



AdaptaScan Reader to a PLC-5 Using DH-485 Protocol with the 2760-RB Module and the 2760-SFC2 Protocol Cartridge

Overview

The AdaptaScan-SN3, -SN5 or -SN8 bar code reader may be configured to communicate with the 2760-RB interface module via DH485 protocol, using the 2760-SFC2 protocol cartridge.

This document includes cable diagrams and configuration information for the AdaptaScan readers. It also includes an example PLC-5 program which is needed to establish communication from the PLC to the 2760-RB.

Hardware Requirements

The following Allen-Bradley *hardware* is needed to use the procedure described in this application note:

- 2755-SN3, -SN5, or -SN8 AdaptaScan™ reader and related manuals.
- 2760-RB interface module in a 1771 rack with a PLC-5® processor
- 2760-SFC2 protocol cartridge
- Personal computer or VT 100 type terminal to configure the 2760-RB
- Appropriate cables to program the PLC-5 and to configure the 2760-RB interface module and the AdaptaScan reader. Refer to hardware manuals for cable requirements.
- Catalog Number 1784-KT or equivalent card installed in the computer to enable you to program the PLC-5.

Software Requirements

The following Allen-Bradley *software* is needed to use the procedure described in this application note:

- Bulletin 6200 development software for the PLC-5, to run in the personal computer
- Terminal Emulation software for a personal computer, to configure the 2760-RB
- 2755-ASN Windows-Based Offline Program Software to configure the AdaptaScan reader

Related Publications

This document refers to the following publications, which should be available for reference while working through this application note:

Publication Number	Title
1785-XXX	User Manual for your PLC-5
6200-XXX	Programming Manual for your PLC-5
2755-837	AdaptaScan Bar Code Readers Installation Manual
2755-838	AdaptaScan Configuration Software User Manual
2760-ND001	2760-RB User Manual
2760-2.19	2760-SFC2 Protocol Cartridge Manual

PLC 5 Compatibility

Use the following table as a configuration guideline when using the examples shown in this document.

2760-RB In Use	PLC-5, -15, -25, etc.	New Generation PLC-5 (Series A, Rev. C or above only)
Series A, Rev. G or below	Follow example PLC program as shown on page 9.	Set BT Compatibility Bit S26/4 while in program mode. Use example PLC program shown on page 9.
Series A, Rev H or Above		Add ladder logic using IIN update of RB. BTR must be before 'BTW. Refer to page 10.

Configuration

The 2760-RB configuration example includes sample configuration screens and DIP switch settings needed to establish communication with the AdaptaScan reader via RS-232. Other 2760-RB configuration features not used here are also available. See Publication 2760-ND001.

PLC-5 processor DIP switches

Switch #	1	2	3	4	5	6	7	8
SW-1	on	on	on	on	on	on	on	off
SW-2	off	on	on	on	on	on	on	off
SW-3	on	on	off	off				

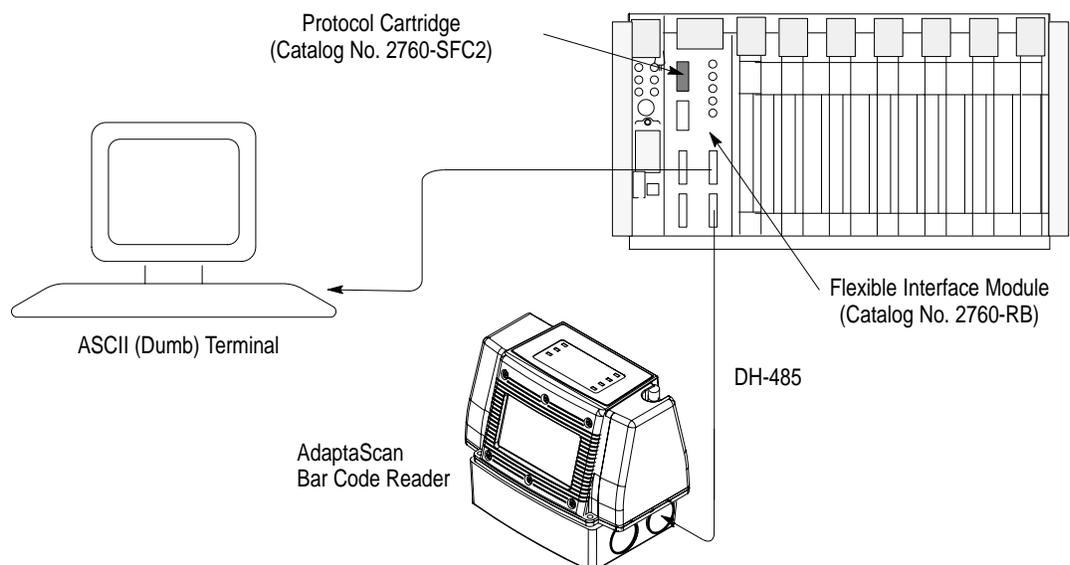
I/O chassis backplane DIP switches

	1	2	3	4	5	6	7	8
	off	off	off	off	off	on	off	off

2760-RB module DIP switches

Switch #	1	2	3	4	5	6	7	8
SW-1	off							
SW-2	off							
SW-3	off	off	off	off				
SW-4	off	off	on	off				

The 2760-RB module is placed in the 1771 chassis in slot 0 next to the PLC. For this application, note that the AdaptaScan reader communicates through port 1 on the 2760-RB. A 1771-ASB module can also be used to communicate with the 2760-RB module over the chassis back plane to Remote I/O.



Configuring the 2760-RB

1. Set all 2760-RB module DIP switches to Off.
2. Connect the smart cable to the Configuration port of the 2760-RB and the serial port of the computer.
3. Use the Terminal Emulator to send a “break sequence” to the 2760-RB:
 - A. Set the baud rate to 9600, 8 data bits, 1 stop bit, no parity, no flow control, and either COM1 or COM2 depending on the smart cable connection.
 - B. Program a function key to send the “break sequence” by using the ^\$B command.
 - C. Send the break sequence to call up the 2760-RB configuration menu.
4. Select menu item 3: Device port protocol names. Set to:
 PORT1=COPYRIGHT 1989 ALLEN-BRADLEY COMPANY INC.
 2760-SFC2 LAN SERIES A REVISION B (YES/NO)=YES
5. Select menu item 21: Identification numbers. Select:
 RS485 LAN 2755-DM6 ASCII MODE 3, 0H (YES/NO)=YES
6. Select option 11: Configuration parameters. Set to:
 SLOT TIME (NO. CHARS) (DEC 0 ... 255) = 15
 INTER-CHAR TIME (NO. CHARS) (DEC 0 ... 255) = 7
 IDLE TIME (NO. CHARS) (DEC 0 ... 255) = 3
 RETRIES (DEC 0 ... 255) = 3
 19,200 BITS PER SECOND (YES/NO)=YES
 BCD NODE NUMBERS (ENABLE/DISABLE)= ENABLE
 BYTE SWAPPING (ENABLE/DISABLE)=ENABLE
 RECEIVE MATRIXING (ENABLE/DISABLE)=DISABLE
 MATRIX ADDRESS (HEX 0 ... FFFF) = 0
 RE-ESTABLISH FREQUENCY (DEC 0 ... 255)=5
 POLL FREQUENCY/DESTINATION [0] (HEX 0 ... FFFF)=5
 POLL FREQUENCY/DESTINATION [1] (HEX 0 ... FFFF)=105
 POLL FREQUENCY/DESTINATION [2] (HEX 0 ... FFFF)=5
 POLL FREQUENCY/DESTINATION [3] (HEX 0 ... FFFF)=5
7. Verify that the 2760-RB is in rack 0, group 0 module 0.
8. Save the above configuration.

2755-SN3, -SN5, -SN8 AdaptaScan Reader Configuration

The AdaptaScan Offline Programmer configuration shows only the screens needed to establish communication to the 2760-RB module. Other AdaptaScan configuration parameters (selecting a bar code symbology, trigger methods, etc.) are beyond the scope of this document. See the AdaptaScan Configuration Software user manual.

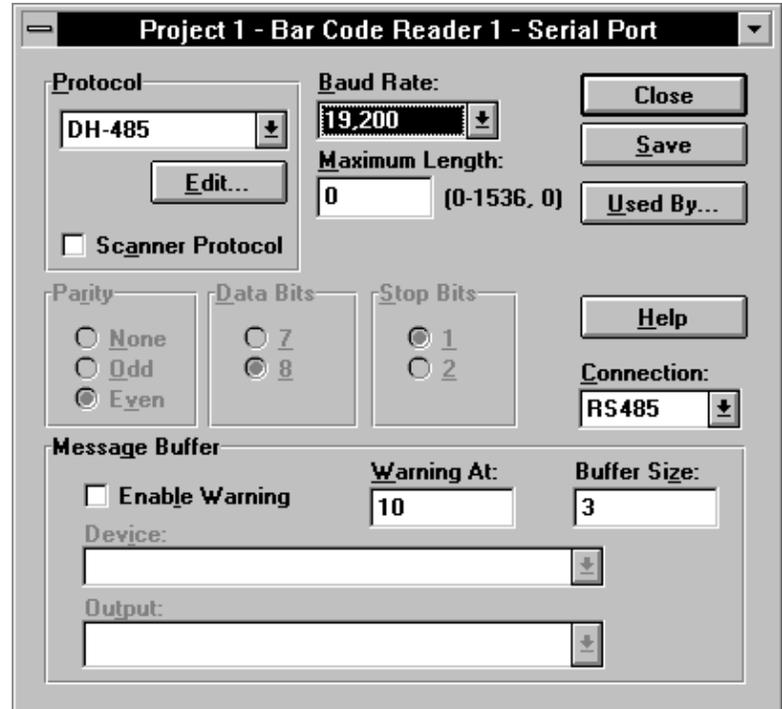
An example configuration for the 2755-SNx AdaptaScan Reader is illustrated below.

Important: The settings illustrated below represent only *part* of the configuration required for the AdaptaScan reader to work in a given application. Refer to the AdaptaScan Configuration Software user's manual for complete details on how to configure the reader for your application.

The Project dialog contains all the basic configuration options.



The Serial Port dialog defines communication parameters (RS-232/RS-485/RS-422) and protocols (ASCII, DH-485, DF1) for the reader's communication ports. Access it by selecting Serial Port in the Project dialog.



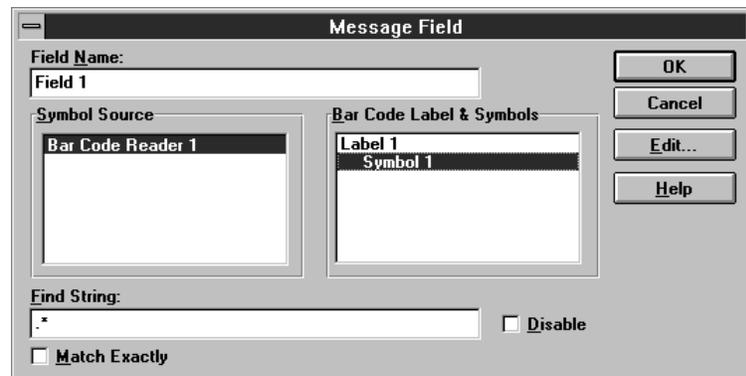
Select Edit to bring up the DH-485 dialog.



The Message dialogs define the format and content of message data sent to the host by the reader when bar codes are decoded. This dialog is accessed by selecting Message in the Project dialog.



When Edit is selected in the New Message screen, the Message Field dialog appears:



And when Edit is selected in the Message Field screen, this dialog appears:

Sample PLC Program

A sample PLC program appropriate for using a PLC 5/15/25 with a 2760 -RB module appears below.

```

| I:000      N7:0      N7:5      +-----+
+---] [-----]/[-----]/[-----]+Block Transfer Read  +---O---+
|      13      15      15      |Rack                0|
|                               |Group                1|
|                               |Module                0|
|                               |Control Block   N7:100+---O---+
|                               |Length                0|
|                               |Continuous            N|
|                               +-----+

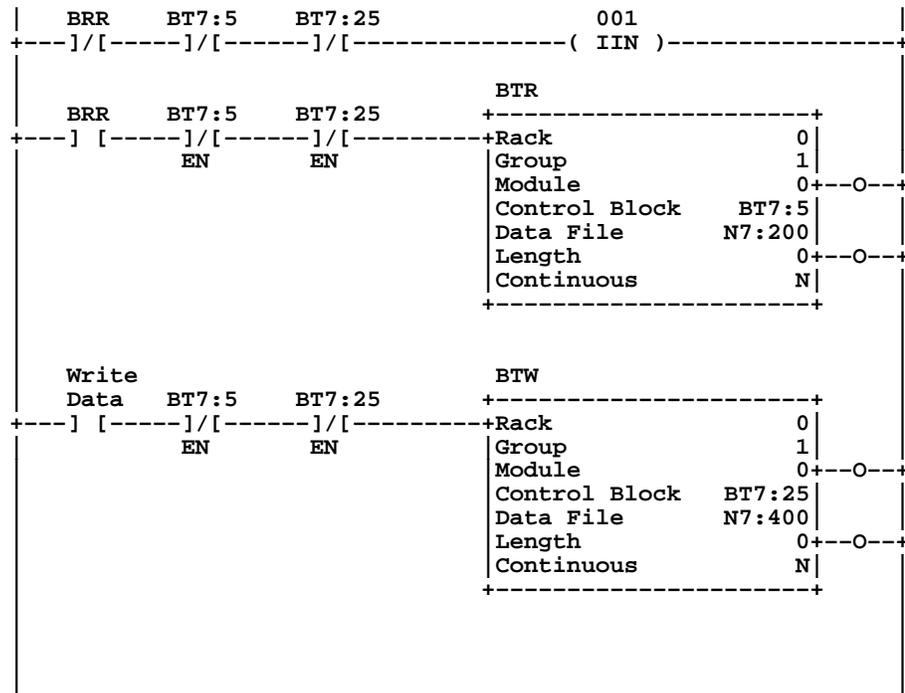
Write
Data  N7:0      N7:5      +-----+
+---] [-----]/[-----]/[-----]+Block Transfer Write  +---O---+
|      15      15      |Rack                0|
|                               |Group                1+---O---+
|                               |Module                0|
|                               |Control Block   N7:5|
|                               |Data File       N7:200+---O---+
|                               |Length                0|
|                               |Continuous            N|
|                               +-----+

```

Refer to your PLC-5 Instruction Reference Manual for detailed information on using the PLC-5 programming software.

Using the 2760-RB, Revision H or Above, with the New Generation PLC5

When the 2760-RB, Revision H or above, is used with the New Generation PLC5 processors in a local rack, there is a possibility that the PLC will not see the BRR bit from the 2760-RB. For the PLC5 to see the BTR bit, an odd number of image scans must occur. To ensure that the BTR instruction sees the BRR bit (bit 13) you must place an Immediate Input Instruction addressed to the BRR bit in another rung just before the Block Transfer Read (BTR) rung. This ensures that the BRR bit is seen by the NP-5 processor.



Note: BTR must come before BTW.

Cabling

Cable 1 must be constructed to connect a configuration terminal to the 2760-RB module configuration port.

Cable 1

2760-RB (config. port)		Dumb Terminal (VT-1000)
25-pin D male		25-pin D female
Tx 2	—————	3 Rx
Rx 3	—————	2 Tx
GND 7	—————	7 GND

Cable 2 must be constructed to connect the RS-485 port of the AdaptaScan Reader wiring base to Port 1 of the 2760-RB module.

Cable 2

2760-RB Port 1		AdaptaScan Terminal Strip, Nema 4
25-pin D male		RS-485
A	—————	TxA
B	—————	TxB
GND 7	—————	GND

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World Headquarters, Allen-Bradley, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414 382-2000 Fax: (1) 414 382-4444