



Allen-Bradley

**Bulletin 1203
Remote I/O
Communications
Module**

**Catalog Numbers
1203-GD1
1203-GK1
1336-GM1**

**Getting
Started
Manual**

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this manual we use notes to make you aware of safety considerations:



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is critical for successful application and understanding of the product.

Summary of Changes

We would like to call your attention to the following changes to the 1203-5.1 manual which have occurred since the previous version published in April, 1996. All references to page, table, and figure numbers refer to the December publication. Page, table, and figure numbers in the July, 1997 publication may not match the page, table, and figure number references mentioned here due to omissions or inclusions and, likewise, text and graphics shifting somewhat from page to page.

- Page 1–1 was updated to include the 1336 IMPACT and 1397 drives.
- Figure 1.1 was changed to reflect a change in LED colors.
- Figure 1.2 was changed to reflect a change in LED colors.
- Figure 4.1 was changed to reflect a change in LED colors.
- Table 4.A was changed to reflect a change in LED colors.
- Table 5.A was changed to identify the column headings more clearly.

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Preface

Read this preface to familiarize yourself with the rest of the manual. This preface covers the following topics:

- who should use this manual
- the purpose of this manual
- safety precautions
- firmware support
- product compatibility
- terms and abbreviations
- conventions used in this manual
- Allen–Bradley support

Who Should Use this Manual?

Use this manual if you are responsible for designing, installing, programming, or troubleshooting control systems that use the Bulletin 1203 remote I/O communications module. You must have previous experience with and a basic understanding of electrical terminology, configuration procedures, required equipment, and safety precautions.

To efficiently use this communications module, you must be able to program and operate an Allen-Bradley programmable controller. In particular, you must be familiar with remote I/O concepts and configuration and be able to program block transfer instructions.

Purpose of this Manual

This manual provides you with the information you need to apply the remote I/O communications module that is available for products that include the SCANport™ communications port. This manual describes the procedures for installing, configuring, and troubleshooting the remote I/O communications module. Block transfer instructions are explained in a separate software programming manual.

For information on specific product features, refer to the product manual.

Important: Read this manual in its entirety before installing, operating, servicing, or initializing the remote I/O communications module.

Contents of this Manual

This manual contains the following information:

Chapter:	Title:	Contents:
	Preface	Describes the purpose, background, and scope of this manual as well as an overview of this product.
1	Overview	Provides an overview of the adapter features, configuration information, and diagnostic information.
2	Installation	Provides the procedures you need to mount the Bulletin 1203 remote I/O communications module, connect the power, and configure the switches, as well as providing cabling and hardware information.
3	Configuration and Interfacing	Provides information such as addressing, information transfer, and sample programs.
4	Troubleshooting	Provides information about the LED indications and fault descriptions.
5	Specifications	Provides the environmental, electrical, and communications specifications.

Safety Precautions

Please read the following safety precautions carefully.



ATTENTION: Only personnel familiar with SCANport devices and the associated machinery should plan or implement the installation, start-up, configuration, and subsequent maintenance of this remote I/O communications module. Failure to comply may result in personal injury and/or equipment damage.



ATTENTION: This module contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing, or repairing this assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference Allen-Bradley Publication 8000-4.5.2, *Guarding against Electrostatic Damage*, or any other applicable ESD protection handbook.

Firmware Support

This manual supports communication module firmware versions 1.xx and 2.xx (the xx designator may vary). Features that work with specific firmware versions will be denoted as such.

PLC Product Compatibility

This adapter is designed to be used with the following Allen-Bradley programmable controllers:

- PLC-2/30[®] with SD2 (communications module version 1.02 or later)
- PLC-3[®]
- SLC 500[™] with 1747-SN scanner
- PLC-5/10[™], PLC-5/15[™], PLC-5/25[™] family
- PLC-5/30[™], PLC-5/40[™], PLC-5/40L[™], PLC-5/60[™], PLC-5/60L[™] family, PLC-5/80[™]
- PLC5/250[™]
- PLC[®] scanner modules and subscanners.



This adapter was tested with the current revision level of the PLC processors listed. Earlier versions of the processors may not be compatible.

Terms and Abbreviations

The following terms and abbreviations are specific to this product. For a complete listing of Allen-Bradley terminology, refer to the *Allen-Bradley Industrial Automation Glossary*.

In this manual, we refer to the:

- remote I/O communications module as *communications module*
- variable frequency ac drive (1305, 1336 FORCE, or 1336 PLUS) as the *drive* or *SCANport device*
- The programmable logic controller as the *programmable controller*
- Allen-Bradley remote input/output network as *remote I/O*
- earth ground as *Gnd*

Common Techniques Used in this Manual

The following conventions are used throughout this manual:

- Bulleted lists provide information, not procedural steps.
- Numbered lists provide sequential steps or hierarchical information.
- *Italic* type is used for emphasis and chapter names.



We also use this convention to call attention to helpful information.

Allen–Bradley Support

Allen–Bradley offers support services worldwide, with over 75 Sales/Support Offices, 512 authorized Distributors and 260 authorized Systems Integrators located throughout the United States alone, plus Allen–Bradley representatives in every major country in the world.

Local Product Support

Contact your local Allen–Bradley representative for:

- sales and order support
- product technical training
- warranty support
- support service agreements

Technical Product Assistance

If you need to contact Allen–Bradley for technical assistance, please review the information in the *Troubleshooting* chapter first. If you are still having problems, then call your local Allen–Bradley representative.

Overview

Chapter Objectives

Chapter 1 covers the following information:

- a description of the communications module
- SCANport device compatibility
- configuration switches
- datalinks
- safety precautions

Adapter Description

The remote I/O communications module is an optional interface device designed to provide a direct, digital link between an Allen-Bradley programmable controller and any device that uses the SCANport™ communication port. The current list of products that use the SCANport communications interface includes: 1305, 1336 PLUS, 1336 FORCE, 1336 IMPACT, 1397, and SMP3 and SMC Dialog Plus. The board connects to these products through the SCANport peripheral interface.

The adapter is available in both Open style (Figure 1.1) and Enclosed (Figure 1.2) type configurations. The Open style module mounts inside certain drives, depending on drive size (refer to Table 1.A). You can use the Enclosed module with any compatible SCANport device that is mounted outside the drive package.

Table 1.A Remote I/O Configurations

Designation	Enclosure	Power Supply Source	Used With
Open Style	Open PC board	Supplied by drive	1336 PLUS ^① 1336 FORCE ^②
Enclosed	IP30	24V ac/dc separately supplied or 120/240V ac separately supplied	1305 1336 PLUS 1336 FORCE SMP3 SMC Dialog Plus Other SCANport products

^①7.5 hp and higher sizes only

^②7.5 hp and higher sizes with standard adapter board only

SCANport Device Compatibility

The remote I/O communications module does not support version 1.xx (the .xx designator may vary) of the 1305 drive. If you try to use the remote I/O communications module with a version 1.xx 1305, the remote I/O communications module will continually reset itself, resulting in the red adapter fault status LED and the amber SCANport status LED both flashing simultaneously indicating an error condition. Firmware revision 2.xx or higher on the 1305 is required to support remote I/O communications and block transfer.

Figure 1.1
Open Style Communications Module

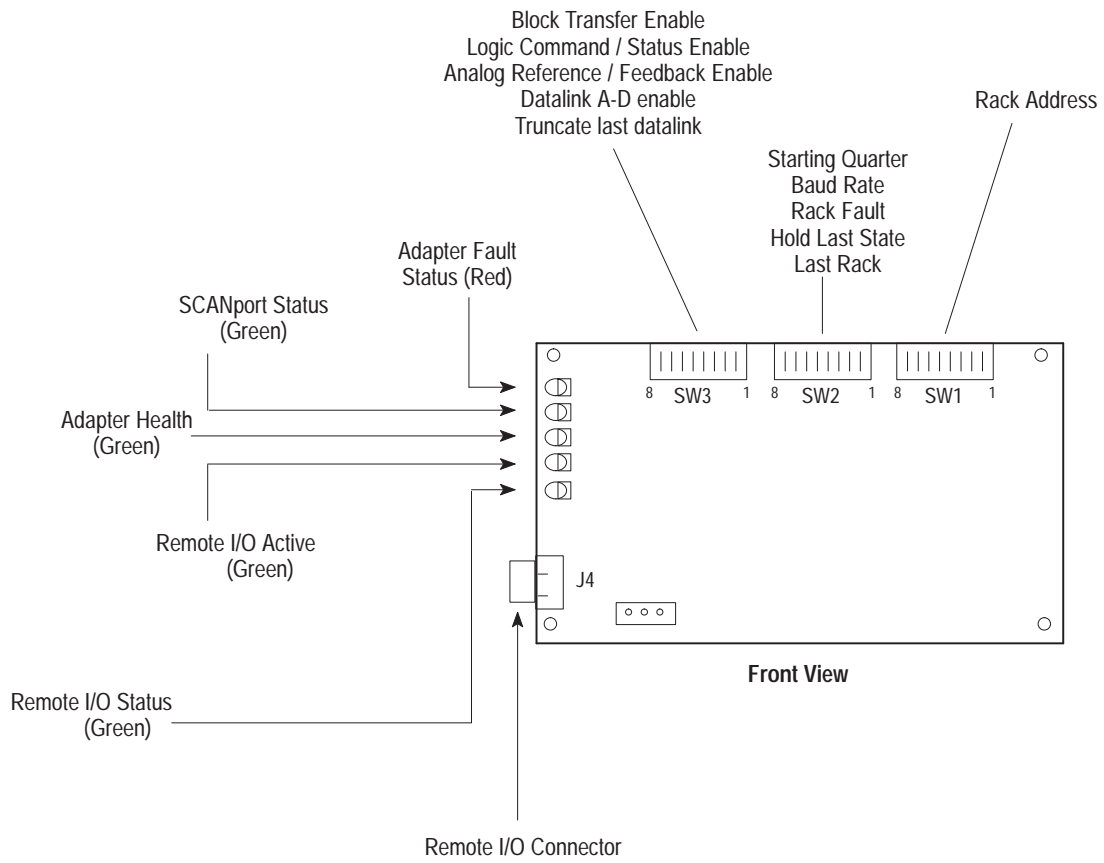
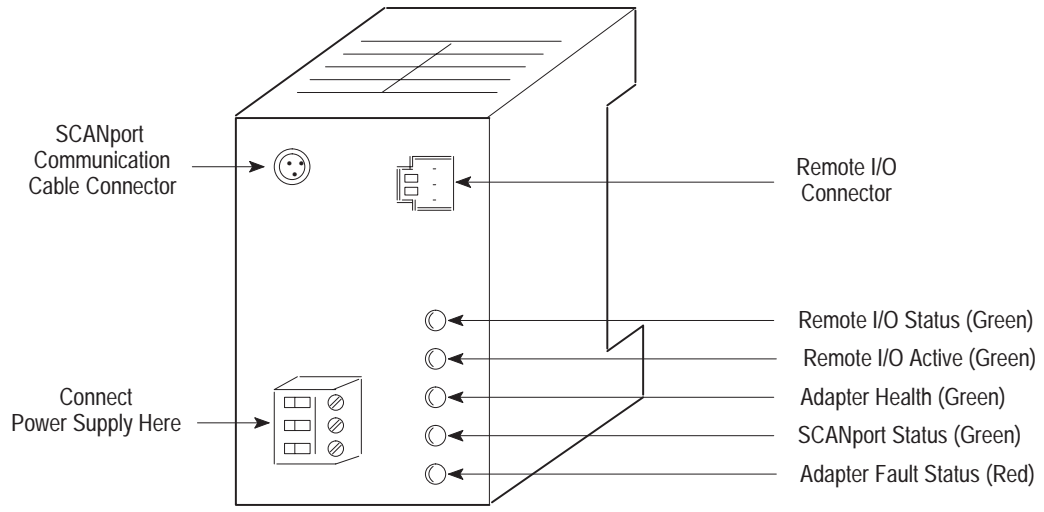
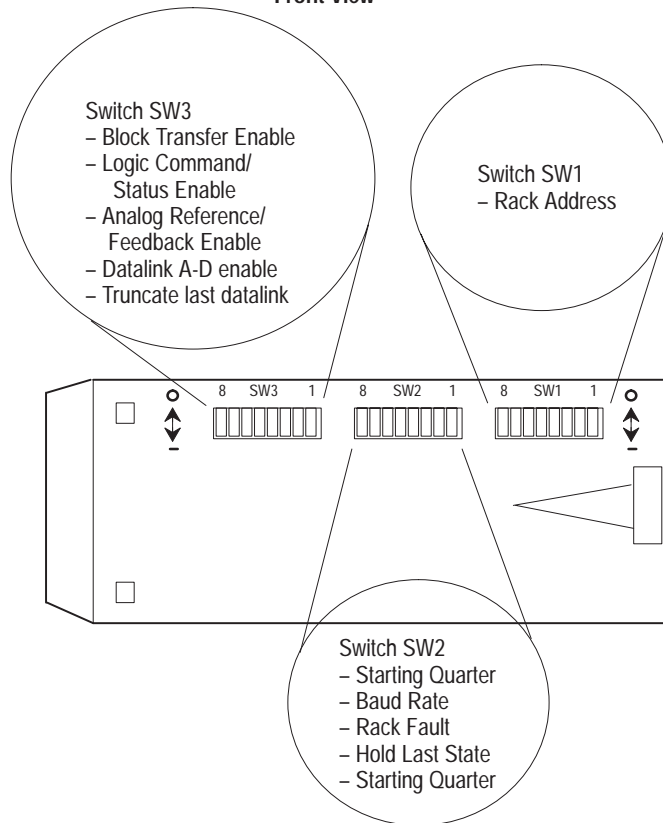


Figure 1.2
Enclosed Style Communications Module

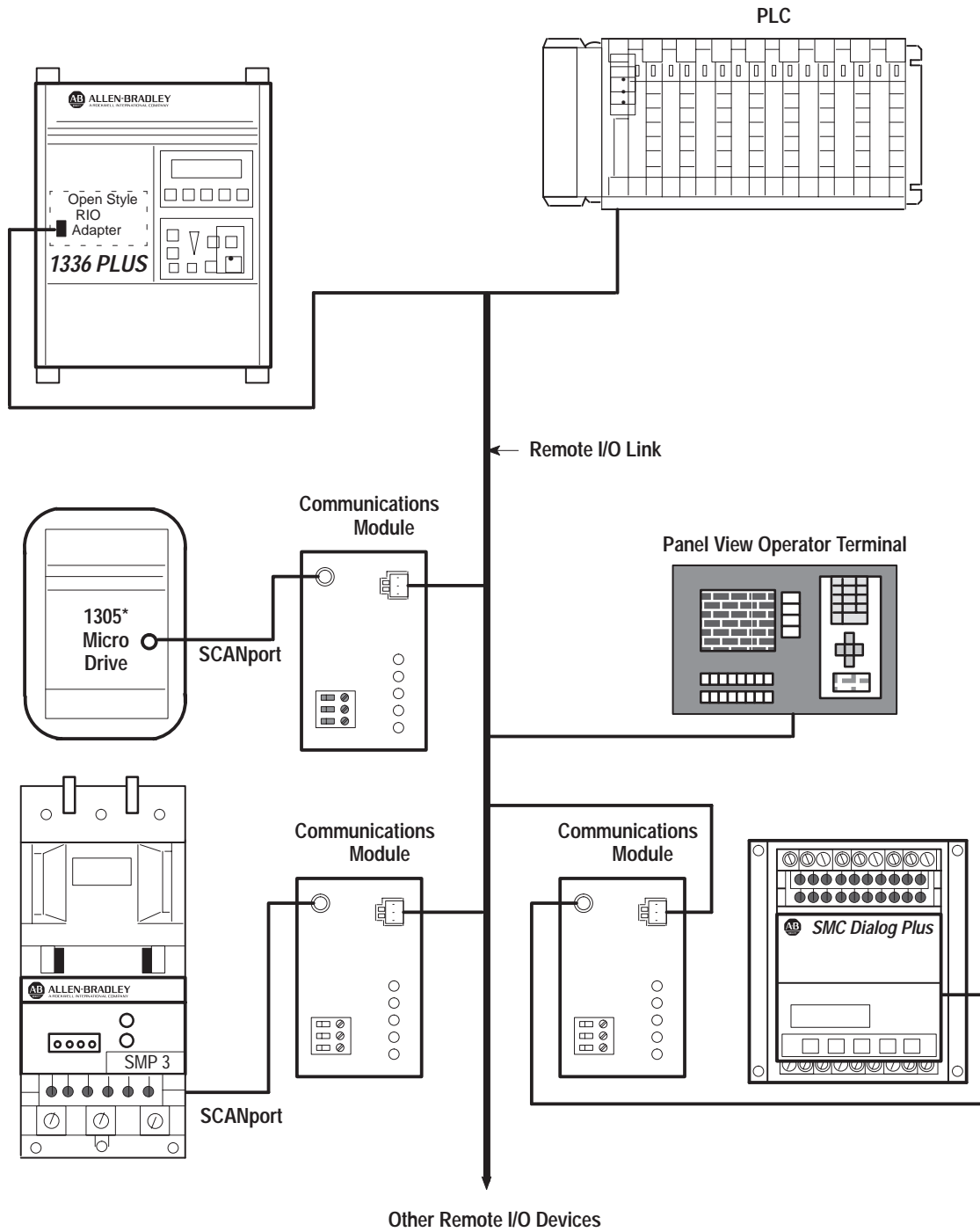


Front View



Bottom View

Figure 1.3
Typical Programmable Controller/SCANport Device Interconnection

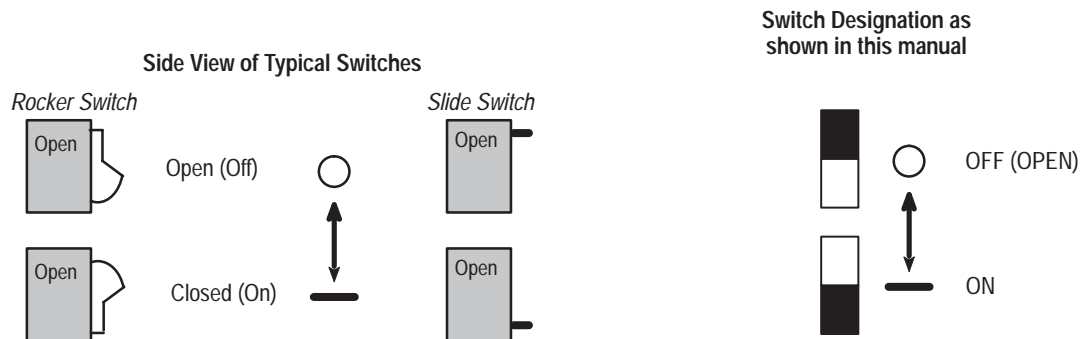
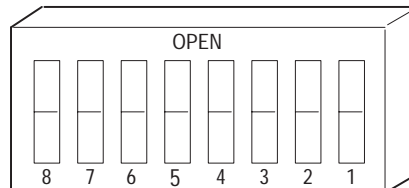


***NOTE:** Refer to Page 1-1 for compatibility requirements of SCANport devices

Configuration Switches

The remote I/O communications module contains three DIP switches SW1, SW2, and SW3 (Figure 1.1 and Figure 1.2). Switches are set On or Off as detailed in Figure 1.4. For a detailed explanation of switch configuration, refer to Chapter 2, *Installation*.

Figure 1.4
Configuration Switch



Datalinks

Datalinks are a SCANport mechanism for transferring additional information between a programmable controller and a SCANport device. Each datalink switch on the adapter reserves two words of the programmable controller I/O image table. The 1305, 1336 PLUS, and 1336 FORCE drives support this mechanism. For additional details, refer to Chapter 3, *Configuration and Interfacing*.

Safety Precautions

Please read the following safety precautions.



ATTENTION: This board contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing, or repairing this assembly. Component damage may result if you do not follow ESD control procedures. If you are not familiar with static control procedures, refer to Allen-Bradley publication 8000-4.5.2, *Guarding Against Electrostatic Damage*, or any other applicable ESD Protection Handbook.



ATTENTION: Servicing or configuring the RIO boards on drives larger than 3hp involves opening the 1336 drive cabinet which creates the potential to come in contact with other drive components. Energized industrial control equipment can be hazardous. Severe injury or death can result from electrical shock, burn, or unintended actuation of controlled equipment.

Recommended practice is to disconnect and lock out all control equipment from power sources, and allow stored energy in any capacitors to dissipate. If you must work near energized equipment, you must follow the safety related work practices of NFPA 70E, *Electrical Safety Requirements for Employee Workplaces*.

Installation

Chapter Objectives

Chapter 2 provides information to help you:

- set the module configuration switches
- mount the remote I/O module
- connect the remote I/O cable
- connect the termination resistor
- connect the SCANport link
- connect the power supply

Read this chapter completely before you attempt to install or configure your remote I/O communications module. Double check all connections and option selections before you apply power.

Important: Switch selections take effect only on power-up. If you change selections after power is applied, cycle the power to use the new settings.

Setting the Module Configuration Switches

This publication describes switches as being either on or off. If the switch assembly has the word OPEN printed on it, the word OPEN corresponds to OFF (O).

When you change the adapter board configurations, keep in mind the addressing conventions of the type of processor that you are using. In all cases, each remote I/O device must have a unique address that the processor can recognize.

Important: This adapter is not compatible with complementary I/O configurations because the adapter uses both output and input image words for proper drive control.



ATTENTION: When you make changes to the switch settings, use a blunt, pointed instrument such as a ball point pen. Do not use a pencil because the lead (graphite) of the pencil may damage the switch assembly.

ATTENTION: Failure to check connections and switch settings for compatibility with your application when configuring the communications module, could result in personal injury and/or equipment damage due to unintended or undesirable operation of the drive or process equipment.

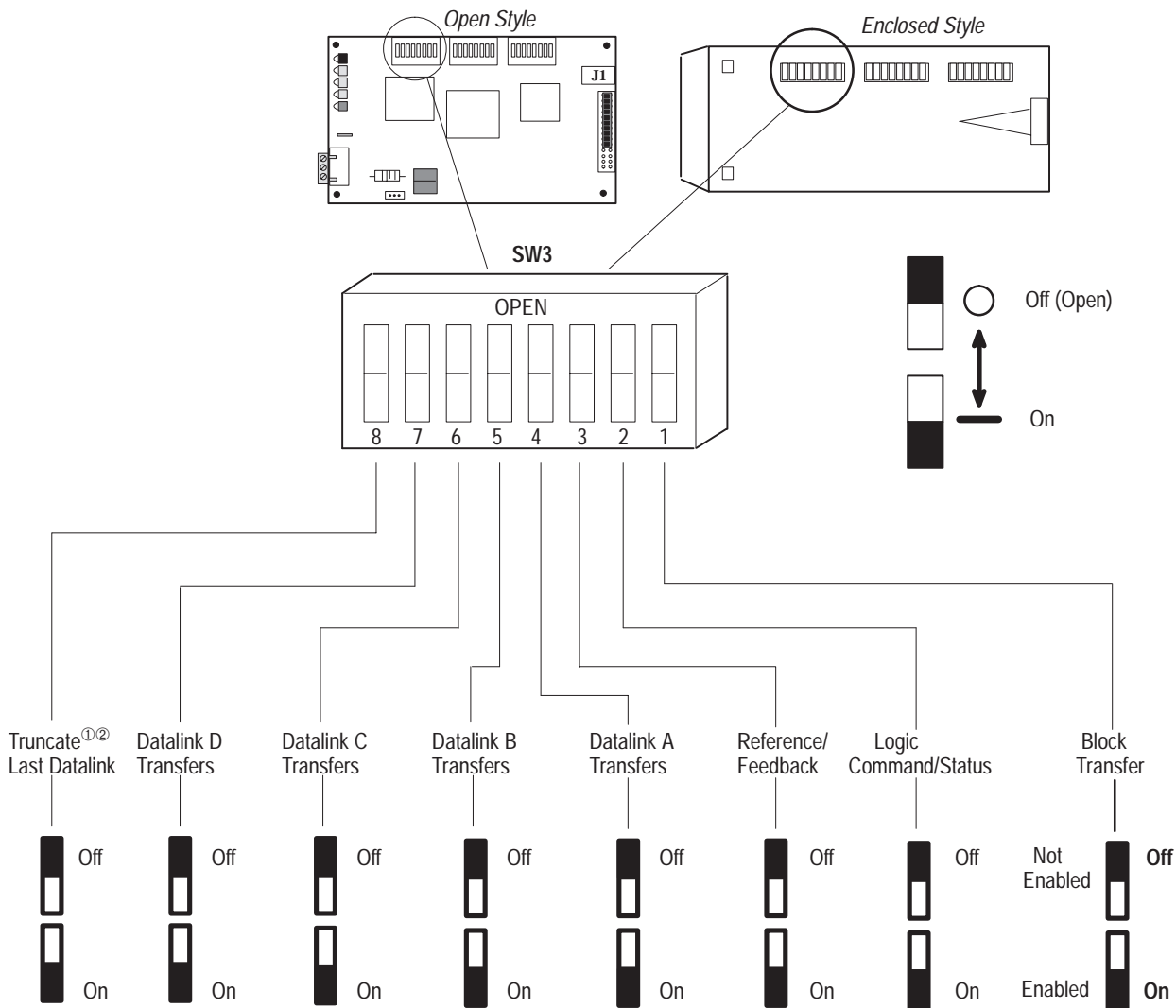
Switch SW3

Set switch SW3 first. The settings on this switch determine how the SCANport device uses the data contained in the programmable controller I/O image table. SW3 also establishes the minimum rack size that this communications module requires.

▶ The switches are labeled in the same orientation as they appear on the board.

Table 2.A, SW3 Image Table Map, and Figure 2.2, SW3 Flowchart, are included to help you set the DIP switches properly. It may also be helpful to color in the final switch settings in Figure 2.1 as a visual record of your SW3 settings. Chapter 3 contains several examples of how to fill in the worksheet and set these DIP switches.

Figure 2.1
Configuration Switch SW3 Settings



① IMPORTANT: Only available on communications modules with version 1.02 or later firmware.
 ② All datalinks are two words, the truncate function will delete the last datalink word. (If "Datalink B" is the last used, "Data in B2" and "Data Out B2" will be truncated.)

Table 2.A
SW3 Image Table Map

RESERVED FOR:		Minimum Required Rack Size ^①	Start At Group
Output Image	Input Image		
		1/4 Rack	0, 2, 4, or 6
		Half Rack	0, 2, or 4
		3/4 Rack	0 or 2
		Full Rack	0 only

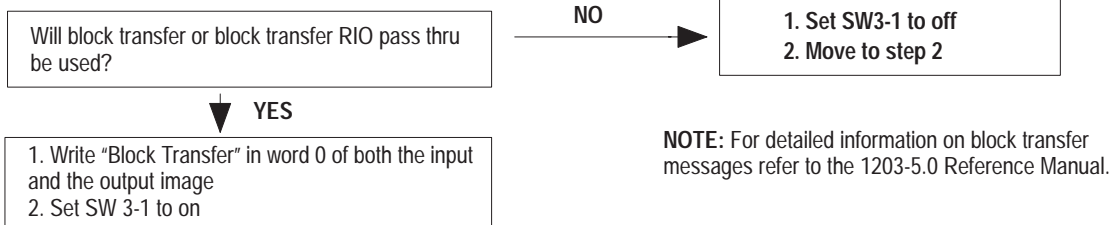
^① Use this to select settings for switch SW2, switches 1 and 2

How to use Table 2.A:

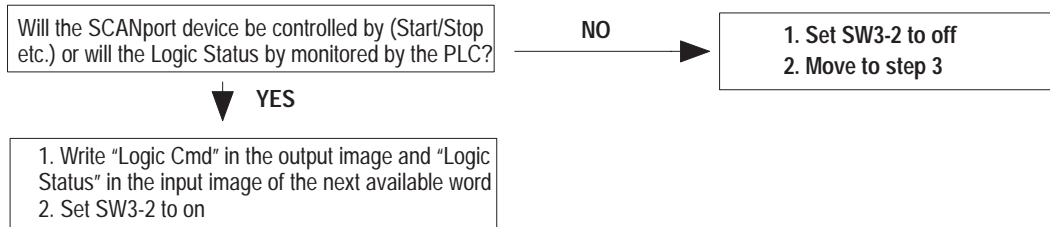
1. Use Figure 2.2 to set DIP switch SW3 and fill out Table 2.A.
2. Use minimum rack size shown in Table 2.A to set DIP switch SW2-1 and SW2-2.

Figure 2.2
SW3 Flowchart

Step 1. Block Transfer



Step 2. Logic Command



Step 3. Reference/Feedback

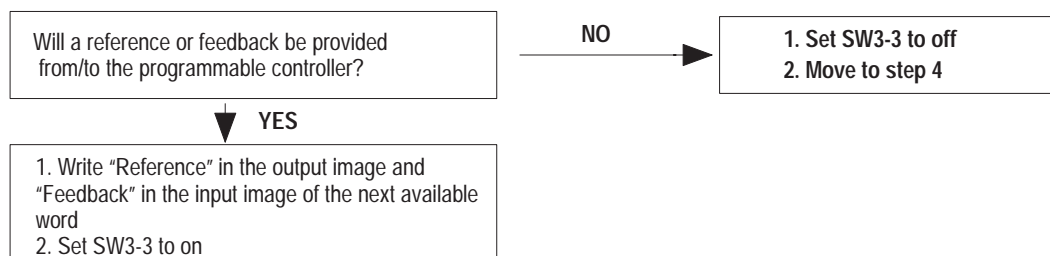
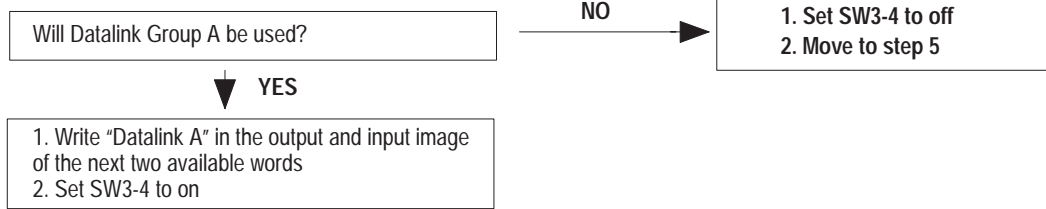
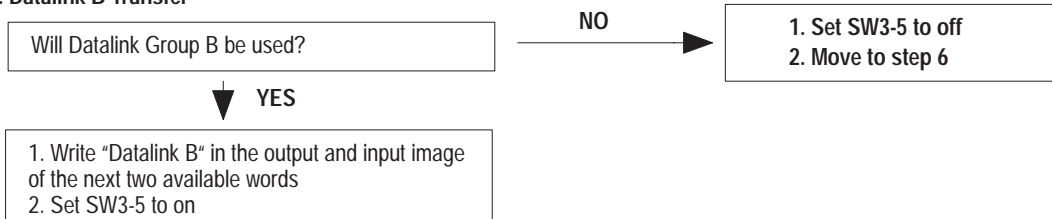


Figure 2.2
SW3 Flowchart continued

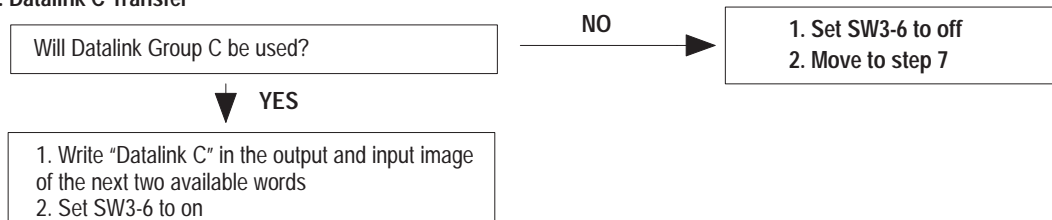
Step 4. Datalink A Transfer



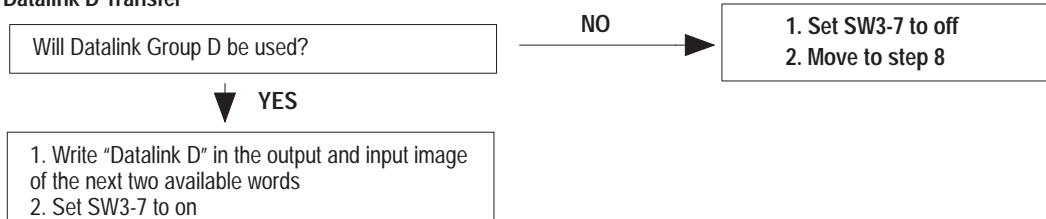
Step 5. Datalink B Transfer



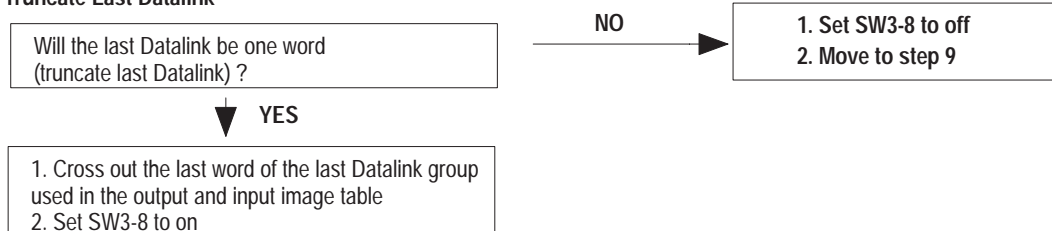
Step 6. Datalink C Transfer



Step 7. Datalink D Transfer



Step 8. Truncate Last Datalink



Step 9. Calculate minimum rack size

Refer to Table 2.A on page page 2-3.

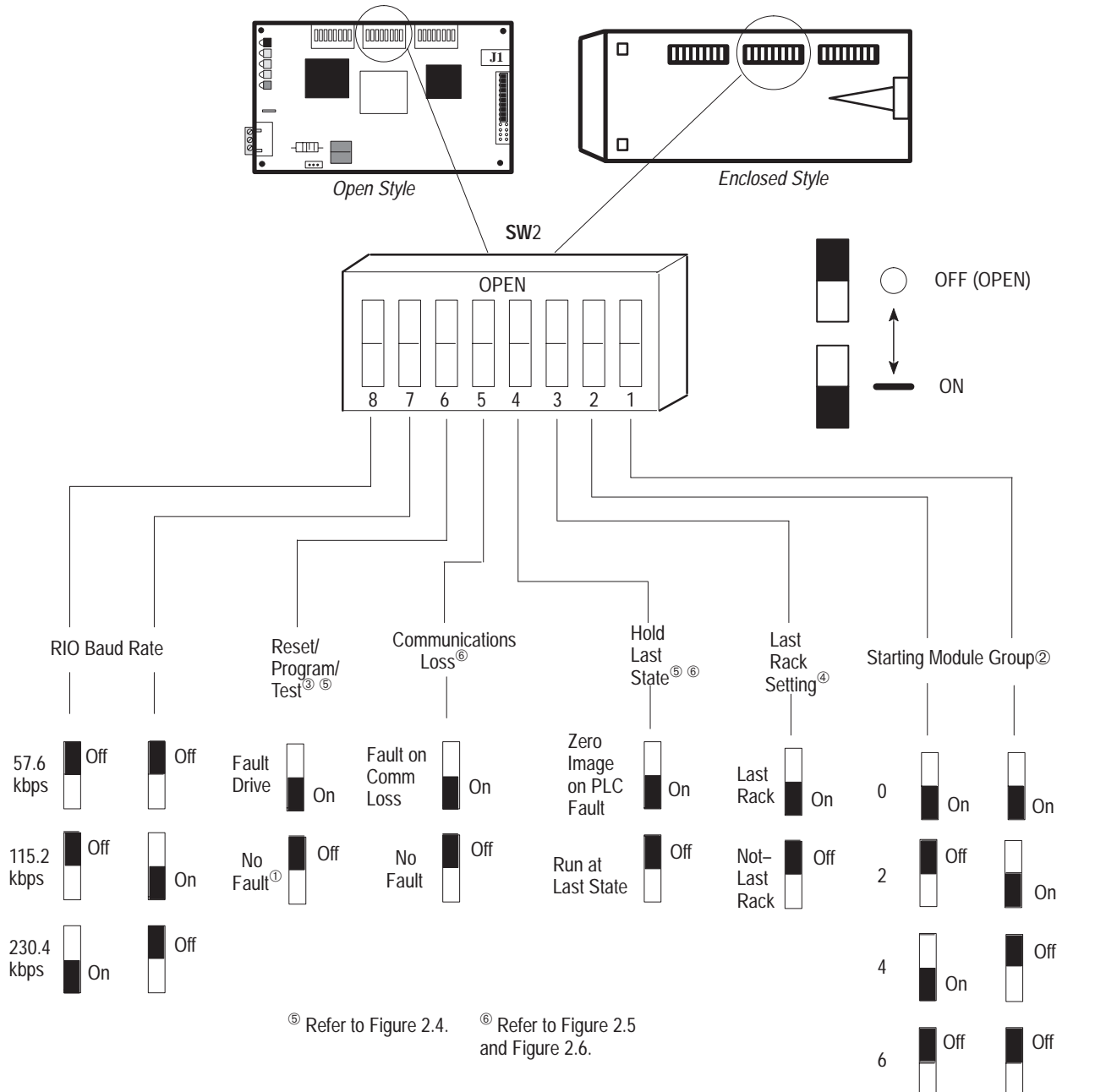
1. Record the minimum rack size in Table 2.A on page 2-3.
2. Use the minimum rack size to set Dip switches SW2-1 and SW2-2.

Switch SW2

Switch SW2 determines Rack Size, Last State, Rack Fault, and Bit Rate Selections as shown in Figure 2.3.

▶ The switches are labeled in the same orientation as they appear on the board.

Figure 2.3 Configuration Switch SW2 Settings



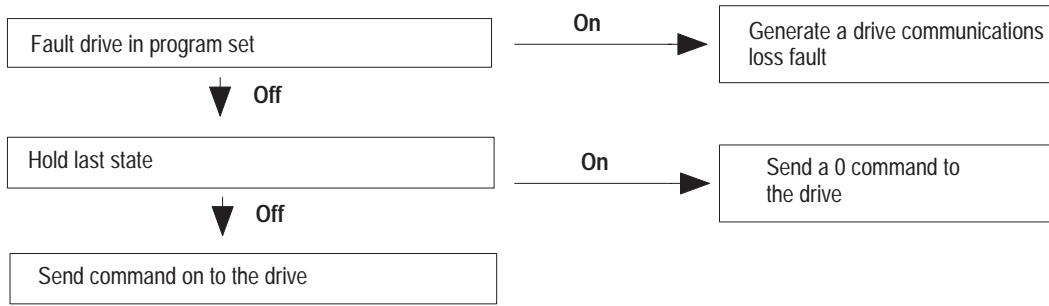
① If this switch is set to No Fault, the setting of the Hold Last State switch determines the data sent to the SCANport device when the PLC is in Reset/Program/Test.

② The setting of this switch is determined by the amount of discrete I/O that will be passed between the PLC and the drive. Refer to Table 2.A for more information.

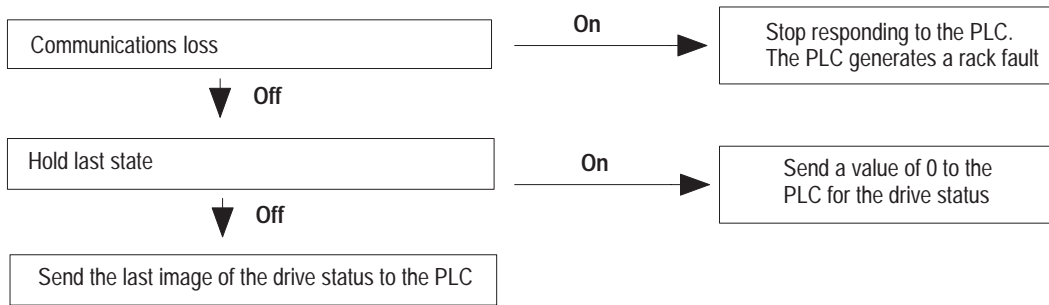
③ This switch is active on Firmware Version 2.xx modules only. It is not used by modules containing Firmware Version 1.xx.

④ Set this switch on the last module used for a given rack address. It does not electrically terminate the RIO link.

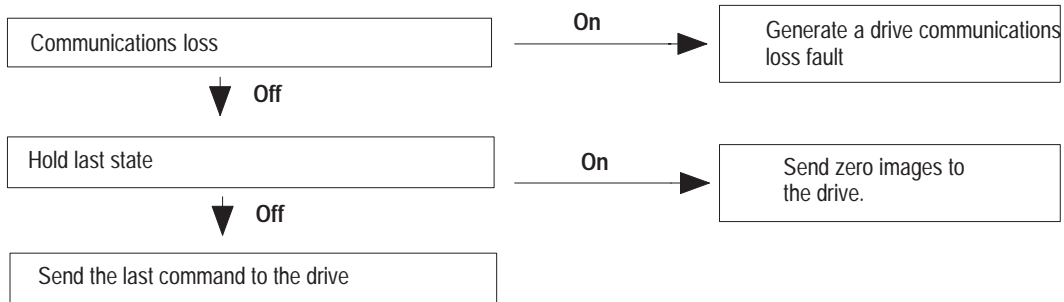
**Figure 2.4
PLC Switched to Program**



**Figure 2.5
SCANport Cable Unplugged**



**Figure 2.6
RIO Cable Disconnected**



Switch SW1

Switch SW1 controls starting quarter and rack address options as shown in Figure 2-7.

► **Note:** When using a PLC-2 family processor, you need to offset the value of the rack number by one. The PLC-2 cannot have a remote I/O rack numbered zero. Therefore, add a value of one to the Rack No value in Table 2.B when writing your PLC code.

Figure 2.7
Configuration Switch SW1 Settings

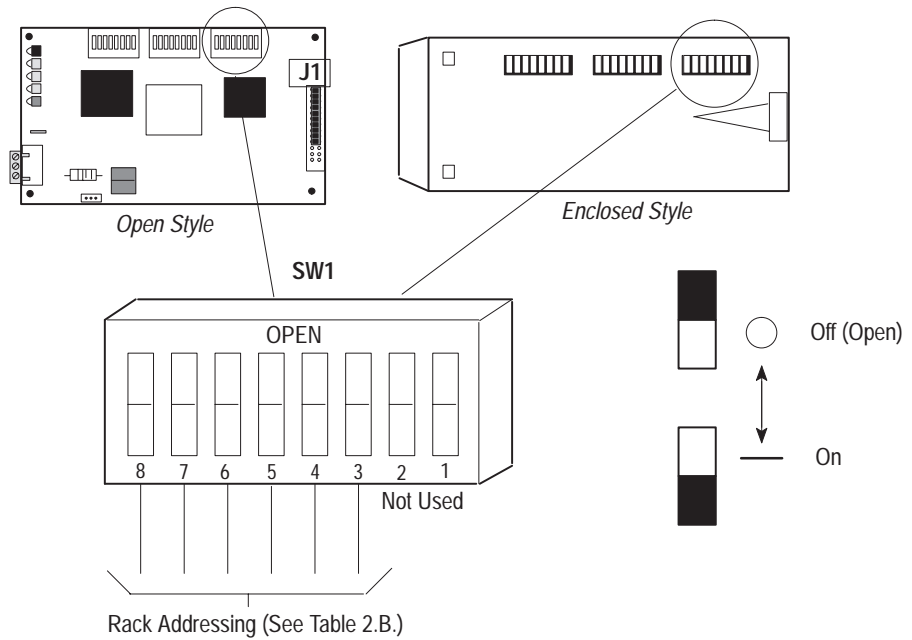


Table 2.B
Switch SW1 Settings
SW1-8 through SW1-1 DIP Switch Definitions, Rack Address

Rack No.	SW1-8	SW1-7	SW1-6	SW1-5	SW1-4	SW1-3	SW1-2	SW1-1
00	On	On	On	On	On	On	not used	
01	Off	On	On	On	On	On	not used	
02	On	Off	On	On	On	On	not used	
03	Off	Off	On	On	On	On	not used	
04	On	On	Off	On	On	On	not used	
05	Off	On	Off	On	On	On	not used	
06	On	Off	Off	On	On	On	not used	
07	Off	Off	Off	On	On	On	not used	
10	On	On	On	Off	On	On	not used	
11	Off	On	On	Off	On	On	not used	
12	On	Off	On	Off	On	On	not used	
13	Off	Off	On	Off	On	On	not used	
14	On	On	Off	Off	On	On	not used	
15	Off	On	Off	Off	On	On	not used	
16	On	Off	Off	Off	On	On	not used	
17	Off	Off	Off	Off	On	On	not used	
20	On	On	On	On	Off	On	not used	
21	Off	On	On	On	Off	On	not used	
22	On	Off	On	On	Off	On	not used	
23	Off	Off	On	On	Off	On	not used	
24	On	On	Off	On	Off	On	not used	
25	Off	On	Off	On	Off	On	not used	
26	On	Off	Off	On	Off	On	not used	
27	Off	Off	Off	On	Off	On	not used	
30	On	On	On	Off	Off	On	not used	
31	Off	On	On	Off	Off	On	not used	
32	On	Off	On	Off	Off	On	not used	
33	Off	Off	On	Off	Off	On	not used	
34	On	On	Off	Off	Off	On	not used	
35	Off	On	Off	Off	Off	On	not used	
36	On	Off	Off	Off	Off	On	not used	
37	Off	Off	Off	Off	Off	On	not used	

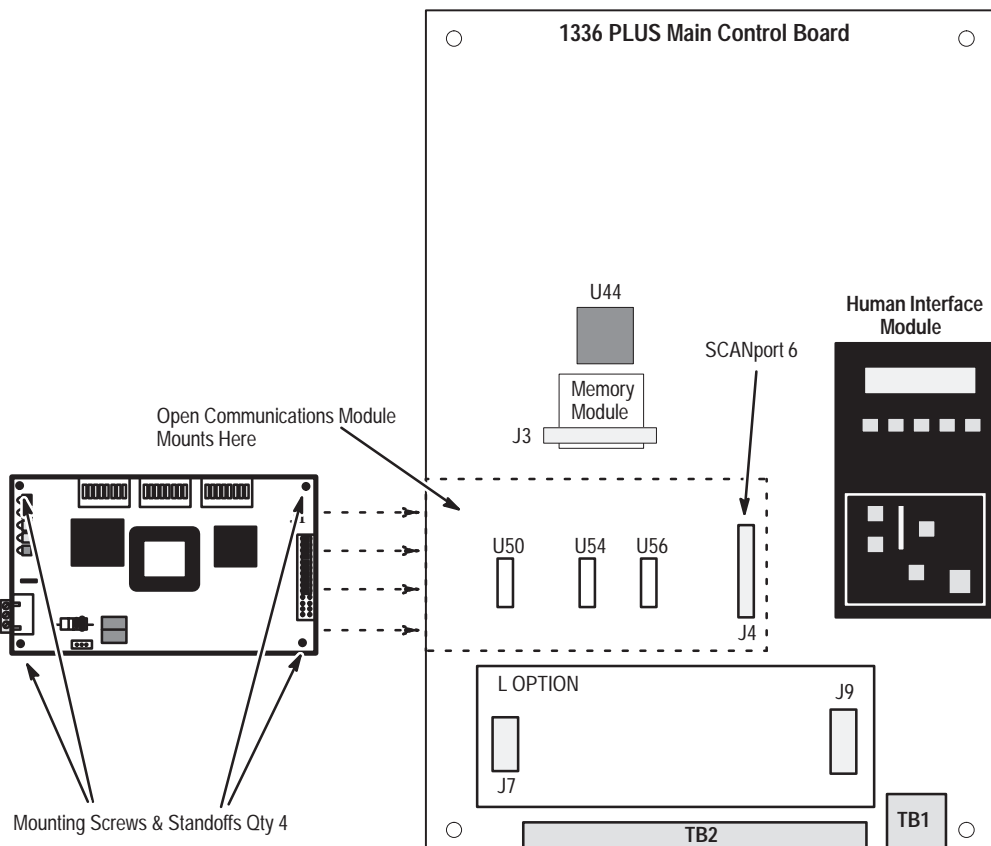
Mounting the Remote I/O Module

The remote I/O communications module can be provided in three mounting configurations:

- Open Style board factory installed in a drive (not available for all drives)
- Open Style board as a separate kit
- Enclosed style for panel mount or DIN rail mount

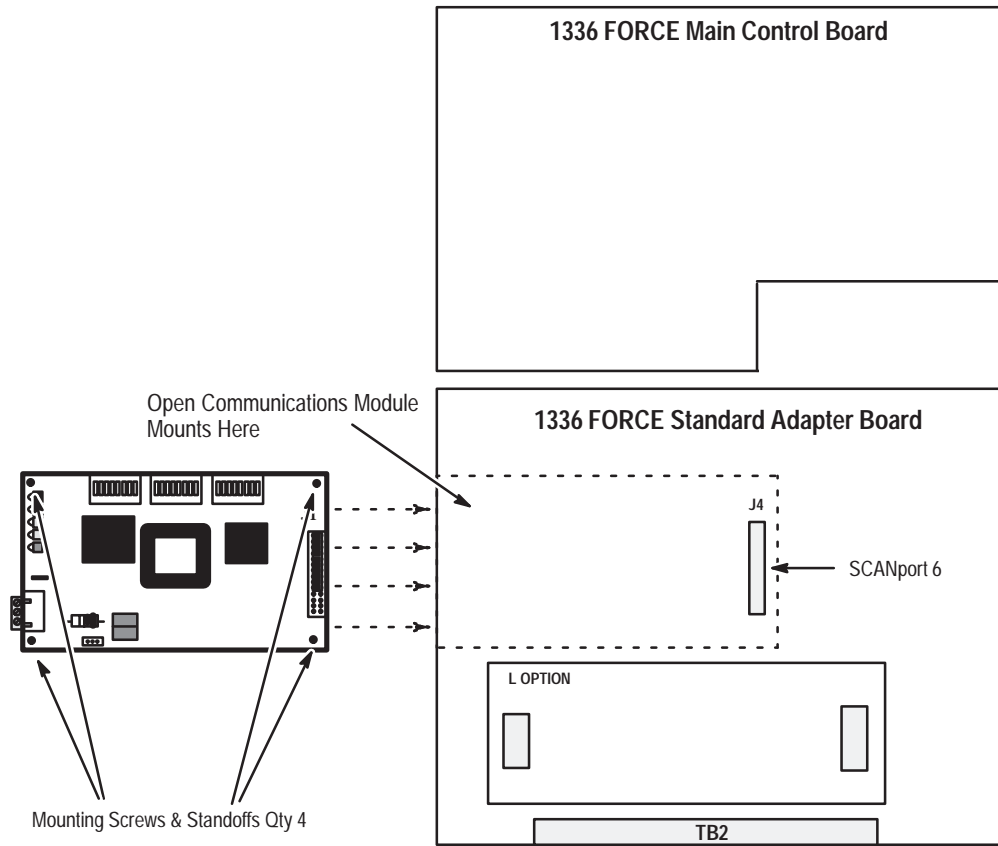
This section provides mounting information for the Enclosed style and the Open style kit.

Figure 2.8
Open Style Communications Module Mounting Location (1336 Plus 7.5-500HP)



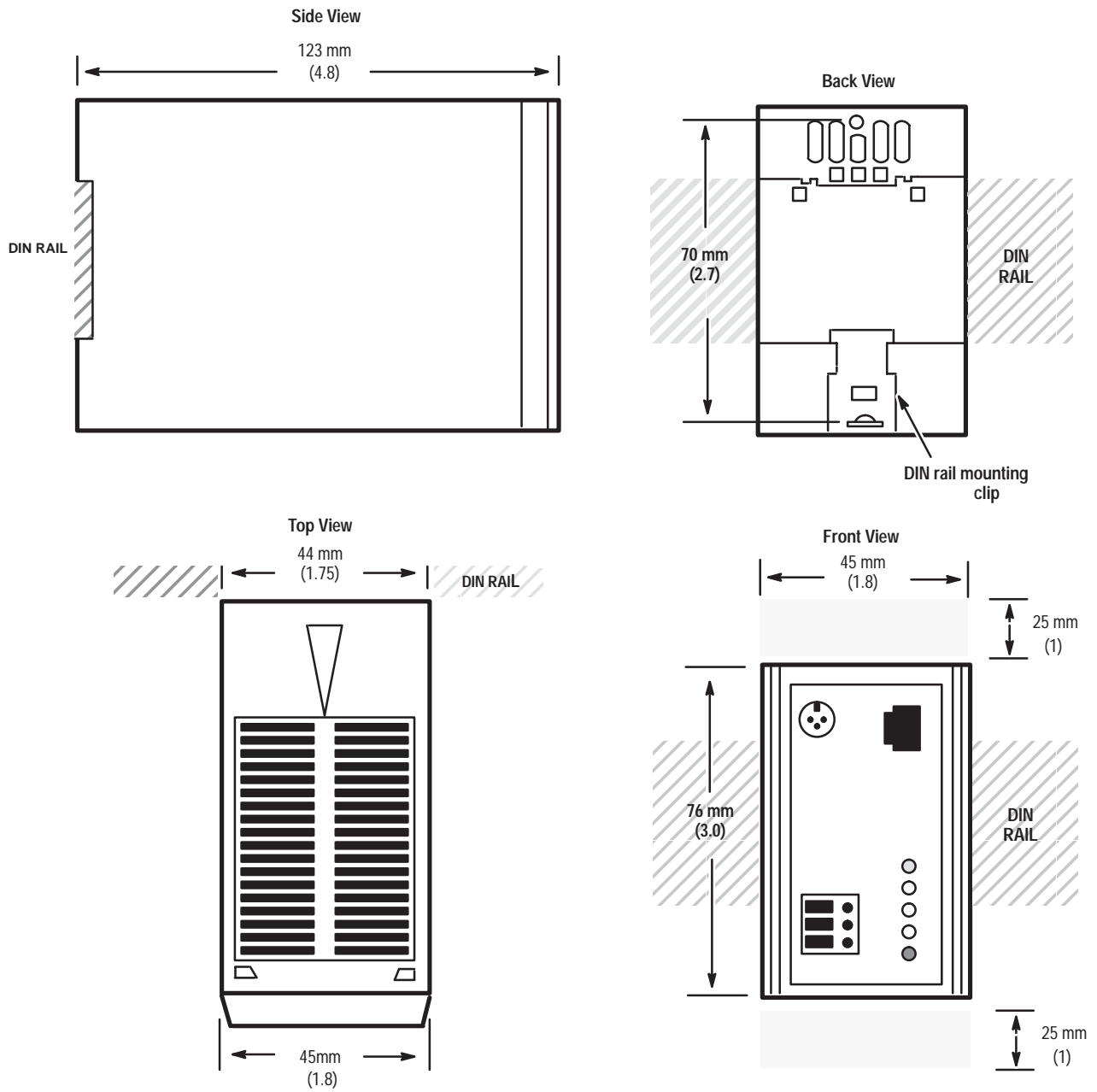
Install the board with the component side facing you.

Figure 2.9
Open Style Communications Module Mounting Location (1336
FORCE Drive)



Install the board with the component side facing you.

Figure 2.10
Enclosed Style Communications Module Dimensions



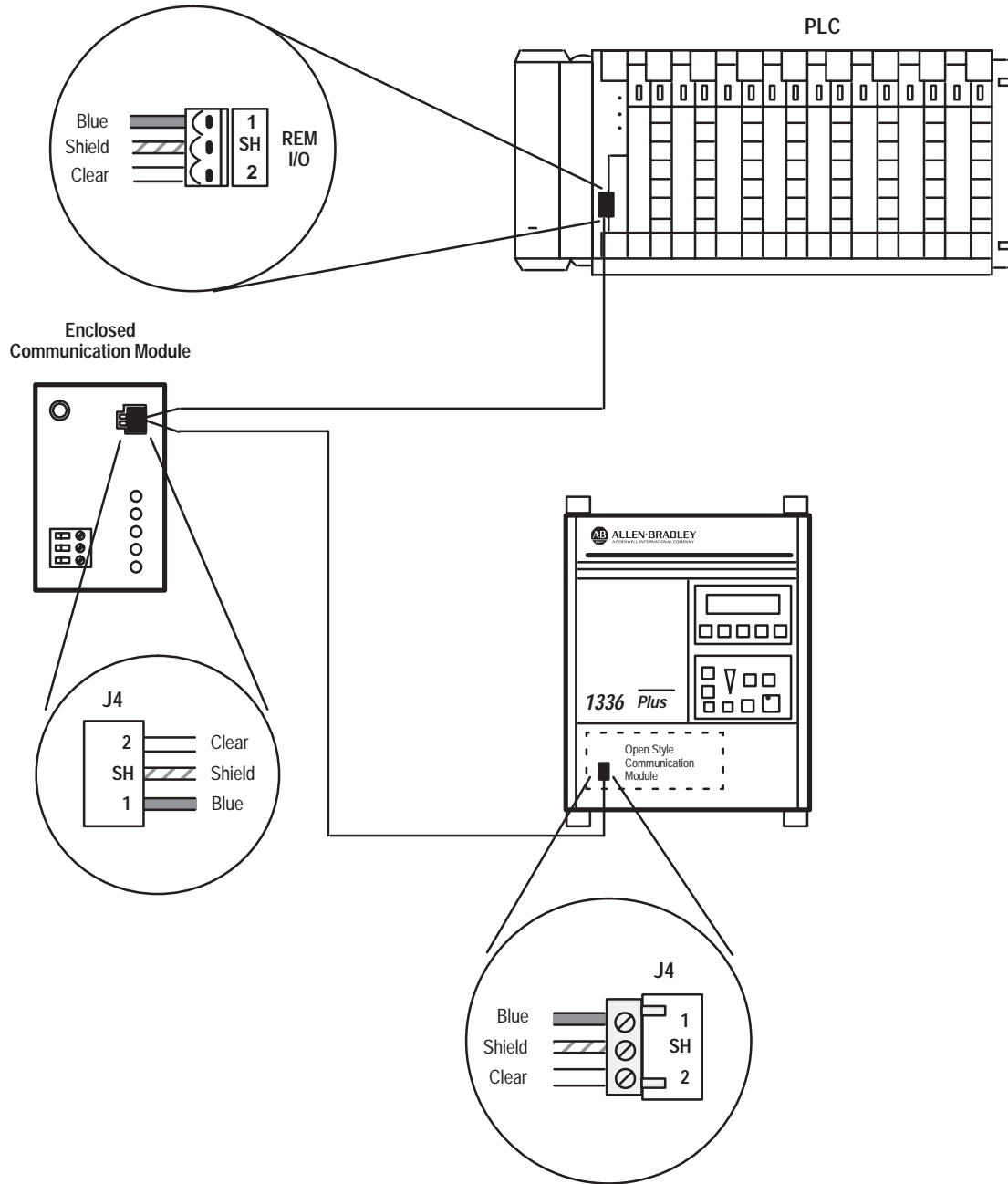
Note: The enclosure requires clearance at the top and bottom for proper cooling. Additional space will be required if access to DIP switches is desired without having to remove the device.

All dimensions in millimeters and (inches)

Connecting the Remote I/O Cable

You must connect remote I/O communications module cables as shown in the example in Figure 2.11. Refer to Table 2.C for cable guidelines.

Figure 2.11
Remote I/O Module Interconnections



Twinaxial cable used for remote I/O (RIO) and Data Highway+ (DH+™) communications represents a communications transmission line in which certain characteristics exist. The following are some general guidelines that must be adhered to in order to obtain the best results.

Cable Type – Only 1770-CD Belden #9463 is approved for RIO and DH+ installations. All other cable types or manufacturers, no matter how similar, are untested. Using other cable types is strictly at your own risk.

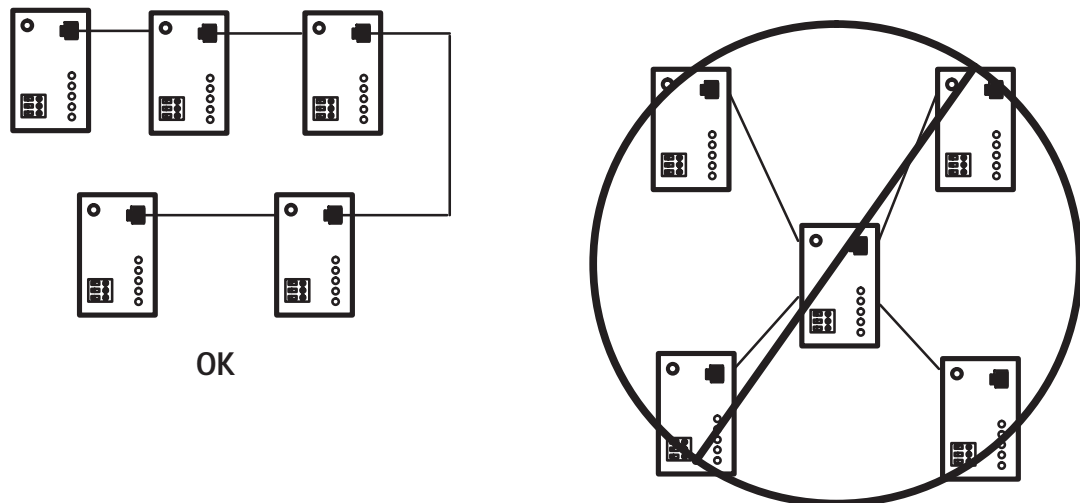
Important: The transmission rate determines the maximum cable length.

Table 2.C
Twinaxial Cable Guidelines

Remote I/O link communications rate	Cable length cannot exceed:
57.6 kbps	3,048 m (10,000 ft)
115.2 kbps	1,524 m (5,000 ft)
230.4 kbps	762 m (2,500 ft)

Connections – Connect all three conductors, blue, clear, and shield, at each wiring point. No additional ground connections should be made to the shield.

Important: DO NOT use star type connections. Only two cables may be connected at any wiring point on a series connection application.



These are general rules and certain deviations may be warranted because diverse installation and environmental concerns could change the requirements.

Connecting the Termination Resistor

You must terminate both ends of a remote I/O link to ensure proper operation. This termination is required only at the ends of the physical cable. Each remote I/O network should have exactly two termination resistors installed. Use Table 2.D and Figure 2.12 and Figure 2.13 to determine the proper termination for your particular link. Termination resistor R3 is located on the board, and the J2 jumper selects this resistor.

Table 2.D
Termination Resistor Requirements

If this device is an end device of a remote I/O link:	Terminate the link by:
Programmable controller	Refer to the manual for your model processor.
Open style, single point remote I/O adapter	Set jumper J2 in position 1-2 for termination and 2-3 for no termination as shown in Figure 2.12. The jumper enables a 150 ohm resistor as the terminator resistor.
Enclosed style single point remote I/O adapter	<p>Connect a terminator resistor between the remote I/O terminals labeled 1 and 2 as shown in Figure 2.13. Use either a 150 Ohm or an 82 Ohm terminator.</p> <ul style="list-style-type: none"> You must use an 82 Ohm resistor if the remote I/O link is operating at 230.4 kbps (terminator must be connected at both the scanner and the adapter). You should use an 82 Ohm resistor if the remote I/O link is operating at 57.6 kbps or 115.2 kbps unless one of the devices on the link is listed in Table 2.E. If you are using a device listed in Table 2.E, then you must use a 150 Ohm terminator.

Important: The following products (Table 2.E) cannot be on a link using 82-Ohm termination resistors.

Table 2.E
Unsupported Remote I/O Link Devices

Device Type	Catalog Number	Series
Scanners	1771-SN	All
	1772-SD, -SD2	
	1775-SR	
	1775-S4A, -S4B	
	6008-SQH1, -SQH2	
Adapters	1771-AS	All
	1772-ASB	A
	1771-DCM	All
Miscellaneous	1771-AF	All

Figure 2.12
Terminating a Remote I/O Link Using the Module Mounted Resistor

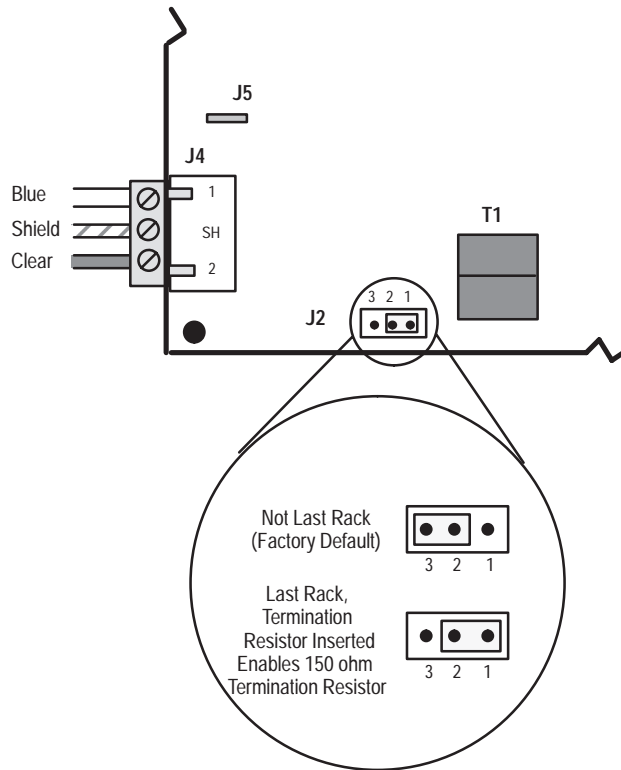
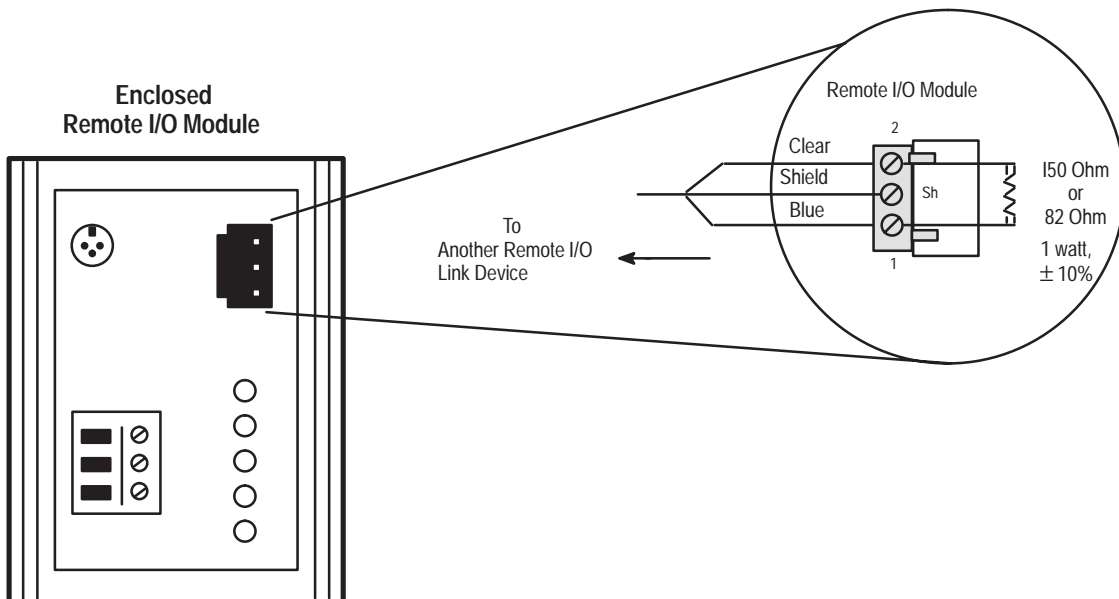


Figure 2.13
Terminating a Remote I/O Link Using an External Resistor



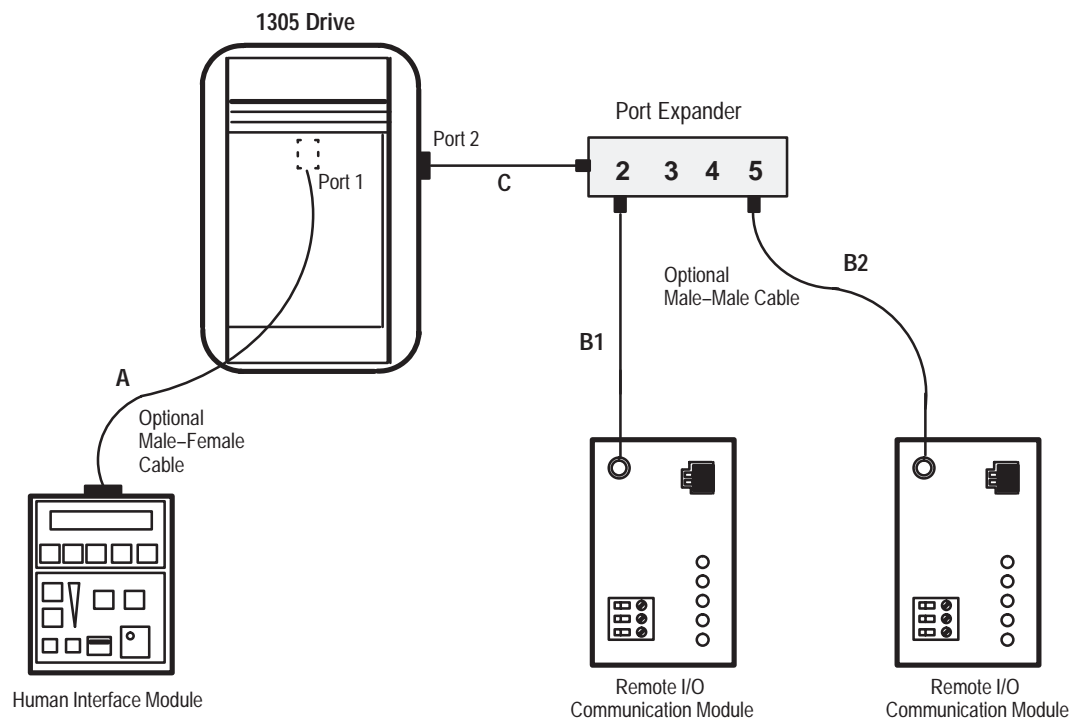
Connecting the SCANport Link

SCANport cables are available in either Male-to-Male or Male-to-Female configuration. You can connect cables of up to 10 meters (33 feet) from the master to the SCANport device (A in Figure 2.14). If you use a port expander as shown in Figure 2.14, subtract the cable length from the master to the port expander from the cable length used to connect the device to the expander ($B1 + C =$ maximum 10 meters).

1305 Drive

An Allen-Bradley SCANport link cable is used to make the connection between the communications module and the drive (Figure 2.14).

Figure 2.14
SCANport connection on Remote I/O



Important: The maximum cable distance between any two master devices cannot exceed 10 meters (33 feet) of cable. For example, $B1 + C =$ maximum of 10 meters or $B1 + B2 =$ maximum of 10 meters.

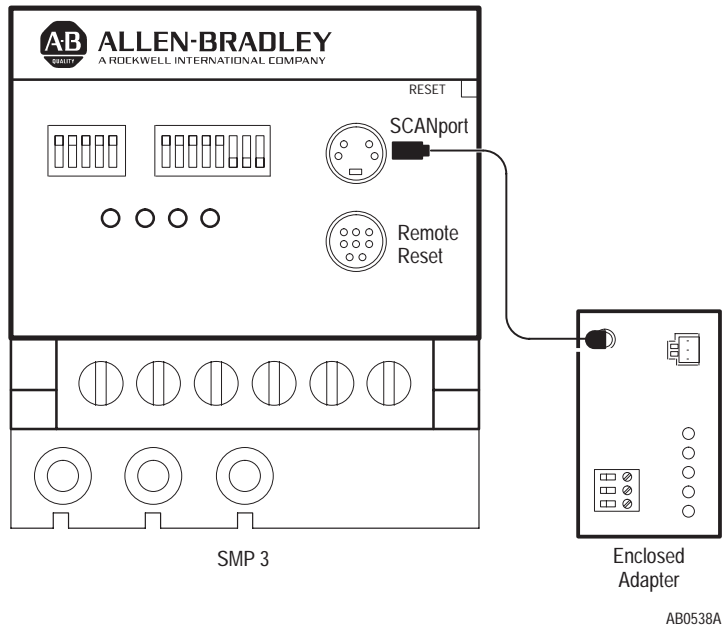
1336 PLUS (7.5 – 500HP) and 1336 FORCE

Refer to the product manual for connection information. On larger horsepower 1336 PLUS and 1336 FORCE drives with an open remote I/O module mounted in the drive, you do not need a separate SCANport cable connection.

SMP 3

An Allen-Bradley SCANport cable is used to connect the communications adapter and an SMP 3. See the cable requirements on page 2-16 for details on cable length.

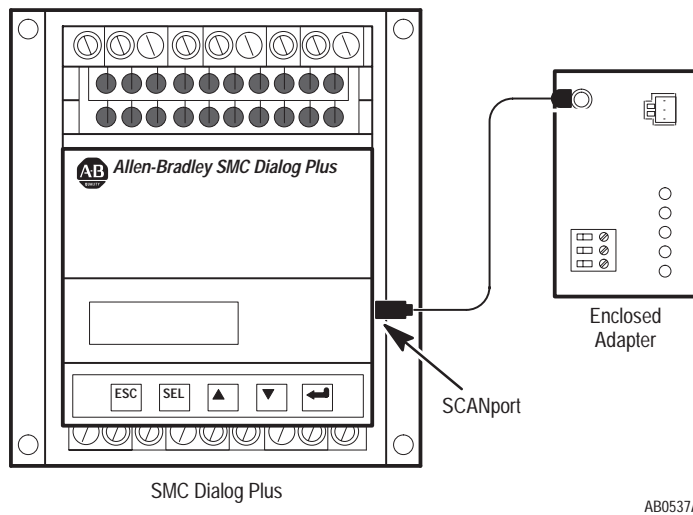
Figure 2.15
SCANport connection on Remote I/O



SMC Dialog Plus

An Allen-Bradley Bulletin 1202 SCANport cable is required to connect the communications adapter and the SMC Dialog Plus controller.

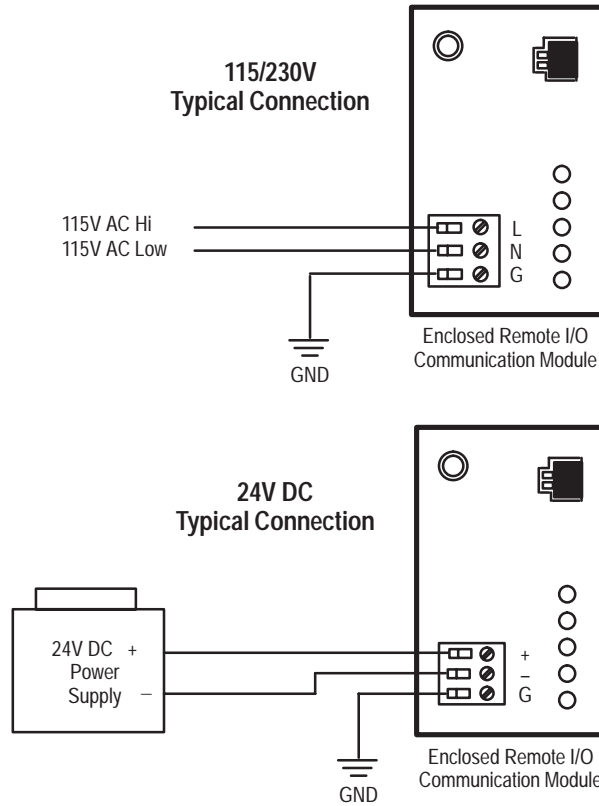
Figure 2.16
SCANport connection on Remote I/O



Connecting the Power Supply

The Enclosed remote I/O is powered from a separate 24V dc or 115V ac power supply (Figure 2.17). With the open style remote I/O board mounted in the drive, no separate power supply connections are required.

Figure 2.17
Typical Power Supply Connection



Configuration and Interfacing

Chapter Objectives

Chapter 3 provides information on how the remote I/O communications module and a programmable controller communicate. The following topics are covered:

- programmable controller data table use
- data transfer through the adapter

Important: Block transfer messaging is covered in a separate publication.



ATTENTION: When you configure a system for the first time, disconnect the motor from the machine or process during the initial testing.

Programmable Controller Data Table Use

The remote I/O communications module allows a SCANport device to look and act like a remote I/O chassis when connected to a programmable controller. Data contained in the input/output image table is transferred between the programmable controller by the remote I/O scanner, the same as with any remote I/O chassis. You control the location and amount of data transferred by setting the rack address and starting quarter/rack size DIP switches on the remote I/O communication module.

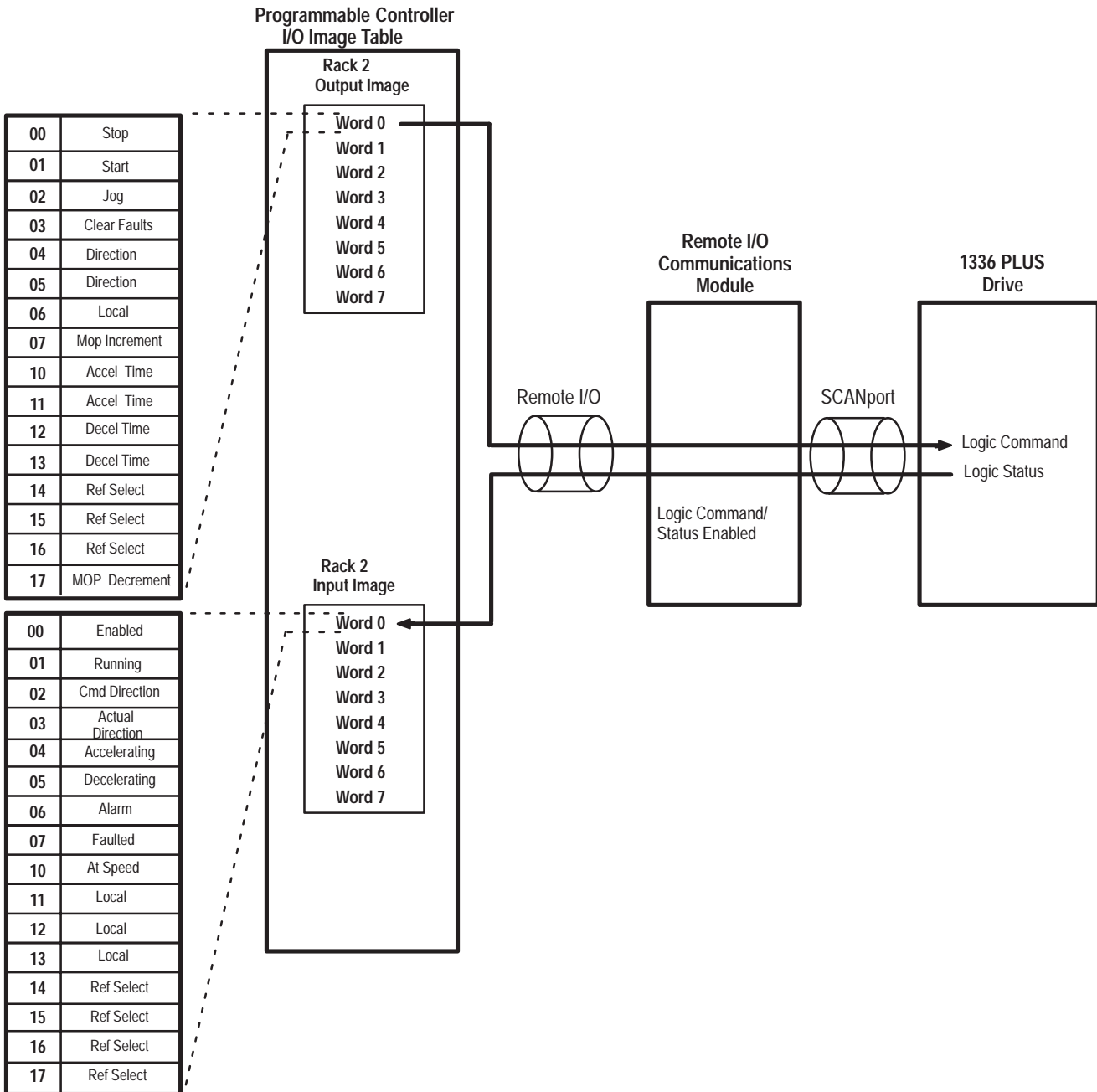
Figure 3.1 shows a typical example of data transfer between a programmable controller, the remote I/O communications module, and a 1336 PLUS drive. This same concept works for all SCANport devices. In this example, assume that you have set the DIP switches for rack address 2, a rack size of 1/4 (or greater if larger amounts of data are to be transferred), and has enabled (Set) the Logic Command/Status switch.

Data placed in the output image table area for rack address 2 is transferred to the remote I/O communications module every rack scan. The communications module then transfers the data to the 1336 PLUS drive as Logic Command. Logic status data is transferred from the drive to the remote I/O communications module and then passed to the programmable controller during a rack scan.



ATTENTION: The RIO to SCANport conversion is asynchronous. Any data sent to the adapter for transfer to the drive must be maintained until the drive has received the data.

Figure 3.1
Typical Example of Data Transfer Through the Communications Module



► This is a typical example of data transfer from a PLC to a 1336 PLUS drive. Refer to the manual provided with your SCANport-compatible product for actual Control and Status words.

Important: The communications module does not scale the data that is transferred. If data in the programmable controller is manipulated in units other than device units, the data must first be converted before being sent to the device. Consequently, all scaling of the data must be done in the PLC. Refer to the appropriate SCANport device manual for details on device units.

Data Transfer Through the Communications Module

DIP switch SW3 determines how the data contained in the programmable controller I/O image table is used in the drive (Figure 3.2). The first three switches (1 through 3) select the basic control features. Switches 4 through 7 support additional capability to transfer selected parameter information between the drive and the programmable controller. Products that have this capability have a group of parameters for adapter I/O. These parameters are identified as “Data In” and “Data Out” parameters. Each datalink switch on the adapter consumes two words (unless truncated using SW3-8) in both the input and output image table of the programmable controller.

The following are the rules for using datalink switches:

1. Normally, each datalink switch reserves two words in both the input and output image tables of the programmable controller. The starting module group/rack size switch (SW2, 1-2) on the adapter must be set to support this.
2. The truncate last datalink switch truncates the last datalink to one word in the input and output image table, instead of two. You can use this to minimize the required rack size consumed by a communications module.
3. Each set of datalink parameters in the drive can only be used by one remote I/O communications module. If more than one module is connected to a single SCANport link, the switch settings must not conflict.
4. Parameter setting in the drive determine the data passed through the datalink mechanism. Refer to the “Adapter I/O” group in the drive manual for details.

Table 3.A
Datalink Switch SW3 Settings

SW3 switch:	State:	Input and output parameter assignments in the drive:
Datalink A SW3-4	On Off	Reserves Data In/Out A for this adapter Data In/Out A not used by this adapter
Datalink B SW3-5	On Off	Reserves Data In/Out B for this adapter Data In/Out B not used by this adapter
Datalink C SW3-6	On Off	Reserves Data In/Out C for this adapter Data In/Out C not used by this adapter
Datalink D SW3-7	On Off	Reserves Data In/Out D for this adapter Data In/Out D not used by this adapter
Truncate Last Datalink SW3-8	On Off	Truncates the last datalink to one word No truncation performed

Figure 3.2
Typical Programmable Controller Configuration Using Datalink A

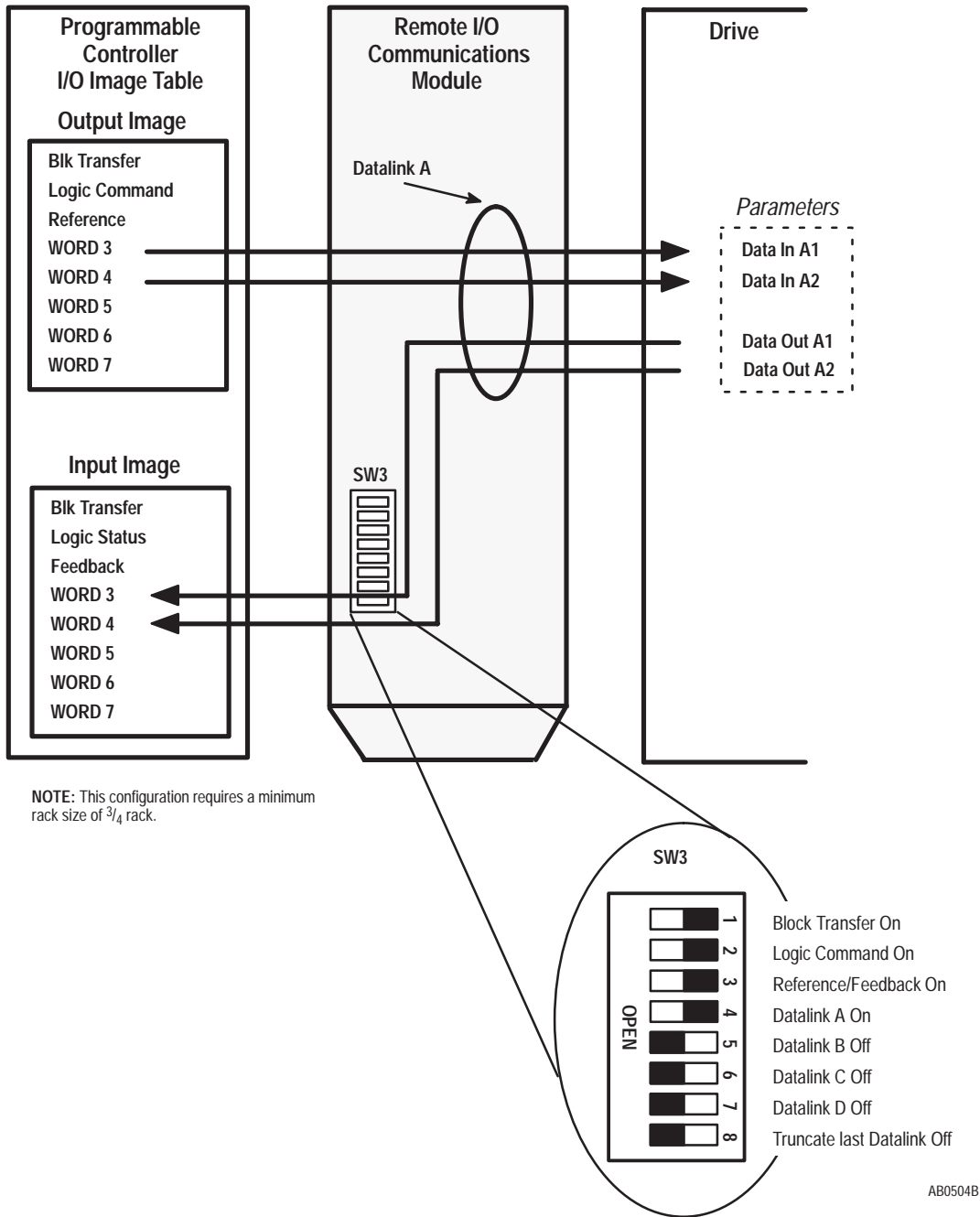
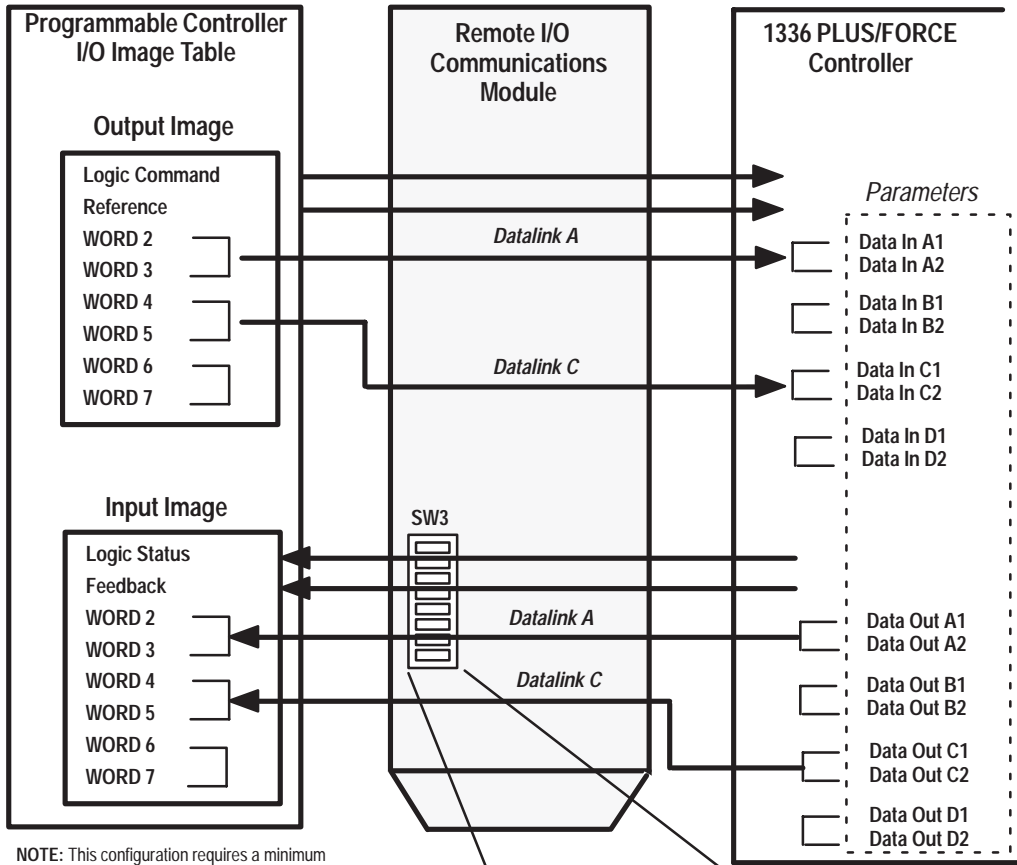
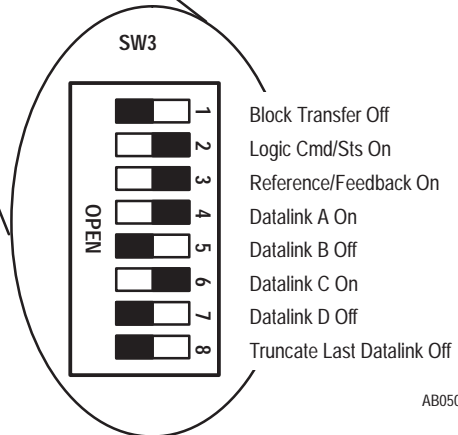


Figure 3.3
 Typical Programmable Controller Configuration for 1305 and 1336 PLUS/FORCE without Block Transfer

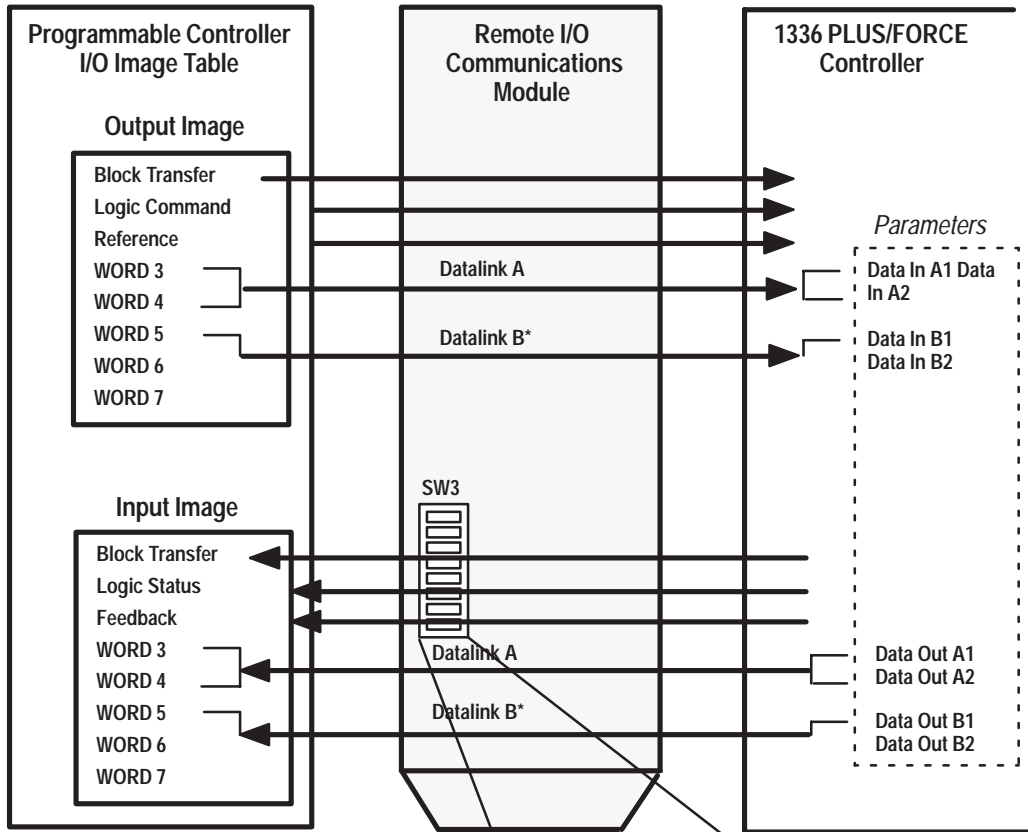


NOTE: This configuration requires a minimum rack size of 3/4 rack.

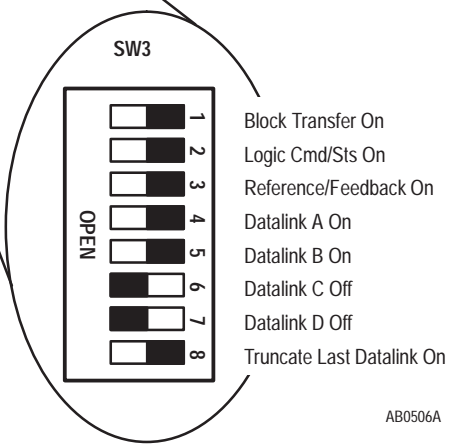


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Figure 3.4
 Typical Programmable Controller Configuration for 1305 and 1336 PLUS/FORCE with Block Transfer

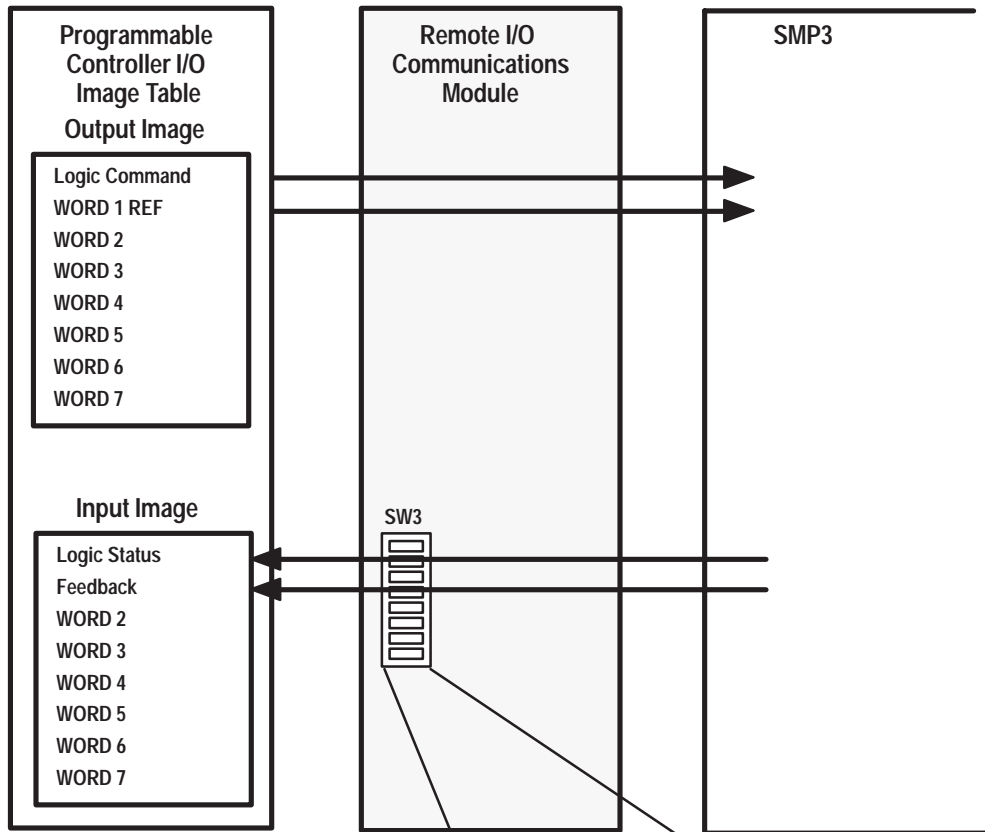


*NOTE: Datalink B has been truncated on a 1/4 rack boundary. Only the first word of Datalink B is transferred. This configuration requires a minimum rack size of 3/4 rack.

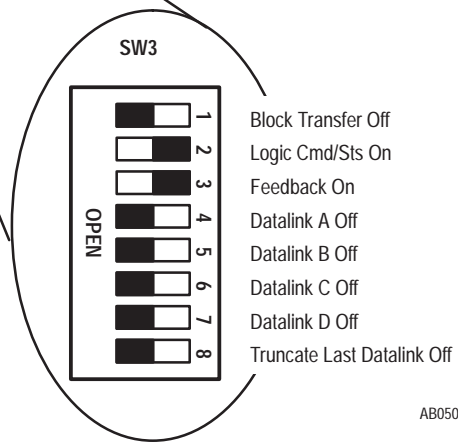


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Figure 3.5
Typical Programmable Controller Configuration for SMP3

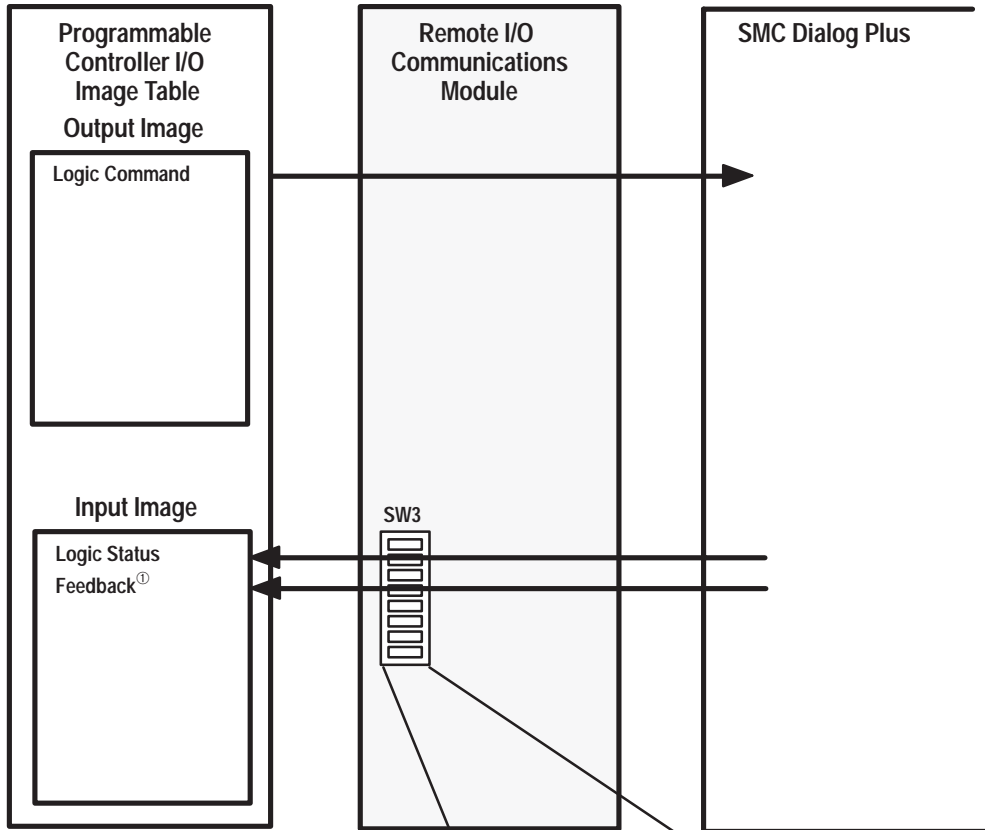


*NOTE: While the reference is sent via the SCANport to the SMP3, the reference is ignored by the SMP3.

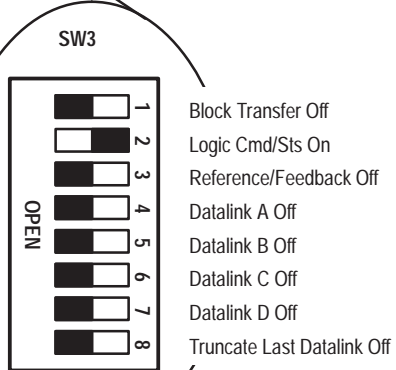


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Figure 3.6
 Typical Programmable Controller Configuration for SMC Dialog Plus without Block Transfer

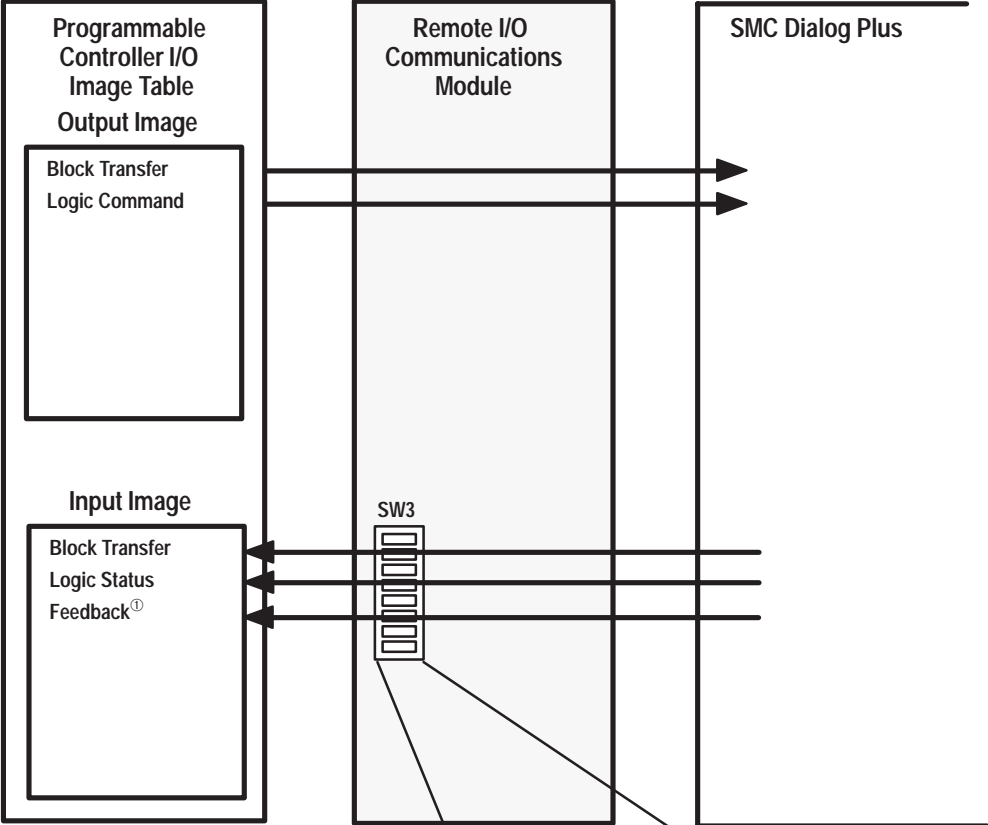


^①Current Phase A

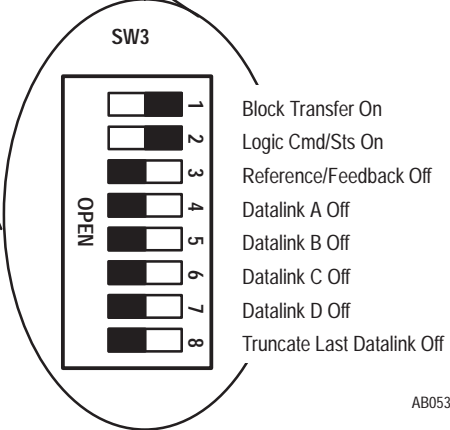


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Figure 3.7
Typical Programmable Controller Configuration for SMC Dialog Plus with Block Transfer



①Current Phase A



AB0536A

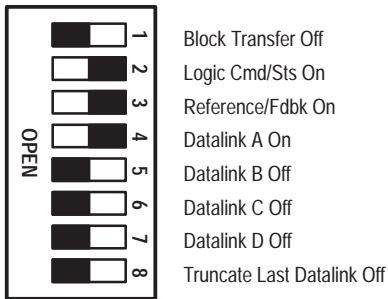
Figure 3.8
SLC 5/02™ Controller Example

Example Information:

PLC Type – SLC 5/02
 Drive Type – 1336 PLUS
 Drive Rack Address – 2
 Rack Size – 1/2 Rack Minimum
 Starting Module Group – 0

PLC Image Table Map

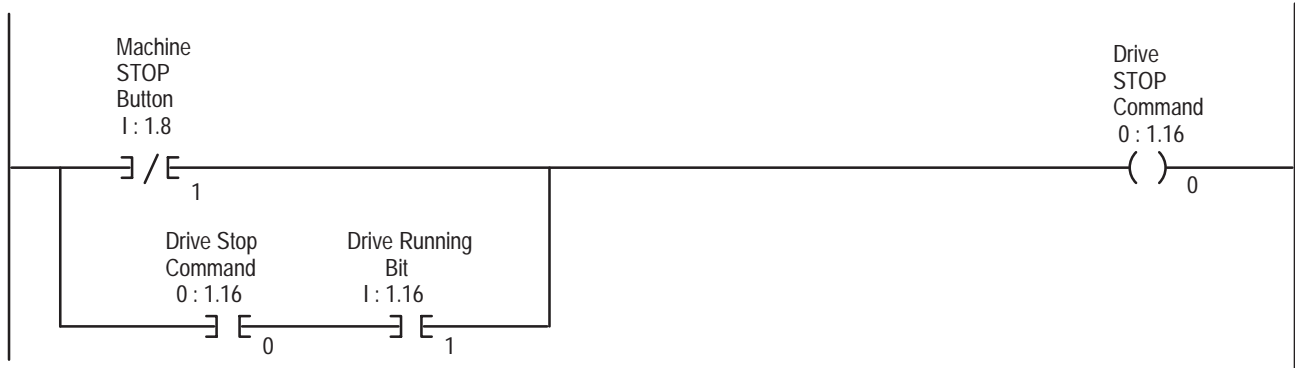
PLC WORD	OUTPUT IMAGE	INPUT IMAGE
0	Logic Cmd	Logic Sts
1	Reference	Feedback
2	Datalink A	Datalink A
3	Datalink A	Datalink A



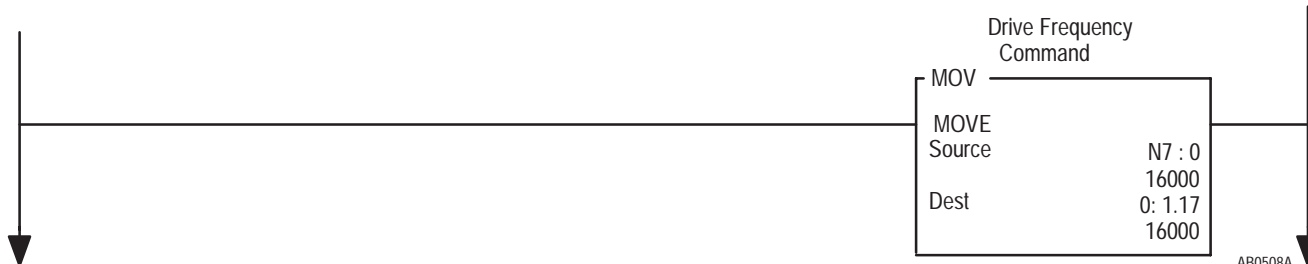
When the Machine Start PushButton is pressed, the PLC sends a START command to the drive. The drive will start if no STOP command is being sent by the PLC or any other control device. (Start button is a normally open contact in this example.)



When the Machine Stop Pushbutton is pressed, the PLC sends a STOP command to the drive. (Stop button is normally closed contact in this example).



This rung transfers a frequency command from the PLC data table to the drive. A range of 0 to 32767 is equivalent to Zero to Maximum Frequency. (In this example, the drive's Frequency Select parameters are set to receive a frequency reference from the RIO Adapter.)



AB0508A

SLC 5/02 Example continued

When the Machine JOG Pushbutton is pressed, the PLC will send a JOG command to the drive. (Jog button is a normally open contact in this example.)



When the Machine Clear Faults Pushbutton is pressed, the PLC sends a Clear Faults command to the drive. (Clear Faults button is a momentary normally open contact in this example.)



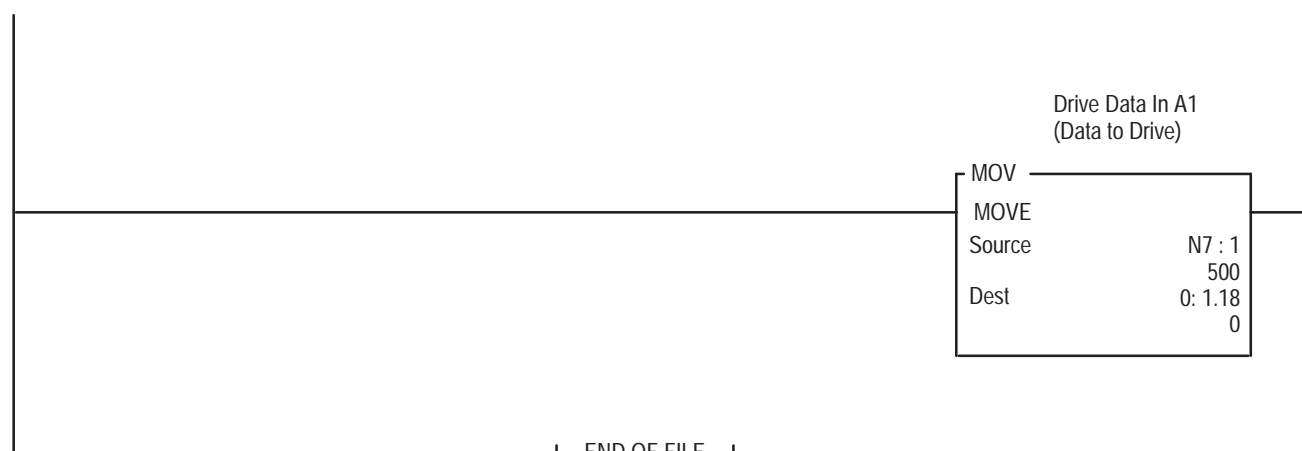
When the Drive is running, the PLC will receive a Drive Running Status Bit.



When the drive is faulted, the PLC will receive a Drive Faulted Status Bit.



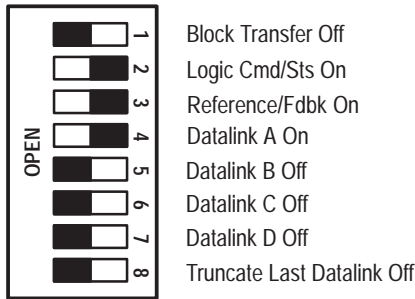
This rung moves a value from the PLC data table into the drive parameter specified by the Data In A1 parameter of the drive.



**Figure 3.9
PLC 5/15 Controller Example**

Example Information:

PLC Type – PLC 5/15
 Drive Type – 1336 PLUS
 Drive Rack Address – 2
 Rack Size – 1/2 Rack Minimum
 Starting Module Group – 0



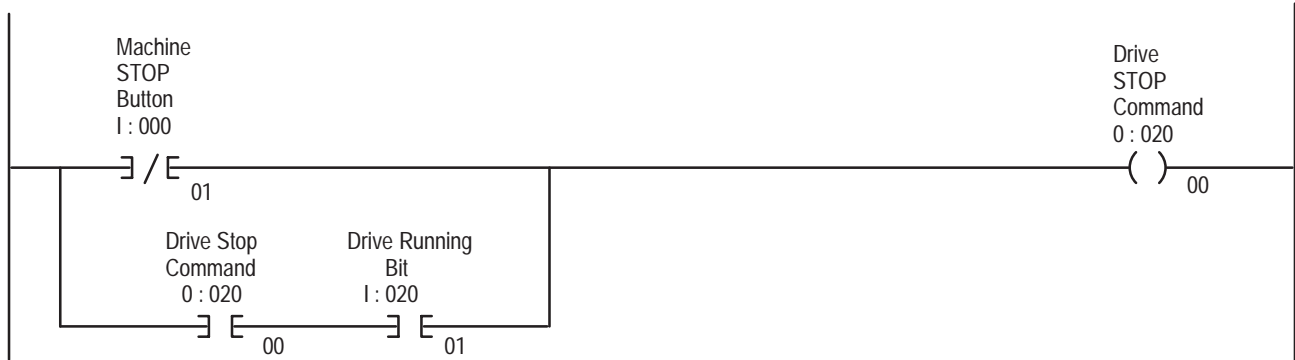
PLC Image Table Map

PLC WORD	OUTPUT IMAGE	INPUT IMAGE
0	Logic Cmd	Logic Sts
1	Reference	Feedback
2	Datalink A	Datalink A
3	Datalink A	Datalink A

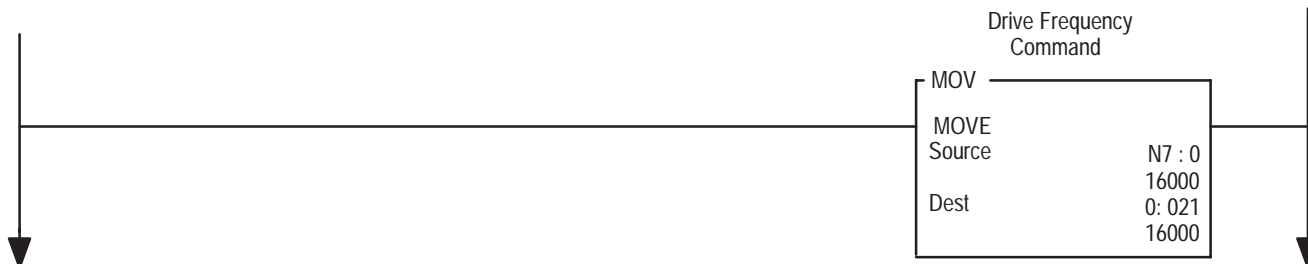
When the Machine Start Pushbutton is pressed, the PLC sends a START command to the drive. The drive will start if no STOP command is being sent to the PLC or any other control device. (Start button is a normally open contact in this example.)



When the Machine Stop Pushbutton is pressed, the PLC sends a STOP command to the drive. (Stop button is normally closed contact in this example).



This rung transfers a frequency command from the PLC data table to the drive. A range of 0 to 32767 is equivalent to Zero to Maximum Frequency. (In this example, the drive's Frequency Select parameters are set to receive a frequency reference from the RIO Adapter.)



PLC 5/15 Example continued

When the Machine JOG Pushbutton is pressed, the PLC will send a JOG command to the drive. The drive will start and run at the programmed Jog Frequency if no STOP command is being sent by the PLC or other control device. (Jog button is a normally open contact in this example.)



When the Machine Clear Faults Pushbutton is pressed, the PLC sends a Clear Faults command to the drive. (Clear Faults button is a momentary normally open contact in this example.)



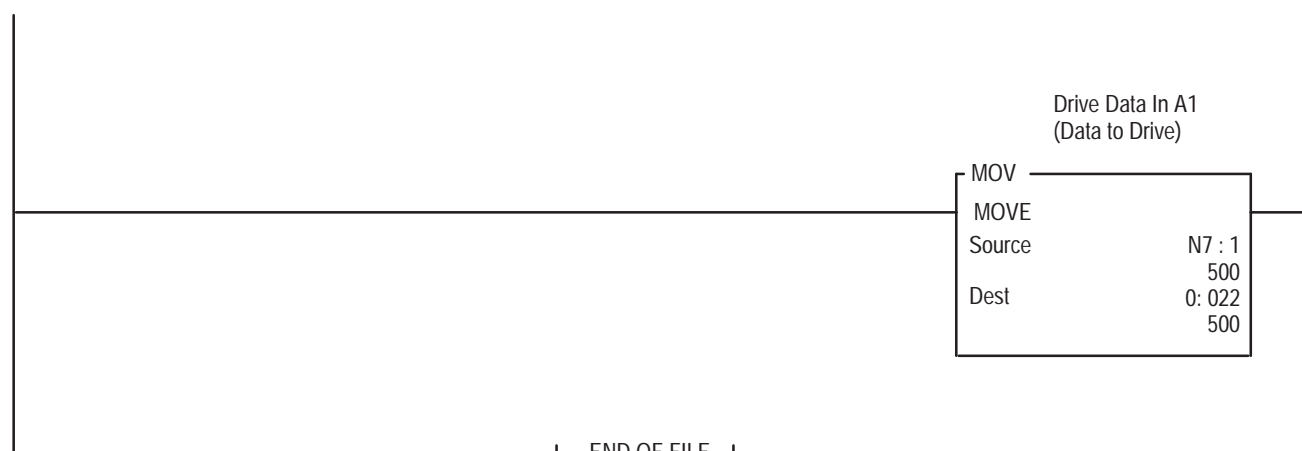
When the Drive is running, the PLC will receive a Drive Running Status Bit.



When the drive is faulted, the PLC will receive a Drive Faulted Status Bit.



This rung moves a value from the PLC data table into the drive parameter specified by the Data In A1 parameter of the drive.



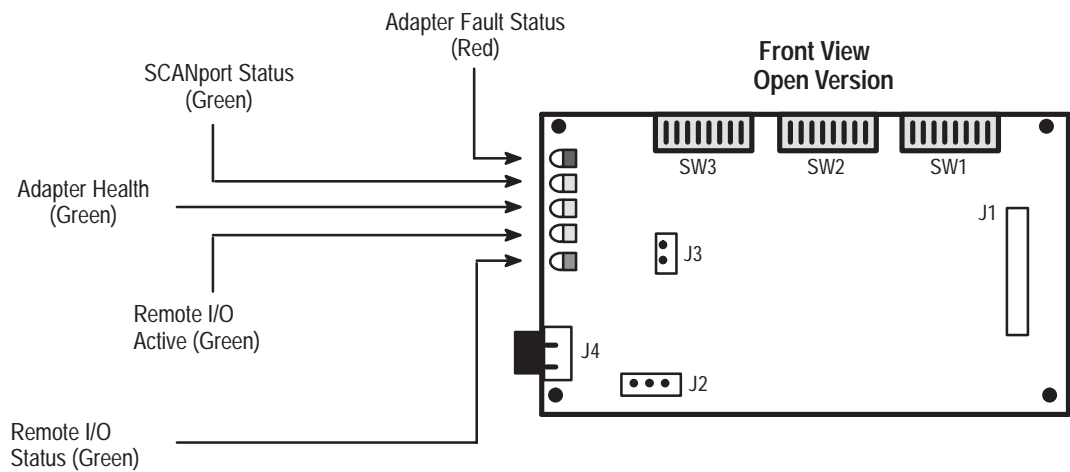
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Troubleshooting

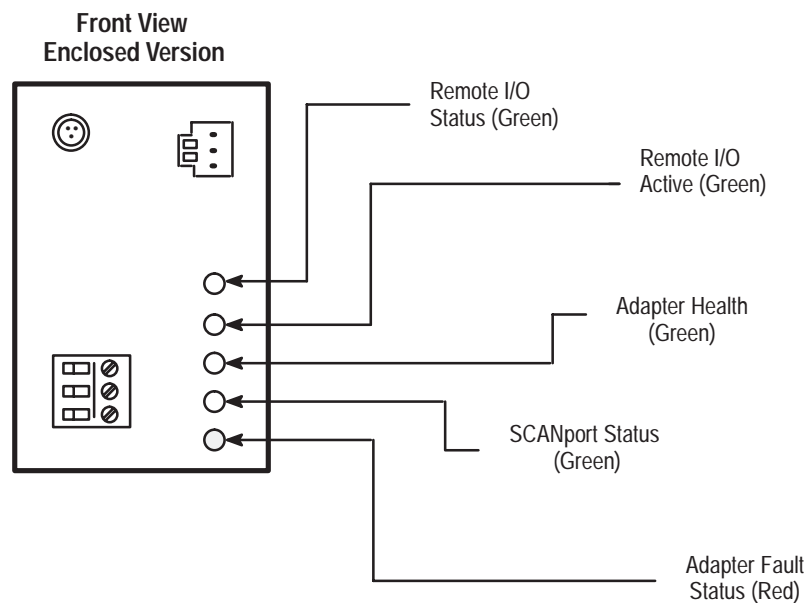
Chapter Objectives

Chapter 4 provides information to help you troubleshoot your remote I/O system using the LED indicators on the front of the device (Figure 4.1). The remote I/O module is a non-serviceable device that should be returned to Allen-Bradley for replacement when a major fault exists that is attributable to the remote I/O communications module itself.

Figure 4.1
LED Locations



Refer to Table 4.A for details on LED operation.



Troubleshooting Table

Table 4.A
General Indications

Indicator	Color	Probably cause	Recommended action
Adapter Fault Status	Red (Steady)	Unrecoverable fault	Replace the adapter.
	Red (Blinking)	Recoverable fault	Check configuration switch setting, check for SCANport cable connection.
	Red (Off)	Normal operation	None
SCANport Status	Green (Steady)	Normal operation	SCANport is active.
	Green (Off)	No SCANport communication	Check SCANport cables, device, cycle power.
	Green (Blinking)	When blinking in tandem with red fault status, a device incompatibility exists	Check compatibility of drive on page 1-1 of this manual.
Adapter Health	Green (Steady)	Normal operation	None.
	Green (Off)	Internal adapter fault	Cycle power.
Remote I/O Active	Green (Steady)	Normal operation	None.
	Green (Off)	No data transfer from PLC/SLC	Remote I/O offline, make certain the PLC is in Run Mode, check rack address, check wiring and processor.
Remote I/O Status	Green (Steady)	Normal Operation	None.
	Green (Blinking)	PLC is in Reset/Program/Test Mode	None.
	Green (Blinking)	PLC has more rack space allocated than is being used	Do a PLC auto configuration.
	Green (Off)	No communication with processor	Check wiring to processor. Check adapter configuration in processor.
Adapter Fault Status and Adapter Health	Red (Blinking) and Green (Steady)	Configuration switch setting incorrect	Check configuration switch settings.
		Remote I/O and/or SCANport cable not wired or connected properly	Check SCANport and remote I/O cable connections.

Specifications

Chapter Objectives

Chapter 5 provides you with background information and specifications that you may need to install, repair, or apply your remote I/O communications module.

Product Specifications

Table 5.A
General Indications

	Open Style (1336-GM1)	Enclosed Style -- 115V ac (1203-GD1)	Enclosed Style -- 24V dc (1203-GK1)
Environmental			
Operating temperature	0–50°C (32–122°F)	0–50°C (32–122°F)	0–50°C (32–122°F)
Storage temperature	–40–85°C (–40–158°F)	–40–85°C (–40–158°F)	–40–85°C (–40–158°F)
Relative humidity	0–95%, non-condensing	0–95%, non-condensing	0–95%, non-condensing
Electrical			
Input voltage	Supplied by drive	85–264V ac, 1 ph	24V dc, ±10%
Input frequency	NA	45–63 Hz	NA
Input current	NA	35 mA maximum	0.4 amps maximum
SCANport load	60 mA	60 mA	60 mA
Communications	SCANport peripheral interface		
Drive side	Allen Bradley remote I/O		
PLC side	57.6K, 115.2K, or 230.4K		
Baud rates	1/4, 1/2, 3/4, or full		
Rack size			
Dimensions			
Enclosure type	Open (IP00)	NEMA 1 (IP30)	NEMA 1 (IP30)
Package size	Not applicable	45mm x 76mm (1.8 x 3.0 in)	45mm x 76mm (1.8 x 3.0 in)

Programmable Controller Compatibility

This communications module is designed to be used with the following Allen-Bradley programmable controllers:

- PLC-2/30[®] with SD2 (communications module version 1.02 or later)
- PLC-3[®]
- SLC500[™] with 1747-SN scanner
- PLC 5/10[™], 5/15[™], 5/25[™] family
- PLC 5/30[™], 5/40[™], 5/40L[™], 5/60[™], 5/60L[™] family and PLC-5/80[™]
- PLC 5/250[™]
- PLC[®] scanner modules and subscanners.



Note: This adapter was tested with the current revision level of the PLC processors listed. Earlier versions of the processors may not be compatible.



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✓ CHECK THE FUNCTION THAT MOST CLEARLY DESCRIBES YOUR JOB.

- SUGGEST/RESPONSIBLE FOR THE PURCHASE OF EQUIPMENT
- DESIGN/IMPLEMENT ELECTRICAL SYSTEMS
- SUPERVISE FLOOR OPERATIONS
- MAINTAIN/OPERATE PROGRAMMABLE MACHINERY
- TRAIN/EDUCATE MACHINE USERS

✓ WHAT LEVEL OF EXPERIENCE DO YOU HAVE WITH EACH OF THE FOLLOWING PRODUCTS?

	NONE	LITTLE	MODERATE	EXTENSIVE
PROGRAMMABLE CONTROL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC/DC DRIVES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PERSONAL COMPUTERS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NC/CNC CONTROLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DATA COMMUNICATIONS/LAN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

✓ RATE THE OVERALL QUALITY OF THIS MANUAL BY CIRCLING YOUR RESPONSE BELOW. (1) = POOR (5) = EXCELLENT

HELPFULNESS OF INDEX/TABLE OF CONTENTS	1	2	3	4	5
CLARITY	1	2	3	4	5
EASE OF USE	1	2	3	4	5
ACCURACY AND COMPLETENESS	1	2	3	4	5
QUALITY COMPARED TO OTHER COMPANIES' MANUALS	1	2	3	4	5
QUALITY COMPARED TO OTHER ALLEN-BRADLEY MANUALS	1	2	3	4	5

✓ WHAT DID YOU LIKE MOST ABOUT THIS MANUAL?

✓ WHAT DID YOU LIKE LEAST ABOUT THIS MANUAL?

✓ PLEASE LIST ANY ERRORS YOU FOUND IN THIS MANUAL (REFERENCE PAGE, TABLE, OR FIGURE NUMBERS).

✓ DO YOU HAVE ANY ADDITIONAL COMMENTS?


✓ COMPLETE THE FOLLOWING.

NAME _____ COMPANY _____

TITLE _____ DEPARTMENT _____

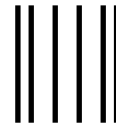
STREET _____ CITY _____ STATE _____ ZIP _____

TELEPHONE _____ DATE _____

CUT ALONG DOTTED LINE 

FOLD HERE

FOLD HERE

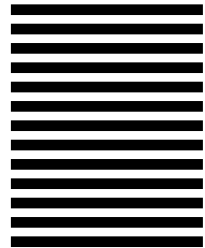


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