Application Note

2755-DS/DD Bar Code Decoder to 2760-RB and PLC-5® (RS-232/ASCII Protocol with 2760-RB Module and 2760-SFC1 or -SFC2 Protocol Cartridge)

Overview

This document provides instructions on interfacing the 2755-DS/DD bar code decoder to the 2760-RB interface module via "dumb terminal protocol" RS-232 using either the 2760-SFC1 or 2760-SFC2 protocol cartridge.

These instructions provide cable diagrams and configuration information for the 2760-RB and 2755-DS/DD decoder. Also included is an introductory PLC program listing which you can use to establish communications between the PLC and the 2760-RB interface module.

Hardware Requirements

Implementation of the procedures described in this application note require the following hardware:

- Allen-Bradley Bulletin 2755-DD or 2755-DS enhanced bar code decoder
- Bulletin 2760-RB in a Bulletin 1771 rack with a PLC-5 processor
- *Either* the Bulletin 2760-SFC1 or -SFC2 protocol cartridge
- Personal computer (PC) with terminal emulator software or VT-100 type terminal to configure the 2755-DS/DD bar code decoder and the 2760-RB module
- Appropriate cables to program the PLC-5 and configure the 2755-DS/DD bar code decoder. Refer to user manuals manuals for cable requirements
- Catalog Number 1784-KT card or equivalent installed in your personal computer to enable you to program the PLC-5.

Software Requirements

Implementation of the procedures described in this application note require the following Allen-Bradley software:

- Bulletin 6200 development software for the PLC-5
- Terminal emulation package such as Procomm® (if using a personal computer to configure the 2755-DS/DD)

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 Enhanced Bar Code Decoder User's Manual
2760-ND001	Bulletin 2760 Flexible Interface Module User Manual
2755-ND002	Bulletin 2760 DF1/ASCII Protocol Cartridge User Manual
2755-822	Bulletin 2760 RS485 LAN Master/Slave Protocol Cartridge User Manual

Configuration

Mount the Catalog Number 2760-RB interface module in Slot 0 of the 1771 chassis (next to the PLC). The Bulletin 2755-DS/DD bar code decoder communicates through Port 1 of the 2760-RB module. A Catalog Number 1771-ASB interface module can also be used to communicate with the 2760-RB module over the chassis backplane via Remote I/O.

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. or 1771-ASB	New Generation PLC-5 (Series A, Rev. C or above only)
Series A, Rev. G or below	Follow example PLC program as shown in Figure 5	Set BT Compatibility Bit S26/4 while in program mode. Use example PLC program shown in Figure 5.
Series A, Rev H or above		Add ladder logic using IIN update of RB. BTR must be before 'BTW. Refer to Figure 6

Figure 1
Configuration

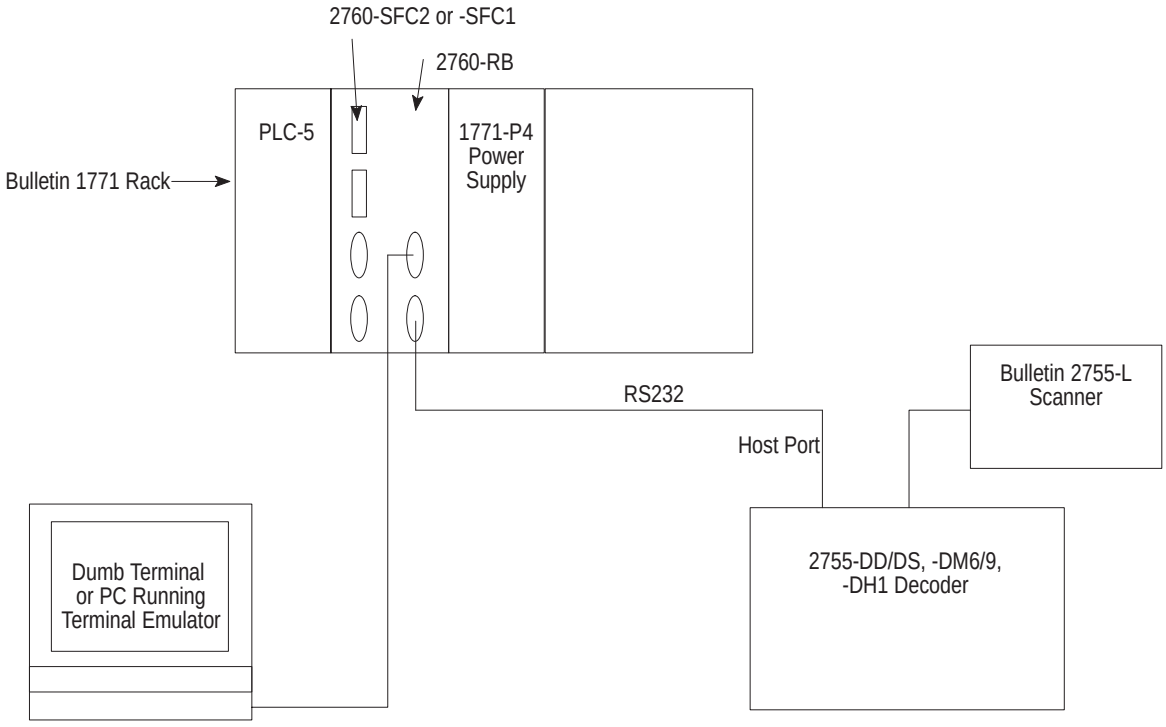


Table A
PLC-5 Processor Dip Switch Settings

Switch No.	1	2	3	4	5	6	7	8
SWI-1	on	on	on	on	on	on	on	off
SWI-2	off	on	on	on	on	on	on	off
SW-3	on	on	off	off				

Table B
I/O Chassis Backplane Dip Switch Settings

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

Table C
2760-RB Module Dip Switch Settings

Switch No.	1	2	3	4	5	6	7	8
SWI-1	off	off	off	off	off	off	off	off
SWI-2	off	off	off	off	off	off	off	off
SW-3	off	off	off	off				
SW-4	off	off	on	off				

Running the Application

The configuration screens for the 2760-RB and the 2755-DS/DD decoder should be entered exactly as shown in the following pages. Save them, and then restart the decoder.

Figure 2
2755-DS/DD Host Communications Configuration Screen

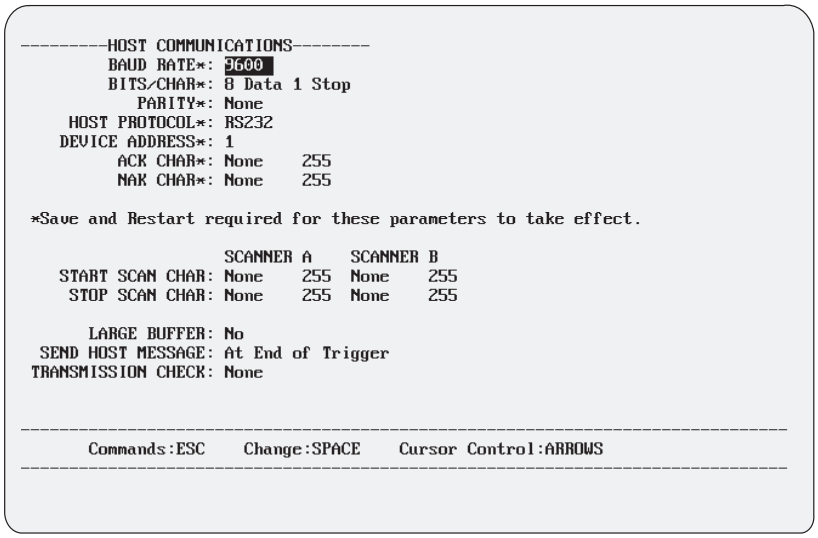
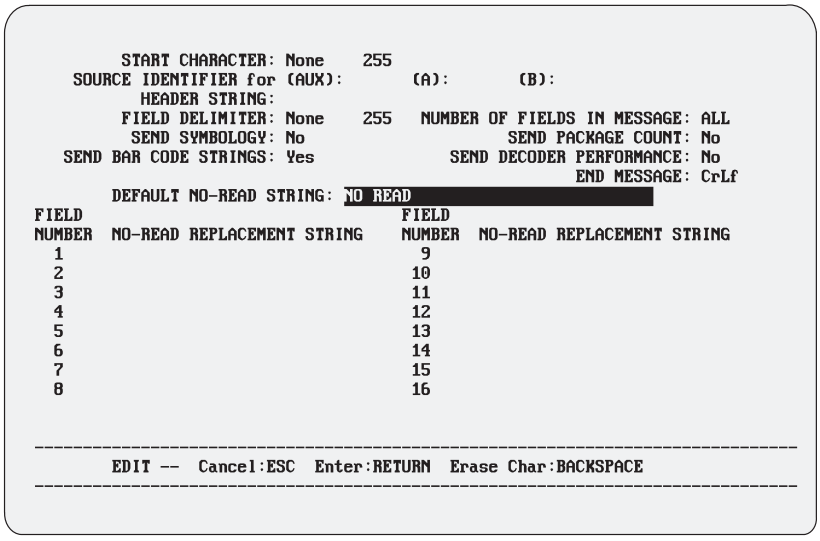


Figure 3
2755-DS/DD Host Message Format Configuration Screen



Important: When configuring the 2760-RB module, first select “Main Menu Selection 90B” to reset the unit to factory defaults. Then configure screens 3, 21, and 11 in that order exactly as shown below.

Figure 4a
2760-RB Module Configuration Screens

```
        2760–RB        SERIES A  REVISION J
  COPYRIGHT 1989                ALLEN–BRADLEY COMPANY, INC.
  ____________________________________________________________

1X  – CONFIGURATION PARAMETERS        2X  – IDENTIFICATION NUMBERS
3   – DEVICE PORT PROTOCOL NAMES      4DM – MATCH CODE ENTRIES
5I  – DISCRETE BYTE INPUT ENTRIES     6   – THE DATA MATRIX ENTRIES
7   – THE PASS THROUGH ENTRIES        8   – NON–VOLATILE SCRATCH PAD AREA
9XF – RB MODULE FUNCTIONS             AX  – HARDWARE DIAGNOSTICS
BX  – SOFTWARE DIAGNOSTICS            C   – EXIT CONFIGURATION MODE

WHERE X (0 TO 7) AND D (1 TO 3) ARE PORT NUMBERS WHICH ARE DEFINED BELOW :

0 – RB CMMND PRCSS   2 – SERIAL PORT 2   4 – CONFIG PORT     6 – I/O RACK SLT 1
1 – SERIAL PORT 1    3 – SERIAL PORT 3   5 – I/O RACK SLT 0   7 – RESERVED

WHERE F (A TO E) ARE FUNCTIONS THAT RB CAN PERFORM WHICH ARE DEFINED BELOW :

A – RESET   B – SET DEFAULTS   C – FLUSH   D – INITIALIZE   E – CLEAR DIAGS

WHERE M (A TO T) AND I (A TO H) ARE ENTRY NUMBERS FOR THE SELECTION MADE ABOVE.

            ENTER A MAIN MENU SELECTION:
```

```
            ENTER A MAIN MENU SELECTION: 3

PORT 1 = COPYRIGHT 1989          ALLEN–BRADLEY COMPANY, INC.
 2760–SFC1 DT    , SERIES A , REVISION B    (YES/NO) = YES.

PORT 2 = COPYRIGHT 1989          ALLEN–BRADLEY COMPANY, INC.
2760–SFC1 DT    , SERIES A , REVISION B    (YES/NO) = YES.

PORT 3 = COPYRIGHT 1989          ALLEN–BRADLEY COMPANY, INC.
2760–SFC1 DT    , SERIES A , REVISION B    (YES/NO) = YES.

EDIT THIS SELECTION (YES/NO) ?
```

Figure 4b
2760-RB Module Configuration Screens

```
ENTER A MAIN MENU SELECTION: 21

DUMB TERM. UNSPECIFIED PROTOCOL, 13fh (YES/NO) = YES.

EDIT THIS SELECTION (YES/NO) ?
```

```
ENTER A MAIN MENU SELECTION: 11

MODEM CONTROL (ENABLE/DISABLE) = DISABLE.
9600 BITS PER SECOND (YES/NO) = YES.
8 BITS NO PARITY (YES/NO) = YES.
XON/XOFF (ENABLE/DISABLE) = DISABLE.
RS232 (YES/NO) = YES.
RECEIVE MATRIXING (ENABLE/DISABLE) = DISABLE.
BYTE SWAPPING (ENABLE/DISABLE) = ENABLE.
BINARY DATA NO CONVERSIONS (YES/NO) = YES.
HDR/TLR ON OUTPUT (ENABLE/DISABLE) = ENABLE.
HEADER BYTE LENGTH (DEC 0...4) = 0.
HEADER DATA[0] (HEX 0...ff) = 0.
HEADER DATA[1] (HEX 0...ff) = 0.
HEADER DATA[2] (HEX 0...ff) = 0.
HEADER DATA[3] (HEX 0...ff) = 0.
TRAILER BYTE LENGTH (DEC 0...4) = 2.
TRAILER DATA[0] (HEX 0...ff) = a.
TRAILER DATA[1] (HEX 0...ff) = d.
TRAILER DATA[2] (HEX 0...ff) = 0.
TRAILER DATA[3] (HEX 0...ff) = 0.
MAX DATA BYTE LENGTH (DEC 0...124) = 0.
MIN DATA BYTE LENGTH (DEC 0...124) = 0.

CONTINUE THIS SELECTION (YES/NO) ?
```

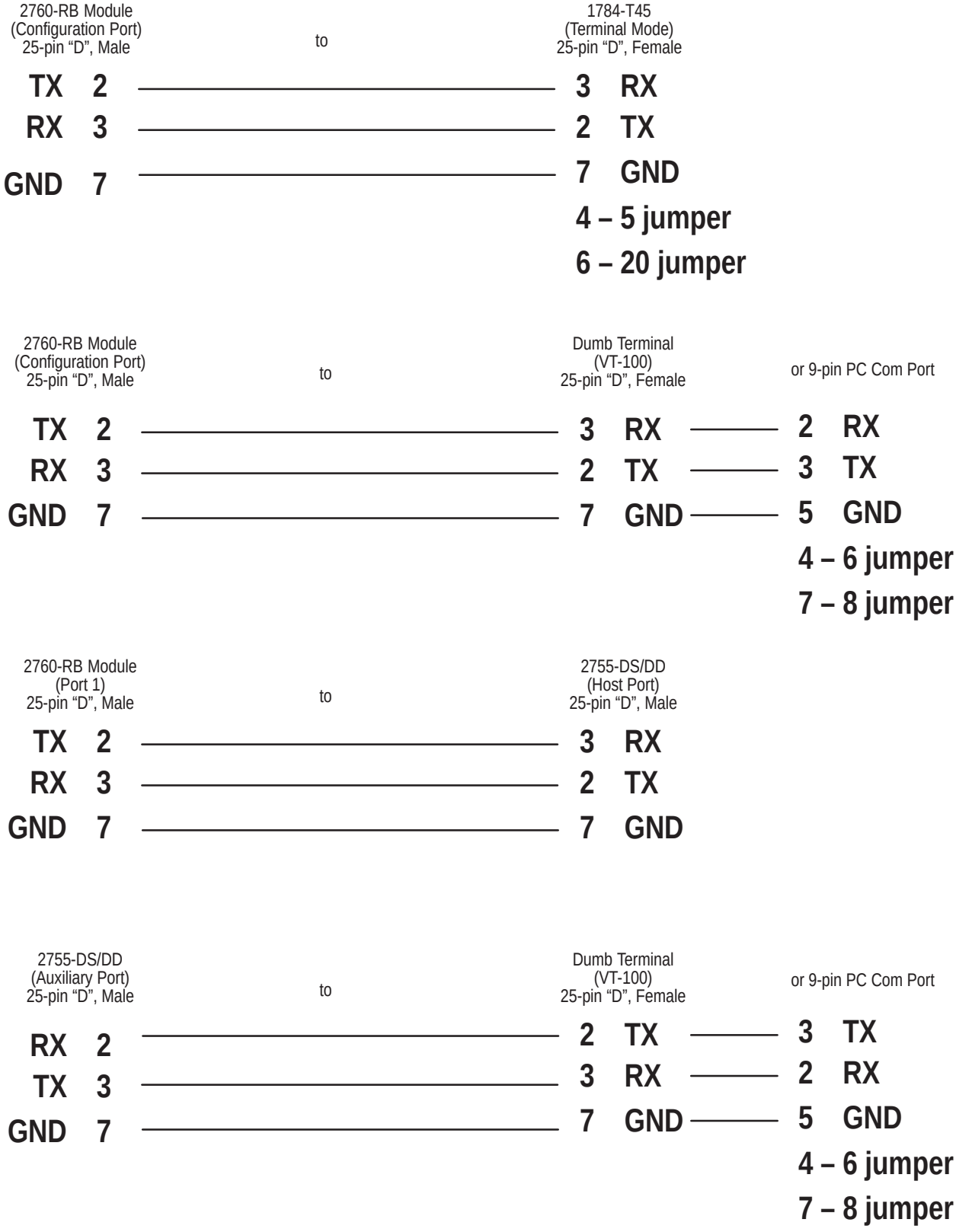
Figure 5
Example PLC program for PLC-5, -15, -25, or 1771-ASB

```
                                                    3 August 1994   Page 1
Program Listing Report          PLC-5/10    File 2_54FIG1         Rung 2:0

Rung 2:0
USE THIS SAMPLE LOGIC WITH THE 5/10,15-25 PROCESSORS.
THE RB MODULE CONTROLS THE "BRR BIT" ADDRESS I:000/13. WHEN THE RB MODULE
HAS DATA, IT WILL TOGGLE THE BRR BIT.
| I:000  N7:0  N7:5                          +BTR---------------+      |
+--] [---]/[---]/[--------------------------+BLOCK TRNSFR READ +-(EN)-+
|   13    15    15                          |Rack            00|      |
|                                           |Group            0+-(DN) |
|                                           |Module           0|      |
|                                           |Control Block N7:0+-(ER) |
|                                           |Data file   N7:100|      |
|                                           |Length           0|      |
|                                           |Continuous       N|      |
|                                           +------------------+      |
Rung 2:1
B3/0 IS ANY WRITE INITIATE BIT. IF THE BTW IS NOT USED, THIS RUNG CAN BE
OMMITED ALONG WITH THE CONTROL ENABLE BIT ABOVE, N7:5/EN.

THE ONLY WAY TO KNOW IF YOU HAVE SUCCESSFULLY COMPLETED A BTR OR BTW IS
TO USE THE DONE BIT.  THE BRR BIT IS AN UNRELIABLE INDICATOR OF READS.

|   B3   N7:0  N7:5                          +BTW---------------+      |
+--] [---]/[---]/[--------------------------+BLOCK TRNSFR WRITE+-(EN)-+
|   0     15    15                          |Rack            00|      |
|                                           |Group            0+-(DN) |
|                                           |Module           0|      |
|                                           |Control Block N7:5+-(ER) |
|                                           |Data file   N7:200|      |
|                                           |Length           0|      |
|                                           |Continuous       N|      |
|                                           +------------------+      |
Rung 2:2
|                                                                     |
+----------------------------[END OF FILE]-----------------------------+
|                                                                     |
```

Figure 6
Example PLC program for 2760-RB Revision H or above to PLC 5/20, -5/30, -5/40, or 5/50

```
                                                    3 August 1994   Page 1
Program Listing Report         PLC-5/30    File 2_54FIG2        Rung 2:0

Rung 2:0
| I:001  N7:5 N7:25                                                 001  |
+--]/[---]/[---]/[-------------------------------------------------(IIN)-+
|   13    15    15                                                      |
Rung 2:1

USE THIS SAMPLE LOGIC IF YOU HAVE A SER A REVISION H OR ABOVE RB MODULE
AND A NEW GENERATION 5/20-60 OR ABOVE PROCESSOR.  THE IIN IS NEEDED TO
FORCE A SCAN OF THE BRR BIT I:001/13. THIS DOES NOT APPLY TO REMOTE RACK
APPLICATIONS, ONLY LOCAL USE.

| I:001  N7:5 N7:25                    +BTR--------------------+      |
+--] [---]/[---]/[----------------------+BLOCK TRNSFR READ      +-(EN)-+
|   13    15    15                     |Rack                 00|      |
|                                      |Group                 1+-(DN) |
|                                      |Module                0|      |
|                                      |Control Block     N7:50+-(ER) |
|                                      |Data file        N7:200|      |
|                                      |Length                0|      |
|                                      |Continuous            N|      |
|                                      +----------------------+      |
Rung 2:2
THE BTR SHOULD COME BEFORE THE BTW.  B3/0 CAN BE ANY WRITE INITIATE BIT.
THE ONLY WAY TO KNOW YOUR INSTRUCTION IS COMPLETE AND SUCCESSFUL IS TO
USE THE DONEBITS IN THE BTR AND BTW.

|   B3   N7:5 N7:25                    +BTW--------------------+      |
+--] [---]/[---]/[----------------------+BLOCK TRNSFR WRITE     +-(EN)-+
|   0     15    15                     |Rack                 00|      |
|                                      |Group                 1+-(DN) |
|                                      |Module                0|      |
|                                      |Control Block     N7:25+-(ER) |
|                                      |Data file        N7:400|      |
|                                      |Length                0|      |
|                                      |Continuous            N|      |
|                                      +----------------------+      |
Rung 2:3
|                                                                      |
+--------------------------[END OF FILE]-----------------------------+
|                                                                      |

NO MORE FILES
```

Figure 7
Cable diagrams



Notes:

Notes:

Rockwell *Automation*

Allen-Bradley

Allen-Bradley, a Rockwell Automation Business, has been helping its customers improve productivity and quality for more than 90 years. We design, manufacture and support a broad range of automation products worldwide. They include logic processors, power and motion control devices, operator interfaces, sensors and a variety of software. Rockwell is one of the worlds leading technology companies.

Worldwide representation.

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 • Ireland • Israel • Italy • Jamaica • Japan • Jordan • Korea • Kuwait • Lebanon • Malaysia • Mexico • Netherlands • New Zealand • Norway • Pakistan • Peru • Philippines • Poland • Portugal • Puerto Rico • Qatar • Romania • Russia–CIS • Saudi Arabia • Singapore • Slovakia • Slovenia • South Africa, Republic • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • United Arab Emirates • United Kingdom • United States • Uruguay • Venezuela • Yugoslavia

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

Publication 2755-2.54 – September 1995

40062-319-01(A)