



Bulletin 2755 Bar Code Decoder to PLC-5/30/40/60 ASCII User Port

Application Note

Overview

The New Generation PLC-5[®] processors from Allen-Bradley have a user port that can be used to interface a single point Series 2755 Bar Code Decoder using either RS-232 or RS-422 communication.

This document includes cable diagrams for a variety of Bulletin 2755 bar code decoders, configuration information for the 2755-DS/DD decoder, as well as an example PLC[®] program necessary to establish communication through User Port 0 on the PLC-5 platform.

Hardware Requirements

Implementation of the procedure described in this application note requires the following Allen-Bradley hardware:

- 2755-DS/DD Enhanced Bar Code Decoder and related manuals.
- Bulletin 1785 PLC-5 processor.
- Bulletin 1771 rack.
- Bulletin 1771 power supply.
- Appropriate cables to program the PLC-5 and configure the Bulletin 2755 bar code decoder. Refer to hardware manuals for cable requirements.
- Catalog Number 1478-KT card installed in your personal computer to enable you to program the PLC-5.

Software Requirements

Implementation of the procedure described in this application note requires the following Allen-Bradley software:

- Bulletin 6200 development software for the PLC-5.
- Terminal Emulation Package (such as Procomm[®] or Windows[™] Terminal) to configure the 2755 DS/DD with a personal computer.

Related Publications

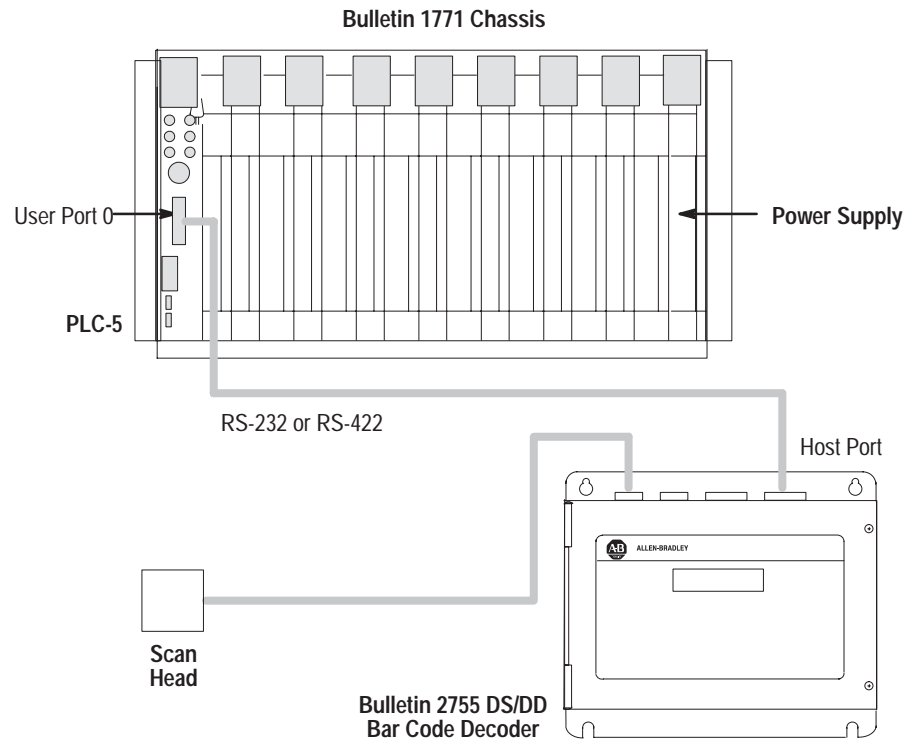
This document refers to the following publications, which should be available for reference while working through this application note:

Publication Number	Title
1785-XXX	User Manual for your PLC-5
6200-XXX	Programming Manual for your PLC-5
2755-833	Bulletin 2755-DS/DD Series B Enhanced Decoder User Manual

Configuration

For this application the PLC-5 occupies the PLC slot in a 1771 rack. Power is supplied externally or from an internal power supply installed in any acceptable slot in the 1771 rack.

Figure 1
 Configuring PLC-5 to Bulletin 2755 DS/DD Bar Code Decoder



Cabling

Cabling connecting the Host port of the Bulletin 2755–DS/DD Enhanced Bar Code Decoder to User Port 0 on the PLC-5 must be constructed. For RS-422 installations, a special pinout cable must be constructed. Refer to the figures below for cabling diagrams.

Figure 2
 RS-232 Cable Diagrams (PLC-5 to 2755 Bar Code Decoder)

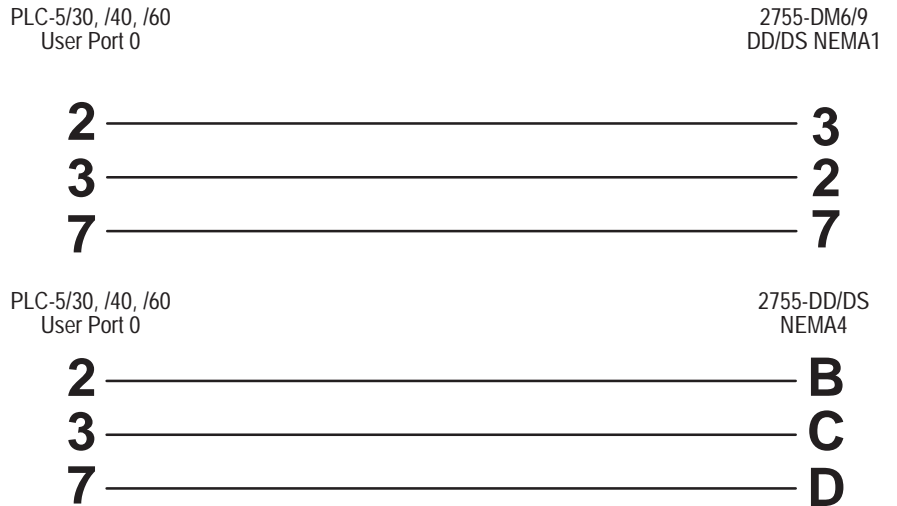
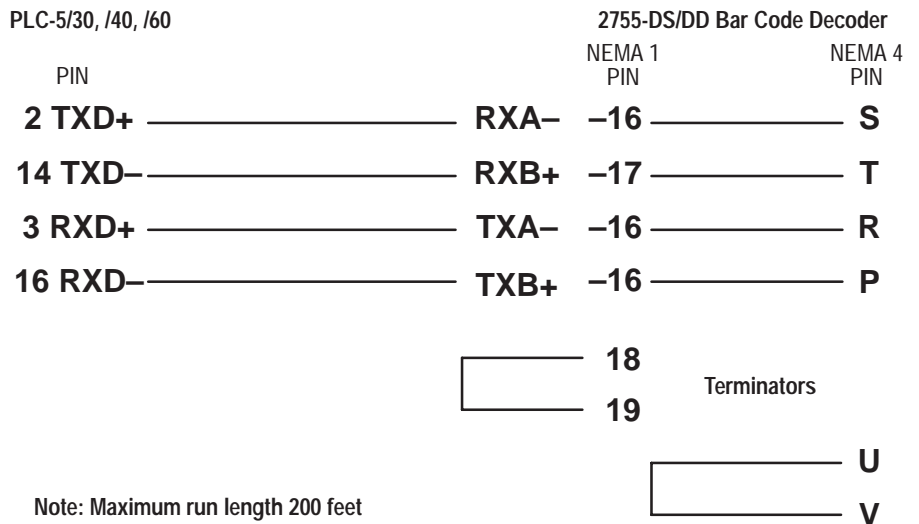


Figure 3
 RS-422 Cable Diagrams (PLC-5 to 2755 Bar Code Decoder)



PLC-5 Configuration

Set the PLC-5 “Channel 0” to **USER** as shown in the Channel Overview screen illustrated in Figure 4. Configure Channel 0 as shown in the User Mode Channel 0 Configuration illustrated in Figure 5. Note that Termination 1 is set for **\0xd** or Carriage Return **[CR]**, and “Termination 2” is set for **\0xa** or Line Feed **[LF]**. These terminators, along with the **ARL** instruction in the PLC-5, allow the User port to read in one message at a time with **[CR]** **[LF]** terminators.

Figure 4
Channel Overview Screen

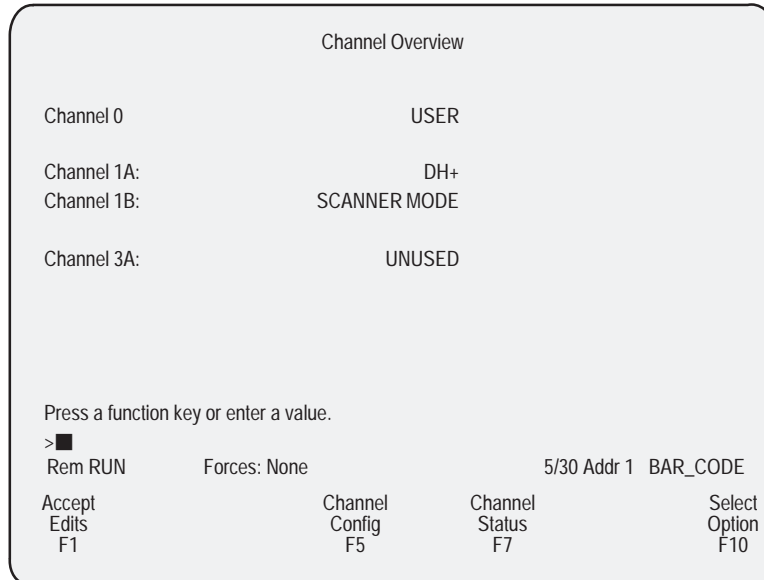
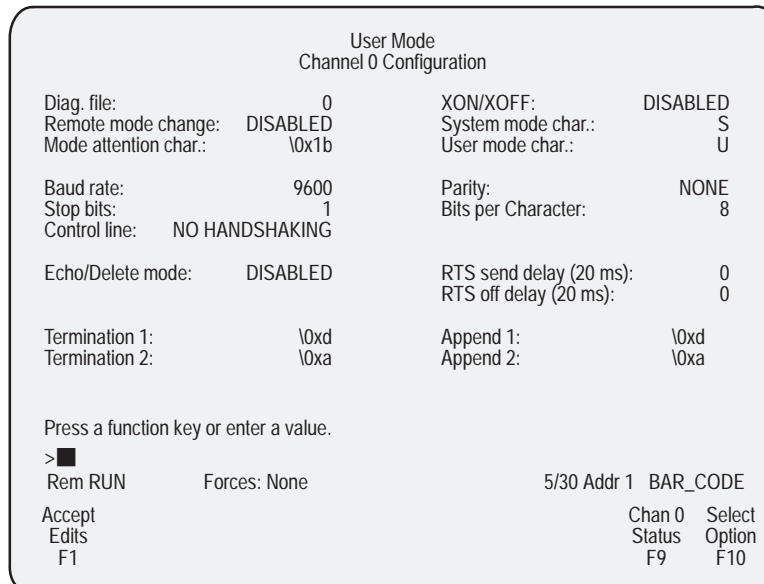


Figure 5
Channel 0 Configuration Screen



2755-DS/DD Enhanced Bar Code Decoder Configuration

An example configuration for the 2755-DS/DD Bar Code Decoder appears in Figure 6 and Figure 7. Notice that the **END MESSAGE** is set to **[CR] [LF]**. Note that the settings illustrated below represent only *part* of the configuration required for the 2755-DS/DD Enhanced Bar Code Decoder to work in a given application. Refer to the decoder documentation for complete details on decoder configuration.

Figure 6
 2755-DS/DD Host Communications Configuration Screen.

```

-----HOST COMMUNICATIONS-----
BAUD RATE*: 9600
BITS/CHAR*: 8 Data 1 Stop
PARITY*: None
HOST PROTOCOL*: RS232
DEVICE ADDRESS*: 1
  ACK CHAR*: None 255
  MARK CHAR*: None 255

*Save and Restart required for these parameters to take effect.

          SCANNER A   SCANNER B
START SCAN CHAR: None 255 None 255
STOP SCAN CHAR: None 255 None 255

LARGE BUFFER: No
SEND HOST MESSAGE: At End of Trigger
TRANSMISSION CHECK: None

-----
Commands:ESC   Change:SPACE   Cursor Control:ARROWS
-----
  
```

Figure 7
 2755-DS/DD Host Message Format Configuration Screen.

```

START CHARACTER: None 255
SOURCE IDENTIFIER for (AUX): (A): (B):
HEADER STRING:
FIELD DELIMITER: None 255 NUMBER OF FIELDS IN MESSAGE: ALL
SEND SYMBOLOGY: No SEND PACKAGE COUNT: No
SEND BAR CODE STRINGS: Yes SEND DECODER PERFORMANCE: No
END MESSAGE: CrLf

DEFAULT NO-READ STRING: NO READ THIS LIGHTER

FIELD NUMBER NO-READ REPLACEMENT STRING FIELD NUMBER NO-READ REPLACEMENT STRING
1 9
2 10
3 11
4 12
5 13
6 14
7 15
8 16

-----
EDIT -- Cancel:ESC Enter:RETURN Erase Char:BACKSPACE
-----
  
```

PLC-5 Program

The sample ladder logic listing appearing in Figure 8 below instructs the PLC-5 to:

- Rung 2:0 – Read one string of ASCII data terminated with a **[CR] [LF]**.
- Rung 2:1 – Based on the done bit from the ASCII Read Line instruction in run 0, move the string data into an integer file in the PLC-5 data table.

Note: The Length variable in the Copy File instruction is set to 12. This value includes a leading word indicating string length, ten words of bar code data, and one word for the **[CR] [LF]** terminator.

Figure 8
 Sample PLC Ladder Listing.

```

                                     3 August 1994   Page 1
Program Listing Report                PLC-5/30   File 2_51F6_8   Rung 2:0
Rung 2:0
| R6:23                                +ARL-----+
+--]/[-----+ASCII READ LINE      +-(EN)-+
|           DN                                |Channel  0|
|                                           |Dest      ST52:72+-(DN)|
|                                           |Control   R6:23|
|                                           |String Length  0+-(ER)|
|                                           |Characters Read  0|
|                                           +-----+
Rung 2:1
| R6:23                                +COP-----+
+--]/[-----+COPY FILE              +--+
|           DN                                |Source  #ST52:72|
|                                           |Dest    #N7:10|
|                                           |Length  12|
|                                           +-----+
Rung 2:2
|-----[END OF FILE]-----|
|-----|

```

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

Running the Application

Refer to Figure 9 for an example of a bar code data string in the ASCII file, and to Figure 10 for an example of the resulting data table.

Figure 9
 PLC-5 ASCII File.

ADDRESS		LEN	STRING TEXT
ST52:69		0	
ST52:70		0	
ST52:71		0	
ST52:72		22	NO READ THIS LIGHTER^M^J

Press a function key or enter a value.

ST52:72 = ■

Rem RUN	Forces: None	Data:Decimal	Addr:Decimal	5/30	Addr 1	BAR_CODE
Change Radix F1	Edit String F3	Specify Address F5	Next File F7	Prev File F8		

Figure 10
 PLC-5 Data Table After Copy ("COP") Instruction.

ADDRESS	0	1	2	3	4	5	6	7	8	9
N7:0	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100
N7:10	\00116	N	O	R	E	A	D	T	H	I
N7:20	E	R	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100
N7:30	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100
N7:40	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100
N7:50	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100
N7:60	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100	\00100
N7:70	\00100	\00100	\00100	\00100	\00116	\00116	\00116	\00116	\00116	\00116
N7:80	\00116	\00116	\00116	\00116	\00116	\00116	\00116	\00116	\00116	\00116
N7:90	\00116	\00116								

Press a function key or enter a value.

N7:10 = ■

RUN	Forces: None	Data:ASCII	Addr:Decimal	5/30	Addr 1	BAR_CODE
Change Radix F1		Specify Address F5	Next File F7	Prev File F8		

PLC and PLC-5 are registered trademarks of Allen-Bradley Co., Inc., a Rockwell International Company
Windows is a trademark of Microsoft
Procomm is a registered trademark of Datastorm Technologies, Inc.



Allen-Bradley has been helping its customers improve productivity and quality for 90 years. A-B designs, manufactures and supports a broad range of control and automation products worldwide. They include logic processors, power and motion control devices, man-machine interfaces and sensors. Allen-Bradley is a subsidiary of Rockwell International, one of the world's leading technology companies.



With major offices worldwide.

Algeria • Argentina • Australia • Austria • Bahrain • Belgium • Brazil • Bulgaria • Canada • Chile • China, PRC • Colombia • Costa Rica • Croatia • Cyprus • Czech Republic • Denmark • Ecuador • Egypt • El Salvador • Finland • France • Germany • Greece • Guatemala • Honduras • Hong Kong • Hungary • Iceland • India • Indonesia • Israel • Italy • Jamaica • Japan • Jordan • Korea • Kuwait • Lebanon • Malaysia • Mexico • New Zealand • Norway • Oman • Pakistan • Peru • Philippines • Poland • Portugal • Puerto Rico • Qatar • Romania • Russia-CIS • Saudi Arabia • Singapore • Slovakia • Slovenia • South Africa, Republic • Spain • Switzerland • Taiwan • Thailand • The Netherlands • Turkey • United Arab Emirates • United Kingdom • United States • Uruguay • Venezuela • Yugoslavia

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