



AdaptaScan™ Bar Code Readers Application Guide

(Catalog Numbers 2755-SN3, -SN5, -and -SN8)

Purpose of this Document

This document update revises the following publication. Keep this document update for reference.

Publication	Description
2755-6.8	AdaptaScan Bar Code Readers Application Guide

Summary of Update

The following sections summarize the information contained in this Document Update. Changes are presented as those that effect the entire document or for a specific chapter in the document.

Changes that Effect the Entire Document

The following provides an update for changes that effect the entire document.

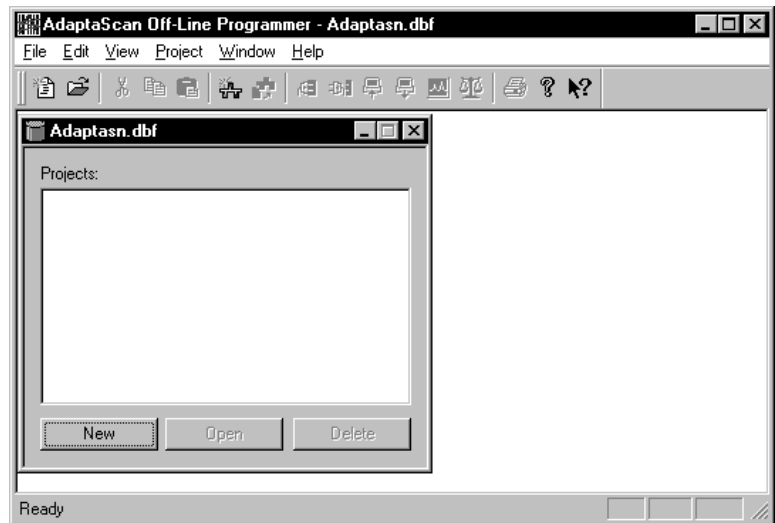
Application Guide Database File

There is now an Application Guide Database File containing all of the applications found in the *AdaptaScan Bar Code Readers Application Guide* (Publication No. 2755-6.8). The file is included as part of the AdaptaScan Installation Files.

File	Function
APPGUIDE.DBF	Database containing example projects from the AdaptaScan Application Guide.

Project Database Dialog Box

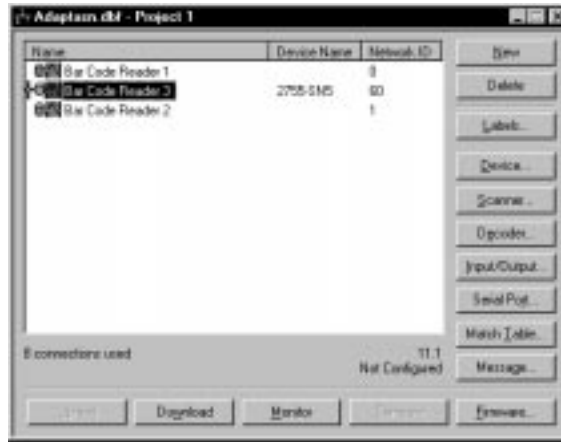
Starting with version 11.x is a new project database dialog box that allows you to select or create a database file. You can use this to help organize your project. From the Windows™ **Start** menu, select **Programs>AdaptaScan OLP>AdaptaScan OLP**. The database dialog opens.



You can create multiple database (.DBF) files with different projects.

Project Dialog Box

There is a new Project dialog box that offers Upload/Download functionality.

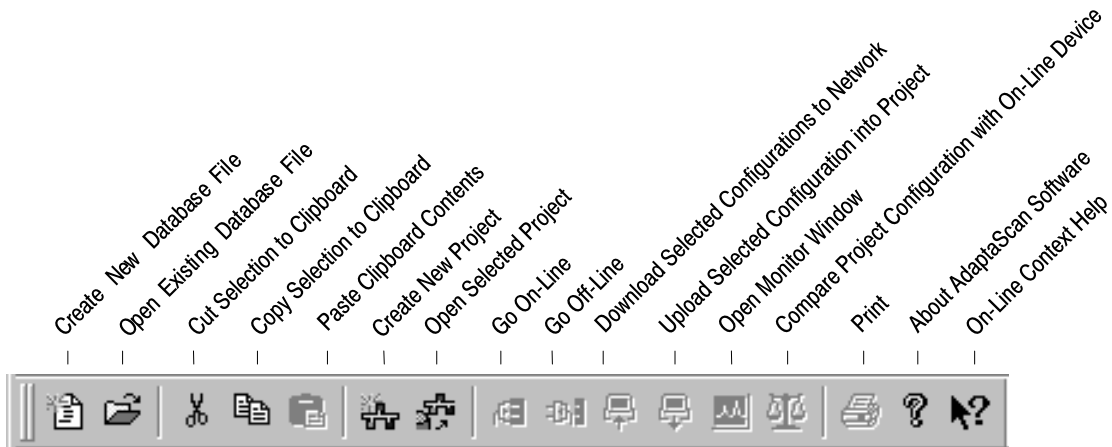


The buttons on the Project window are defined below.

Select:	To:
	Create a new Bar Code Reader configuration (Bar Code Reader 1, Bar Code Reader 2, Bar Code Reader 3, ...) in the Project window.
	Delete the selected Bar Code Reader configuration from the Project window.
	Define label setups and symbologies for Reader operation.
	Define a unique name and enter a description for the Reader. Also defines a DeviceNet™ address for the Reader.
	Specify linear or raster scanning, how scanning is triggered, and access the focus function.
	Define when the Reader decodes data and what label is decoded. Also defines the inter-symbol timer and performance indicator parameters.
	Define the operation for package detector, discrete inputs, discrete outputs, timer and ASCII trigger commands.
	Define communication parameters (RS-232, RS-485/RS422) and protocols (ASCII, DH-485, DF1) for the Reader's communication ports.
	Define match table, package and counter functions for decoded bar code data.
	Define the format and content of messages sent to the host after bar codes are decoded.
	Transfer the configuration stored in a Reader to the currently opened project in the AdaptaScan Software.
	Downloads the highlighted configurations to the reader or network.
	View the operation of a single Reader or another Reader on the same network.
	Compare the Reader configuration within the project with the on-line device.
	Download new firmware to a selected Reader.

Toolbar

Version 11.x offers a new toolbar. Turn the tool bar view on or off from the View menu. The tool icons provide shortcuts to the following menu items:



Move the toolbar to any side of the window or detach the toolbar and place anywhere on your screen by clicking on and holding down the mouse key while dragging the toolbar.



← Default Position



Bottom Position →



















↖ Detached



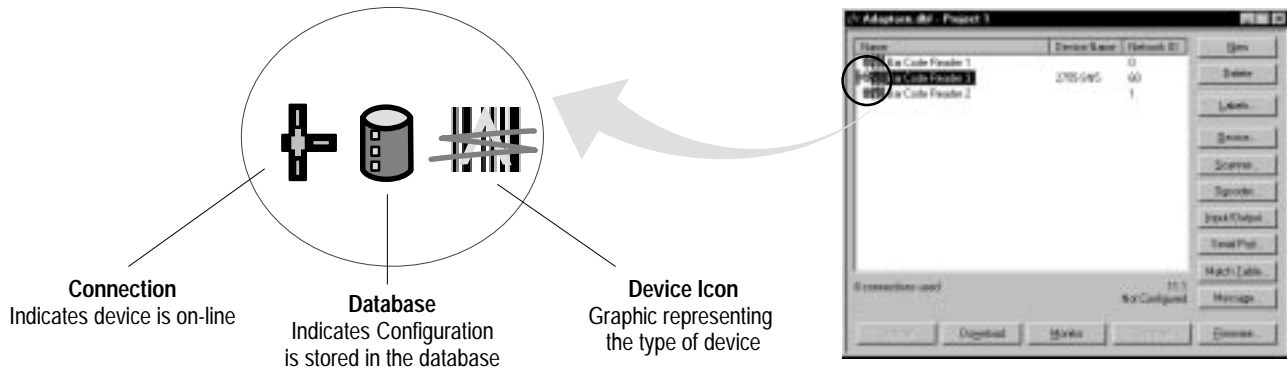
Side Window →

The following provides a brief summary of the AdaptaScan tools.

Tool	Icon	or Select from menu:	Description
Create New Database		File >New	Creates a database file that will contain project configuration files.
Open Existing Database		File >Open	Opens window allowing you to select an existing database file (.dbf) containing project configuration files.
Open Selected Project		Project >Open	Opens the project currently selected in the AdaptaScan database file window.
Create New Project		Project >New	Creates a new project within the currently open database file (.dbf).
Go On-Line		On-Line Tools >Go On-Line	Connects the programming computer to the network.
Go Off-Line		On-Line Tools >Go Off-Line	Disconnects the programming computer from the network.
Upload Selected Configuration into Project		On-Line Tools >Upload	Uploads the configuration stored in the selected reader to the current project.
Download Selected Configurations to Network		On-Line Tools >Download	Downloads the selected Reader configuration(s) to the Readers on the network.
Open Monitor Window		On-Line Tools >Monitor	Opens on-line monitor window.
Compare Project Configuration with On-Line Device		On-Line Tools >Compare	Compares the configuration database of the currently selected Reader to the actual configuration stored within the Reader.
Cut Selection to Clipboard		Edit >Cut	Removes the currently selected item from the dialog or window and places the item on the clipboard.
Copy Selection to Clipboard		Edit >Copy	Copies the currently selected item from the dialog or window and places the copy on the clipboard.
Paste Clipboard Contents		Edit >Paste	Pastes the last item placed on the clipboard to the currently selected location.
Print		File >Print	Opens the print dialog that allows you to print out an application report.
About AdaptaScan Software		Help >About Off-Line Programmer	Opens a dialog showing the software revision and serial numbers along with other software information.
On-Line Context Help		Help >Contents	When selected, displays a pointer. this pointer may be moved to an area on a dialog or menu and clicked for help about the item.

Online Tools

There are new online tools – project window icons. The project window status icons display the status of the Reader connections and configurations.



Connection

When displayed, indicates a connection was made to the device:

- Yellow (default) indicates that the AdaptaScan software does not have the information required to determine whether the device's configuration matches the configuration in the software database.
- Green appears after a Compare operation (see page 11) was performed and the configuration of the on-line reader matches the database configuration.
- Red appears after a Compare operation (see page 11) was performed and the configuration of the on-line reader does not match the database configuration.

Database

When displayed, indicates that a database configuration exists for the Reader. The color indications are the same as for the Connection icon (see descriptions above).

Device Icon

Displays the icon associated with the device. Here are some common device icons:



= AdaptaScan Reader



= PhotoEye photo-electric detector



= SDN Scanner Card



= KFD DeviceNet Personal Computer Interface

Cut, Copy, and Paste

You can now cut, copy, and paste some items within and between database files:

- projects
- Reader configurations
- match fields
- message fields
- labels
- label fields

The cut, copy, and paste icons and menu selections will only be available where they can be used. Otherwise the icons will appear grayed out.

Important: Cutting or copying and then pasting a Reader configuration is different from importing/exporting Reader configurations.

When an individual Reader configuration is pasted into a project, only the original Reader's configuration dialog boxes are copied and recreated in the new project. Connections to and from the original configuration are not recreated using Paste. If you use import/export, the connections to the original module are maintained. Paste is useful when you need to make a configuration similar to an existing configuration in the currently open project or another project.

When you need to make an exact copy of a configuration, copy and paste the entire project in the AdaptaScan database dialog or use the import/export functions (see next page).

Import/Export Configurations

You can now import/export configurations. Using the import/export functions you can transfer exact copies of Reader configurations between projects. The imported/exported configurations maintain the internal and external connections.

1. Open the project you want to import the configuration file into.
2. From the **File** menu, select **Import**. The Import Configuration dialog is displayed.



3. Enter the path>filename of the Reader configuration you want to import (.cfg file).
4. Click **Open** to import the Reader configuration into the project.

Online Functionality

There is now an online function. The Go On-Line command establishes communications between the AdaptaScan software and the reader or DeviceNet network using the communication channel specified on the Preferences dialog. To go on-line with AdaptaScan software:

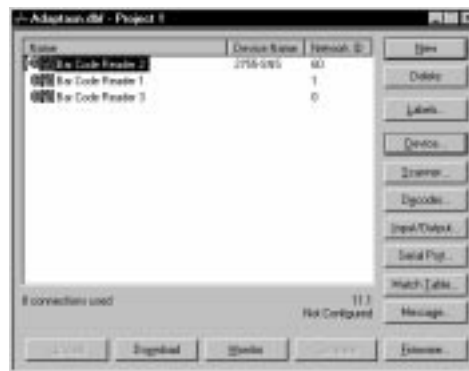
Go On-Line



1. Click the Go On-Line icon or select **Go On-Line** from the **Communications** menu.

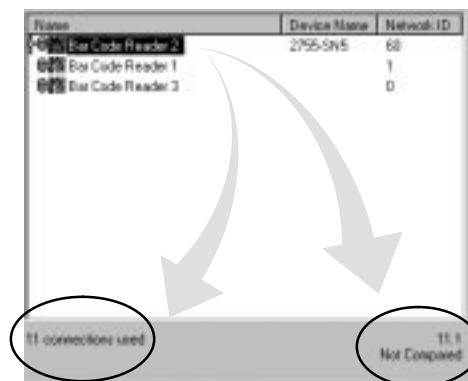
The project window will display the devices on the network along with their catalog no. and address.

Note: The Query dialog may be displayed when you go on-line (depending on your preference settings).



Note: If you are connected to the DeviceNet network using the Reader configuration cable, only AdaptaScan Readers on the network are identified and displayed. When connecting using a DeviceNet communications card and driver software on your computer, all DeviceNet nodes on the network are identified and displayed.

2. Highlight individual readers in the list to display the currently loaded firmware revision and their configuration status.



When going on-line:

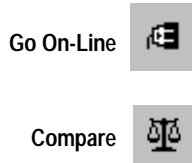
- You can only be on-line with one project at a time. Use the **Go Off-Line** command (Communications menu) when you want to switch to another project.
- **Upload, Download, Monitor** and **Compare** functions are only available for AdaptaScan Readers having the same major version number as the AdaptaScan software (firmware version 11.x or greater)
- The **Firmware** button, for downloading firmware to a Reader, is only available when the communications channel is set for Configuration Port (direct connection using configuration cable).
- Use **Refresh** (Communications menu) to query the network and update the display.
- Use **Query** (View menu) to display the Query dialog. The Query dialog allows you to specify the network addresses read when on-line functions are used. By only checking the addresses that are required, you can increase the speed at which network operations occur.

Compare Tool

The Compare Tool compares the calculated Cyclic Redundancy Check (CRC) of the configuration stored in the project database with the CRC of the configuration stored in the Reader. Compare is useful when checking if a Reader's configuration has been changed to determine if an upload or download is necessary.

Note: Compare is not available if you are using peer-to-peer connections (data, triggers, or I/O shared between Readers). In addition, cut and copied Reader configurations between projects may not match when compared due to differences in the label configurations between projects.

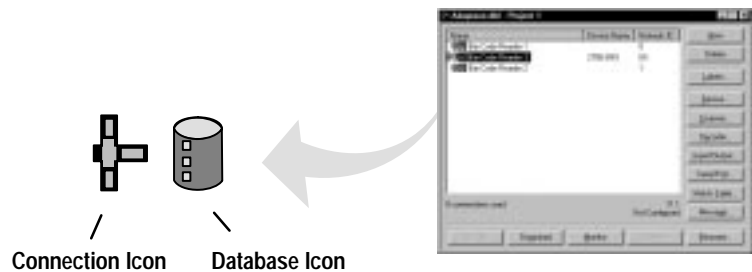
To use compare:



1. Make sure the software is on-line by clicking the Go On-Line icon or by selecting **Go On-Line** from the **Communications** menu.

Note: The Query dialog may be displayed when you go on-line (depending on your preference settings).

2. Select the Reader configuration you want to compare with the actual configuration stored within the Reader.
3. Click the Compare tool icon or select **Compare** from the **Communications** menu.



If the Reader configuration has been compared and does not match the configuration stored in the Reader, the connection icon appears red.

If the Reader configuration has been compared and matches the configuration stored in the Reader, the database and connection icons appear green.

If a Reader configuration has not been compared to the configuration stored in a Reader, the database and connection icons appear yellow.

Message Format

The Message Format dialog box has changed. You now have Swap and Pad check box and Handshaking enabled or disabled



Swap and Pad

When selected, high and low data bytes swap positions. Select swap bytes when data is sent in the wrong order (high byte first). For example, data to a PLC® is sent with the first character of a string in the second byte. By swapping the bytes, the first character corresponds to the first byte. When selected, uneven numbered data is padded with a zero so that messages always contain an even number of bits.

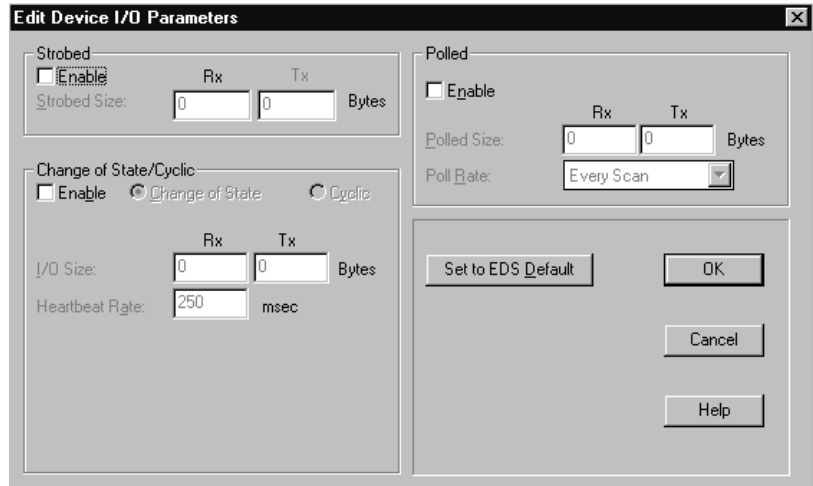
Handshaking

When selected, allows the PLC or SLC™ to use bits in the DeviceNet assembly objects to control the transfer of message data.

Chapter 9 – Communicating with an SLC 5/03™ Processor on a DeviceNet™ Network

The AdaptaScan operates in either polled mode or change of state modes for version 11.x and higher. Under **To Configure the 1747-SDN DeviceNet Scanner**, the sequence is:

- Click the Edit I/O Parameters button.



For the AdaptaScan to operate in Polled mode:

- Under Polled, check the enable box. Change of State/Cyclic Enable box should not be checked.
- Change the Poll Size Rx box to **8** (Bytes).
- Change the Poll Size Tx box to **1** (Bytes).
- In the Poll Rate List box, select **Every Scan**.

For the AdaptaScan to operate in Change of State mode:

- Under Change of State/Cyclic, check the enable box. Polled Enabled should not be checked.
- Select Change of State
- Change the Poll Size Rx box to **8** (Bytes).
- Change the Poll Size Tx box to **1** (Bytes).

- Click the OK button to return to the Scan List Editor button.

Continue with the remaining steps of the section to configure the 1747-SDN DeviceNet scanner.

Chapter 10 – Communicating with an SLC 5/03 Processor on a DeviceNet Network using Explicit Messaging

Explicit messaging for AdaptaScan using firmware version 11.x has changed. The data packet from the SLC (or PLC) has an additional word which must be included.

Under **Overview**, the AdaptaScan bar code reader is on node 10, not node 3.

Under **Define the DeviceNet Address**, the address is 10, not 3.

Refer to **Explicit Message Program Control Limitations** to find the explanation of the Service Name, Service Code, and Example.

Under **Example Data Tables**, response file should be:

Address	Response File (good response)		
N25:0	0101	000C	900C

Also, the explicit message is written in the N20:0 integer address.

Address	Data = Hex Code (matchcode download of 0300 data)											
N20:0	0101	0012	100A	000F	0001	0001	100B	01CE	0300	0004	3330	3030

(0300 = Byte swap only for the data 33303030.)

The table below provides the data packets and their descriptions.

Packet	Description
01	TXID. The reader uses this value to track the transaction to completion and returns the value to with the response that matches the request downloaded by the processor.
01	CMD/Status. For each download, you assign a command code to instruct the reader how to administer the request.
00	Port. The DeviceNet port where the transaction is routed.
12	Size. The size of the transaction body in bytes (0CH=12 bytes). The transaction body can be as many as 29 words (58 bytes) in length. If the size exceeds 29 words, an error code will be returned.
10	Service. For each explicit message request and response, the service attribute contains the service request and response codes that match the corresponding request for the TXID.
0A	Mac ID (node address). The DeviceNet network allows a node range of 0–63.
00	Parameter Class
0F	Parameter Class
00	Instance Number (MSB)
01	Instance Number (LSB)
00	Attribute (MSB)
01	Attribute (LSB)
10	Set Attribute Single Request (MSB)
0B	Length [The byte size count begins the Set Attributes Single request (MSB)]
10	Set Attribute Single Request (MSB)
CE (206)	Class (MSB)
03	Attribute Number – Rule (MSB)
00	Instance Number (LSB)
00	Length of String (MSB)
04	Length of String (LSB) being downloaded.
33	ASCII 33
30	ASCII 30
30	ASCII 30
30	ASCII 30

The response of the 0101 900C response code is 90 for successful and 94 for fail.

A response code will not be sent out. Once the download is complete the LEDs on the AdaptaScan will turn off and on, indicating a reset was performed. After the Execute this Transaction Block CMD Status (01) is sent, use a Reset all Client/Server Transaction Command Code (03) to perform the next download transaction.

Under **Notes on using Explicit Messaging**, explicit messaging must always start at word 224 (i.e., M0:1.224) if using an SLC processor (PLC on word 64).

Under **Downloading Other Host Commands**, the tables are:

Read Performance Indicator Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	04
Get Performance Request	4C
Class	C8
Instance Number (LSB)	01
Instance Number (MSB)	00

*3F = Address 63, modify as required

Read Performance Indicator Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
Data (LSB)	01
Data (MSB)	00

Reset Package Counter Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	06
Class	D2
Set Attribute Single Request	10
Instance Number (LSB)	00
Instance Number (MSB)	00
Attribute Number- Reset Counters	09
Data	01

*3F = Address 63, modify as required

Reset Package Counter Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90

Read Match Counters Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	05
Get Attribute Single Request	0E
Class	CE
Instance Number (LSB)	01
Instance Number (MSB)	00
Attribute Number	08

*3F = Address 63, modify as required

Read Match Counters Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
Data (LSB)	00
Data	00
Data	00
Data (MSB)	00

Read Package Counters Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	05
Get Attribute Single Request	0E
Class	D2
Instance Number (LSB)	01
Instance Number (MSB)	00
Attribute Number- Match Count	08

*3F = Address 63, modify as required

Read Package Counters Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
Data (LSB)	00
Data	00
Data	00
Data (MSB)	00

Reset Match Counters Command

Packet Contents	Data Sent
Response Codes	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	06
Get Attribute Single Request	10
Class	CE
Instance Number (LSB)	00
Instance Number (MSB)	00
Attribute Number- Reset Counters	0B
Data	01

*3F = Address 63, modify as required

Reset Match Counters Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90

Read Message Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	05
Get Attribute Single Request	0E
Class	CC
Instance Number (LSB)	00
Instance Number (MSB)	00
Attribute Number - Message	14

*3F = Address 63, modify as required

Read LED Status Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	04
Read LED Status Request	43
Class	CB
Instance Number (LSB)	01
Instance Number (MSB)	00

*3F = Address 63, modify as required

Set Output Timer Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	07
Set Attribute Single Request	10
Class	D0
Instance Number (LSB)	02
Instance Number (MSB)	00
Attribute Number - Max Time	09
Data (LSB)	FA
Data (MSB)	00

*3F = Address 63, modify as required

** Time in milliseconds

Read Message Response

Packet Contents	Response
DeviceNet Address	3F*
Set Attribute Single Response	90
String Length (LSB)	04
String Length (MSB)	00
ASCII Message Data	30**
ASCII Message Data	32
ASCII Message Data	30
ASCII Message Data	30

*3F = Address 63, modify as required

** Example data = 0200

Read LED Status Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
I/O 1	See Table Next Page
I/O 2	See Table Next Page
Trigger / Read	See Table Next Page
On Symbol	See Table Next Page
Laser On	See Table Next Page
Module	See Table Next Page
Network	See Table Next Page

Set Match Code Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	0B
Set Attribute Single Request	10
Class	CE
Instance Number (LSB)	01
Instance Number (MSB)	00
Attribute Number	03
String Length (LSB)	04
String Length (MSB)	00
ASCII Character 0	30**
ASCII Character 3	33
ASCII Character 0	30
ASCII Character 0	30

*3F = Address 63, modify as required

** Example data = 0300

Set Match Code Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Response	90

LED Status Response

Byte	Bits	LED Indicator	Data at Indicated Bit Address = LED State							
			0 = Off	1 = Yellow	2 = Green	3 = Red	4 = Not Used	5 = Flash Yellow	6 = Flash Green	7 = Flash Red
0	0-2	I/O 1	OFF	ON						
	3-5	I/O 2	OFF	ON						
1	0-2	TRIGGER / READ	No Trigger	Triggered	Valid Read					
	3-5	ON SYMBOL	Not Reading	Reading				Read <100%		
2	0-2	LASER ON	OFF	ON						
	3-5	MODULE	No Power		Device OK	Hardware Fault			Power Up	Minor Fault
3	0-2	NETWORK			DeviceNet OK	DeviceNet Fault			Established	No Response
	3-5									

Chapter 11 – Communicating with a PLC-5® Processor on a DeviceNet Network

The AdaptaScan operates in either Polled or Change of State modes for version 11.x or higher. Under **To Configure the 1771-SDN DeviceNet Scanner**, the sequence is:

8. For the AdaptaScan to operate in Polled mode, edit the following parameters in the Edit Device I/O Parameters dialog:
 - Under Polled, check the enable box. Change of State/Cyclic Enable box should not be checked.
 - In the Poll Rx Size box, type **8** (Bytes).
 - In the Poll Tx Size box, type **1** (Bytes).
 - From the Poll Rate list box, select **Every Scan**.

The dialog should look like this:



For the AdaptaScan to operate in Change of State mode:

- Under **Change of State/Cyclic**, check the enable box. Polled Enabled should not be checked.
- Select **Change of State**
- Change the Poll Size Rx box to **8** (Bytes).
- Change the Poll Size Tx box to **1** (Bytes).

Continue with the remaining steps of the section to configure the 1771-SDN DeviceNet scanner.

Chapter 12 – Communicating with a PLC-5 Processor on a DeviceNet Network using Explicit Messaging

Explicit messaging for AdaptaScan using firmware version 11.x has changed. The data packet from the PLC (or SLC) has an additional word which must be included.

Under **Overview**, the AdaptaScan bar code reader is on node 10, not node 3.

Under **Define the DeviceNet Address**, the address is 10, not 3.

Refer to **Explicit Message Program Control Limitations** to find the explanation of the Service Name, Service Code, and Example.

Under **Example Data Tables**, response file should be:

Address	Response File (good response)		
N25:0	0101	000C	900C

Also, the explicit message is written in the N20:0 integer address.

Address	Data = Hex Code (matchcode download of 0300 data)											
N20:0	0101	0012	100A	000F	0001	0001	100B	01CE	0300	0004	3330	3030

(0300 = Byte swap only for the data 33303030.)

Under **Notes on using Explicit Messaging**, explicit messaging must always start at word 64 if using an PLC processor (SLC on word 224).

The table below provides the data packets and their descriptions.

Packet	Description
01	TXID. The reader uses this value to track the transaction to completion and returns the value to with the response that matches the request downloaded by the processor.
01	CMD/Status. For each download, you assign a command code to instruct the reader how to administer the request.
00	Port. The DeviceNet port where the transaction is routed.
12	Size. The size of the transaction body in bytes (0CH=12 bytes). The transaction body can be as many as 29 words (58 bytes) in length. If the size exceeds 29 words, an error code will be returned.
10	Service. For each explicit message request and response, the service attribute contains the service request and response codes that match the corresponding request for the TXID.
0A	Mac ID (node address). The DeviceNet network allows a node range of 0–63.
00	Parameter Class
0F	Parameter Class
00	Instance Number (MSB)
01	Instance Number (LSB)
00	Attribute (MSB)
01	Attribute (LSB)
10	Set Attribute Single Request (MSB)
0B	Length [The byte size count begins the Set Attributes Single request (MSB)]
10	Set Attribute Single Request (MSB)
CE (206)	Class (MSB)
03	Attribute Number – Rule (MSB)
00	Instance Number (LSB)
00	Length of String (MSB)
04	Length of String (LSB) being downloaded.
33	ASCII 33
30	ASCII 30
30	ASCII 30
30	ASCII 30

The response of the 0101 900C response code is 90 for successful and 94 for fail.

A response code will not be sent out. Once the download is complete the LEDs on the AdaptaScan will turn off and on, indicating a reset was performed. After the Execute this Transaction Block CMD Status (01) is sent, use a Reset all Client/Server Transaction Command Code (03) to perform the next download transaction.

Under **Downloading Other Host Commands**, the tables are:

Read Performance Indicator Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	04
Get Performance Request	4C
Class	C8
Instance Number (LSB)	01
Instance Number (MSB)	00

*3F = Address 63, modify as required

Read Performance Indicator Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
Data (LSB)	01
Data (MSB)	00

Reset Package Counter Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	06
Class	D2
Set Attribute Single Request	10
Instance Number (LSB)	00
Instance Number (MSB)	00
Attribute Number- Reset Counters	09
Data	01

*3F = Address 63, modify as required

Reset Package Counter Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90

Read Match Counters Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	05
Get Attribute Single Request	0E
Class	CE
Instance Number (LSB)	01
Instance Number (MSB)	00
Attribute Number	08

*3F = Address 63, modify as required

Read Package Counters Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	05
Get Attribute Single Request	0E
Class	D2
Instance Number (LSB)	01
Instance Number (MSB)	00
Attribute Number- Match Count	08

*3F = Address 63, modify as required

Reset Match Counters Command

Packet Contents	Data Sent
Response Codes	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	06
Get Attribute Single Request	10
Class	CE
Instance Number (LSB)	00
Instance Number (MSB)	00
Attribute Number- Reset Counters	0B
Data	01

*3F = Address 63, modify as required

Read Match Counters Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
Data (LSB)	00
Data	00
Data	00
Data (MSB)	00

Read Package Counters Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
Data (LSB)	00
Data	00
Data	00
Data (MSB)	00

Reset Match Counters Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90

Read Message Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	05
Get Attribute Single Request	0E
Class	CC
Instance Number (LSB)	00
Instance Number (MSB)	00
Attribute Number - Message	14

*3F = Address 63, modify as required

Read LED Status Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	04
Read LEDS Request	43
Class	CB
Instance Number (LSB)	01
Instance Number (MSB)	00

*3F = Address 63, modify as required

Set Output Timer Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	07
Set Attribute Single Request	10
Class	D0
Instance Number (LSB)	02
Instance Number (MSB)	00
Attribute Number - Max Time	09
Data (LSB)	FA
Data (MSB)	00

*3F = Address 63, modify as required

** Time in milliseconds

Read Message Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
String Length (LSB)	04
String Length (MSB)	00
ASCII Message Data	30*
ASCII Message Data	32
ASCII Message Data	30
ASCII Message Data	30

* Example data = 0200

Read LED Status Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Single Response	90
I/O 1	See Table Next Page
I/O 2	See Table Next Page
Trigger / Read	See Table Next Page
On Symbol	See Table Next Page
Laser On	See Table Next Page
Module	See Table Next Page
Network	See Table Next Page

Set Match Code Command

Packet Contents	Data Sent
DeviceNet Address	3F*
Set Attribute Single Request	10
Parameter Class	0F
Instance	01
Attribute	01
Length	0B
Set Attribute Single Request	10
Class	CE
Instance Number (LSB)	01
Instance Number (MSB)	00
Attribute Number	03
String Length (LSB)	04
String Length (MSB)	00
ASCII Character 0	30**
ASCII Character 3	33
ASCII Character 0	30
ASCII Character 0	30

*3F = Address 63, modify as required

** Example data = 0300

Set Match Code Response

Packet Contents	Response
DeviceNet Address	3F
Set Attribute Response	90

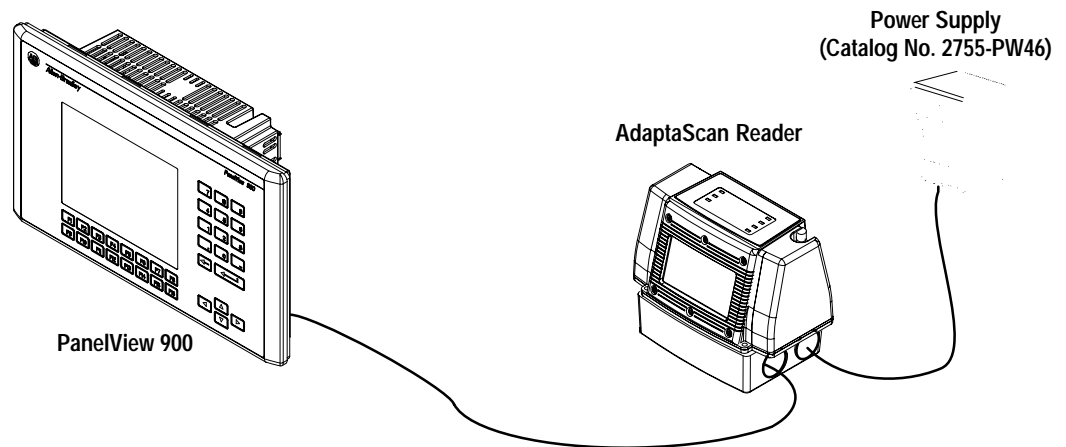
LED Status Response

Byte	Bits	LED Indicator	Data at Indicated Bit Address = LED State							
			0 = Off	1 = Yellow	2 = Green	3 = Red	4 = Not Used	5 = Flash Yellow	6 = Flash Green	7 = Flash Red
0	0-2	I/O 1	OFF	ON						
	3-5	I/O 2	OFF	ON						
1	0-2	TRIGGER / READ	No Trigger	Triggered	Valid Read					
	3-5	ON SYMBOL	Not Reading	Reading				Read <100%		
2	0-2	LASER ON	OFF	ON						
	3-5	MODULE	No Power		Device OK	Hardware Fault			Power Up	Minor Fault
3	0-2	NETWORK			DeviceNet OK	DeviceNet Fault			Established	No Response
	3-5									

Chapter 17 – Communicating with PanelView 900™ Terminals on a DeviceNet Network

Under **AdaptaScan Application**, the sections are:

This application provides an example of using explicit-client messages to monitor decoded bar code data and change attributes of an AdaptaScan Bar Code Reader. The AdaptaScan is connected directly to the PanelView™.



The DeviceNet network must be supplied with power. In this application, you can use the AdaptaScan power supply (Catalog No. 2755-PW46). The power supplies used with DeviceNet are sized to the number of devices and DeviceNet cable lengths. Review your DeviceNet literature for DeviceNet network configuration data.

Note: AdaptaScan software version 11.x or later with reader firmware 11.x or later is required to run this application.

Connections

The PanelView connects directly to the DeviceNet terminal block in the AdaptaScan wiring base. Refer to Publication No. 2755-837 for DeviceNet and power supply connections.

PanelView Screen

The following shows how the PanelView screen appears in PanelBuilder™ (Catalog No. 2711-ND3). You will need to create this screen for your application.



In this application, the PanelView terminal:

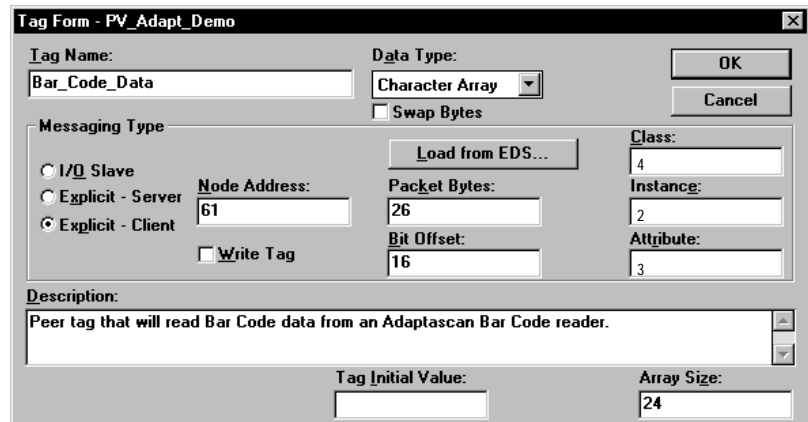
- displays decoded bar code data and package count from the AdaptaScan Reader
- resets the package count

Read Bar Code Data and Package Count Tag Configuration

The dialog box for the bar code display object is shown below. The display is configured as an ASCII string with an embedded variable (bar code data) and package count. The Field Width is set to 24 characters and is based on the expected maximum bar code data length in characters plus 10 character package count. The tag name is Bar_Code_Data.



By selecting the Edit Tag option, you can edit the tag data as shown below.



The tag data type is “Character Array”. It is an explicit-client read message with the Class, Instance and Attribute values as shown. To read bar code data and package count, the bit offset must be set to 16. The offset is necessary since the first two bytes represent the length of the requested data.

AdaptaScan Configuration

The AdaptaScan Reader must be configured to make data available for the PanelView terminal. You must configure the AdaptaScan Reader for the bar code symbology being read, the number of bar codes, scan pattern and triggering as you would for any other application. Refer to Publication No. 2755-838 for information regarding the basic set up of the AdaptaScan Bar Code Reader. The following sections only provide the information necessary to make the data available for the PanelView terminal.

Making Bar Code Data Available

To make the bar code data available on DeviceNet, the AdaptaScan Bar Code Reader must be configured to make the data available. The two dialog screens shown below set up a message field that contains the bar code data. See Publication No. 2755-838. The fields containing Symbol 1, Symbol 2, Symbol 3, define three bar code types configured for the AdaptaScan Reader.



Making Package Counter Data Available

Package counter data must be made available to the PanelView terminal by setting up an unconditional match in the AdaptaScan Bar Code Reader. The figure below shows the two dialog boxes that need to be modified.

The screenshot shows the "Message Format" dialog box with the following settings:

- Header:** [Empty text box]
- Source ID:** [Empty text box]
- Trailer:** [Empty text box]
- Swap and Pad:**
- Field Delimiter:** [44] (0-255, 44)
 Disable
- Message Destination:**
 - DeviceNet
 - Handshaking
 - Serial Port
 - Device: [Bar Code Reader11]
- Include:**
 - Field Data
 - Scan Count
 - Counter:**
 - Include
 - Device: [Bar Code Reader10]
 - Counter: [Package 1]

Current Message Size: 12

Chapter 18 – Using DH485 in Slave Mode with an SLC 5/03 or SLC 5/04™ Controller

This application describes how to set up the AdaptaScan bar code reader from an SLC 5/03 or SLC 5/04 controller using DH485 protocol in slave mode.

DH485 Master is used for bar code data traveling at medium or slow speeds. Data is sent to the SLC 5/03 or SLC 5/04 controller whether it was requested or not by the SLC 5/03 or SLC 5/04 controller.

DH485 Slave is used for bar code data traveling at high speeds. The SLC 5/03 or SLC 5/04 controller initiates the request for bar code data.

Refer to chapter 3 for a listing of additional host commands and response codes.

Hardware Requirements

The hardware items required for this application are:

- 2755-SN3, -SN5, or -SN8 AdaptaScan Bar Code Reader
- 2755-PW46 or -PW47 Power Supply
- 2755-NC43 or -NC48 Configuration Cable
- 2755-NB40 or -NB41 Wiring Base (Ser. A/Rev. B or higher)
- 1747-L532, -L541, -L542, or -L543 SLC Processor
- 1746-A4, -A7, -10, or -A13 Chassis
- 1746-P3 Power Supply
- 1747-CP3 RS-232 Programming Cable
- 1747-AIC Isolated Link Coupler or 1761-NET-AIC Advanced Interface Converter
- 1747-PIC RS-232/DH-485 Converter
- Computer running Windows 3.1 (or later) or Windows 95™
- 9-to-25 Pin Adapter (for computers with a 25-pin COM port)

Software Requirements

The software requirements for this application are:

- 2755-ASN AdaptaScan Offline Programming Software
- 9323-PA2E Advanced Programming Software. (The original ICOM SLC software is not compatible with this AdaptaScan network.)

Related Publications

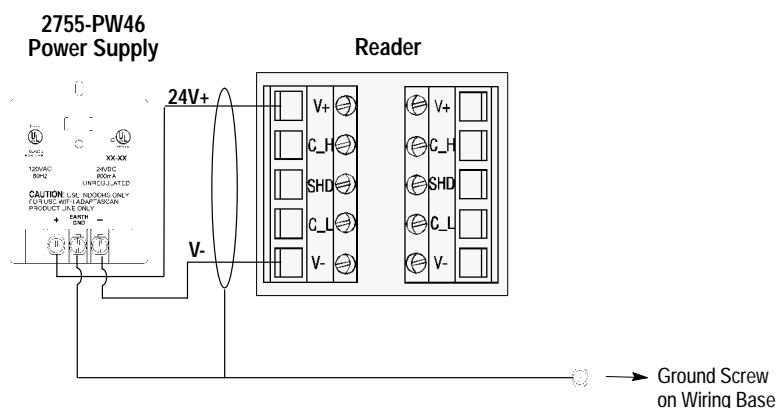
Related publications include:

Publication	Description
2755-837	AdaptaScan Bar Code Readers User Manual
2755-838	AdaptaScan Software User Manual
1747-6.2	SLC 500™ Modular Hardware Style Installation and Operation Manual
9399-APSUM-11.15.95	Advanced Programming Software User Manual

Connecting a Power Supply to the Reader

The following illustration shows how to connect a 2755-PW46 or -PW47 power supply to a single bar code reader.

Use a shielded cable (Belden 9316 recommended) to make the connections. Connect the shield to the ground screw on the reader's wiring base.



Connecting to the DH-485 Network

The wiring base of the AdaptaScan Reader has an RS-485/RS-422 terminal block for point-to-point or network connections.

This section shows three connection options:

- Connecting readers to SLC 5/03
- Connecting readers to SLC 5/04 using two 1747-AIC Modules
- Connecting readers to SLC 5/04 using one 1747-AIC Module

Note: You can use the 1761-NET-AIC Advanced Interface Converter in place of the 1747-AIC Module.

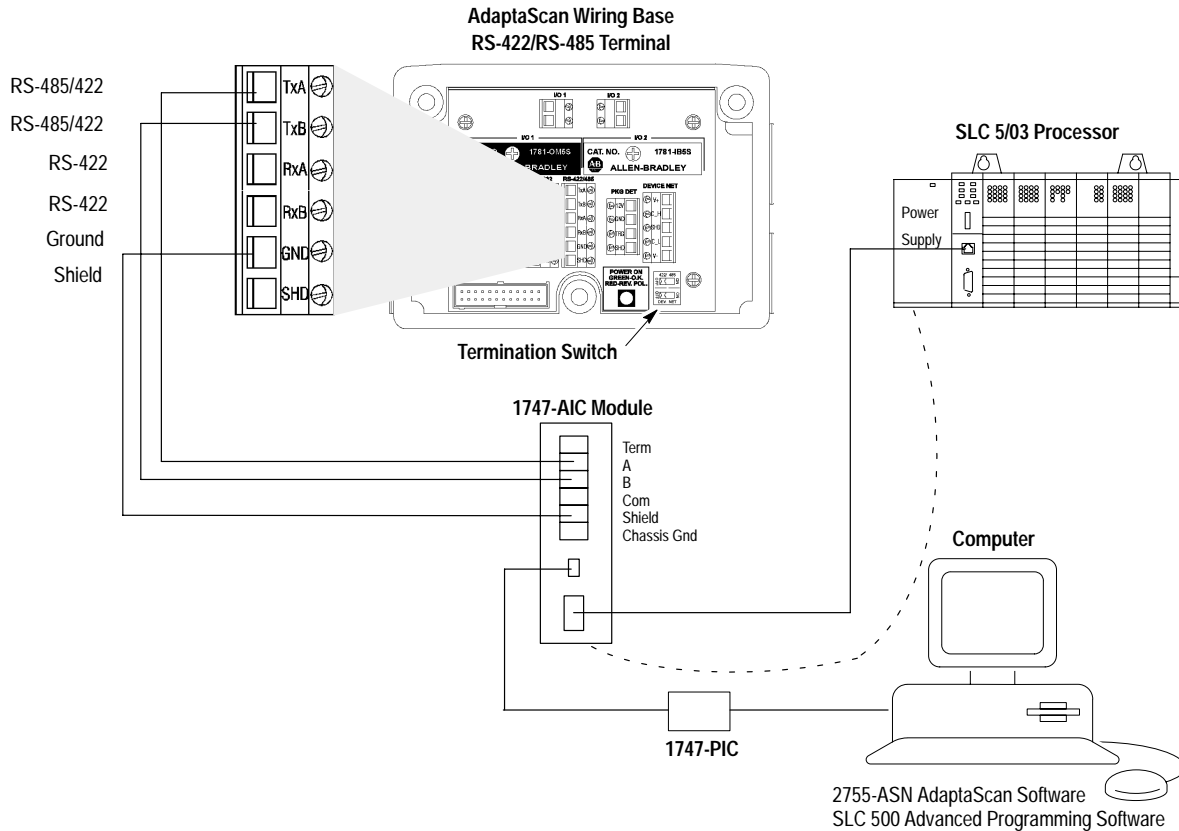
Important: The DH485 network cable requires proper shielding, grounding and termination. Refer to Data Highway/Data Highway Plus™/Data Highway DH485 Cable Installation Manual (Publication 1770-6.2.2).

Important: When setting up a DH-485 network using an AdaptaScan, make sure that the nodes on the network are in sequential order. The SLC 5/03 or 5/04 should be Node 1, and AdaptaScan should be Node 2, and each node after that should be 3, 4, and so forth. If other DH-485 nodes are needed (i.e. DTAM, etc...), the AdaptaScan node number(s) must be first. Node gaps must be avoided in order to prevent the AdaptaScan from Soliciting of Successor (SOS). By preventing SOS, bar code throughput is maximized as it is sent to the SLC. In other words, when setting up the AdaptaScan via DH-485 the first priority is to process bar code data instead of finding node gaps.

Connecting Readers to SLC 5/03 Controller

You must use a link coupler if the distance between the reader and the SLC is greater than 15.2 meters (50 feet). The reader can connect directly to another RS-485/RS-422 device. Point-to-point and network connections are the same.

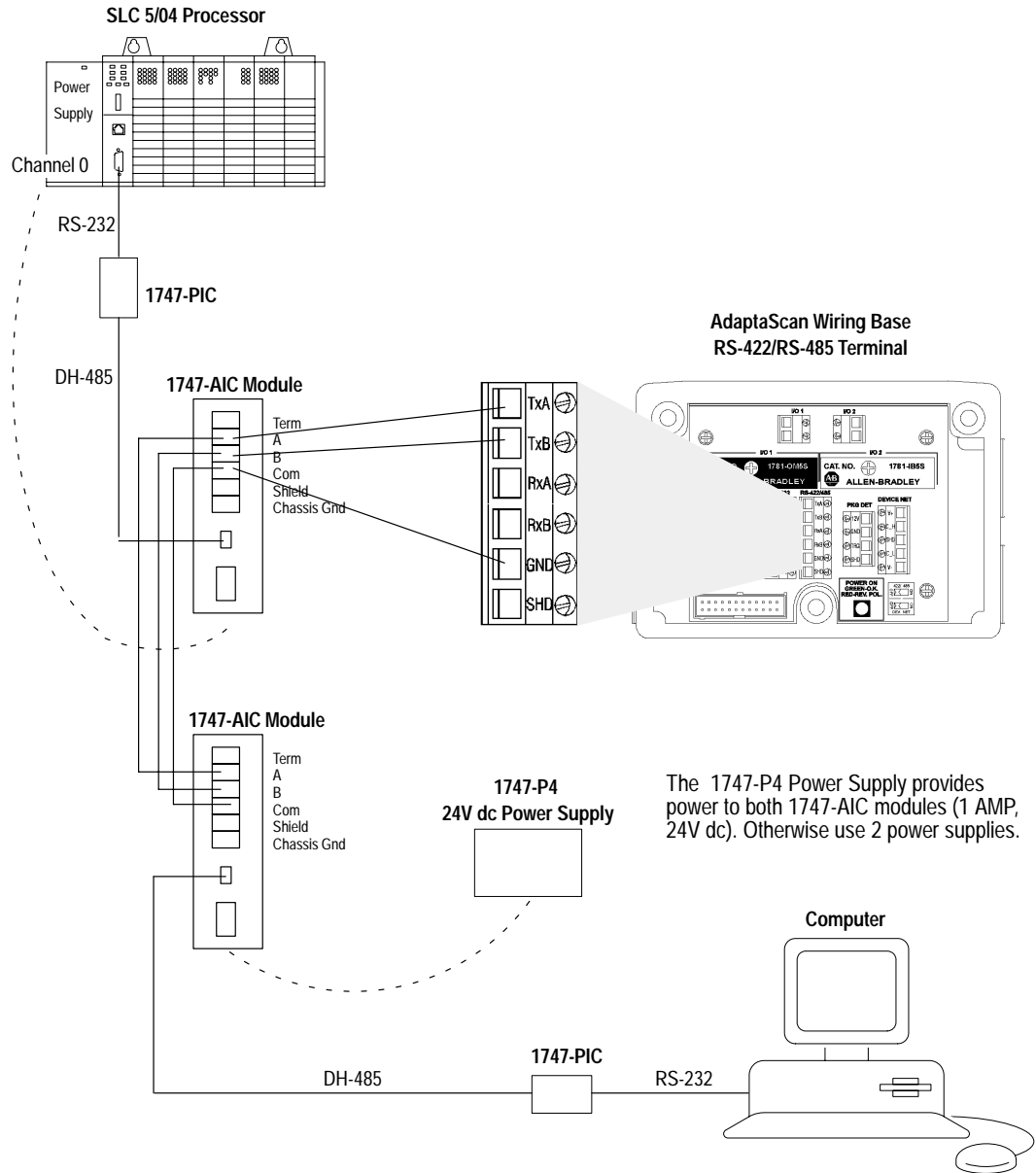
The end devices on the DH-485 network must be terminated. The wiring base of the AdaptaScan Reader provides a termination switch.



Connecting Readers to SLC 5/04 Controller – 2 AIC Modules

The SLC 5/04 controller requires two 1747-PIC converters and a power supply to connect to the second 1747-AIC module.

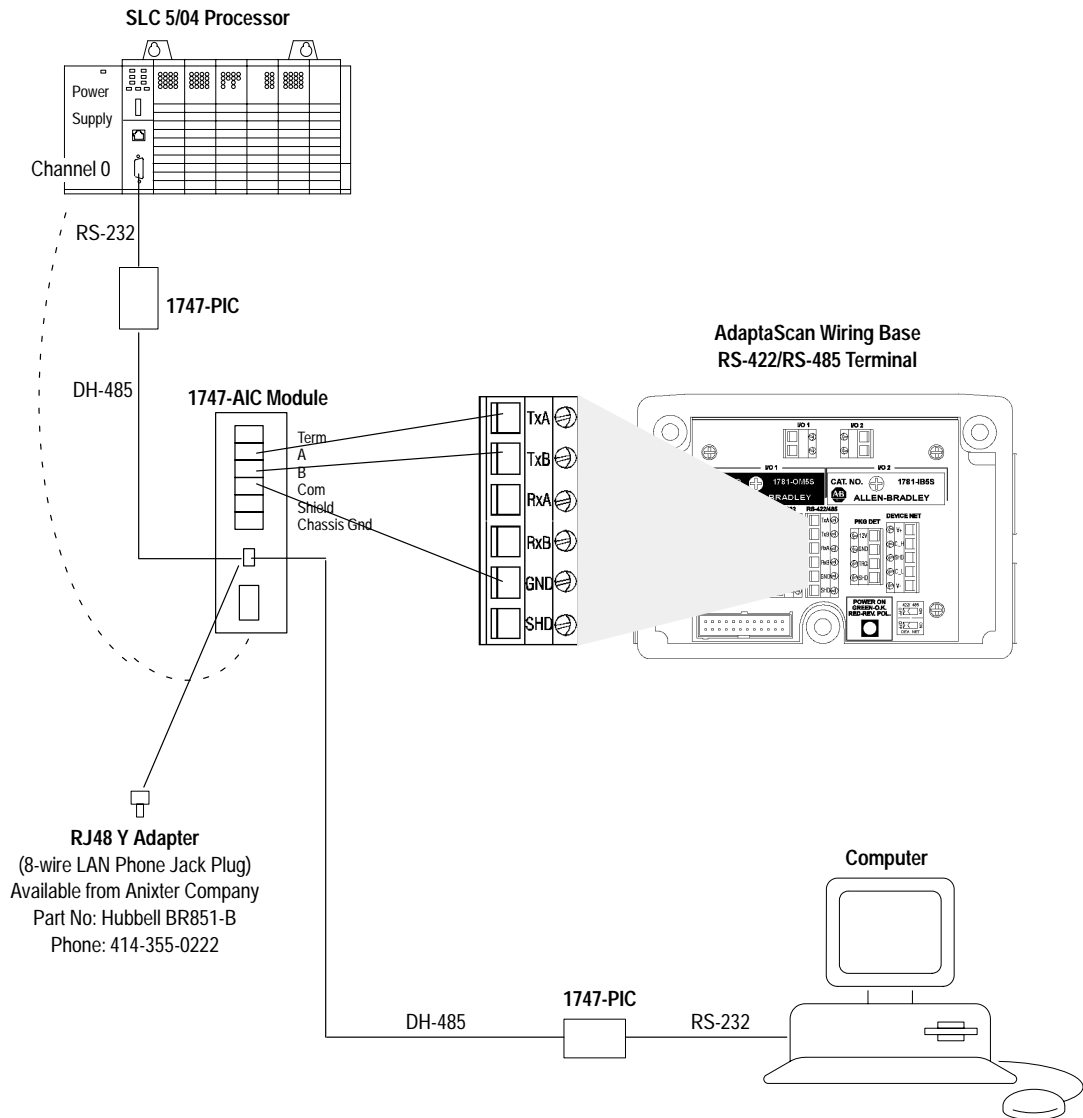
The end devices on a DH-485 network must be terminated. The wiring base of the AdaptaScan Reader provides a termination switch.



Connecting Readers to SLC 5/04 Controller – 1 AIC Module

The SLC 5/04 controller requires two 1747-PIC converters. However, you can use an RJ48 Y adapter (8-wire LAN phone jack plug) to connect the two 1747-PIC modules. The RJ48 Y adapter is a modular adapter for 4-pair cable which parallels two 4-pair jacks and one 4-pair modular plug. This adapter eliminates the second 1747-AIC module shown in the previous SLC 5/04 network diagram.

The end devices on a DH-485 network must be terminated. The wiring base of the AdaptaScan Reader provides a termination switch.



Configuring Bar Code Reader 1

This section shows how to configure one the AdaptaScan Bar Code Readers using the AdaptaScan Software (Catalog No. 2755-ASN).

The procedures in this section show how to:

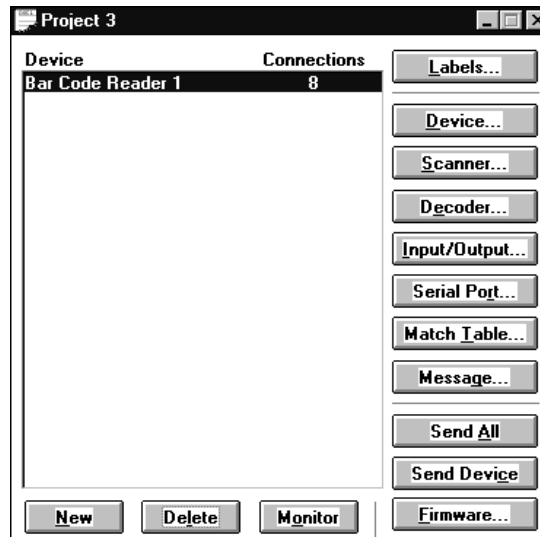
- configure a bar code label and symbol
- define the DeviceNet node address of the AdaptaScan Reader
- configure the scanner
- configure the decoder trigger
- configure the serial port
- configure the format of messages and the message destination

The steps may vary for some procedures because of the different requirements of applications. For example, the bar code labels may vary from one application to the next.

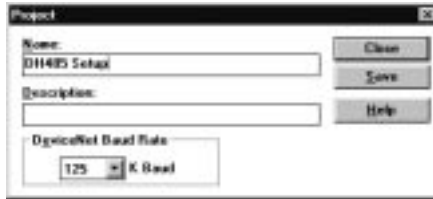
Create a New Project

Create a new project named DH485 Setup for the AdaptaScan Bar Code Readers.

1. Choose New from the Project menu to create a new project.
2. Click the New button to add a bar code reader (Bar Code Reader 1) to the project.



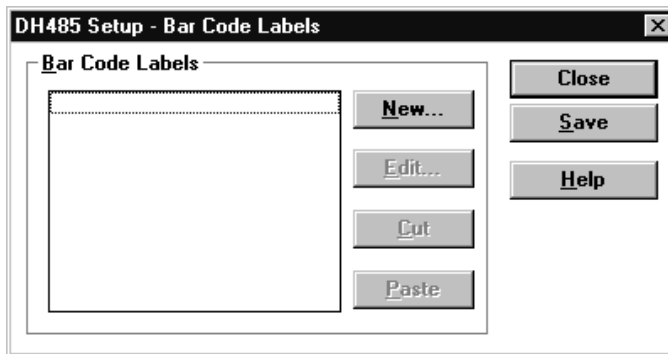
3. Choose Edit from the Project menu to rename the project **DH485 Setup**.



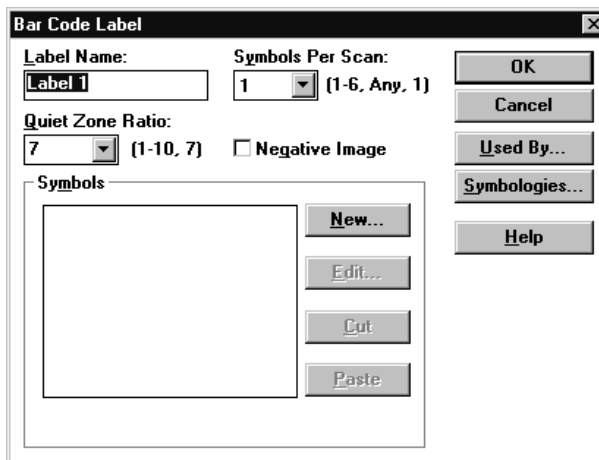
4. Click Save to save the project under the new name and then Close to return to the Project dialog.

Define the Bar Code Label

1. Click the Label button to open the Bar Code Labels dialog.



2. Click the New button to add a label to open the Bar Code Label dialog.



3. Click the New button to add a symbol.

4. Select a symbology and any other parameters (Identifier, Lengths) required by your application.

Bar Code Label Symbol

Name:

Symbology:

Identifier: Include Identifier

Lengths

	From:	Through:	
<input type="checkbox"/> Length 1	<input type="text" value="1"/>	<input type="text" value="64"/>	(1-64)
<input type="checkbox"/> Length 2	<input type="text" value="1"/>	<input type="text" value="64"/>	(1-64)
<input type="checkbox"/> Length 3	<input type="text" value="1"/>	<input type="text" value="64"/>	(1-64)

5. Click OK to return to the main Project dialog.

Define the DeviceNet Address

1. Click the Device button to open the Device dialog.

DH485 Setup - Bar Code Reader 1 - Device

Name:

Description:

DeviceNet Address:

The Baud Rate is 125 K Baud.

2. Select a DeviceNet address.

Note: The DeviceNet address is not always the same as the DH-485 node address. A DH-485 node address is assigned later.

3. Connect the 2755-NC43 or -NC48 cable to the reader.
4. Click the Apply button.
5. Click Save and Close to return to the Project dialog.

Configure the Scanner

1. Click the Scanner button on the Project dialog to open the Scanner dialog.



2. Configure the scan pattern and use the Focus procedure for optimum scanner focus. Use the Apply button to send the scanner configuration to the AdaptaScan.
3. Click the Close button and return to the Project dialog.

Configure the Decoder Trigger

This application uses a Timer to trigger the reader's decoder. The Timer is typically used during application setup. Refer to Publication 2755-837 for other input sources that trigger the decoder.

1. Click the Decoder button from the main Project dialog.
2. Under Triggered By, select **Timer** from the Input list.



3. Click Save and Close to return to the main Project dialog.

Configure the Serial Port

1. Click the Serial Port button from the Project dialog.

The screenshot shows the 'DH485 Setup - Bar Code Reader 1 - Serial Port' dialog box. It contains the following fields and controls:

- Protocol:** A dropdown menu currently showing 'Terminal' with an 'Edit...' button below it.
- Baud Rate:** A dropdown menu showing '9,600'.
- Maximum Length:** A text input field with '0' and a range '(0-1536, 0)'.
- Buttons:** 'Close', 'Save', 'Used By...', and 'Help'.
- Scanner Protocol:** An unchecked checkbox.
- Parity:** Radio buttons for 'None' (selected), 'Odd', and 'Even'.
- Data Bits:** Radio buttons for '7' and '8' (selected).
- Stop Bits:** Radio buttons for '1' (selected) and '2'.
- Connection:** A dropdown menu showing 'RS232'.
- Message Buffer:**
 - Enable Warning
 - Warning At:** Text input field with '56'.
 - Buffer Size:** Text input field with '64'.
 - Device:** A dropdown menu.
 - Output:** A dropdown menu.
- Enable Pass-Through to DeviceNet:** An unchecked checkbox.

2. Set the parameters as follows:

- From the Protocol list box, select **DH-485**
- From the Baud Rate list box, select **19,200**
- From the Connection list box, select **RS485**

The Serial Port must match the host configuration.

3. Click the Edit button to select DH485 Slave Mode.

DH485 Slave Mode

1. Click the Protocol Edit button in the Serial Port dialog.

DH-485

Node: 31 (0-31)

Maximum Node: 31 (0-31)

Destination

Node: 0 (0-31) N9:Offset: 100 (0-32765, 100)

Master/Slave

Slave Master

PCCC Enabled

OK

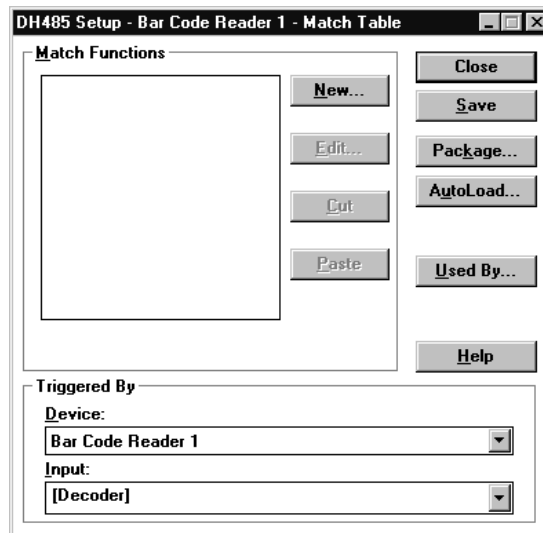
Cancel

Help

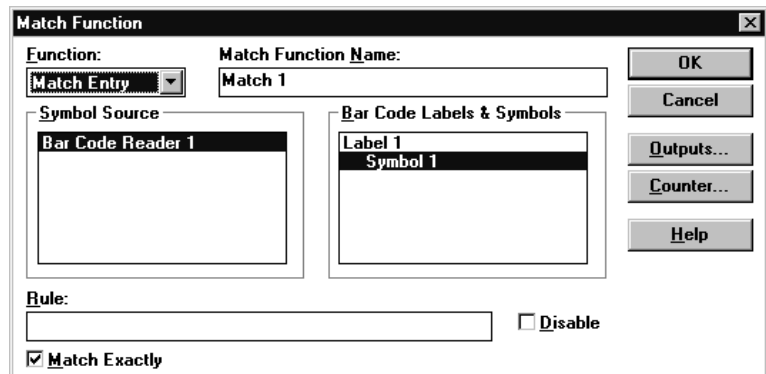
2. Edit the parameters as follows:
 - Click the PCCC Enabled box
 - From the Master/Slave box, select **Slave**
 - From the Node box, select **2**
This is the DH485 node address.
3. Click OK to return to the main Serial Port dialog.
4. Click Save and Close to return to the main Project dialog.

Configure for Match Codes

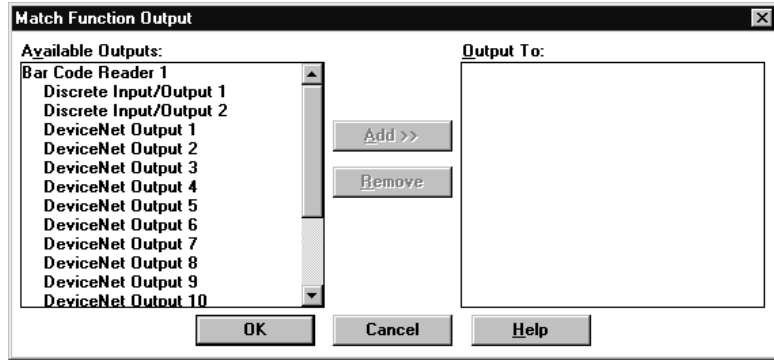
1. Click the Match Table button to open the Match Table dialog.



2. Click the New button to open the Match Function dialog and create a Match Function.



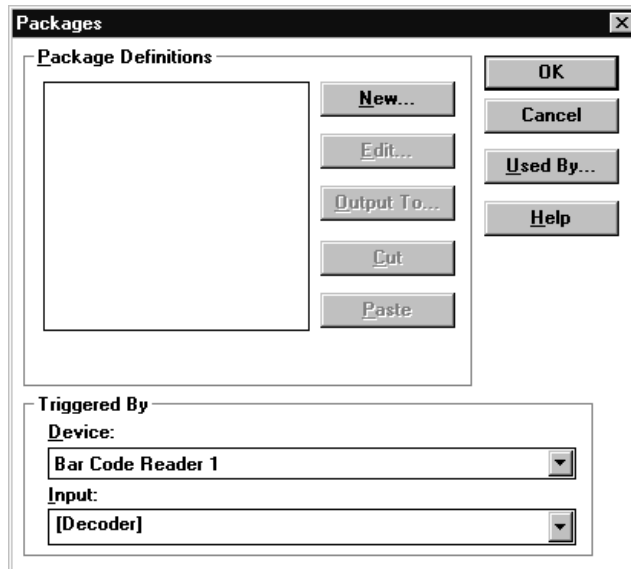
3. Under Function, select **Match Entry**.
Match Entry specifies that a match occurs whenever decoded bar code data matches the Rule: entry.
4. Under Symbol Source, select **Bar Code Reader 1**.
5. Under Bar Code Labels and Symbols, select **Symbol 1**.
6. Click the Match Exactly box.
Match Exactly specifies that ASCII characters are matched instead of a metacharacter rule.
7. Click the Outputs button to specify which output activates when a match occurs.



8. Under Available Outputs, select **Discrete Input/Output 1**.
9. Click the Add>> button to add this selection to the Output To: area.
10. Click OK to return to the main Match Table dialog.

Configure for a Package

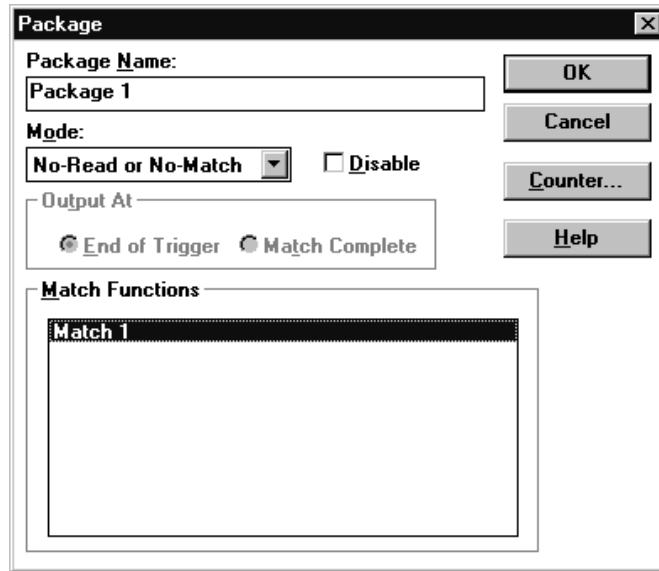
1. Click the Package button to open the Package dialog.



2. Click the new button to create a Package.
3. Under Mode, select **No-Read or No-Match**.

This mode is used to determine when a label is not read or does not match the rule defined in the Match function.

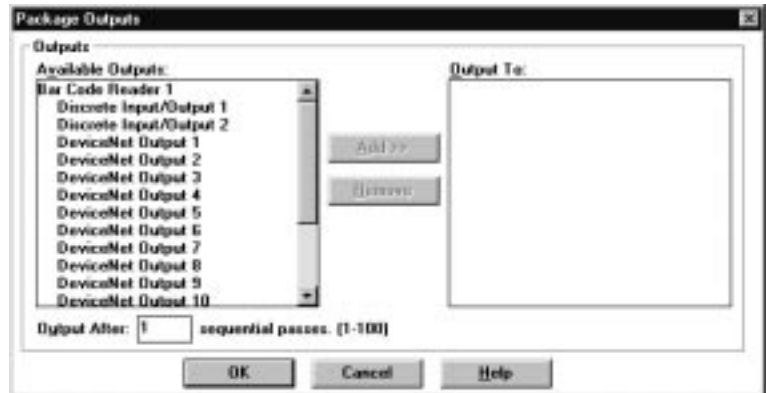
4. Highlight Match 1 to enable the Match function.



5. Click OK to return to the main Package dialog.

Configure for an Output

1. Click the Output To button to specify which output activates when a No-Read or No-Match occurs.



2. Under available Outputs, select **Discrete Input/Output 2**.
3. Click the Add>> button to add this selection to the Output To: area.
4. Click OK to return to the main Match Table dialog.
5. Click Save and Close to return to the Project dialog.

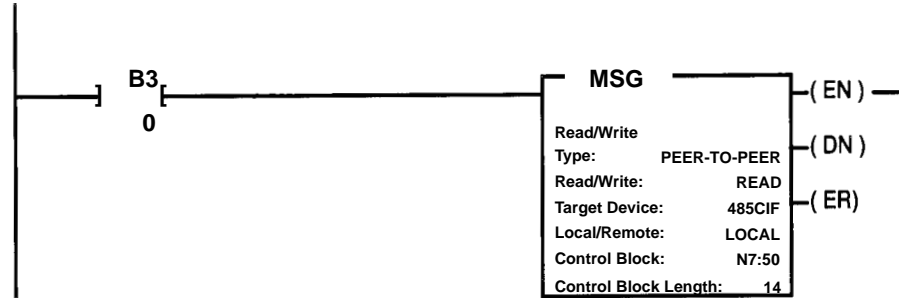
Sending the Configuration to the Reader

From the main Project dialog, click the Download Device button to download the configuration to the bar code reader.

SLC Ladder Logic

This section describes how to view match codes in Slave Mode via ladder logic.

Use the following SLC ladder logic for DH485 Slave Mode if the AdaptaScan I/O LEDs cannot be used for viewing.



Note: You can only initiate one read or one write at a time. Reads and writes should never be initiated at the same time.

Message Instruction Configuration

For the Message Instruction, the configuration is listed in the table below.

Parameter	Configuration
Type	Peer-to-Peer
Read/Write	Read
Target Device	485CIF
Local/Remote	Local
Control Block	N7:50
Channel	0
Target Node	2
Destination File Access	N7:80
Target Offset	255 (Change 255 to 256 or 100H in the third word of the Control Block. An offset greater than 255 tells the MSG instruction that the SLC controller is talking to a bar code device.)
Message Length in Elements	2
Message Timeout (seconds)	0

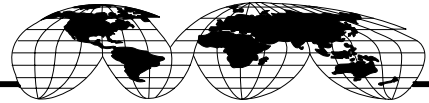
Notes

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