for nviDrvSpdStpt. For example, if nviDrvSpeedStpt value is 100% and nviDrvSpeedScale value is -150%, then actual speed setpoint value is -150% (reverse direction at 1.5 times nominal speed).

Valid Range: -163.84…163.83%

Default Value: Defined by nciDrvSpeedScale.

Module Configuration

Variable: nviNV_config

Format: UNVT_DPI_CONFIG

Explanation:

This network variable input provides information on how parameters should be mapped to network variables. The NVI contains two fields:

- NV_index
- DPI_parameter

To check an already existing configuration, use the following procedures:

A. To check which DPI parameter a network variable is connected to, use nviNV_config with the following data:

UNVT_DPI_CONF.NV_index = NV_index to check
UNVT_DPI_CONF.DPI_parameter = 65535 (decimal)

B. To check which network variable a DPI parameter is connected to, use nviNV_config with the following data:

UNVT_DPI_CONF.NV_index = 255 (decimal)
UNVT_DPI_CONF.DPI_parameter = DPI parameter to check

The result of the requests above are placed in nvoFB_config. If there is no configuration available, 0 (zero) is returned.

Valid Range:

NV_index out: 14…20

LON SNVT	NV_Index	Default PowerFlex 70/700 Drive Parameter
nvoDrvSpeed	14	1
nvoDrvCurnt	15	3
nvoDrvPwr	17	7
nvoDrvVolt	18	6
nvoDrvRunHours	19	10
nvoDrvFreqAct	20	1

NV_index in: 31…36

LON SNVT	NV_Index	Default PowerFlex 70/700 Drive Parameter
nciNmlSpeed	31	44
nciMinSpeed	32	81
nciMaxSpeed	33	55
nciRampUpTm	34	140
nciRampDownTime	35	142
nciNmlFreq	36	43

Default Value:

This configuration is the default for PowerFlex 70/700 drives. For other drives, the defaults are 0 and need to be configured prior to network commissioning. A value of 0 means the variable is disabled and cannot be used to send/receive data.

Note: It is necessary to configure nciNmlFreq and nciMaxSpeed to operate the drive from the network.

Datalink Ins

Variable: nviDatalinkA1
nviDatalinkA2
nviDatalinkB1
nviDatalinkB2
nviDatalinkC1
nviDatalinkC2
nviDatalinkD1
nviDatalinkD2

Format: UNVT_DATALINK

Explanation:

These network variable inputs are used for generic parameter writes by way of Datalink Ins. To set up a Datalink, configure the adapter according to the drive manual. All data is sent in raw format; that is, no scaling is performed.

Example:

If PowerFlex 70/700 drive parameter 300 - [Data In A1] is set to ‘101’, it is pointing to drive parameter 101 - [Preset Speed 1]. Any value written to nviDatalinkA1 updates drive parameter 101 - [Preset Speed 1] with the value. A value of ‘100’ equates to 10.0 Hz (note that no scaling is performed).

Network Variable Outputs (NVOs)

This section describes the network variable outputs. No output values are sent over the network, unless they have changed (except nvoDrvSpeed, which is sent for the heartbeat functionality, and nvoObjStatus, if update status is requested).

Node Object Status

Variable: nvoObjStatus

Format: SNVT_obj_status

Explanation:

This network variable output reports node object status and is updated every time its status changes (see Node Object Request on page 4-5).

Valid Range:

Invalid_ID	The node has been asked for an invalid object ID.
Invalid_IDrequest	The node has been asked for an unsupported request.
Report_mask	Report supported fields.
Comm_failure	No contact with DPI.
In_alarm	The drive is faulted.
Manual_control	The drive is not controlled from the LonWorks peripheral.

Drive Status

Variable: nvoDrvStatus

Format: SNVT_state

Explanation:

This network variable output provides the status of the drive by way of the Logic Status word (see Appendix C).

Drive Current

Variable: nvoDrvCurnt

Format: SNVT_amp

Explanation:

This network variable output provides the drive output current in amps.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 3 - [Output Current]

This can be mapped using the nviNV_config variable.

Drive Speed

Variable: nvoDrvSpeed

Format: SNVT_level_percent

Explanation:

This network variable output provides the speed of the drive as a percentage of the nominal speed. This network variable output is also used as a heartbeat to monitor the health of the LonWorks communication interface.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 1 - [Output Freq]

This can be mapped using the nviNV_config variable.

Drive Power

Variable: nvoDrvPwr

Format: SNVT_power_kilo

Explanation:

This network variable output provides the drive power in kilowatts.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 7 - [Output Power]

This can be mapped using the nviNV_config variable.

Drive Voltage

Variable: nvoDrvVolt

Format: SNVT_volt

Explanation:

This network variable output provides the drive voltage in volts.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 6 - [Output Voltage]

This can be mapped using the nviNV_config variable.

Output Frequency

Variable: nvoDrvFreqAct

Format: SNVT_freq_hz

Explanation:

This network variable output provides the drive output frequency in Hz. This value is always positive. It does not indicate the forward/reverse direction of motor revolution.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 1 - [Output Freq]

This can be mapped using the nviNV_config variable or adapter **Parameter 28 - [DrvFreqActParam]**.

Operation Hour Counter

Variable: nvoDrvRunHours

Format: SNVT_time_hour

Explanation:

This network variable output provides the drive total running time in whole hours.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 10 - [Elapsed Run Time]

This can be mapped using the nviNV_config variable or adapter **Parameter 27 - [DrvRunHoursParam]**.

Configuration Feedback

Variable: nvoFB_config

Format: SNVT_count

Explanation:

This network variable output is used to verify that the configuration of the adapter is correct. When changing the configuration with the nviNV_config variable, nvoFB_config responds with the NV_index that was updated.

Datalink Outs

Variable: nvoDatalinkA1
nvoDatalinkA2
nvoDatalinkB1
nvoDatalinkB2
nvoDatalinkC1
nvoDatalinkC2
nvoDatalinkD1
nvoDatalinkD2

Format: UNVT_DATALINK

Explanation:

These network variable outputs are used for generic parameter inputs by way of Datalink Outs. To set up a Datalink, configure the adapter according to the drive manual. All data is sent in raw format; that is, no scaling is performed.

Example:

If PowerFlex 70/700 drive parameter 310 - [Data Out A1] is set to ‘16’, it is pointing to drive parameter 16 - [Analog In 1 Value]. The value in drive parameter 16 - [Analog In 1 Value] is read in nvoDatalinkA1. A value of ‘1000’ equates to 1.000 mA or volt (note that no scaling is performed).

Generic Parameter Data

Variable: nvoGenData

Format: SNVT_DATALINK

Explanation:

This network variable output provides data from the parameter number defined by nciParRdAdr. No scaling is performed and all data is presented in raw format.

Network Configuration Inputs (NCIs)

The values of the NCIs change when written to and keep their values after a power cycle.

All NCIs, with a corresponding parameter in the drive, are read from the drive after reset and when going from offline to online. When the parameter is updated from the network, it is written to the drive.

Send Heartbeat

NCI: nciSndHrtBt

Format: SNVT_time_sec

Explanation:

This network configuration input specifies the maximum send time for the variable nvoDrvSpeed.

Valid Range: 0.0…6553.4 seconds

Default Value: 0.0 seconds (disabled)

Receive Heartbeat

NCI: nciRcvHrtBt

Format: SNVT_time_sec

Explanation:

This network configuration input specifies the maximum time that is allowed to elapse between updates of the network variable input nviDrvSpeedStpt. Setting nciRcvHrtBt to ‘0’ disables the Receive Heartbeat function. If a timeout occurs, the adapter will implement a fault action in **Parameter 6 - [Comm Flt Action]**.

Valid Range: 0.0…6553.4 seconds

Default Value: 120.0 seconds

Minimum Send Time

NCI: nciMinOutTm

Format: SNVT_time_sec

Explanation:

This network configuration input specifies the minimum period of time that expires before the network variable outputs can be re-sent. All variables are updated if they changed at each period end. This can help to limit the use of bandwidth on the LonWorks network. Setting nciMinOutTm to ‘0’ disables transmission limiting.

Valid Range: 0.0…6553.4 seconds.

Default Value: 0.0 seconds (disabled)

Motor Nominal Speed

NCI: nciNmlSpeed

Format: SNVT_rpm

Explanation:

This network configuration input sets the nominal speed of the motor in RPM.

Default Value: 1740 RPM

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 44 - [Motor NP RPM]

This can be adjusted using the nviNV_config variable or adapter **Parameter 30 - [NmlSpeedParam]**.

Nominal Frequency

NCI: nciNmlFreq

Format: SNVT_freq_hz

Explanation:

This network configuration input sets the nominal frequency of the motor.

Default Value: 60 Hz.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 43 - [Motor NP Hertz]

This can be adjusted using the nviNV_config variable or adapter **Parameter 29 - [NmlFreqParam]**.

Minimal Speed

NCI: nciMinSpeed

Format: SNVT_lev_percent

Explanation:

This network configuration input specifies the minimum speed of the motor. Its value is entered as a percentage of nominal frequency as defined by the Nominal frequency (nciNmlFreq) configuration value.

For example, if nciNmlFreq = 50 Hz. and nciMinSpeed = 10%, the minimum speed is 5 Hz.

Valid Range: The minimum speed value must be validated as follows:

-163.84% ≤ minimum speed ≤ maximum speed ≤ 163.83%

Default Value: 0.0 Hz.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 81 - [Minimum Speed]

This can be adjusted using the nviNV_config variable or adapter **Parameter 32 - [MinSpeedParam]**.

Maximum Speed

NCI: nciMaxSpeed

Format: SNVT_lev_percent

Explanation:

This network configuration input specifies the maximum speed of the motor. Its value is entered as a percentage of nominal frequency as defined by the Nominal Frequency (nciNmlFreq) configuration value.

For example, if nciNmlFreq = 50 Hz. and nciMaxSpeed = 125%, the maximum speed is 62.5 Hz.

Valid Range: The maximum speed value must be validated against the minimum speed value as follows:

-163.84% ≤ minimum speed ≤ maximum speed ≤ 163.83%

Default Value: 130.0 Hz.

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 55 - [Maximum Freq]

This can be adjusted using the nviNV_config variable or adapter **Parameter 31 - [MaxSpeedParam]**.

Ramp Up Time

NCI: nciRampUpTm

Format: SNVT_time_sec

Explanation:

This network configuration input sets the acceleration time. The value specifies the length of time it will take to bring the inverter from stop to maximum frequency.

Default Value: 10.0 seconds

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 140 - [Accel Time]

This can be adjusted using the nviNV_config variable or adapter **Parameter 33 - [RampUpTmParam]**.

Ramp Down Time

NCI: nciRampDownTm

Format: SNVT_time_sec

Explanation:

This network configuration input sets the deceleration time. The value specifies the length of time it will take to bring the inverter to a stop when running at maximum frequency.

Default Value: 10.0 sec

Default PowerFlex 70/700 Drive Parameter Mapping:

Parameter 142 - [Decel Time]

This can be adjusted using the nviNV_config variable or adapter **Parameter 34 - [RampDownTmParam]**.

Speed Setpoint Scaling Default Value

NCI: nciDrvSpeedScale

Format: SNVT_lev_percent

Explanation:

This network configuration input sets a default value to nviDrvSpeedScale on every startup.

Default Value: 0%

Valid Range: ±163%

Generic Parameter Read Address

NCI: nciParRdAdr

Format: SNVT_count

Explanation:

This network configuration input is used to read any parameter in the drive. The data is read via the nvoGenData output.

Default Value: 0 (Not used)

Valid Range: Any valid drive parameter.

Generic Parameter Write Address

NCI: nciParWriAdr

Format: SNVT_count

Explanation:

This network configuration input is used to set the parameter number to which a write operation is to be performed. The actual data value is collected from nciParWriData. The write operation is triggered only when nciParWriData is updated. The write operation is not triggered if nciParWriAdr is updated.

Writing to a parameter using this method causes a Nonvolatile Storage (NVS) memory update (EEPROM write cycle). Do not write parameter data frequently using this method. Datalinks do not write to NVS and should be used for frequently changed parameters.

Default Value: 0 (Not used)

Valid Range: Any valid drive parameter.

Generic Parameter Write Data

NCI: nciParWriData

Format: UNVT_DATALINK

Explanation:

This network configuration input is the raw data value that is written to the drive parameter set in nciParWriAdr. The adapter will not scale the value.

Default Value: 0

Valid Range: —

Conditions Required for Operation

This section describes what conditions are required for performing some common actions and how the combination of SNVTs and SCPTs affects the operation of the drive.

Starting the Drive

The drive will RUN if nviDrvSpeedStpt.state is TRUE.

Stopping the Drive

The drive stops using the default stop mode if NviSpeedStpt.state is set to '0' or if the node is brought offline or disabled, depending on the setting of adapter **Parameter 8 - [Idle Flt Action]**.

Adjusting the Frequency Setting

The actual value written to the drive equals:

nciNmlFreq * (nviDrvSpeedStpt / 100) * (nviDrvSpeedScale / 100)

Explanation:

Nominal frequency is the base for scale and setpoint percent values. See Network Variable Inputs (NVIs) on page 4-5 for information about nviSpeedStpt and nviSpeedScale.

nviSpeedScale	nviSpeed Stpt.value	nviSpeed Stpt.state	Resulting Speed
0%	0%	1	0 Hz (RUN)
100%	0%	1	0 Hz (RUN)
0%	100%	1	0 Hz (RUN)
150%	100%	0	(Normal) Stop
150%	100%	1	1.5 * 1.0 * nciNmlFreq (RUN)
-75%	100%	1	-0.75 * 1.00 * nciNmlFreq (RUN)
150%	50%	1	1.5 * 0.50 * nciNmlFreq (RUN)

Resetting Faults

If an error occurs, the drive faults. After removing the cause of the fault and setting nviObjRequest to RQ_CLEAR_ALARM, the drive can be reset.

nciMinOutTm versus nciSendHrtBt

The nciMinOutTm has priority over nciSendHrtBt. This means that heartbeats are not sent as often as specified in nciSendHrtBt if nciMinOutTm has a longer time set.

Error Handling

If nciRcvHrtBt is larger than zero, and heartbeats are not received within the nciRcvHrtBt time, then communication with the LonWorks network is considered down. The adapter response to loss of communication depends on the setting of adapter **Parameter 6 - [Comm Flt Action]**.

See Chapter 5, Troubleshooting for more information on potential problems with the adapter and network.

Resource Files

LonMark resource files define the components of the external interface for a LonWorks device. These files allow installation tools and operator interface applications to interpret data produced by a device and to correctly format data sent to a device. They also help a system integrator or system operator to understand how to use a device and to control the LonMark objects on a device.

The LonWorks module uses three types of resource files:

- **Type File (uses a '.TYP' file extension) -** Defines network variable, configuration property, and enumerated types. LonMark standard network variable and configuration property types are defined in the STANDARD.TYP file.
- **Functional Profile Template (uses a '.FPT' file extension) -** Defines functional profiles that are used for describing LonMark objects. A functional profile specifies the mandatory and optional network variable and configuration property components of a LonMark object. LonMark standard functional profiles are defined in the STANDARD.FPT file.
- **Format File (uses a '.FMT' file extension) -** Defines display and input formats for network variable and configuration property types defined in a type file. Formats for the LonMark standard network variable and configuration property types are defined in the STANDARD.FMT file.

In addition to the resource files, the following file types are also used:

- **Language File -** Defines language-dependent strings. There is a separate language file for each supported language. The supported language file determines the extension of a language file. Two language files are presently available for the LonMark standard type files; these are STANDARD.ENU for American English and STANDARD.ENG for British English.
- **XIF File -** Defines the external interface for a LonWorks device. This file contains self-documentation information, number of address table entries, number of message tags, and the number, types, and directions of network variables.

The resource files and XIF file are shipped with the LonWorks module on digital media.

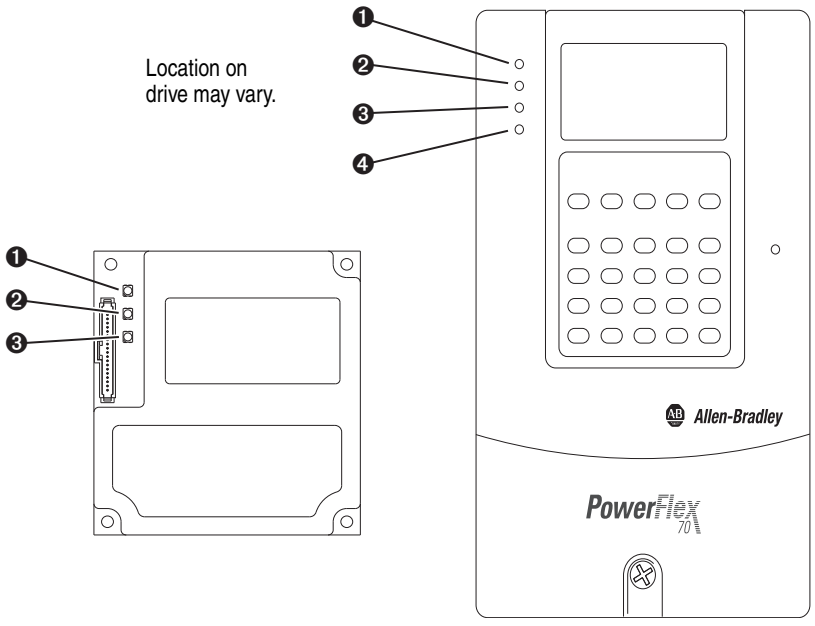
Notes:

Troubleshooting

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

Understanding the Status Indicators

The adapter has three status indicators. They can be viewed on the adapter or through the drive cover.



Item	Status Indicator	Description	Page
❶	PORT	DPI Connection Status	5-2
❷	MOD	Adapter Status	5-2
❸	NET A	LonWorks Communication Status	5-3
❹	NET B (only on drive cover)	Not used for LonWorks	—

PORT Status Indicator

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

Status	Cause	Corrective Action
Off	The adapter is not powered or is not properly connected to the drive.	• Securely connect the adapter to the drive using the Internal Interface (ribbon) cable. • Apply power to the drive.
Flashing Red	The adapter is not receiving a ping message from the drive.	• Verify that cables are securely connected and not damaged. Replace cables if necessary. • Cycle power to the drive.
Steady Red	The drive has refused an I/O connection from the adapter. Another DPI peripheral is using the same DPI port as the adapter.	**Important:** Cycle power to the drive after making any of the following corrections: • Verify that all DPI cables on the drive are securely connected and not damaged. Replace cables if necessary. • Verify that the DPI drive supports Datalinks. • Configure the adapter to use a Datalink that is not already being used by another peripheral.
Steady Orange	The adapter is connected to a product that does not support Allen-Bradley DPI communications.	Connect the adapter to a product that supports Allen-Bradley DPI communications (for example, a PowerFlex 7-Class drive).
Flashing Green	The adapter is establishing an I/O connection to the drive.	No action required. Normal behavior if no DPI I/O is enabled.
Steady Green	The adapter is properly connected and is communicating with the drive.	No action required.

MOD Status Indicator

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

Status	Cause	Corrective Action
Off	The adapter is not powered or is not properly connected to the drive.	• Securely connect the adapter to the drive using the Internal Interface (ribbon) cable. • Apply power to the drive.
Flashing Red: 2 Hz.	MinSendTime on the sending node is less than SendHeartBeatTime on that node.	Adjust the values of MinSendTime and SendHeartBeatTime to match each other.
3 flashes… then steady Red	The software detected a RAM checksum error.	Cycle power to the drive.
6 flashes… then steady Red	The software detected a Flash checksum error.	Update the adapter with the latest firmware revision.
8 Hz.	The adapter CPU cannot communicate with the Neuron Chip.	Cycle power to the drive.
Steady Red	The adapter has failed the hardware test.	• Cycle power to the drive. • Replace the adapter.
Flashing Green	The adapter is operational, but is not transferring I/O data to a controller.	• Program the controller to recognize and transmit I/O to the adapter. • Normal behavior if no DPI I/O is enabled.
Steady Green	The adapter is operational and transferring I/O data to a controller.	No action required.

NET A Status Indicator (Service Indicator)

This red/green bicolor LED indicates the status of the network connection as shown in the table below, and is controlled by the Neuron Chip.

Status	Cause	Corrective Actions
Off	The node is configured.	No action required.
Flashing Red	WINK command received.	No action required.
Flashing Green	The node is not configured.	Configure the node.
Steady Green	The node has no application program.	The Neuron Chip must be loaded with a new application program.

Viewing and Clearing Adapter Diagnostic Items

If you encounter unexpected communications problems, the adapter diagnostic items can help you or Rockwell Automation personnel troubleshoot the problem. Adapter diagnostic items can be viewed with any of these drive configuration tools:

- LCD PowerFlex 7-Class HIM (Diagnostics/Device Items)
- Connected Components Workbench software, version 1.02 or later
- DriveExplorer software, version 2.01 or later
- DriveExecutive software, version 3.01 or later

Using the HIM to View and Clear Adapter Diagnostic Items

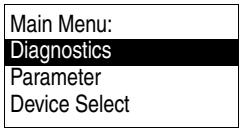
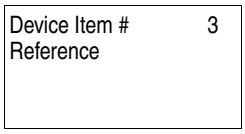
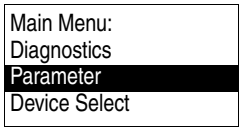
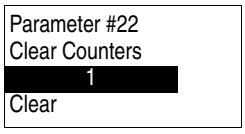
Step	Example Screen
Viewing Diagnostic Items	
1. Access parameters in the adapter. See Using the PowerFlex 7-Class HIM to Access Parameters on page 3-2.	
2. Press the ▲ or ▼ key to scroll to **Diagnostics**.	
3. Press the ↵ (Enter) key to display the Diagnostics menu in the adapter.	
4. Repeat steps 2 and 3 to enter the **Device Items** option.	
5. Press the ▲ or ▼ key to scroll through the items.	
Clearing Diagnostic Items	
1. Access parameters in the adapter. See Using the PowerFlex 7-Class HIM to Access Parameters on page 3-2.	
2. Press the ▲ or ▼ key to scroll to **Parameter**.	
3. Press the ↵ (Enter) key to display the list of parameters in the adapter.	
4. Repeat steps 2 and 3 to select **Parameter 22 - [Clear Counters]**.	
5. Set the value to '1' (Clear) and press the ↵ (Enter) key to clear diagnostic items 26 and 27.	

Table 5.A Adapter Diagnostic Items

No.	Name	Description
1	Common Logic Cmd	The present value of the Common Logic Command being transmitted to the drive by this adapter.
2	Product Logic Cmd	The present value of the Product Logic Command being transmitted to the drive by this adapter.
3	Reference	The present value of the Reference being transmitted to the drive by this adapter. Note that a 16-bit value will be sent as the Most Significant Word of the 32-bit field.
4	Common Logic Sts	The present value of the Common Logic Status being received from the drive by this adapter.
5	Product Logic Sts	The present value of the Product Logic Status being received from the drive by this adapter.
6	Feedback	The present value of the Feedback being received from the drive by this adapter. Note that a 16-bit value will be sent as the Most Significant Word of the 32-bit field.
7	Datalink A1 In	The present value of respective Datalink In being transmitted to the drive by this adapter. If not using a Datalink, this parameter should have a value of zero. If the drive indicates a 16-bit Datalink size, the Datalink value appears in the least significant 16 bits of this diagnostic item, and the most significant 16 bits of this diagnostic item are zero (0).
8	Datalink A2 In	
9	Datalink B1 In	
10	Datalink B2 In	
11	Datalink C1 In	
12	Datalink C2 In	
13	Datalink D1 In	
14	Datalink D2 In	
15	Datalink A1 Out	The present value of respective Datalink Out being received from the drive by this adapter. If the drive indicates a 16-bit datalink size, the value appears in the least significant 16 bits of this diagnostic item, and the most significant 16 bits of this diagnostic item are zero (0).
16	Datalink A2 Out	
17	Datalink B1 Out	
18	Datalink B2 Out	
19	Datalink C1 Out	
20	Datalink C2 Out	
21	Datalink D1 Out	
22	Datalink D2 Out	
23	Field Flash Cntr	Number of times the adapter has been flash updated.
24	DPI Tx Err Cntr	The present value of the DPI CAN Transmit error counter.
25	DPI Rx Err Cntr	The present value of the DPI CAN Receive error counter.
26	LON Tx Err	Number of CRC errors detected during packet reception.
27	LON Lost Msg	Number of incoming packets that have been discarded due to no available application buffers.
28	Last Reset Cause	0 = Power Up; 1 = External; 2 = Watchdog; 3 = Software; 4 = Cleared
29	Neuron State	0 = appl_uncnfg; 1= cnfg_online; 2 = unknown; 3 = cnfg_offline; 4 = soft_online
30	Neuron Chip ID	The Neuron Chip ID number as an enumerated value.
31	nviDrvSpdSp.val	Last nviDrvSpdStpt.Value reported to the adapter from the network.
32	nviDrvSpdSp.st	Last nviDrvSpdStpt.State reported to the adapter from the network.
33	nviDrvSpdSp.scale	Last nviDrvSpdStpt.Scale reported to the adapter from the network.
34	nvoDrvSpeed	The present Drive Speed propagated to the network nvoDrvSpeed variable.

Viewing and Clearing Events

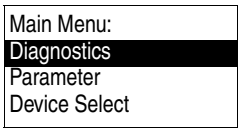
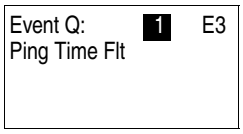
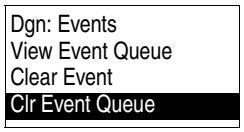
The adapter has an event queue to record significant events that occur in the operation of the adapter. When such an event occurs, an entry is put into the event queue. You can view the event queue with any of these drive configuration tools:

- LCD PowerFlex 7-Class HIM
- Connected Components Workbench software, version 1.02 or later
- DriveExplorer software, version 2.01 or later
- DriveExecutive software, version 1.01 or later

The event queue can contain up to 32 entries. Eventually the event queue becomes full, because its contents are retained through adapter resets. At that point, a new entry replaces the oldest entry. Only an event queue clear operation or adapter power cycle can clear the event queue contents.

Resetting the adapter to defaults has no effect on the event queue.

Using the HIM to View and Clear Events

Step	Example Screen
Viewing Events	
1. Access parameters in the adapter. See Using the PowerFlex 7-Class HIM to Access Parameters on page 3-2.	
2. Press the ▲ or ▼ key to scroll to **Diagnostics**.	
3. Press the ↵ (Enter) key to display the Diagnostics menu in the adapter.	
4. Repeat steps 2 and 3 to enter the **Events** option and then **View Event Queue** option.	
5. Press the ▲ or ▼ key to scroll through events. The most recent event is Event 1.	
Clearing Events	
1. Access parameters in the adapter. See Using the PowerFlex 7-Class HIM to Access Parameters on page 3-2.	
2. Press the ▲ or ▼ key to scroll to **Diagnostics**.	
3. Press the ↵ (Enter) key to display the Diagnostics menu in the adapter.	
4. Repeat steps 2 and 3 to enter the **Events** option and then the **Clear Event** option or **Clr Event Queue** option. A message will pop up to confirm that you want to clear the message or queue.	
5. Press the ↵ (Enter) key to confirm your request. If **Clr Event Queue** was selected, all event queue entries will then display 'No Event'.	

Events

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.B Adapter Events

Code	Event	Description
1	No Event	Empty event queue entry.
2	DPI Bus Off Flt	A bus-off condition was detected on DPI. This event may be caused by loose or broken cables or by noise.
3	Ping Time Flt	A ping message was not received on DPI within the specified time.
4	Port ID Flt	The adapter is not connected to a correct port on a DPI product.
5	Port Change Flt	The DPI port changed after start up.
6	Host Sent Reset	The drive sent a reset event message.
7	EEPROM Sum Flt	The EEPROM in the adapter is corrupt.
8	Online @ 125kbps	The adapter detected that the drive is communicating at 125 kbps.
9	Online @ 500kbps	The adapter detected that the drive is communicating at 500 kbps.
10	Bad Host Flt	The adapter was connected to an incompatible product.
11	Dup Port Flt	Another peripheral with the same port number is already in use.
12	Type 0 Login	The adapter has logged in for Type 0 control.
13	Type 0 Time Flt	The adapter has not received a Type 0 status message within the specified time.
14	DL Login	The adapter has logged into a Datalink.
15	DL Reject Flt	The drive rejected an attempt to log in to a Datalink because the Datalink is not supported or is used by another peripheral.
16	DL Time Flt	The adapter has not received a Datalink message within the specified time.
17	Control Disabled	The adapter has sent a ‘Soft Control Disable’ command to the drive.
18	Control Enabled	The adapter has sent a ‘Soft Control Enable’ command to the drive.
19	Normal Startup	The adapter successfully started up.
20	Message Timeout	A Client-Server message sent by the adapter was not completed within 1 sec.
21	DPI Fault Msg	The DPI host drive has faulted.
22	DPI Fault Clear	The user cleared a fault in the adapter.
23	Net Comm Flt	The adapter detected a communication fault on the network (received Heartbeat timeout).
24	Flt Cfg Error	One of the Flt Cfg xx parameters is set to a value greater than 65535 and the drive requires a 16-bit value.
25	LON Online	The adapter is online with the LonWorks network.
26	LON Offline	The adapter is offline from the LonWorks network.
27	LON Reset	The adapter has detected a reset of the Neuron Chip.
28	LON Enable	The node is enabled by RQ_ENABLE.
29	LON Disable	The node is disabled by RQ_DISABLE.
30	Language CRC Bad	The language text memory segment is corrupt.

Specifications

This appendix presents the specifications for the adapter.

Communications

Network Protocol Data Rate	 LonWorks 78 kbps
Drive Protocol Data Rates	 DPI 125 kbps or 500 kbps

Electrical

Consumption Drive Network	 200 mA at 5V DC supplied by the host drive None

Mechanical

Dimensions Height Length Width	 20 mm (0.79 inches) 86 mm (3.39 inches) 78.5 mm (3.09 inches)
Weight	85 g (3 oz.)

Environmental

Temperature Operating Storage	 -10…50 °C (14…122 °F) -40…85 °C (-40…185 °F)
Relative Humidity	5…95% non-condensing
Atmosphere	**Important:** The adapter **must not** be installed in an area where the ambient atmosphere contains volatile or corrosive gas, vapors or dust. If the adapter 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
UL	UL508C
cUL	CAN / CSA C22.2 No. 14-M91
CE	EN50178 and EN61800-3
CTick	EN61800-3

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.

Adapter Parameters

Appendix B provides information about the adapter parameters.

About Parameter Numbers

The parameters in the adapter are numbered consecutively.

Configuration Tool	Numbering Scheme
• HIM • DriveExplorer • DriveExecutive	The adapter parameters begin with parameter 01. For example, **Parameter 01 - [DPI Port]** is parameter 01 as indicated by this manual.

Parameter List

Parameter No.	Name and Description	Details
01	**[DPI Port]** Displays the port to which the adapter is connected. This usually is port 5.	Minimum: 0 Maximum: 7 Type: Read Only
02	**[DPI Data Rate]** Displays the data rate used by the drive. This data rate is set in the drive and the adapter detects it.	Values: 0 = 125 kbps 1 = 500 kbps Type: Read Only
03	**[Ref/Fdbk Size]** Displays the size of the Reference/Feedback. The drive determines the size of the Reference/Feedback.	Values: 0 = 16-bit 1 = 32-bit Type: Read Only
04	**[Datalink Size]** Displays the size of each Datalink word. The drive determines the size of Datalinks.	Values: 0 = 16-bit 1 = 32-bit Type: Read Only
05	**[Reset Module]** No action if set to '0' (Ready). Resets the adapter if set to '1' (Reset Module). Restores the adapter to its factory default settings if set to '2' (Set Defaults). This parameter is a command. It resets to '0' (Ready) after the command has been performed.	Default: 0 = Ready Values: 0 = Ready 1 = Reset Module 2 = Set Defaults Type: Read/Write Reset Required: No

ATTENTION: Risk of injury or equipment damage exists. If the adapter is transmitting I/O that controls the drive, the drive can fault when you reset the adapter. Determine how your drive will respond before resetting a connected adapter.

Parameter No.	Name and Description	Details
06	**[Comm Flt Action]** Sets the action that the adapter and drive takes if the adapter detects that network communication has been disrupted (if **Parameter 7 - [RcvHrtBeat Time]** times out before nviDrvSpeedStpt is updated from the network). This setting is effective only if I/O that controls the drive is transmitted through the adapter.	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. **Parameter 6 - [Comm Flt Action]** and **Parameter 7 - [RcvHrtBeat Time]** let you determine the action of the adapter and connected drive if I/O communication is disrupted. By default, this parameter faults the drive. You can set 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).	
07	**[RcvHrtBeat Time]** Sets the time used as a Receive Heartbeat timer and triggers the fault action in **Parameter 6 - [Comm Flt Action]**.	Default: 120.0 seconds Minimum: 0.0 seconds Maximum: 3276.7 seconds Type: Read/Write Reset Required: No
	ATTENTION: Risk of injury or equipment damage exists. **Parameter 7 - [RcvHrtBeat Time]** lets you determine how long it will take the adapter to detect a loss of network communication. By default, this parameter sets the timeout to 120 seconds. You can set this parameter so that the duration is shorter, longer, or disabled. When set to disabled (0 seconds), this also disables adapter **Parameter 6 - [Comm Flt Action]**. Therefore, a communication fault action is ignored. 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).	
08	**[Idle Flt Action]** Sets the action that the adapter and drive takes during offline/disable occurrences.	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. **Parameter 8 - [Idle Flt Action]** lets you determine the action of the adapter and connected drive during an offline/disable occurrence. By default, this parameter faults the drive. You can set 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
09	**[DPI I/O Cfg]** Sets the I/O that is transferred through the adapter. **NOTE:** The Cmd/Ref bit must be set to control the drive via the network. The respective Datalink bit(s) must be set if the nvi/nvo Datalink variables are used.	Default: xxx0 0001 Bit Values: 0 = I/O disabled 1 = I/O enabled Type: Read/Write Reset Required: Yes Bit Definition: Not Used, Not Used, Not Used, Datalink D, Datalink C, Datalink B, Datalink A, Cmd/Ref Default: x, x, x, 0, 0, 0, 0, 1 Bit: 7, 6, 5, 4, 3, 2, 1, 0
10	**[DPI I/O Act]** Displays the I/O that the adapter is actively transmitting. The value of this parameter is usually equal to the value of **Parameter 9 - [DPI I/O Cfg]**.	Default: xxx0 0001 Bit Values: 0 = I/O disabled 1 = I/O enabled Type: Read Only Bit Definition: Not Used, Not Used, Not Used, Datalink D, Datalink C, Datalink B, Datalink A, Cmd/Ref Default: x, x, x, 0, 0, 0, 0, 1 Bit: 7, 6, 5, 4, 3, 2, 1, 0
11	**[Flt Cfg Logic]** Sets the Logic Command data that is sent to the drive if **Parameter 6 - [Comm Flt Action]** is set to '4' (Send Flt Cfg) and communication is disrupted. The bit definitions depend on the product to which the adapter is connected. See Appendix C or the documentation for the drive being used.	Default: 0000 0000 0000 0000 Minimum: 0000 0000 0000 0000 Maximum: 1111 1111 1111 1111 Type: Read/Write Reset Required: No
12	**[Flt Cfg Ref]** Sets the Reference data that is sent to the drive if **Parameter 6 - [Comm Flt Action]** is set to '4' (Send Flt Cfg) and communication is disrupted. **NOTE:** This is a linear engineering unit value where '0' equals 0 Hz. and 32,767 equals the Hz. value in the PowerFlex 7-Class drive parameter 55 - [Maximum Freq].	Default: 0 Minimum: 0 Maximum: 4294967295 Type: Read/Write Reset Required: No **Important:** If the drive uses a 16-bit Reference, the most significant word of this value must be set to zero (0) or a fault will occur.
13 14 15 16 17 18 19 20	**[Flt Cfg A1 In]** **[Flt Cfg A2 In]** **[Flt Cfg B1 In]** **[Flt Cfg B2 In]** **[Flt Cfg C1 In]** **[Flt Cfg C2 In]** **[Flt Cfg D1 In]** **[Flt Cfg D2 In]** Sets the data that is sent to the Datalink in the drive if **Parameter 6 - [Comm Flt Action]** is set to '4' (Send Flt Cfg) and communication is disrupted. **NOTE:** These are 32-bit values. If 16-bit Datalinks are active, only the least significant word is used. If the 32-bit value is out of range for a 16-bit Datalink, a configuration error forces a correction before I/O can be enabled.	Default: 0 Default: 0 Default: 0 Default: 0 Default: 0 Default: 0 Default: 0 Default: 0 Minimum: 0 Maximum: 4294967295 Type: Read/Write Reset Required: No **Important:** If the drive uses 16-bit Datalinks, the most significant word of this value must be set to zero (0) or a fault will occur.

Parameter No.	Name and Description	Details
21	**[Send Service Pin]** Broadcasts a LON Service Pin Message from the Neuron Chip. This provides the Neuron ID. An alternate method for providing the Neuron ID is to enter the ID number manually. The Neuron ID can be viewed using Diagnostic Item # 30 (see page 5-4).	Default: 0 = Ready Values: 0 = Ready 1 = Send Type: Read/Write Reset Required: No
22	**[Clear Counters]** Clears the network diagnostic counters (Diagnostic Items # 26 and 27; see page 5-4).	Default: 0 = Ready Values: 0 = Ready 1 = Clear Type: Read/Write Reset Required: No
23	**[DrvSpeedParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nvoDrvSpeed (see page 4-10). Setting this parameter value to '0' disables the adapter from retrieving the corresponding parameter value from the drive.	Default: 1 Values: PowerFlex 7-Class drive parameter numbers Type: Read/Write Reset Required: Yes
24	**[DrvCurntParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nvoDrvCurnt (see page 4-9). Setting this parameter value to '0' disables the adapter from retrieving the corresponding parameter value from the drive.	Default: 3 Values: PowerFlex 7-Class drive parameter numbers Type: Read/Write Reset Required: Yes
25	**[DrvPwrParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nvoDrvPwr (see page 4-10). Setting this parameter value to '0' disables the adapter from retrieving the corresponding parameter value from the drive.	Default: 7 Values: PowerFlex 7-Class drive parameter numbers Type: Read/Write Reset Required: Yes
26	**[DrvVoltParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nvoDrvVolt (see page 4-10). Setting this parameter value to '0' disables the adapter from retrieving the corresponding parameter value from the drive.	Default: 6 Values: PowerFlex 7-Class drive parameter numbers Type: Read/Write Reset Required: Yes
27	**[DrvRunHoursParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nvoDrvRunHours (see page 4-11). Setting this parameter value to '0' disables the adapter from retrieving the corresponding parameter value from the drive.	Default: 10 Values: PowerFlex 7-Class drive parameter numbers Type: Read/Write Reset Required: Yes
28	**[DrvFrqActParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nvoDrvFreqAct (see page 4-11). Setting this parameter value to '0' disables the adapter from retrieving the corresponding parameter value from the drive.	Default: 1 Values: PowerFlex 7-Class drive parameter numbers Type: Read/Write Reset Required: Yes
29	**[NmlFreqParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nciNmlFreq (see page 4-11).	Default: 43 Values: PowerFlex 7-Class drive parameter numbers Type: Read/Write Reset Required: Yes

Parameter No.	Name and Description	Details	
30	**[NmlSpeedParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nciNmlSpeed (see page 4-14).	Default: Values: Type: Reset Required:	44 PowerFlex 7-Class drive parameter numbers Read/Write Yes
31	**[MaxSpeedParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nciMaxSpeed (see page 4-15).	Default: Values: Type: Reset Required:	55 PowerFlex 7-Class drive parameter numbers Read/Write Yes
32	**[MinSpeedParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nciMinSpeed (see page 4-15).	Default: Values: Type: Reset Required:	81 PowerFlex 7-Class drive parameter numbers Read/Write Yes
33	**[RampUpTmParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nciRampUpTm (see page 4-16).	Default: Values: Type: Reset Required:	81 PowerFlex 7-Class drive parameter numbers Read/Write Yes
34	**[RampDownTmParam]** Sets the PowerFlex 7-Class drive parameter number to be used with nciRampDownTm (see page 4-16).	Default: Values: Type: Reset Required:	81 PowerFlex 7-Class drive parameter numbers Read/Write Yes

Notes:

Logic Command/Status Words

This appendix presents the definitions of the Logic Command and Logic Status words that are used for some products that can be connected to the adapter. If the Logic Command/Logic Status for the product that you are using is not listed, refer to your product's documentation.

PowerFlex 70/70EC, PowerFlex 700/700VC, and PowerFlex 700H Drives

Logic Command Word

Logic Bits																	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Command	Description
															x	Stop [1]	0 = Not Stop 1 = Stop
														x		Start [1][2]	0 = Not Start 1 = Start
													x			Jog	0 = Not Jog (Par. 100) 1 = Jog
												x				Clear Faults	0 = Not Clear Faults 1 = Clear Faults
										x	x					Direction	00 = No Command 01 = Forward Command 10 = Reverse Command 11 = Hold Direction Control
									x							Local Control	0 = No Local Control 1 = Local Control
								x								MOP Increment	0 = Not Increment 1 = Increment
						x	x									Accel Rate	00 = No Command 01 = Accel Rate 1 Command (Par. 140) 10 = Accel Rate 2 Command (Par. 141) 11 = Hold Accel Rate
				x	x											Decel Rate	00 = No Command 01 = Decel Rate 1 Command (Par. 142) 10 = Decel Rate 2 Command (Par. 143) 11 = Hold Decel Rate
	x	x	x													Reference Select [3]	000 = No Command 001 = Ref A Select (Par. 90) 010 = Ref B Select (Par. 93) 011 = Preset 3 (Par. 103) 100 = Preset 4 (Par. 104) 101 = Preset 5 (Par. 105) 110 = Preset 6 (Par. 106) 111 = Preset 7 (Par. 107)
x																MOP Decrement	0 = Not Decrement 1 = Decrement

[1] A '0 = Not Stop' condition (logic 0) must first be present before a '1 = Start' condition starts the drive. The Start command acts as a momentary Start command. A '1' starts the drive, but returning to '0' does not stop the drive.

[2] This Start does not function if a digital input (parameters 361-366) is programmed for 2-Wire Control (option 7, 8, or 9).

[3] This Reference Select does not function if a digital input (parameters 361-366) is programmed for 'Speed Sel 1, 2, or 3' (option 15, 16 or, 17). Note that Reference Select is 'Exclusive Ownership' – see drive User Manual for more information.

Logic Status Word

Logic Bits																Status	Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
															x	Ready	0 = Not Ready (Par. 214) 1 = Ready
														x		Active	0 = Not Active (Running) 1 = Active
													x			Command Direction	0 = Reverse 1 = Forward
												x				Actual Direction	0 = Reverse 1 = Forward
											x					Accel	0 = Not Accelerating 1 = Accelerating
										x						Decel	0 = Not Decelerating 1 = Decelerating
									x							Alarm	0 = No Alarm (Par. 211 & 212) 1 = Alarm
								x								Fault	0 = No Fault (Par. 243) 1 = Fault
							x									At Speed	0 = Not At Reference 1 = At Reference
				x	x	x										Local Control (1)	000 = Port 0 (TB) 001 = Port 1 010 = Port 2 011 = Port 3 100 = Port 4 101 = Port 5 110 = Port 6 111 = No Local
x	x	x	x													Reference	0000 = Ref A Auto (Par. 90) 0001 = Ref B Auto (Par. 93) 0010 = Preset 2 Auto 0011 = Preset 3 Auto 0100 = Preset 4 Auto 0101 = Preset 5 Auto 0110 = Preset 6 Auto 0111 = Preset 7 Auto 1000 = Term Blk Manual 1001 = DPI 1 Manual 1010 = DPI 2 Manual 1011 = DPI 3 Manual 1100 = DPI 4 Manual 1101 = DPI 5 Manual 1110 = DPI 6 Manual 1111 = Jog Ref

(1) See 'Owners' in the drive User Manual for more information.

PowerFlex 700S Drives — Logic Command Word (Phase II Control)

Logic Bits																Command	Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
															x	Normal Stop	0 = Not Normal Stop 1 = Normal Stop
														x		Start (1)	0 = Not Start 1 = Start
													x			Jog 1	0 = Not Jog using [Jog Speed 1] (Par. 29) 1 = Jog using [Jog Speed 1] (Par. 29)
												x				Clear Fault (2)	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							Reserved	
								x								Jog 2	0 = Not Jog using [Jog Speed 2] (Par. 39) 1 = Jog using [Jog Speed 2] (Par. 39)
							x									Current Limit Stop	0 = Not Current Limit Stop 1 = Current Limit Stop
						x										Coast Stop	0 = Not Coast to Stop 1 = Coast to Stop
					x											Reserved	
				x												Reserved	
			x													Spd Ref Sel0	
		x														Spd Ref Sel1	
	x															Spd Ref Sel2	
x																Reserved	

Bits			
14	13	12	
0	0	0	= Spd Ref A (Par. 27)
0	0	1	= Spd Ref B (Par. 28)
0	1	0	= Preset 2 (Par. 15)
0	1	1	= Preset 3 (Par. 16)
1	0	0	= Preset 4 (Par. 17)
1	0	1	= Preset 5 (Par. 18)
1	1	0	= Preset 6 (Par. 19)
1	1	1	= Preset 7 (Par. 20)

(1) A Not Stop condition (logic bit 0 = 0, logic bit 8 = 0, and logic bit 9 = 0) must first be present before a 1 = Start condition starts the drive.

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

Logic Status Word (Phase II Control)

Logic Bits																	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Status	Description
															x	Active	0 = Not Active 1 = Active
														x		Running	0 = Not Running 1 = Running
													x			Command Direction	0 = Reverse 1 = Forward
												x				Actual Direction	0 = Reverse 1 = Forward
											x					Accel	0 = Not Accelerating 1 = Accelerating
										x						Decel	0 = Not Decelerating 1 = Decelerating
									x							Jogging	0 = Not Jogging 1 = Jogging
								x								Fault	0 = No Fault (Par. 323, 324, 325) 1 = Fault
							x									Alarm	0 = No Alarm (Par. 326, 327, 328) 1 = Alarm
						x										Flash Mode	0 = Not in Flash Mode 1 = In Flash Mode
					x											Run Ready	0 = Not Ready to Run (Par. 156) 1 = Ready to Run
				x												At Limit (1)	0 = Not At Limit (Par. 304) 1 = At Limit
			x													Tach Loss Sw	0 = Not Tach Loss Sw 1 = Tach Loss Sw
		x														At Zero Spd	0 = Not At Zero Speed 1 = At Zero Speed
	x															At Setpt Spd	0 = Not At Setpoint Speed 1= At Setpoint Speed
x																Enable	0 = Not Enabled 1 = Enabled

(1) See Parameter 304 - [Limit Status] in the PowerFlex 700S drive User Manual for a description of the limit status conditions.

PowerFlex 750-Series Drives

Important: When using a 20-COMM-L adapter with a PowerFlex 750-Series drive, the upper word (bits 16…31) of the Logic Command and Logic Status words are not accessible and cannot be used. Only when using a PowerFlex 750-Series drive with a 20-750 communication Option Module (or the PowerFlex 755 drive's embedded EtherNet/IP adapter) is the upper word accessible and used.

Logic Command Word

Logic Bits																	
31…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	

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

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

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

Logic Status Word

Logic Bits																	
31…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 (Par. 933) 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 (Emb. 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	

A

Adapter

Devices such as drives, controllers, and computers usually require a network communication adapter to provide a communication interface between them and a network such as LonWorks. An adapter 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-COMM-L LonWorks adapter connects PowerFlex 7-Class drives to a LonWorks network. Adapters are also called ‘cards’, ‘embedded communication options’, ‘gateways’, ‘modules’, or ‘peripherals’.

B

Binding

A process whereby a network variable input and a network variable output are connected together. Binding a network variable tells the device which other devices it should talk to and what information it should share. Only network variables of the same SNVT type can be bound together. For example, a temperature type could not be bound to a pressure type.

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.

C

CAN (Controller Area Network)

CAN is a serial bus protocol on which DPI is based.

Channel

The transmission media that connect devices on the network such as twisted pair 78 kbps or power line carrier. Also called segment.

Configuration Property

A data value used to configure the application program in a device.

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

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.

D

Data Rate

The speed at which data is transferred on the network. Each device on the network must be set for the same data rate.

Datalinks

A Datalink is a type of pointer used by PowerFlex 7-Class drives to transfer data to and from the controller. Datalinks enable specified parameters to be read or written to without using explicit messages. The drive determines the size of Datalinks.

DPI (Drive Peripheral Interface)

A second generation peripheral communication interface used by various Allen-Bradley drives and power products, such as PowerFlex 7-Class drives. It is a functional enhancement to SCANport.

DPI Peripheral

A device that provides an interface between DPI and a network or user. Peripheral devices are also referred to as ‘adapters’ or ‘modules’. The 20-COMM-L adapter, 1203-USB or 1203-SSS converter, and PowerFlex 7-Class HIMs (20-HIM-xxx) are examples of DPI peripherals.

DPI Product

A device that uses the DPI communication interface to communicate with one or more peripheral devices. For example, a motor drive such as a PowerFlex 7-Class drive is a DPI product. In this manual, a DPI product is also referred to as ‘drive’ or ‘host’.

DriveExplorer Software

A tool for monitoring and configuring Allen-Bradley products and network communication adapters. It can be used on computers running various Microsoft Windows operating systems. DriveExplorer software (version 2.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, that you can use to program, monitor, control, troubleshoot, and maintain Allen-Bradley products. DriveTools SP software 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.

F

Fault Action

A fault action determines how the adapter and connected drive act when a communication fault (for example, a cable is disconnected) occurs.

Fault Configuration

When communication is disrupted (for example, a cable is disconnected), the adapter and connected 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 adapter. 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, Reference, and/or Datalink(s).

H

HIM (Human Interface Module)

A device that can be used to configure and control a drive. PowerFlex 7-Class HIMs (20-HIM-xxx) can be used to configure PowerFlex 7-Class drives and their connected peripherals.

Hold Last

When communication is disrupted (for example, a cable is disconnected), the adapter and connected 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 adapter, it continues to run at the same Reference.

I

Interoperability

The ability of systems from different manufacturers and of different types to share information with each other without losing any of their independent functional capabilities and without requiring complex programming by the integrator.

I/O Data

I/O data, sometimes called ‘implicit messages’ or ‘input/output’, is time-critical data such as a Logic Command and Reference. The terms ‘input’ and ‘output’ are defined from the controller’s point of view. Output is produced by the controller and consumed by the adapter. Input is produced by the adapter and consumed by the controller.

L

Logic Command/Logic Status

The Logic Command is used to control the PowerFlex 7-Class drive (for example, start, stop, and direction). It consists of one 16-bit word of output to the adapter from the network. The definitions of the bits in this word depend on the drive, and are shown in Appendix C.

The Logic Status is used to monitor the PowerFlex 7-Class drive (for example, operating state and motor direction). It consists of one 16-bit word of input from the adapter to the network. The definitions of the bits in this word depend on the drive, and are shown in Appendix C.

LON™

An acronym for local operating network. Consists of intelligent devices, or nodes, that are connected by one or more communications media and that communicate with one another using a common protocol.

LonMaker™ Software

Windows™-based software package for designing, documenting, installing, and maintaining multi-vendor, open, interoperable LonWorks networks.

LonWorks™ Device

Hardware and software than runs an application and communicates with other devices using the LonWorks protocol. May optionally interface with input/output hardware. Includes at least one processor and a LonWorks transceiver. A LonWorks device typically includes a Neuron Chip.

LonWorks Network

Intelligent devices that communicate with each other using the LonWorks protocol over one or more communications channels.

LonWorks Protocol

The open control networking protocol designed for applications involving sense, monitor, control, and identification functions. Also known as EIA 709.1 Control Networking Standard and as LonTalk™ protocol.

N

Network Variable

A data item that a particular device application program expects to get from other devices on a network (a *network variable input*) or expects to make available to other devices on a network (a *network variable output*). Examples are a temperature, switch value, and actuator position setting.

Neuron™ Chip

A microprocessor usually contained in each LonWorks node which processes all LonTalk protocol messages, senses inputs, manipulates outputs, implements application-specific functions, and stores installation-specific parameters.

Node

An intelligent device connected to the network. Nodes are programmed to send messages to one another in response to changes in various conditions, and to take action in response to messages they receive.

NVS (Nonvolatile Storage)

NVS is the permanent memory of a device. Devices such as the adapter 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’.

P

Ping

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

PowerFlex 7-Class (Architecture Class) Drives

The Allen-Bradley PowerFlex 7-Class family of drives supports DPI and, at the time of publication, includes the PowerFlex 70, PowerFlex 700, PowerFlex 700H, PowerFlex 700S, PowerFlex 700L, and PowerFlex 7000.

PowerFlex 750-Series (Architecture Class) Drives

The Allen-Bradley PowerFlex 7-Class family of drives supports DPI and, at the time of publication, includes the PowerFlex 753 and PowerFlex 755.

Protocols

Rules that order how information is transmitted and presented. An ‘open protocol’ is one in which the manufacturer has made the language ‘translation’ available to anyone who wants to use it.

R

Reference/Feedback

The Reference is used to send a setpoint (for example, speed, frequency, or torque) to the drive. It consists of one word of output to the adapter from the network. The size of the word (either a 16-bit word or 32-bit word) is determined by the drive.

Feedback is used to monitor the speed of the drive. It consists of one word of input from the adapter to the network. The size of the word (either a 16-bit word or 32-bit word) is determined by the drive.

S

SCPT (Standard Configuration Property Type)

SCPTs are standardized definitions of the units, scaling, encoding, and meaning of the contents of configuration properties.

SNVT (Standard Network Variable Type)

SNVTs are a set of predefined types of network variables with associated units, such as degrees, centigrade, etc. SNVTs promote interoperability of products from different manufacturers by standardizing the names given to output and input network variables.

Status Indicators

LEDs that are used to report the status of the adapter, network, and drive. The status indicators are on the adapter and can be viewed on the front cover of the drive when the drive is powered.

T

Transceiver

A device that is both a transmitter and a receiver for a communication channel.

Type 0/Type 1/Type 2 Control

When transmitting I/O, the adapter can use different types of messages for control. The Type 0, Type 1, and Type 2 events help Rockwell Automation personnel identify the type of message that is used.

U

Update

The process of updating firmware in a device. The adapter can be updated using various Allen-Bradley software tools. See Updating the Adapter Firmware on page 3-7 for more information.

Z

Zero Data

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

T

U

W

Z

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.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.

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