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

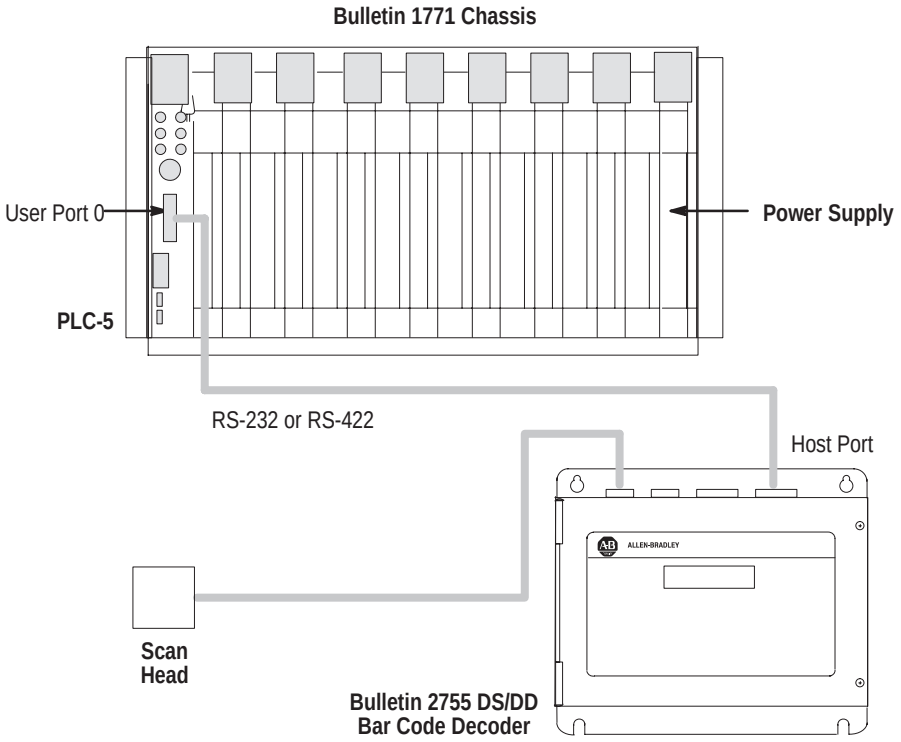
This document refers to the following publications, which should be available for reference while working through this application note:

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)

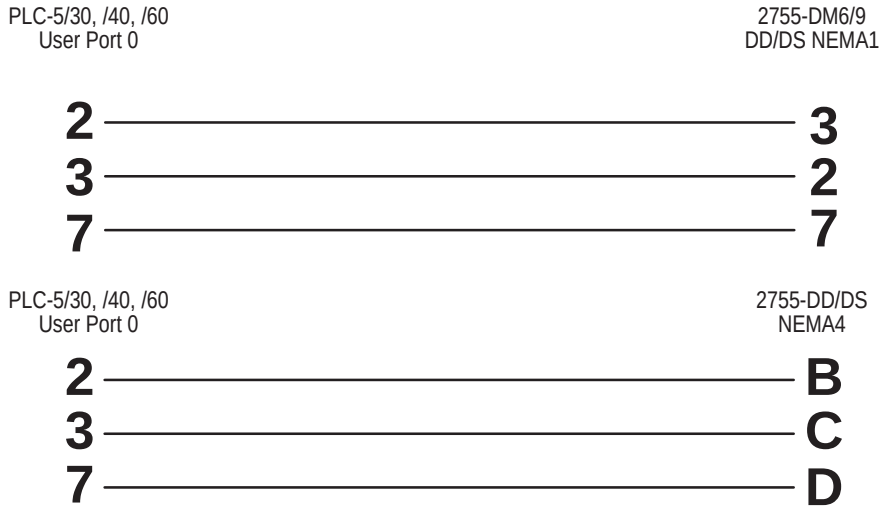
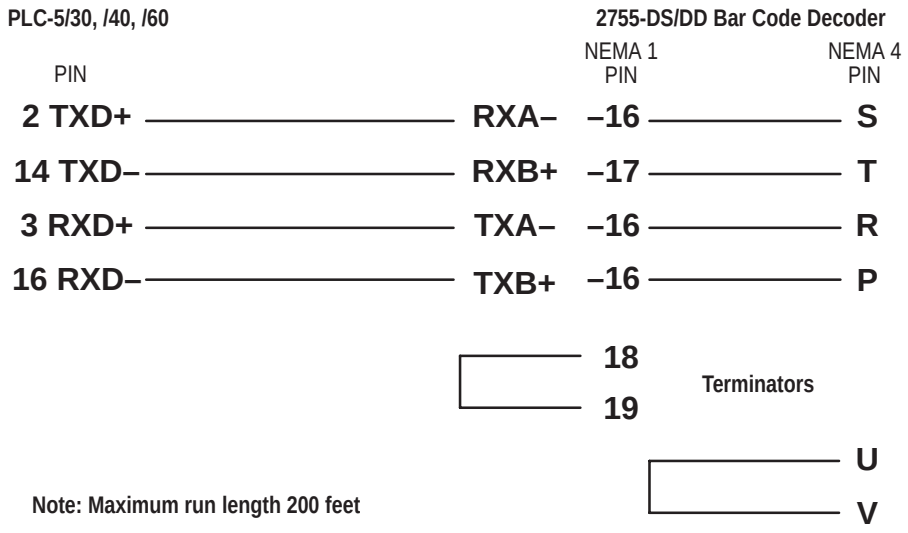


Figure 3
RS-422 Cable Diagrams (PLC-5 to 2755 Bar Code Decoder)



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

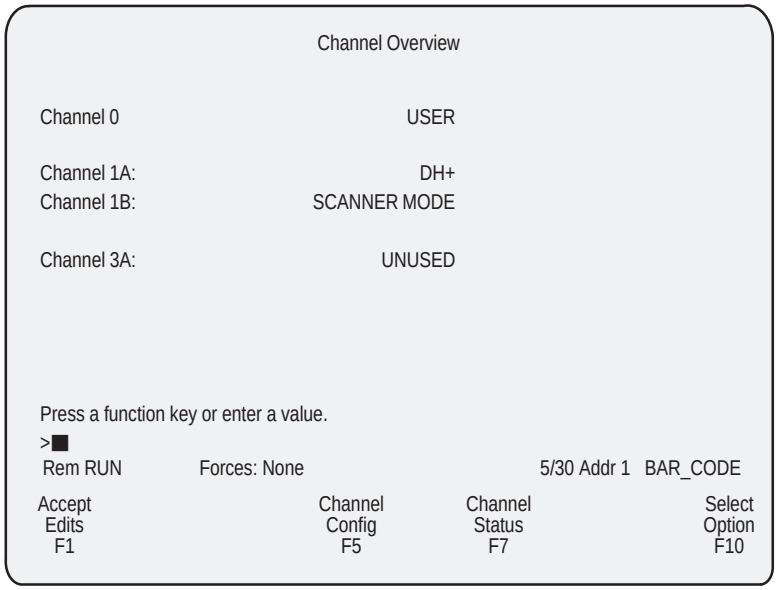
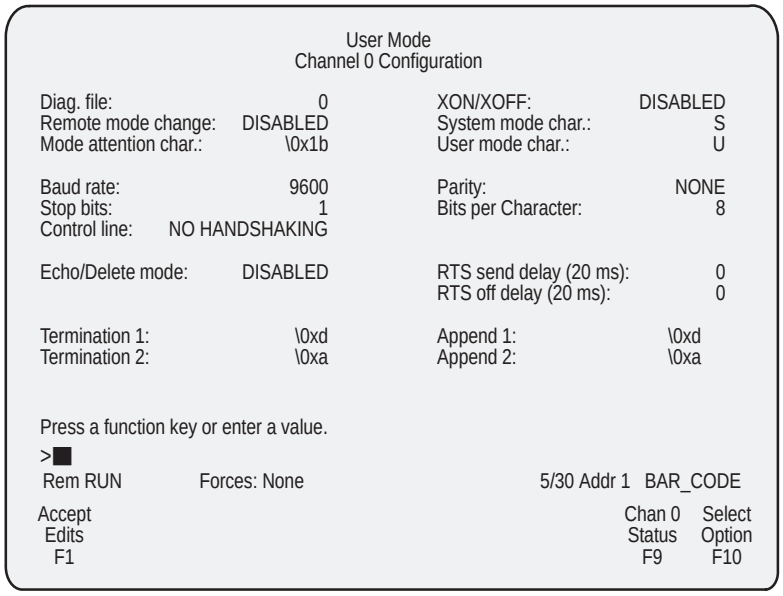


Figure 5
Channel O Configuration Screen



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
          NAK 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                                  FIELD
 NUMBER  NO-READ REPLACEMENT STRING     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.

```
                                    STRING TEXT

ADDRESS          LEN
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          Edit            Specify              Next      Prev
 Radix          String          Address              File      File
  F1             F3              F5                   F7        F8
```

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

```
ADDRESS      0      1      2      3      4      5      6      7      8      9
N7:0        \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00
N7:10       \00\16  N  O     R    E A    D      T  H    I  S     L    I  G    H  T
N7:20        E   R \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00
N7:30       \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00
N7:40       \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00
N7:50       \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00
N7:60       \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00 \00\00
N7:70       \00\00 \00\00 \00\00 \00\00 \00\16 \00\16 \00\16 \00\16 \00\16 \00\16
N7:80       \00\16 \00\16 \00\16 \00\16 \00\16 \00\16 \00\16 \00\16 \00\16 \00\16
N7:90       \00\16 \00\16




Press a function key or enter a value.
N7:10 = ■
RUN          Forces: None     Data:ASCII       Addr:Decimal  5/30  Addr 1   BAR_CODE
Change                        Specify              Next      Prev
 Radix                        Address              File      File
  F1                            F5                   F7        F8
```

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