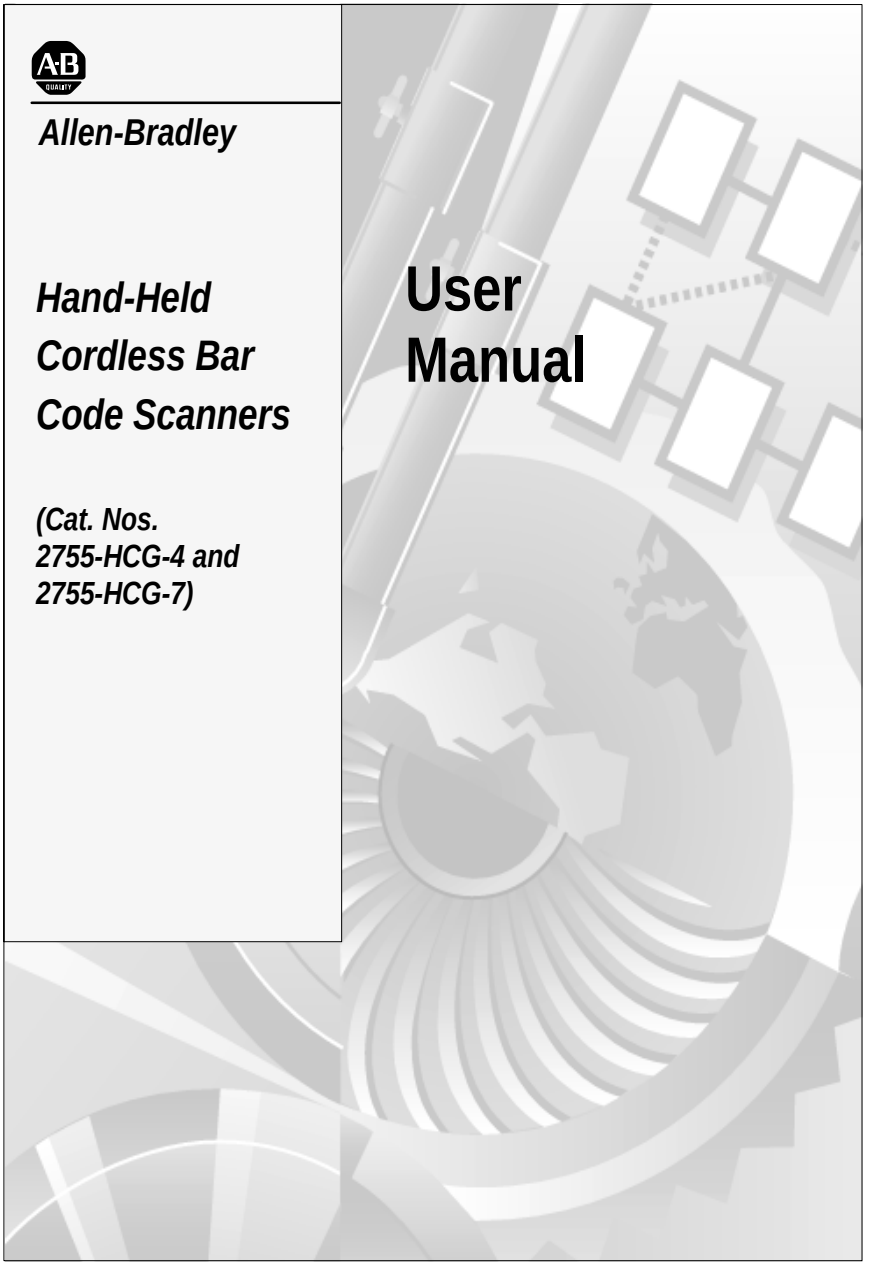


Allen-Bradley

Hand-Held Cordless Bar Code Scanners

(Cat. Nos. 2755-HCG-4 and 2755-HCG-7)

User Manual

Important User Information

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is critical for successful application and understanding of the product.

Table of Contents

Appendix A Specifications

Appendix B Cable Pinouts

Appendix C Advanced Data Formatting

Glossary

Read this preface to familiarize yourself with the rest of the manual. This preface covers the following topics:

- intended audience
- contents of this manual
- related publications
- FCC requirements
- laser warning symbol

Intended Audience

No special knowledge is required to understand this document or use the standard and long range scanners (Catalog Nos. 2755-HCG-4 and 2755-HCG-7). Cordless scanners may be used with a variety of host devices. You should be familiar with the host's communication ports.

ATTENTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

Important: You will need the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6) to download bar codes for the cordless scanners.

Contents of this Manual

The following table briefly describes the contents of each section.

Chapter	Title	Contents
Preface		Describes the purpose, background, and scope of this manual. Also provides a list of related publications.
1	Scanner Features	Provides an overview of the scanner. Includes read range charts and a description of accessory items.
2	Installing Your Hardware	Describes how to connect your scanner system hardware.
3	Configuring Your Scanner	Describes configuration options for the scanner using the bar codes provided in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6).
4	Scanner Operation	Describes how to operate the scanner using the bar codes provided in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6).
5	Maintenance and Troubleshooting	Describes how to maintain and troubleshoot your scanner system hardware.
Appendix A	Specifications	Provides physical, electrical, and environmental specifications.
Appendix B	Cable Pinouts	Provides scanner pinout signal names and a brief description of each.
Appendix C	Advanced Data Formatting	Describes how to customize data before it is transmitted to your host device.
Glossary		Provides terms found within this document.

Related Publications

Below is a list of related publications you may need to refer to when using the cordless scanners.

Publication No.	Title
2755-6.6	Hand-Held Cordless Bar Code Scanners Programming Guide
2755-921	Bar Code Basics

FCC Requirements

Refer to the following sections for the FCC requirements for the standard and long range scanners (Catalog Nos. 2755-HCG-4 and 2755-HCG-7) and 4–slot battery charger (Catalog No. 2755-HCP-B2).

Scanner Requirements

The scanners comply with Part 15 of the FCC Rules and Canadian RSS:210. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

4-Slot Battery Charger Requirements

This device complies with Part 15 of the FCC Rules. See FCC label for additional information.

This equipment has been tested and found to comply with the limits for a Class A digital service, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Laser Warning Symbol

Be aware of the following laser caution symbol.

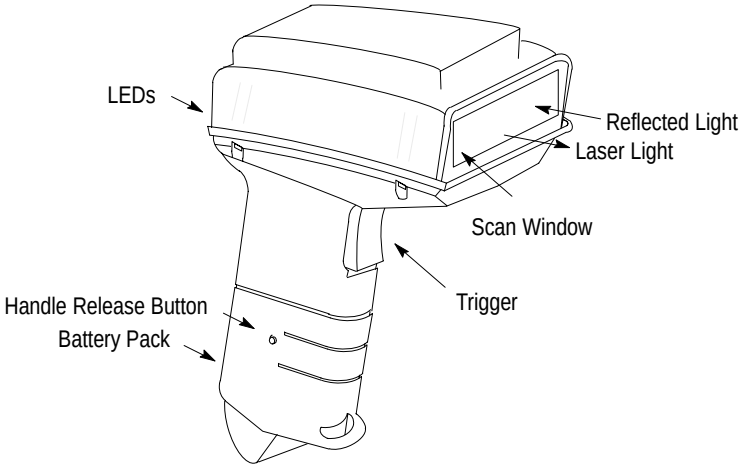
Scanner Features

This chapter describes the features of the standard and long range cordless scanners (Catalog Nos. 2755-HCG-4 and 2755-HCG-7). Included are descriptions of:

- major scanner features
- LED indicators
- decoding
- safety information
- scanning ranges
- accessories

Major Scanner Features

The scanners use a low power visible (red) laser diode for scanning. The trigger turns on the laser which scans a label at approximately 36 scans per second.



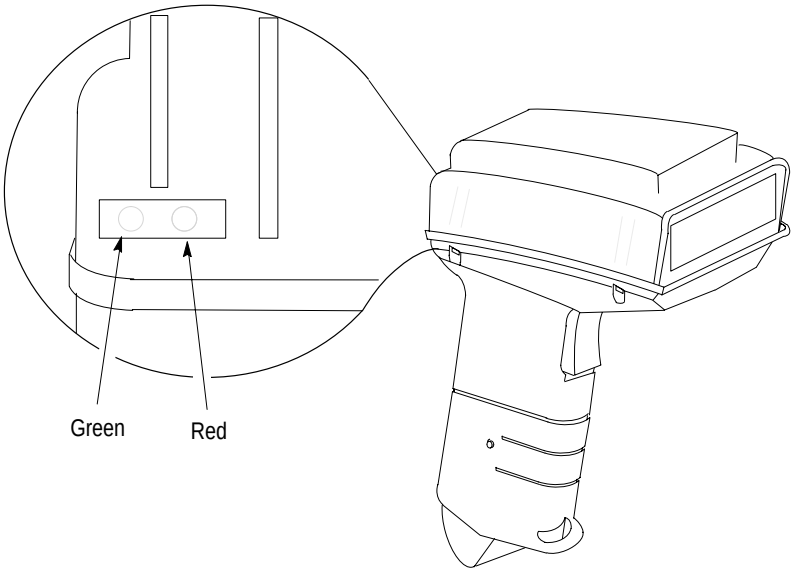
The laser beam:

- exits through the scan window
- reflects off the label back through the window
- is detected by a sensor in the scanner

When a label is read, the laser beam is automatically turned off until the trigger is pressed again. If no label is read, the laser beam automatically turns off after 0.5 to 3 seconds (timeout is adjustable) and remains off until the trigger is released and pressed again.

LED Indicators

On the back of the scanner there is a clear window through which two LEDs are visible.



Green LED = Good Read, indicating that a bar code symbol has been decoded.

Red LED = Scanning, indicating that the laser light is on.

Decoding

The scanners can decode the following symbologies:

- UPC-A
- UPC-E
- Code 39 Full ASCII
- Code 39
- Code 128
- EAN 8
- EAN 13
- EAN 128
- Codabar
- Interleaved 2 of 5
- Discrete 2 of 5
- MSI Plessey

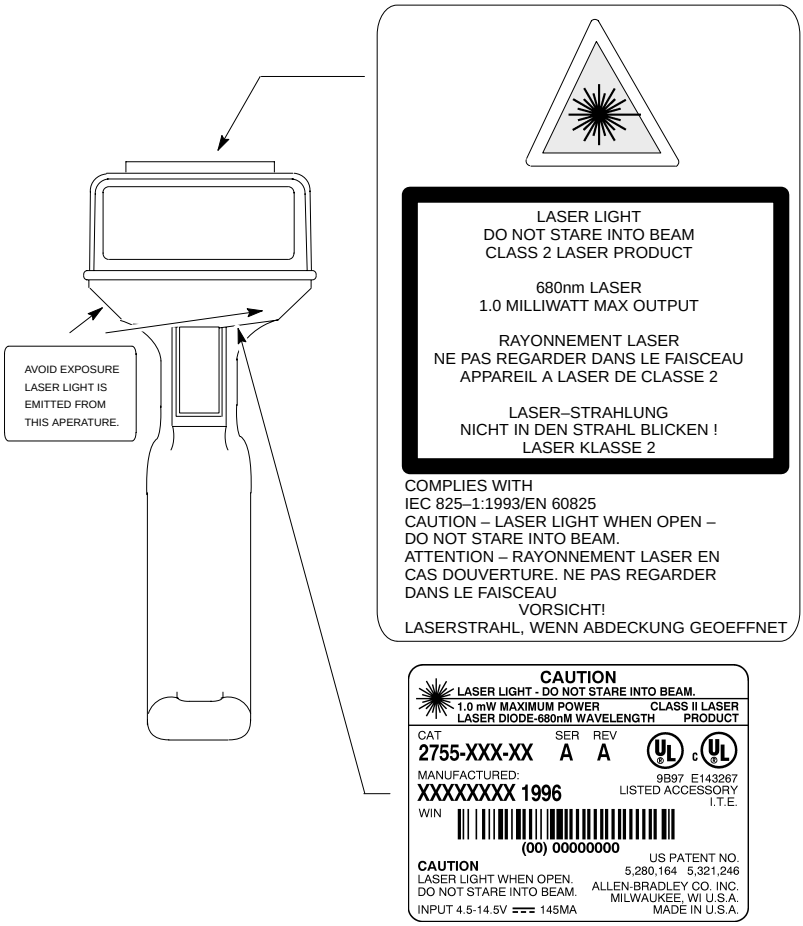
The scanners are autodiscriminating so that multiple symbologies may be enabled at the same time. The only exception is the scanners cannot discriminate between Code 39 and Code 39 Full ASCII.

Safety Information

The scanners use a low power visible laser diode. As with any bright light source, you should avoid staring directly into the beam. Momentary exposure to a CDRH Class II laser is not known to be harmful.

ATTENTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

The following figure shows the location of all safety labels as they appear on the scanner.



Scanning Ranges

The scanners can read bar code symbols at various distances depending upon the type of scanner and narrowest bar code width (width of smallest bars or spaces).

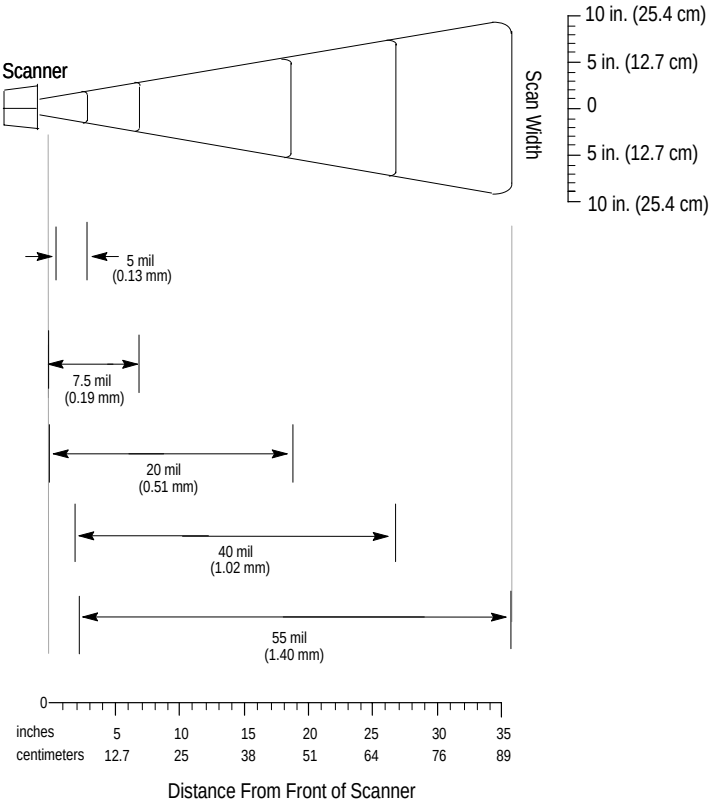
Catalog No. 2755-HCG-4

Minimum Bar Code Width	Read Range
5.0 mil (0.13 mm)	1.0 in. to 3.0 in. (2.5 cm to 7.6 cm)
7.5 mil (0.19 mm)	0.0 in. to 7.0 in. (0.0 cm to 17.8 cm)
20.0 mil (0.51 mm)	0.0 in. to 19.0 in. (0.0 cm to 48.3 cm)
40.0 mil (1.02 mm)	2.0 in. to 27.5 in. (5.1 cm to 69.9 cm)
55.0 mil (1.40 mm)	2.75 in. to 35.0 in. (7.0 cm to 88.9 cm)

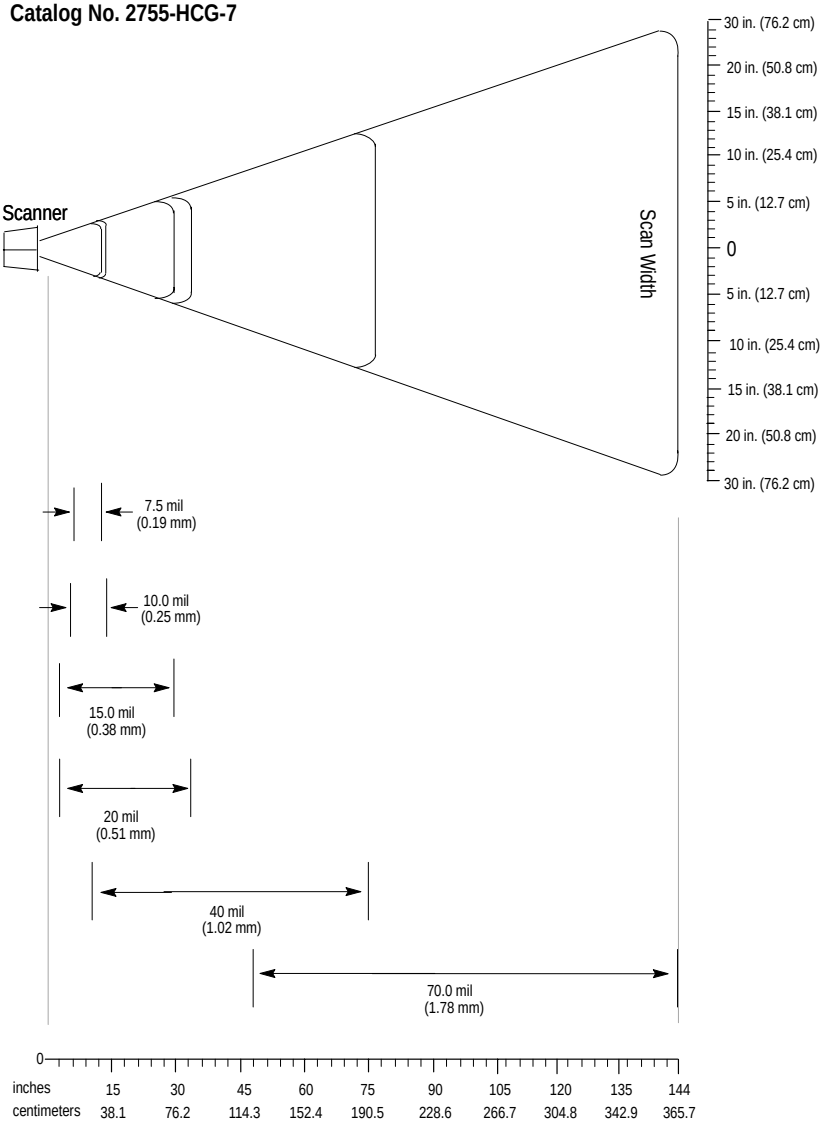
Catalog No. 2755-HCG-7

Minimum Bar Code Width	Read Range
7.5 mil (0.19 mm)	7.0 in. to 12.0 in. (17.8 cm to 30.5 cm)
10.0 mil (0.25 mm)	5.0 in. to 15.0 in. (12.7 cm to 38.1 cm)
15.0 mil (0.38 mm)	3.0 in. to 30.0 in. (7.62 cm to 76.2 cm)
20.0 mil (0.51 mm)	3.0 in. to 34.0 in. (7.62 cm to 86.4 cm)
40.0 mil (1.02 mm)	10.0 in. to 75.0 in. (25.4 cm to 190.5 cm)
70.0 mil (1.78 mm)	48.0 in. to 144.0 in. (121.9 cm to 365.7 cm)

Standard Range Scanner
Catalog No. 2755-HCG-4



Long Range Scanner
Catalog No. 2755-HCG-7



Accessories

The following accessories are available.

- Power Supply – Connects to and provides power for the base/charger unit.
  - 100–240V ac, 50–60 Hz (Catalog No. 2755-HCP-D1)
- RS-232 Cables – Connects the base/charger unit to host RS-232 port. See appendix B for connections.
  - RS-232-C, 25-pin DB, male, Txd on Pin 3 (Catalog No. 2755-HCC-BR2-06)
  - RS-232-C, 25-pin DB, male, Txd on Pin 2 (Catalog No. 2755-HCC-BR1-06)
- Keyboard Wedge Cables – Connects the base/charger unit to keyboard and terminal. See appendix B for connections.
  - For IBM® XT/AT keyboard, 5-pin DIN (Catalog No. 2755-HCC-BP1-06)
  - For PS/2 keyboard. 6-pin Mini-DIN (Catalog No. 2755-HCC-BP2-06)
  - For DEC® VT2xx, 3xx, 4xx keyboards (Catalog No. 2755-HCC-BV1-06)
- Stands – Provides storage for the scanner gun.
  - 5 to 8 inch (127 to 457 mm) height (Catalog No. 2755-HFN-K1)
  - 9 to 16 inch (229 to 406 mm) height (Catalog No. 2755-HFN-K2)
  - Multi-mount Stand (Catalog No. 2755-HFN-K3)
- Protective Boot – Heavy canvas boot provides additional protection for the scanner gun (Catalog No. 2755-HCN-H1).
- Base/Charger Unit – (Catalog No. 2755-HCG-B)
- Holster – (Catalog No. 2755-HCN-H2)
- Belt Clip – (Catalog No. 2755-HCN-H3)
- Battery Pack – (Catalog No. 2755-HCP-B1)

- 4-Slot Desk Mount Universal Rapid Battery Charger – (Catalog No. 2755-HCP-B2)
- Battery Mounting Adapter for Universal Battery Charger – (Catalog No. 2755-HCP-B3)

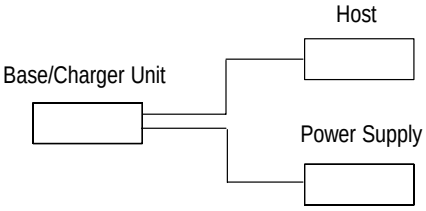
Installing Your Hardware

This chapter describes how to install your hardware. Included is the following sequence on installing your scanner system hardware.

1. unpacking the equipment
2. setting the address of the base/charger unit
3. connecting the host cable to the base/charger unit
4. mounting the base/charger unit
5. mounting the power supply
6. connecting the power supply to the base/charger unit and power receptacle
7. connecting the host cable to the host device
8. charging the battery
9. pairing the scanner to the base/charger unit

Important Notes on Scanner Systems

The following illustrates the base/charger unit connected to the host device and power supply.



Be aware of the following when setting up your scanner system.

- The gun operates up to 50 ft (15.24 m) from the host device depending on the application environment.
- The gun turns itself off after each successful data transmission to conserve battery life.
- Average life of a battery charge is 8 hours. Replace or recharge the battery at the end of the work shift.
- There is a 1-to-1 pairing of guns to bases. (You cannot have multiple guns paired to one base or one gun paired to multiple bases.)
- You need to pair the scanner with the base/charger unit after replacing the battery in the scanner gun. Refer to page 2–16 for information regarding pairing the scanner to the base/charger unit.
- The base/charger unit cannot be placed in an enclosure. RF communication between the gun and the base/charger unit will be affected by the enclosure. However, you should protect the base/charger unit from airborne contaminants.

1. Unpacking the Equipment

Remove the scanner, base/charger unit, power supply, and host interface cable from their packing and inspect for physical damage. If there is damage, contact Allen-Bradley Global Technical Services (GTS) at (**216**) **646-6800**.

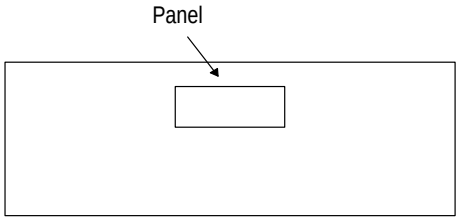
2. Setting the Address of the Base/Charger Unit

You need to set the address of the base/charger unit (Catalog No. 2755-HCG-B) in order to pair the scanner with the base. Pairing allows communication to occur between these two units. Be aware of the following when pairing the scanner to the base/charger unit.

- There is a 1-to-1 pairing of guns and bases. (You cannot have multiple guns paired to one base or one gun paired to multiple bases.)
- You can have 128 gun/base pairs within the same RF communication range.
- Communication between the gun and the base/charger unit may be affected by environmental conditions such as the amount of metal located near the gun and base/charger unit.
- You need to pair a gun to a base/charger unit after replacing the battery in the gun.
- The base/charger must be assigned an unique address between 00 and 7F.

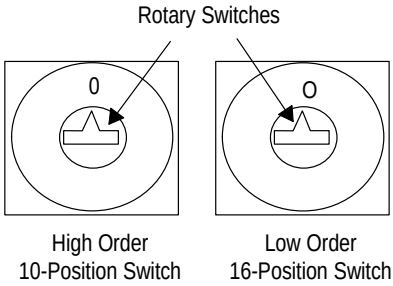
To set the address:

1. Locate the panel on the underside of the base/charger unit.



2. Remove the panel.

3. Locate the two rotary switches. The first switch is a 10-position switch (0 to 9, high order address digit) and the second is a 16-position switch (O to F, low order address digit). **Note:** Positions 8 and 9 are illegal on the 10-position switch.



4. Use a small screwdriver to set the address by inserting the blade into the slot and turning the switch until you reach the appropriate character. The possible settings are listed below. **Note:** Do not a use a large blade to rotate the dials since damage to the dials could result.

Base/Charger Addresses															
00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F

5. Insert the panel.

3. Connecting the Host Cable to the Base/Charger Unit

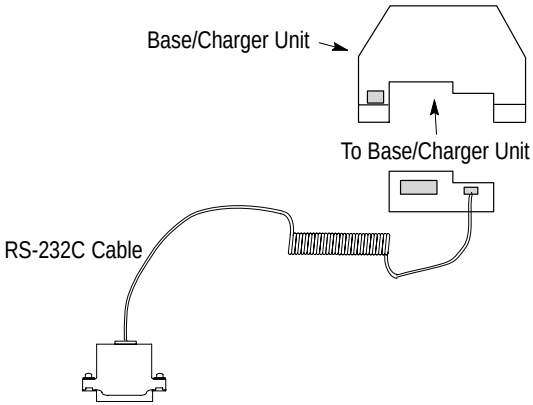
Use the appropriate host interface cable to connect the base/charger unit.

Host	Uses this cable type	Catalog Number
DEC VT 2xx/3xx/4xx	Wedge	2755-HCC-BV1-06
RS-232C devices that TxD output on Pin 2, Female connector. Examples include: RB Module PLC® model 5/11, 5/20, 5/30, 5/40L, 5/60L, or 5/80 SLC™ model 5/03① or 5/04① AB Workstation model T-View™①, T70① or T71① MessageView™① 2755-DS/DD Enhanced Decoder Host Port	RS-232C	2755-HCC-BR2-06 (TxD output on Pin 3, Male connector.)
RS-232C device that TxD output on Pin 3, Female connector. Example includes: 2708-DH5 Workstation Communications Port	RS-232C	2755-HCC-BR1-06 (TxD output on Pin 2, Male connector.)
IBM AT/XT and clones	Wedge	2755-HCC-BP1-06
Dataliner™ model DL 40		
IBM PS/2 (and clones) model 30, 50, 55SX, 60, 70, or 80	Wedge	2755-HCC-BP2-06

① A 25-to-9 pin adapter is required to connect the host device to the base/charger unit cable.

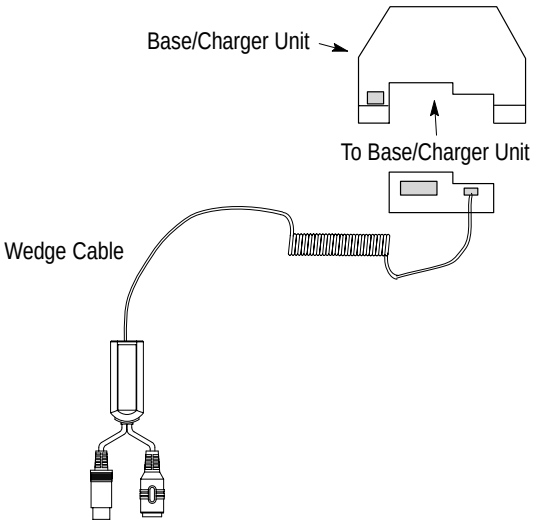
Connecting a RS-232C Cable to the Base/Charger Unit

To connect the RS-232C cable (Catalog Nos. 2755-HCC-BR1-06 or -BR2-06) to the base/charger unit, plug the box end of the RS-232C cable into the base/charger unit.



Connecting a Wedge Cable to the Base/Charger Unit

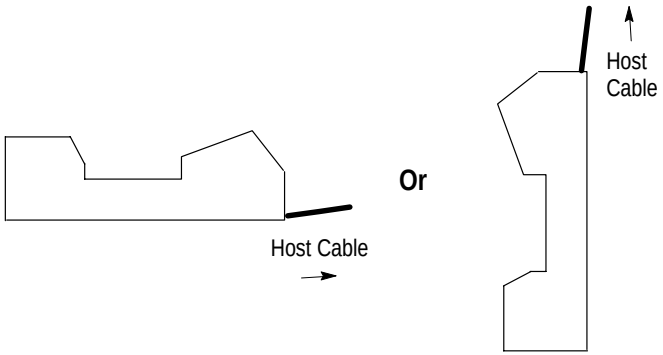
To connect the wedge cable (Catalog No. 2755-HCC-BP1-06, -BP2-06, or -BV1-06) to the base/charger unit, plug the box end of the wedge cable into the base/charger unit.



4. Mounting the Base/Charger Unit

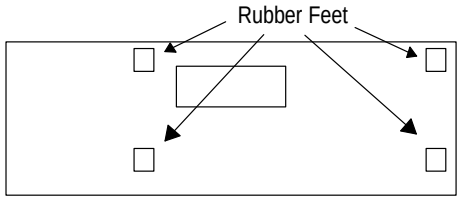
The base/charger unit can be mounted horizontally or vertically as shown below.

ATTENTION: Do not mount the base/charger unit in an enclosure. RF communication between the gun and the base/charger unit will be affected by the enclosure. Also make sure the location of the base/charger unit will not interfere with data transmission between the scanner gun and the base/charger unit. Material placed near the base/charger unit may absorb the RF signal intended for the base/charger unit.

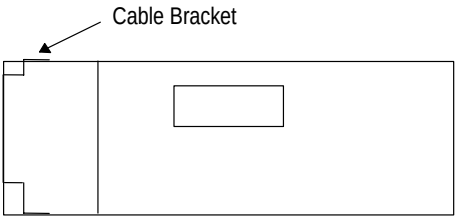


To mount the base/charger unit:

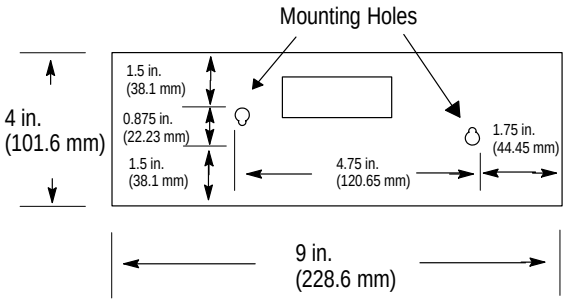
1. Attach the rubber feet to the underside of the base/charger unit.



2. Attach the cable bracket to the underside of the base/charger unit. Make sure you have attached the host interface cable first. You can remove the bracket by prying it off of the base/charger unit with a screwdriver.



3. Remove the mounting template from the installation instruction sheet. The following figure shows the dimensions of the base/charger unit.



4. Secure the template to the mounting surface.

5. Drill holes through the holes marked on the mounting template.

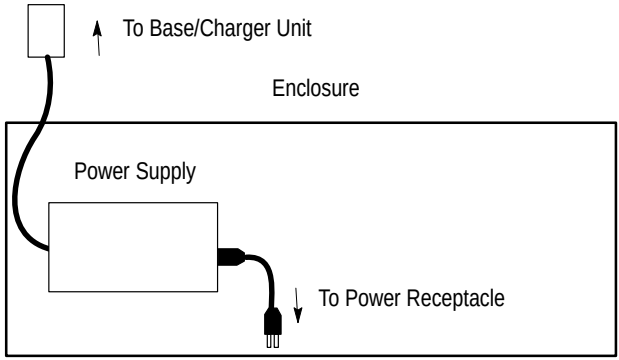
6. Remove the mounting template from the mounting surface.

7. Attach #10 flat-head or pan-head screws to your mounting surface.

8. Mount the base/charger unit.

5. Mounting the Power Supply

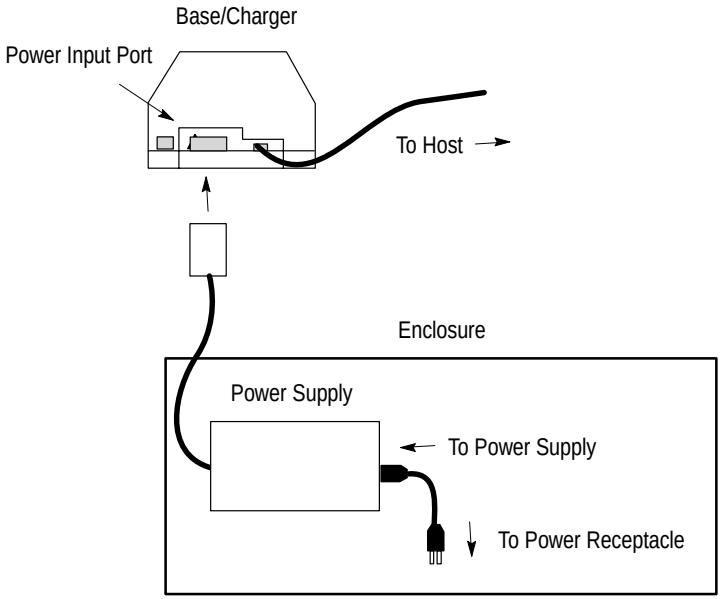
Place the power supply (Catalog No. 2755-HCP-D1) in an enclosure near the base/charger unit and power receptacle. Make sure you can plug the power supply into both the base/charger unit and the power receptacle. Refer to page 2–10 for more information regarding connecting the power supply to the base/charger unit and power receptacle.



The total length of the power supply cable, from the power receptacle to the base/charger unit, is 8 ft (2.44 m).

6. Connecting the Power Supply to the Base/Charger Unit and Power Receptacle

1. Connect the power supply to the power input port on the base/charger unit.



2. Connect the power supply cable (Renewal Part Nos. 77121-801-01, 77121-801-02, or 77121-801-03) to the power supply.
Note: The power supply cables are sold separately from the power supply. Contact your local Allen-Bradley distributor to order the power supply cables.

3. Connect the power supply to the appropriate receptacle supplying the proper voltage level.

Power Supply	Voltage Level
2755-HCP-D1	100–240V ac/50–60 Hz

7. Connecting the Host Cable to the Host Device

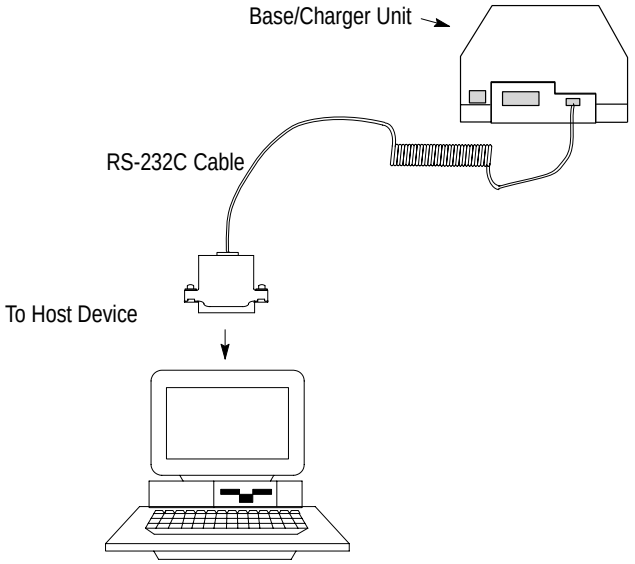
The following sections describe how to connect the host cable to the host device.

Connecting a RS-232C Cable to the Host Device

ATTENTION: Do not install the RS-232C cable (Catalog Nos. 2755-HCC-BR1-06 or -BR2-06) or disconnect/connect the host device with power applied to the host device. Failure to follow this caution may result in damage to the base/charger unit, RS-232C cable, or host device.

To connect the RS-232C cable to the host device:

1. Disconnect power from your host device.
2. Plug the RS-232C cable into the host device.



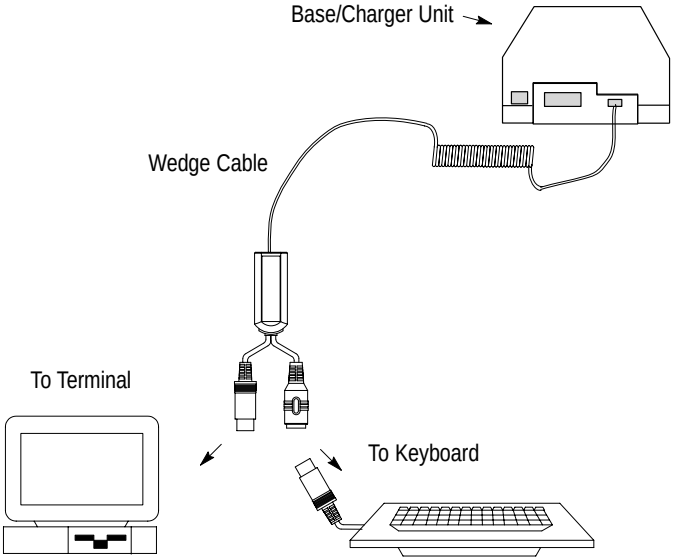
3. Reconnect power to your host device.

Connecting a Wedge Cable to a Host Device

ATTENTION: Do not install the wedge cable (Catalog No. 2755-HCC-BP1-06, -BP2-06, or -BV1-06) or disconnect/connect the host device with power applied to either the wedge cable or host device. Failure to follow this caution may result in damage to the base/charger unit, wedge interface cable, or host device.

To connect the wedge cable to the host device:

1. Disconnect power from your host device.
2. Disconnect the keyboard from the host device.
3. Plug the wedge cable into the host device (i.e., one end into the terminal and the other end into the keyboard).



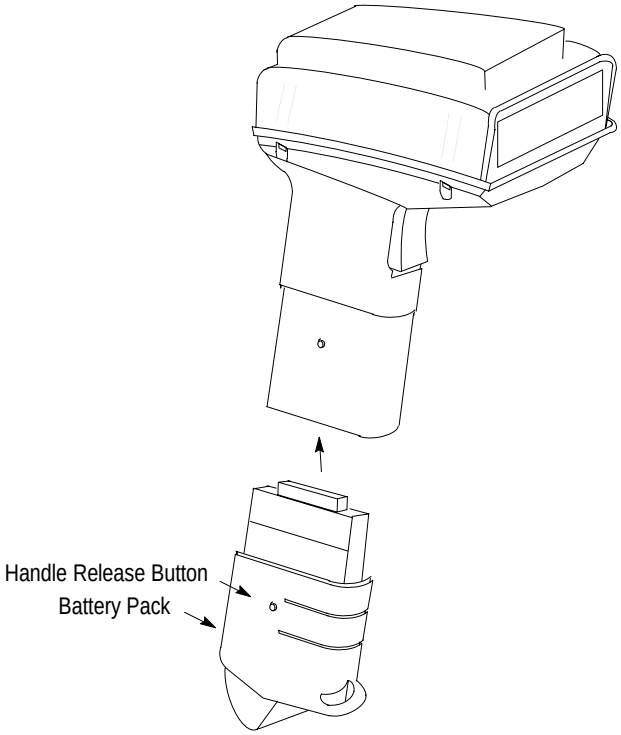
4. Reconnect power to your host device.

8. Charging the Battery

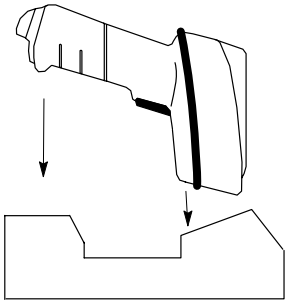
ATTENTION: Charge a battery (Catalog No. 2755-HCP-B1) at room temperature of 65° F (18.3° C) to 70° F (21.1° C) for optimum performance. Allow the battery to adjust to room temperature before charging.

You can charge the battery while the battery is in the gun. To accomplish this task:

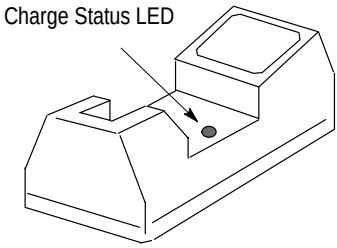
1. Make sure the battery is in the scanner handle. Make sure the handle release button is pressed in below the outer housing when sliding a battery into place.



2. Place the scanner into the base/charger unit as shown below. Make sure that the unit fits snugly into the base/charger.



3. Check the charge status indicator for a full charge (blinking rapidly = full charge), which occurs within two hours. However, you can use the scanner with less than a full charge.



Base/Charger LED Status

Red LED	Indicates
Off	The scanner is not properly inserted into the base/charger or the battery is not functioning properly.
Blinking Slowly	Battery charge is pending. This occurs if the battery temperature is too high or too low or the battery is deeply discharged. After several minutes, normal charging should begin.
On	The battery is actively charging. Charging takes approximately two hours.
Blinking Rapidly	Battery charging is complete.

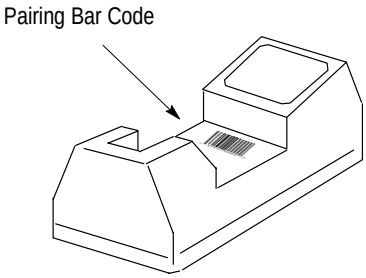
Refer to page 5–13 for more information regarding low battery strength.

Average life of a battery charge is 8 hours. Refer to page 5–10 for replacing the battery.

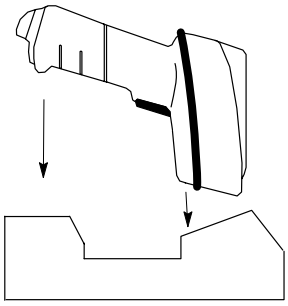
9. Pairing the Scanner to the Base/Charger Unit

There is a 1-to-1 pairing of guns to bases. (You cannot have multiple guns paired to one base or one gun paired to multiple bases.) To pair the scanner with the base/charger unit:

1. Scan the Pairing Bar Code located on the base/charger unit.



2. Insert the scanner into the base/charger unit. You have 15 seconds to insert the scanner or you will hear 4 error beeps to indicate unsuccessful pairing. Successful pairing is indicated by a warble beep and an illuminated green LED on the scanner gun. **Note:** You cannot scan data until pairing of the scanner with the base/charger unit is complete.



Once the scanner is placed in the base/charger unit, information (e.g., addressing, RF channels, etc.) is transferred between the scanner and the base/charger unit.

Configuring Your Scanner

This chapter describes the configuration options for the scanners. Included are:

- important notes on configuring a scanner
- available symbologies
- scanner bar codes
- scanner default settings
- parameter selections
- parameter descriptions
- configuration sequence

Important Notes on Configuring a Scanner

Be aware of the following when configuring the scanner:

- The scanner bar codes are located in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6).
- The scanner may be configured with default values, see page 3–3. If the default values are suitable for your application, scan the Set Defaults bar code.

Available Symbologies

The scanner automatically discriminates between all of the following symbologies. The only exception is that the scanner cannot discriminate between Code 39 and Code 39 Full ASCII (see glossary definition). The scanner can read and decode these symbologies:

- UPC-A
- UPC-E
- Code 39 Full ASCII
- Code 39
- Code 128
- EAN 8
- EAN 13
- EAN 128
- Codabar
- Interleaved 2 of 5
- Discrete 2 of 5
- MSI Plessey

All bar code symbologies are enabled as the default. To disable a symbology, scan the Delete bar code. To enable a symbology, scan the Add bar code for the symbology.

Scanner Bar Codes

All programming codes may be found in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6). The scanner is always enabled to read Code 128 labels since all configuration codes use this symbology.

Scanner Default Settings

The following table lists the default settings for the standard and extended range scanners.

Description	Default Setting
Host Interface	None
Code Types	All Enabled
Code Lengths	
Code 39	1 to 55
Code 128	3 to 55
Codabar	2 to 55
I 2 of 5	14
D 2 of 5	14
MSI Plessey	1 to 55
Decode Options	
Transmit UPC-A Check Digit	Enabled
Transmit UPC-E Check Digit	Enabled
Convert UPC-E to UPC-A	Disabled
EAN Zero Extend	Disabled
Transmit No Decode Message	Disabled
Decode UPC/EAN Supplemental	Disabled
ITF-14/EAN-13 Conversion	Enabled
Transmit Code 39 Check Digit	Disabled
MSI Plessey Check Digit	1
Buffer Code 39	Disabled
Beeper Volume	High

Table continued on the next page.

Description	Default Setting
Beep After Good Decode	Enabled
UPC/EAN Security Level	0
Decode Redundancy	0
UPC-A Preamble	System Character
UPC-E Preamble	System Character
Pause Duration	0
Prefix Value	None
Suffix Value	7013 (<Enter> for wedges, <CR/LF> for serial devices)
Scan Data Transmission Format	Data As Is
Laser Control	
Laser On Time-Out	3 Seconds
RS-232C Options	
Baud Rate	9600
Parity	Odd
Check Parity	Enabled
Hardware Handshaking	None
Software Handshaking	None
Serial Response Time-out	2 Seconds
Stop Bit Select	2
ASCII Data Format	7-bit
RTS Line State	Low
Intercharacter Delay	0
Transmit Code ID Character	Disabled
Transmit AIM Code ID	Disabled
Ignore Unknown Characters	Enabled
International Keypad Emulation	Disabled

Table continued on the next page.

Description	Default Setting
International Keypad Emulation Fast Xmit	Disabled
National Keyboard Type	U.S. English
Set Transmission Frequency (Channel)	50
Wait for Host Interface Response Time	00

Parameter Selections

The following table lists the parameters that are applicable for use with either the RS-232C device or the keyboard wedge device.

Parameter	Host Type	
	RS-232C	Keyboard Wedge
Host Interface	•	•
Code Types	•	•
Code Lengths		
Code 39	•	•
Code 128	•	•
Codabar	•	•
I 2 of 5	•	•
D 2 of 5	•	•
MSI Plessey	•	•
Decode Options		
Transmit UPC-A Check Digit	•	•
Transmit UPC-E Check Digit	•	•
Convert UPC-E to UPC-A	•	•
EAN Zero Extend	•	•
Transmit No Decode Message	•	•
Decode UPC/EAN Supplemental	•	•
ITF-14/EAN-13 Conversion	•	•
Transmit Code 39 Check Digit	•	•
MSI Plessey Check Digit	•	•
Buffer Code 39	•	•
Beeper Volume	•	•

Table continued on the next page.

Parameter	Host Type	
	RS-232C	Keyboard Wedge
Beep After Good Decode	•	•
UPC/EAN Security Level	•	•
Decode Redundancy	•	•
UPC-A Preamble	•	•
UPC-E Preamble	•	•
Pause Duration	•	•
Prefix/suffix Values	•	•
Scan Data Transmission Format	•	•
Laser Control		
Laser On Time-Out	•	•
RS-232C Options		
Baud Rate	•	Not Applicable
Parity	•	Not Applicable
Check Parity	•	Not Applicable
Hardware Handshaking	•	Not Applicable
Software Handshaking	•	Not Applicable
Serial Response Time-out	•	Not Applicable
Stop Bit Select	•	Not Applicable
ASCII Data Format	•	Not Applicable
RTS Line State	•	Not Applicable
Intercharacter Delay	•	•
Transmit Code ID Character	•	•
Transmit AIM Code ID	•	•
Ignore Unknown Characters	•	•
International Keypad Emulation	Not Applicable	•

Table continued on the next page.

Parameter	Host Type	
	RS-232C	Keyboard Wedge
International Keypad Emulation Fast Xmit	Not Applicable	•
National Keyboard Type	•	•
Set Transmission Frequency (Channel)	•	•
Wait for Host Interface Response Time	•	•

Parameter Descriptions

The following sections describe the parameters that can be used with either the RS-232C device or the keyboard wedge device.

Host Interface Code

Allows you to select the host device.

Code types

Allows you to select the appropriate bar code symbology.

Code 39 Full ASCII

Allows you to assign a code for letters, punctuation marks, numerals, and most keys on the keyboard.

The first 32 codes are non-printable and are assigned to keyboard control characters such as backspace and return. The other 96 codes are printable codes except for space and delete.

Code 39 Full ASCII interrupts the bar code control character ($+%/) preceding a code 39 symbol and assigns an ASCII character. For example, when code 39 Full ASCII is enabled and a +B is scanned, the equivalent is b.

Code 39 Any Length

Allows you to decode a Code 39 symbol containing any number of characters.

Code 39 Length Within Range

Allows you to decode a Code 39 symbol within a specified range of characters.

Code 39 One Length

Allows you to decode a Code 39 symbol containing a selected length of characters.

Code 39 Two Lengths

Allows you to decode a Code 39 symbol containing two selected lengths of characters.

Code 128 Any Length

Allows you to decode a Code 128 symbol containing any number of characters.

Codabar Any Length

Allows you to decode a Codabar symbol containing any number of characters.

Codabar Length Within Range

Allows you to decode a Codabar symbol within a specified range of characters.

Codabar One Length

Allows you to decode a Codabar symbol containing a selected length of characters.

Codabar Two Lengths

Allows you to decode a Codabar symbol containing two selected lengths of characters.

I 2 of 5 Any Length

Allows you to decode an I 2 of 5 symbol containing any number of characters.

I 2 of 5 Length Within Range

Allows you to decode an I 2 of 5 symbol within a specified range of characters.

I 2 of 5 One Length

Allows you to decode an I 2 of 5 symbol containing a selected length of characters.

I 2 of 5 Two Lengths

Allows you to decode an I 2 of 5 symbol containing two selected lengths of characters.

D 2 of 5 Any Length

Allows you to decode a D 2 of 5 symbol containing any number of characters.

D 2 of 5 Length Within Range

Allows you to decode a D 2 of 5 symbol within a specified range of characters.

D 2 of 5 One Length

Allows you to decode a D 2 of 5 symbol containing a selected length of characters.

D 2 of 5 Two Lengths

Allows you to decode a D 2 of 5 symbol containing two selected lengths of characters.

MSI Plessey Any Length

Allows you to decode an MSI Plessey symbol containing any number of characters.

MSI Plessey Length Within Range

Allows you to decode an MSI Plessey symbol within a specified range of characters.

MSI Plessey One Length

Allows you to decode an MSI Plessey symbol containing a selected length of characters.

MSI Plessey Two Lengths

Allows you to decode an MSI Plessey symbol containing two selected lengths of characters.

Transmit UPC-A Check Digit

Decoded UPC-A symbol data is transmitted with or without the check digit.

Transmit UPC-E Check Digit

Decoded UPC-E symbol data is transmitted with or without the check digit.

Convert UPC-E to UPC-A

When enabled, this option converts UPC-E (zero suppressed) decoded data to a UPC-A format before sending the data. After conversion, output data will be affected by UPC-A programming selections such as preamble and check digit settings.

EAN Zero Extend

When enabled, five leading zeros are added to decoded EAN 8 symbol data. The five zeros make the EAN 8 symbols compatible with the EAN 13 format.

Transmit No Decode Message

When enabled, a **NR** is transmitted with each no-read. Prefixes and suffixes appear with the output message.

UPC / EAN Supplemental

When enabled, supplemental digits are decoded. If the supplemental digits are not enabled and a bar code having supplemental digits is read, the supplemental digits are ignored. On the other hand, if supplemental digits are enabled, only bar codes with supplemental digits are decoded.

I 2 of 5 (14 digit) to EAN 13 Conversion

When enabled, 14 character Interleaved 2-of-5 data is converted and transmitted to the host in an EAN 13 format. The I 2 of 5 code must be enabled, have one length set to 14, have a leading zero, and have a valid EAN-13 check digit.

Code 39 Check Digit

When enabled, the scanner verifies the Code 39 check digit (modulo 43 check character).

MSI Plessey check Digit

When enabled, one or two digits at the end of the bar code that checks the integrity of that data.

Code 39 Buffering (Scan and Store)

When enabled, the scanner stores all Code 39 symbol data that has a leading space as the first character. As Code 39 labels are scanned for buffering, the scanner provides a high/low beep to indicate that the data is stored in the buffer. The leading space is not stored in the buffer.

Decoding of a valid Code 39 symbol with no leading space causes transmission in sequence of all buffered data in a first-in, first-out basis, plus transmission of the triggering symbol.

If you select the scan and transmit option, decoded Code 39 symbols without leading spaces are transmitted without being stored in the buffer.

Scan and Store affects Code 39 decodes only. If you select Scan and store, it is recommended that you configure the scanner to decode Code 39 symbology only.

Up to 250 bytes of information may be stored. If you scan a symbol and the buffer is full, the scanner will provide three long high tone beeps. No transmission will occur and the data in the buffer is not affected.

N**ote:** Before you can disable Code 39 buffering, you must clear the buffer.

Beeper Volume

Allows you to select the level of beeper volume.

Beep After Good Decode

When enabled, the scanner will beep during normal operation. The beeper operates during parameter menu scanning and indicates error conditions. It is recommended that you leave this option enabled.

UPC / EAN Security Level

There are four levels of decode security. There is an inverse relationship between security and the ability to decode codes of varying quality. Increasing levels of security are provided for decreasing levels of bar code quality. Select one of the levels below.

The default security level is 0. This level is sufficient for most applications. Higher security levels:

- may result in more no-reads on poor quality labels
- reduce the chance of mis-reads on poor quality labels

Security Level	Decode Operation
0	The scanner decodes many poor or low quality bar codes while providing adequate security for UPC/EAN codes within specifications. This is the default setting.
1	As quality level of UPC / EAN bar codes decrease, certain digits are more susceptible to misreads (1, 2, 7, 8) If you have problems decoding bar codes with these digits, select this security level.
2	If you are having problems decoding poor quality bar codes and the problem isn't limited to the digits (1, 2, 7, 8), select this level.
3	If you selected security level 2 and are still having problems decoding symbols, select this security level. **Note:** Only use this level if you are scanning high quality bar codes. the scanner will reject codes that are not within the specifications for the symbology.

Decode Redundancy

Use this parameter to indicate if a bar code is read one time (level one), two times (level two), or three times (level three) before decoding it. Rereading a bar code helps ensure accuracy in decoding bar codes.

UPC-A / UPC-E Preambles

The UPC preamble consists of the system character and country code. The system character is the the first character on the left side of the symbol. The country code for UPC is always 0. Select whether these characters are sent with the bar code data:

- system character only
- country code and system character
- no preamble

Note: There are separate preamble programming codes for both UPC-A and UPC-E symbols.

Pause Duration

When enabled, this parameter allows you to insert a pause at any point in the data transmission. Pauses are set by scanning a two digit number (i.e., two bar codes, and are measured in 0.1 second increments).

Scan Prefix

To add prefix data to bar code data, scan the Prefix bar code followed by the 4 digit (decimal) ASCII equivalent value for each character. Only one character may be specified as a prefix. When you enter the last digit of a prefix, the scanner lets you know that you have entered a valid value by providing a high-low-high beep.

Scan Suffix

To add suffix data to bar code data, scan the Suffix bar code followed by the 4 digit (decimal) ASCII equivalent value for each character. Only one character may be specified as a suffix. When you enter the last digit of a suffix, the scanner lets you know that you have entered a valid value by providing a high-low-high beep.

Data Transmission Formats

You can set whether or not prefix or suffix data is added to the decoded symbol data. You have four options:

- **<DATA AS IS>** Only bar code data is sent. This is the default setting.
- **<DATA> <SUFFIX>** Bar code data is sent, then the suffix data.
- **<PREFIX><DATA><SUFFIX>** Prefix data is sent, then bar code data followed by the suffix data.
- **<PREFIX> <DATA>** Prefix data is sent then the bar code data.

Laser On Time-Out

This setting determines the maximum time the scanner remains on while the trigger is pressed. The time-out is programmable in 0.5 second increments from 0.5 seconds to 3.0 seconds.

Baud Rate

Sets the rate (bits per second) at which the scanner transmits data. The scanner baud rate setting must match the host setting. If the settings do not match, data may not reach the host device or reach it in distorted form. The selections are:

- 600
- 1200
- 2400
- 4800
- 9600 (default)
- 19200

Parity

Checks to ensure that the correct number of bits are contained in the coded character. You can set the parity of each ASCII coded character that is transmitted. Make sure the parity matches the requirements of the host. The selections are:

- Odd
- Even
- Mark (parity bit always set to 1)
- Space (parity bit always set to 0)
- None (Default)

Check Parity

When enabled, the scanner checks the received characters for parity. The type of parity can be selected with the Parity parameter. The default parameter is Check Parity enabled.

Hardware Handshaking

When enabled, handshaking verifies the readiness of a receiving device before data is transmitted. If the receiving device is periodically occupied with other tasks, hardware handshaking is used to prevent loss of transmitted data. You can enable or disable the hardware handshaking lines, RTS (Request to Send), and CTS (Clear to Send). The DTR (Data Terminal Ready) signal is active high. Hardware handshaking cannot be used in conjunction with software handshaking.

If RTS/CTS handshaking is enabled, the sequence for scanning data is:

1. The base/charger unit checks the Clear to Send (CTS) line. If CTS is active, the base/charger unit will wait for up to one second and check the line again. If the line is still active, the base/charger unit will provide an audible beep and any scanned data will be lost.

2. If the CTS line is not active, the base/charger unit will assert the Request to Send (RTS) line and waits one second for the host to assert the CTS line. When the host asserts the CTS line, the base/charger unit transmits the data. During the transmission of data, the CTS line should be asserted.
3. After the transmission is completed, the base/charger unit will negate the RTS 10 msec after sending the last character.
4. The host device should then negate CTS. The base/charger unit checks the CTS line on the next transmission.

If the sequence for scanning data fails, the base/charger unit issues a transmit error, indicating that the data is lost and must be rescanned. The default parameter is no Hardware Handshaking enabled.

Software Handshaking

Software handshaking controls the transmission of data. Use software handshaking instead of (but not with) hardware handshaking. There are four options:

- None (Default)
- ACK/NAK Only
- ENQ Only
- ACK/NAK with ENQ

ACK/NAK Only checks the result of a transmission. The base/charger unit waits for one of the following responses from the host:

- **<ACK>**
- **<NAK>**

ACK indicates a successful transmission. NAK indicates there is a problem. Whenever the scanner receives a NAK, it retransmits the data up to three times. If an ACK is still not received after three attempts, the transmission is aborted and the scanner will provide four short beeps.

ENQ ONLY requires that the base/charger unit receive an an enquire character (ENQ) from the host before sending data. With ENQ enabled, the base/charger unit must receive an ENQ from the host within a two second period after the last scan or a transmission error occurs. The scanner will provide four short beeps to indicate the error; the base/charger unit is ready to send again.

ACK/NAK with ENQ combines both ACK/NAK and ENQ options.

Serial Response Time-out

When enabled, this parameter determines the maximum period allowed to elapse before the base/charger unit assumes the end of transmission. The delay can last up to 9.9 seconds. The default parameter is enabled at 2 seconds.

Stop Bit Select

The stop bit marks the end of each character transmitted and prepares the receiving device for the next character in the data stream. You can set the number of stop bits to either 1 or 2 to match the host device. The default parameter is set to 2.

ASCII Format

When enabled, the scanner transmits data in an 8-bit ASCII format. This allows the the base/charger unit to interface with devices using that protocol. The default is 7-bit ASCII.

RTS Line State

When enabled, the parameter adjusts the RTS Line State since certain hosts expect the RTS line to be in a certain state (high or low). The default parameter is set to low.

Intercharacter Delay

When enabled, the host system has time to service its receiver and perform other tasks between characters. You can choose up to 99 msec delay between transmission of characters. The default parameter is set to zero.

Transmit Code ID Characters

The code ID identifies a scanned bar code symbol's code type. If enabled, the code ID is sent after the prefix and before the bar code data. The code ID codes are:

- A = UPC-A, UPC-E, or EAN 13
- B = Code 39
- C = Codabar
- D = Code 128
- E = Code 93
- F = Interleaved 2 of 5
- G = Discrete 2 of 5

The default parameter is disabled.

Transmit AIM Code ID

When enabled, the AIM code identifier is sent after the prefix and before the bar code data. The identifier is a three character prefix. Refer to AIM's *Guidelines on Symbology Identifiers* for a description. The default parameter is disabled.

Ignore Unknown Characters

When enabled, all data is sent except for unknown characters and no error beeps are sounded. Unknown characters are those characters that the host device does not recognize. When disabled, all data containing one or more unknown characters is discarded and error beeps are sounded. The default parameter is enabled.

International Keyboard Emulation

When enabled, this parameter allows you to send the code from the type of keyboard that you have. This parameter will allow you to select a national keyboard type. This parameter is supported by IBM AT/XT/PS2 computers only. The default parameter is disabled.

International Keyboard Emulation Fast Transmit

When enabled, this parameter allows you to send the code from the type of keyboard that you have quickly. This parameter will allow you to select a national keyboard type. This parameter is supported by some IBM AT/XT/PS2 computers only. The default parameter is disabled.

National Keyboard Type

Allows you to set the national character type for the keyboard you are using. Selections include U.S. English, French, German, French International, Spanish, Italian, Swedish, and U.K. English. The default parameter is set to U.S. English.

Set Transmission Frequency

Allows you to set the transmission channel of communication between the scanner gun and the base/charger unit. The default parameter is set to 50.

Wait for Host Interface Response Time

The scanning system automatically calculates the time it takes for base/charger unit to communicate with the host device and for the base/charger unit to send an acknowledgement back to the scanner. Under normal operating conditions, you should not enable this bar code option.

If you need to enable this option, the timeout values can range from 1 to 99 seconds. If you receive error beeps while enabling this bar code, increase the timeout value until the error beeps stop. The default parameter is set to 00.

Configuration Sequence

To configure the scanner:

1. Connect the base/charger unit to the host device. Refer to Chapter 2 for more information.
2. Make sure the scanner gun has a fully charged battery. Refer to Chapter 2 for more information.
3. Pair the scanner to the base/charger unit. Refer to Chapter 2 for more information.
4. Decide if the default values meet your requirements. Refer to page 3–3 for a listing of the default parameters. If the default values meet your requirements, scan the Set Defaults bar code located in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6). If the default parameters do not meet your requirements, scan the appropriate bar codes for the options you need found in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6). It is recommended that you scan the Set Defaults bar code before entering any additional bar codes. The scanner parameters may be configured in any sequence.

Scanner Operation

This chapter describes scanner operation. Included are sections on:

- important notes on using your scanner
- testing your scanner
- scanning bar codes

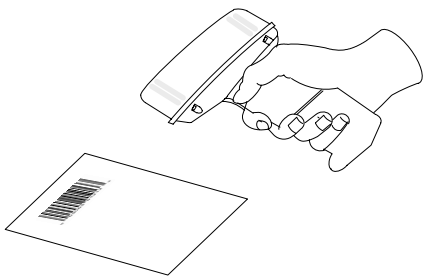
Important Notes on Using Your Scanner

Before using your scanner for data collection, make sure:

- the base/charger unit is connected to the host device,
- the power supply is connected to the base/charger unit,
- the battery is charged, and
- the scanner is paired with the base/charger unit.

Testing Your Scanner

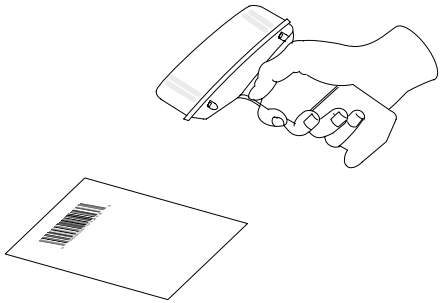
Before using your scanner in an actual application, test the scanner to make sure it is functioning properly. Aim the scanner at a slight angle towards a test bar code found on the inside back cover of this manual and press the trigger. You should see the scan beam on the bar code and the red LED on the back of the scanner should be on. If you have a successful read, the green LED on the back of the gun turns on and remains on until the next scan (trigger pressed). Refer to page 5–13 if the scanner did not function properly.



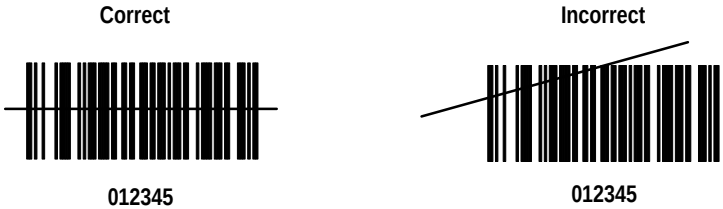
Scanning Bar Codes

To scan a bar code with either a standard range or long range scanner:

1. Make sure the bar code symbol is within the proper scanning range. Refer to page 1–6 for scanning ranges.
2. Hold the scanner at an angle to the bar code symbol. If you hold the scanner directly over the bar code symbol, light can bounce back into the scan window and prevent a successful scan.



3. Aim and press the trigger. For the standard range scanner, make sure the scan beam crosses the entire width of the bar code symbol.



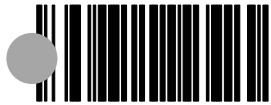
For the long range scanner, you need to press the trigger partially to center the aiming beam on the bar code and then press the trigger fully to emit the full width scanning beam on the bar code.

First Trigger Position

Correct

012345

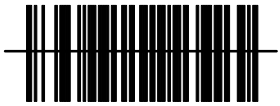
Incorrect



012345

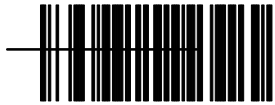
Second Trigger Position

Correct



012345

Incorrect



012345

For both scanners, you should see the scan beam across the bar code and the red LED on the back of the scanner should be on. If the scanner has made a successful read, you will hear one beep and the green LED on the back of the scanner turns on. The green LED stays on for up to one second if the the trigger is down or until you release the trigger. If the scanner has made an unsuccessful attempt to read the bar code, you will hear 4 error beeps. Refer to Troubleshooting on page 5–13 for more information regarding scanning errors.

Chapter 5

Maintenance and Troubleshooting

This chapter describes how to maintain and troubleshoot the scanners. Topics include:

- charging the battery
- conditioning the battery
- changing the battery pack in the scanner gun
- cleaning the scan window
- troubleshooting the scanners
- troubleshooting the 4-slot battery charger
- listening for audible responses
- contacting Allen-Bradley Global Technical Services

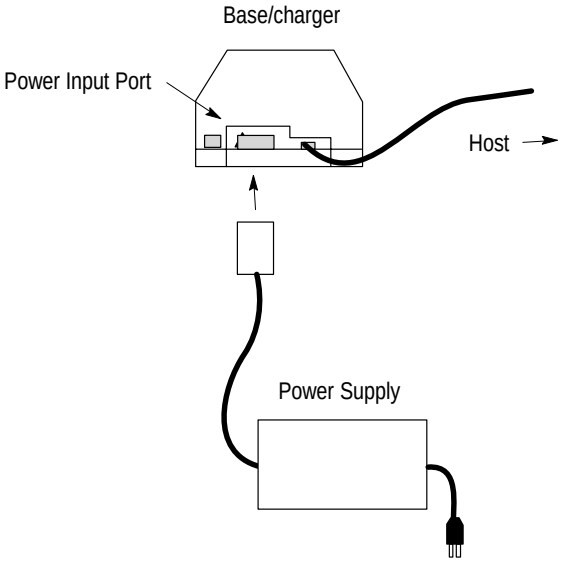
Charging the Battery

You can charge the battery (Catalog No. 2755-HCP-B1) while the battery is in the gun or in the 4-slot battery charger.

ATTENTION: Charge a battery at room temperature of 65° F (18.3° C) to 70° F (21.1° C) for optimum performance. Allow the battery to adjust to room temperature before charging.

In the Gun

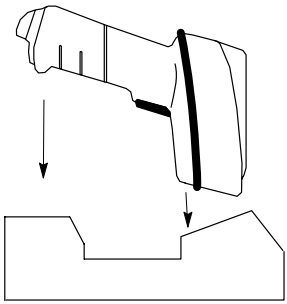
1. Connect the power supply to the power input port on the base/charger unit.



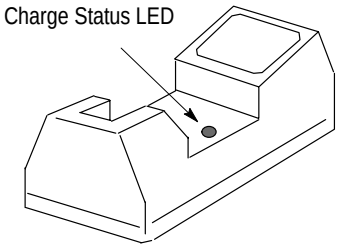
2. Connect the power supply to the appropriate receptacle supplying AC power of the proper voltage level.

Power Supply	Voltage Level
2755-HCP-D1	100–240V ac/50–60 Hz

3. Place the scanner into the base/charger unit as shown below. Make sure that the unit fits snugly into the base/charger.



4. Check the charge status indicator for a full charge (blinking rapidly = full charge), which occurs within two hours. However, you can use the scanner with less than a full charge.



Base/charger LED Status

Red LED	Indicates
Off	The scanner is not properly inserted into the base/charger unit or the battery is not functioning properly.
Blinking Slowly	Battery charge is pending. This occurs if the battery temperature is too high or too low or the battery is deeply discharged. After several minutes, normal charging should begin.
On	The battery is actively charging. Charging takes approximately two hours.
Blinking Rapidly	Battery charging is complete.

Refer to page 5–13 for more information regarding low battery strength.

Average life of a battery charge is 8 hours. Refer to page 5–10 for replacing the battery.

In the 4-Slot Battery Charger

Before using the 4-slot battery charger (Catalog No. 2755-HCP-B2), read all the instructions and cautionary markings on the 4-slot battery charger, battery, and on any products that use the battery.

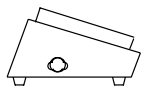
ATTENTION: To reduce the risk of injury, use the 4-slot battery charger only in the way it is intended to be used. Other batteries or adapters may explode causing personal injury and damage.

To help insure proper operation of the 4-slot battery charger and batteries, refer to the following.

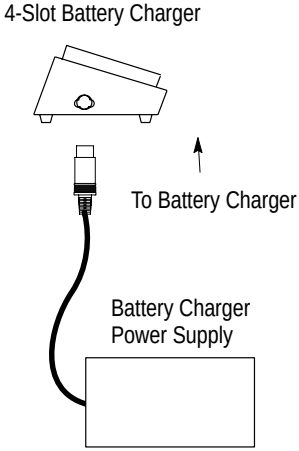
- Do not expose the battery charger to rain, snow, or direct sunlight.
- The battery charger can be used at 32° F to 104° F (0° C to 40° C).
- The battery charger should be placed in a well ventilated area free of airborne contaminants.
- Unplug the battery charger from the receptacle supplying AC power before attempting to clean or change adapters in order to reduce the risk of electrical shock.
- Dispose of dead batteries in accordance with all applicable codes.
- Do not disassemble, incinerate, modify, or short circuit batteries, charger, or related components.
- Perform a battery conditioning cycle on all new NiCd batteries before using to ensure that the battery is fully charged. Refer to page 5–9 to condition a battery.

To charge the battery in the 4-slot battery charger:

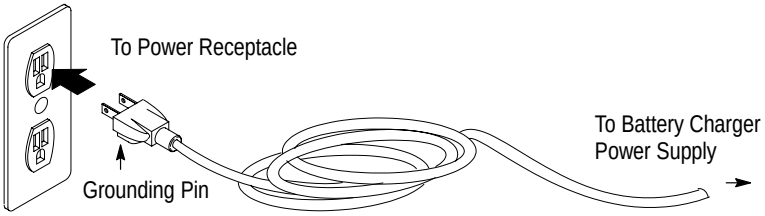
1. Mount the 4-slot battery charger horizontally as shown below.



2. Connect the 4-slot battery charger power supply to the 4-slot battery charger.

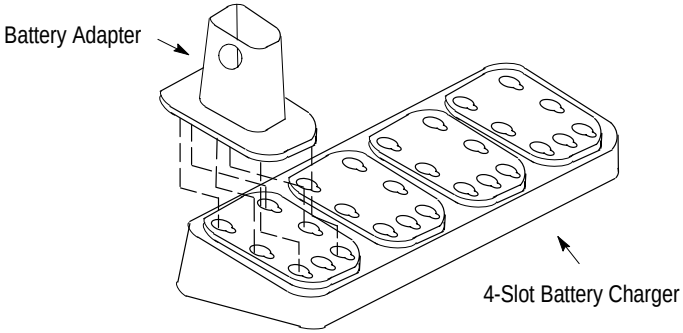


3. Connect the power supply cable to the battery charger power supply and to the outlet supplying AC power. Make sure the outlet box is properly grounded. If you are not sure, have the outlet checked by a qualified electrician.

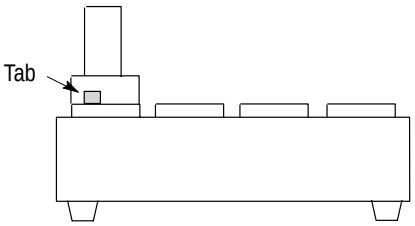


The power supply manages and conditions the power input to the charger, eliminating the need for a replaceable fuse. Should a power surge occur, the power supply connected to the charger temporarily interrupts the current supply until the condition is corrected. If an extreme surge occurred, the power light on the power supply remains off and the power supply needs to be replaced.

4. Attach the battery adapter (Catalog No. 2755-HCP-B3) to the battery charger by aligning the adapter to the charger and sliding the adapter downward, locking into place.

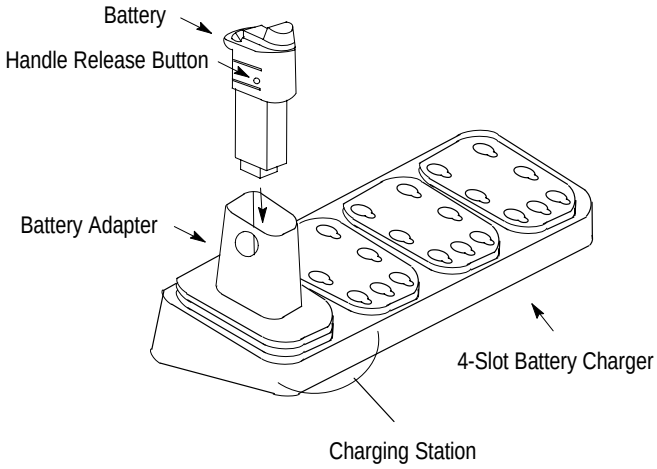


To remove the adapter, push the tab up and slide the adapter outward.



4-Slot Battery Charger

5. Insert a depleted battery into an adapter that is inserted into the 4-slot battery charger. Press the handle release button in as you are sliding the battery into the adapter.



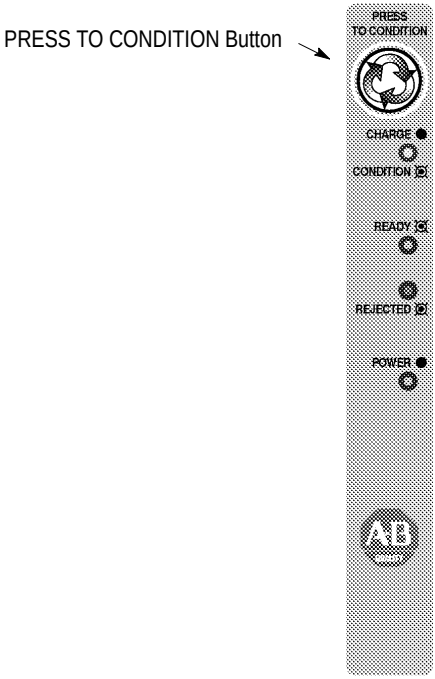
If you are charging a new battery pack, the battery charger may prematurely switch to ready. If this occurs, remove the battery from the adapter and reinsert.

Upon completion of a battery charge, the READY LED on the battery charger will flash. This indicates the battery is 95% charged. For 100% charge, leave the battery on the charger for 3 hours. A fully charged battery can be left on the battery charger indefinitely. The battery charger maintains the battery at 100% of its rated capacity.

Conditioning the Battery

If you are using a battery for the first time or notice a decrease in battery life:

1. Insert the battery into an adapter on the 4-slot battery charger.
2. Depress the PRESS TO CONDITION button for two seconds on the 4-slot battery charger.



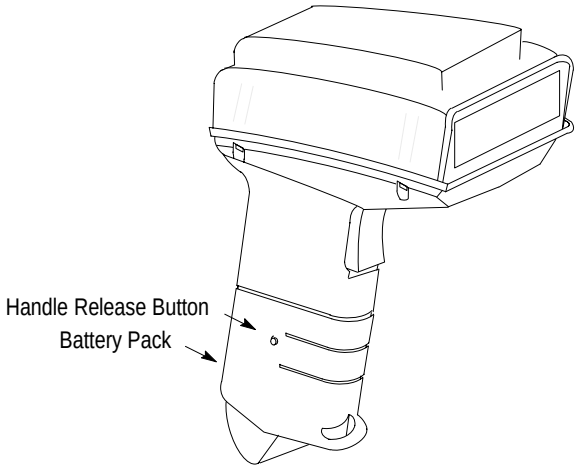
Pressing the PRESS TO CONDITION button performs a complete discharge of the battery and will recharge the battery to full capacity. Conditioning eliminates the situations that may cause the battery to deliver less than its rated capacity. Conditioning may take 3–6 hours.

ATTENTION: Perform the conditioning cycle when the battery is new or shows decreased life. Conditioning batteries more often will shorten battery life.

If conditioning the battery is not successful as indicated by the flashing REJECTED indicator on the battery charger, your battery needs replacement. Contact your local Allen-Bradley distributor for ordering a new battery.

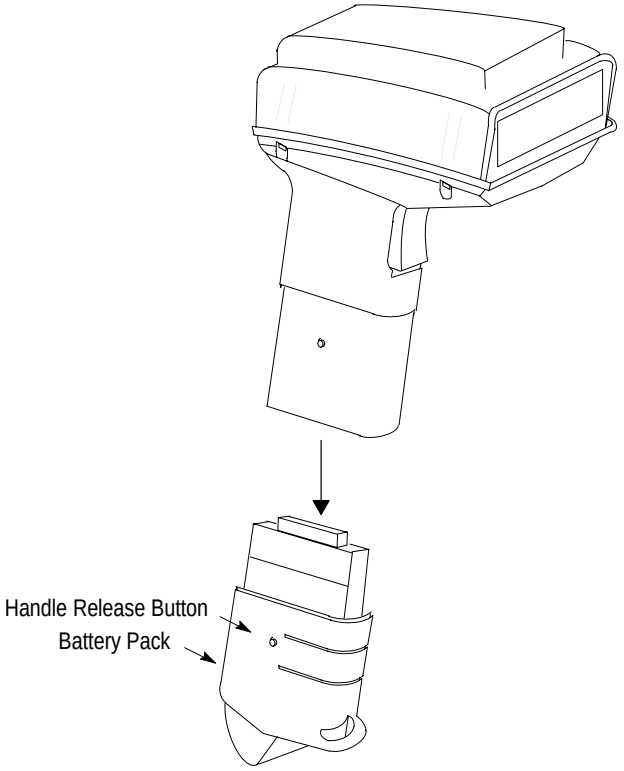
Changing the Battery Pack in the Scanner Gun

1. Locate the handle release button on the scanner.



2. Press in the handle release button below the outer housing with a probe.

3. Slide the battery pack out from the handle.



4. Insert the new battery into the scanner handle. Make sure the handle release button is pressed in below the outer housing when sliding a charged battery into place.

5. Pair the scanner with the base/charger unit. Refer to page 2–16 for information regarding pairing the scanner to the base/charger unit.

Cleaning the Scan Window

Carefully clean the window by first removing loose particles of dirt with clean air. Then use an *optical quality cloth* moistened with an *optical quality cleaning fluid* for plastic lenses and wipe the window in a single direction (don't wipe cloth back and forth across window). Do not leave streaks.

ATTENTION: Do not use abrasive materials such as disposable wipes and facial tissue. Do not use solvents like alcohol or acetone. These materials will damage the window and the finish on the scanner.

ATTENTION: The scanner has no serviceable parts. Do not open the housing of the scanner.

Troubleshooting the Scanners

The following table provides a list of the most common operating problems, the probable causes, and suggested corrective actions.

Problem	Probable Cause(s)	Corrective Action
No Scan Beam	1. Power supply not connected to base/charger unit or power source.	1. Make sure power supply is connected to the base/charger unit and plugged into a power source.
	2. Depleted battery.	2. Recharge battery.
	3. Scan beam has timed out.	3. Normal operation. Release trigger completely and scan again.
	4. Defective scanner.	4. If possible, try another scanner using the same connections. Contact Allen-Bradley Global Technical Services (GTS).
Weak Scan Beam	1. Depleted battery.	1. Recharge battery.
Scan Beam Appears as a Dot, Not a Line	1. Trigger on long range scanner is not fully pressed.	1. Long range scanner has a 2 position trigger. The first position is for the spotter beam. Press the trigger to the next position for scanning.
	2. Defective scanner.	2. Contact Allen-Bradley Global Technical Services (GTS).

Table continued on the next page.

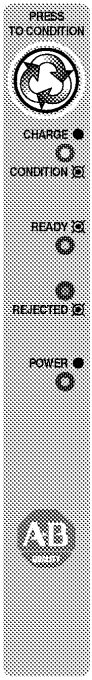
Problem	Probable Cause(s)	Corrective Action
Scan Beam Present, Bar Codes Not Read	1. Scanner and base/charger unit are not paired.	1. Pair the scanner and base/charger unit together.
	2. Scanner out of transmission range.	2. Move scanner closer to base/charger unit.
	3. Scanner not held at slight angle to the bar code.	3. Hold scanner at an angle to the bar code.
	4. Scanner not programmed to read the type of bar code you are scanning.	4. Make sure the scanner is configured for the type of bar code symbols you are scanning.
	5. Scan beam not crossing entire symbol.	5. Make sure scan beam crosses every bar or space on the symbol.
	6. Poor quality bar code symbols.	6. Use the symbols provided on the inside back cover for testing.
	7. Loose cable connections.	7. Check for loose cables/ improper connections.

Troubleshooting the 4-Slot Battery Charger

The following LEDs and tables provide you with information regarding troubleshooting the 4-slot battery charger.

4-Slot Battery Charger LED Status

Each charging station has its own status display to inform you of the station's status as shown below.



LED	Color	Status	Indicates
Charge	Yellow	Solid	Battery is charging.
		Flashing	Battery is conditioning.
Ready	Green	Flashing	Station has charged battery to 95% capacity.
Rejected	Red	Flashing	Faulty battery.
Power	Green	Solid	Power is applied to battery charger.

Identifying 4-Slot Battery Charger Errors

The following table provides a list of the most common operating problems, the probable causes, and suggested corrective actions.

Problem	Probable Cause(s)	Corrective Action
Power Indicator on Battery Charger is Not Lit (all stations)	1. Power supply cord is not connected to power receptacle.	1. Check connection.
	2. Power supply cord not connected to the battery charger.	2. Check connection.
	3. Faulty power supply or 4-slot battery charger.	3. Replace the power supply or the 4-slot battery charger. Contact Allen-Bradley Global Technical Services (GTS).
Power Indicator on Battery Charger is Not Lit (single station)	1. Faulty charging station.	1. Use a different charging station.
	2. Faulty LED.	2. Use a different charging station.
Station Rejected Indicator is Lit (red flashing)	1. Faulty condition identified.	1. Remove battery from the battery adapter. Reinsert the battery adapter into the battery charger.
	2. Over discharge of battery occurred.	2. Allow battery adapter to sit in the battery charger for 15 minutes and then reinsert the battery into that battery adapter.
	3. Defective battery.	3. Replace the battery.
Station is Ready in a Short Period of Time	1. Battery is fully charged.	1. None needed.
	2. Faulty battery.	2. Recharge or replace the battery.

Table continued on the next page.

Problem	Probable Cause(s)	Corrective Action
Station will not go into Charge Mode (yellow solid indicator)	1. Battery charger is not seated properly on the battery charger. 2. Defective battery adapter. 3. Defective battery. 4. Battery is not the proper temperature. 5. Faulty LED on battery charger.	1. Reseat the battery adapter. 2. Replace the battery adapter. 3. Replace the battery. 4. Allow the battery adjust to room temperature. 5. Contact Allen-Bradley Global Technical Services (GTS).
Station will not go into Condition Mode (yellow flashing indicator)	1. Battery is too hot. 2. Battery is already discharged. 3. Faulty LED.	1. Allow battery to cool down. 2. Charge battery. 3. Contact Allen-Bradley Global Technical Services (GTS).
Battery Becomes Hot	1. Battery is defective.	1. Replace battery immediately.
Power Supply Shuts Down Temporarily	1. Power line surge.	1. Power is automatically reset.

Listening for an Audible Response

When scanning a bar code symbol, you hear beeps from the scanner. Refer to the following tables to determine the meaning of the beeps.

Beep During Normal Operation

This Response	Indicates
1 Beep (short–high tone)	Bar code symbol is decoded. Scanner audible response must be enabled.
2 Beeps (long–high tone)	Mismatch between the selected host and interface cable.
4 Beeps (long–high tone)	Format or transmission error detected. This error occurs if the scanner is not properly configured. Verify option settings.
5 Beeps (long–high tone)	Data conversion error detected. This error occurs if the Ignore Unknown Characters is disabled when attempting to transmit data not supported by the selected host.
6 Beeps (short–low tone)	RF out of range error detected. The scan did not register with the base/charger unit.

Beep During Entering Parameter Bar Codes

This Response	Indicates
1 Beep (short–high tone)	Bar code symbol is accepted. Scanner audible response must be enabled.
1 Beep (low–high tone)	Input error. Possible causes: • Incorrect bar code scanned • Cancel scanned • Incorrect configuration sequence
1 Beep (high–low tone)	Keyboard parameter selected. Scan the appropriate bar code.
1 Beep (high–low–high–low tone)	Successful program exit with change in the parameter setting.

Beep During Code 39 Scan and Store

This Response	Indicates
1 Beep (high–low tone)	New Code 39 data was entered into the buffer.
3 Beeps (long high tone)	Code 39 buffer is full.
1 Beep (low–high–low tone)	Attempt to transmit or clear an empty buffer occurred. When the Code 39 buffer was empty, the base station read a command to clear or to transmit a Code 39 buffer.
2 Beeps (long high tone)	Error in data transmission.
1 Beep (low–high tone)	Buffer data transmission successful.

Contacting Allen-Bradley Global Technical Services

If you should require assistance or need additional information on operating the scanners, contact Allen-Bradley Global Technical Services (GTS) at (**216**) **646-6800**.

Specifications

This appendix lists the specifications for the:

- scanners
- 4-slot battery charger
- power supply
- base/charger unit

Scanner Specifications

Description	Specification	
	Standard Range (Catalog No. 2755-HCG-4)	Long Range (Catalog No. 2755-HCG-7)
Power Requirements	4.75V dc to 14V dc: 210 mA @ 5V dc typical	
Scan Repetition Time	Approximately 36 (±3) scans per second (bidirectional)	
Start-up Time	<50 msec from scan enable	
Data Acquisition Time	<110 msec from scan enable	
Skew Tolerance	± 55° from normal	± 60° from normal
Pitch Angle	± 65° from normal	± 45° from normal
Decode Depth of Field	See page 1–6	See page 1–6
Minimum Element Width	0.005 in. (0.127 mm)	0.007 in. (0.178 mn)
Maximum Element Width	0.2 in. (5.08 mm)	
Print Contrast Minimum	20% absolute dark/light reflectance differential, measured @ 675 nm	50% absolute dark/light reflectance differential, measured @ 675 nm

Table continued on the next page.

Description	Standard Range (Catalog No. 2755-HCG-4)	Long Range (Catalog No. 2755-HCG-7)
Frequency Control	Programmable Synthesizer	
Frequency Range	2.4 to 2.5G Hz	
Frequency Resolution	250K Hz steps	
Frequency Stability	± 20 ppm	
Conducted RF Power Output	10 dBm	
Radiated RF Power	1 mW (<50 mV/m @3m)	
Output Bandwidth	250K Hz @ – 3 dB 500K Hz @ – 20 dB	
Ambient Light Immunity Artificial Lighting	450 ft candles (4844 lux)	
Sunlight	8000 ft candles (86112 lux @8 in. on low density bar codes)	8000 ft candles (86112 lux)
Durability	6 ft (8 m) drop to concrete	
Operating Temperature	32° F to 104° F (0° C to 40° C)	
Storage Temperature	-40° F to 140° F (-40° C to 60° C)	
Humidity	5 to 95% noncondensing	
Height	6.3 in. (16 cm)	
Length	5 in. (12.7 cm)	
Width	2.8 in. (7.1 cm)	
CDRH Class	I, II	II
Agency Certification	• CSA certified • UL listed	

4-Slot Battery Charger Specifications

Description	Specification
Catalog Number	2755-HCP-B2
Operating Temperature	32° F to 104° F (0° C to 40° C)
Storage Temperature	-40° F to 140° F (-40° C to 60° C)
Humidity	5 to 95% noncondensing
Agency Certification	• cUL listed • UL listed • TUV EN 60950 approved

Power Supply Specifications

Description	Specification
Catalog Number	2755-HCP-D1
Input Range	100–240V ac/50–60 Hz
Output Range	5V dc @ 3 A 12V dc @ 1 A
Operating Temperature	32° F to 104° F (0° C to 40° C)
Agency Certification	• CSA certified • UL listed • CE marked for all applicable directives. • TUV EN 60950 approved

Base/Charger Unit Specifications

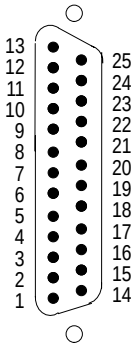
Description	Specification
Catalog Number	2755-HCG-B
Power Requirements	5V dc ± 10% @ 190 mA typical 12V dc ± 10% 400 mA typical
Sensitivity	–94 dBm 10E–4 BER
Selectivity	250K Hz @3 dB points 1 MHz @ 50 dB points
Frequency Control	Programmable Synthesizer
Frequency Range	2.4 to 2.5G Hz
Frequency Resolution	250K Hz steps
Frequency Stability	± 20 ppm
Durability	6 ft (8 m) drop to concrete
Operating Temperature	32° F to 104° F (0° C to 40° C)
Storage Temperature	-40° F to 140° F (-40° C to 60° C)
Humidity	5 to 95% noncondensing
Agency Certification	• CSA certified • UL listed

Cable Pinouts

This appendix provides the pinouts for the following cables:

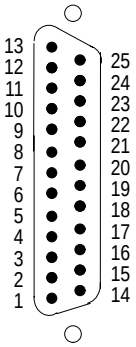
- RS-232-C, 25-pin DB, male, Txd on Pin 3
  (Catalog No. 2755-HCC-BR2-06)
- RS-232-C, 25-pin DB, male, Txd on Pin 2
  (Catalog No. 2755-HCC-BR1-06)
- IBM XT/AT keyboard, 5-pin DIN
  (Catalog No. 2755-HCC-BP1-06)
- PS/2 keyboard. 6-pin Mini-DIN
  (Catalog No. 2755-HCC-BP2-06)
- DEC VT2xx, 3xx, 4xx keyboards
  (Catalog No. 2755-HCC-BV1-06)

RS-232-C, 25-pin DB, male, Txd on Pin 3 (Catalog No. 2755-HCC-BR2-06)



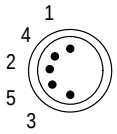
Pin	Signal	Function
1	Not Used	None
2	RXD	Cable pin receives signal from host device.
3	TXD	Cable pin transmits data to host device.
4	CTS	Refer to page 3–17.
5	RTS	Refer to page 3–17.
6	DTR	Host sends signal to to base/charger unit indicating it is ready to communicate.
7	GND	Ground

RS-232-C, 25-pin DB, male, Txd on Pin 2 (Catalog No. 2755-HCC-BR1-06)

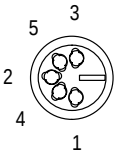


Pin	Signal	Function
1	Not Used	None
2	TXD	Cable pin transmits data to host device.
3	RXD	Cable pin receives signal from host device.
4	RTS	Refer to page 3–17.
5	CTS	Refer to page 3–17.
6	Not Used	None
7	GND	Ground

IBM XT/AT keyboard, 5-pin DIN (Catalog No. 2755-HCC-BP1-06)

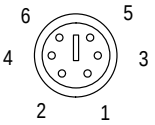


Pin	Signal	Function
1	CLK OUT	Computer sends clock pulse to keyboard to synchronize keys.
2	DATA OUT	Data is sent between the PC and the keyboard.
3	PASS THRU	None
4	GND	Ground
5	V BATT	Power for device connected to this cable end.

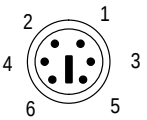


Pin	Signal	Function
1	KEYBD CLK	Synchronous signal between the host and keyboard.
2	KEYBD DATA	Actual data from the depressed key on the keyboard.
3	PASS THRU	None
4	GND	Ground
5	V BATT	Power for device connected to this cable end.

PS/2 keyboard. 6-pin Mini-DIN (Catalog No. 2755-HCC-BP2-06)



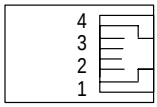
Pin	Signal	Function
1	KEYBD DATA	Actual data from the depressed key on the keyboard.
2	Not Used	None
3	GND	Ground
4	V BATT	Power for device connected to this cable end.
5	KEYBD CLK	Synchronous signal between the host and keyboard.
6	Not Used	None



Pin	Signal	Function
1	DATA OUT	Data is sent between the PC and the keyboard.
2	Not Used	None
3	GND	Ground
4	V BATT	Power for device connected to this cable end.
5	CLK OUT	Computer sends clock pulse to keyboard to synchronize keys.
6	Not Used	None

DEC VT2xx, 3xx, 4xx keyboards (Catalog No. 2755-HCC-BV1-06)

Pin	Signal	Function
1	CRT_SER_OUT	Data is sent from the computer.
2	GND	Ground
3	V BATT	Power for device connected to this cable end.
4	CRT_SER_IN	Data is sent to the computer.



Pin	Signal	Function
1	KEYBD_SER_IN	Data is sent to the keyboard.
2	GND	Ground
3	V BATT	Power for device connected to this cable end.
4	KEYBD_SER_OUT	Data is sent from the keyboard.

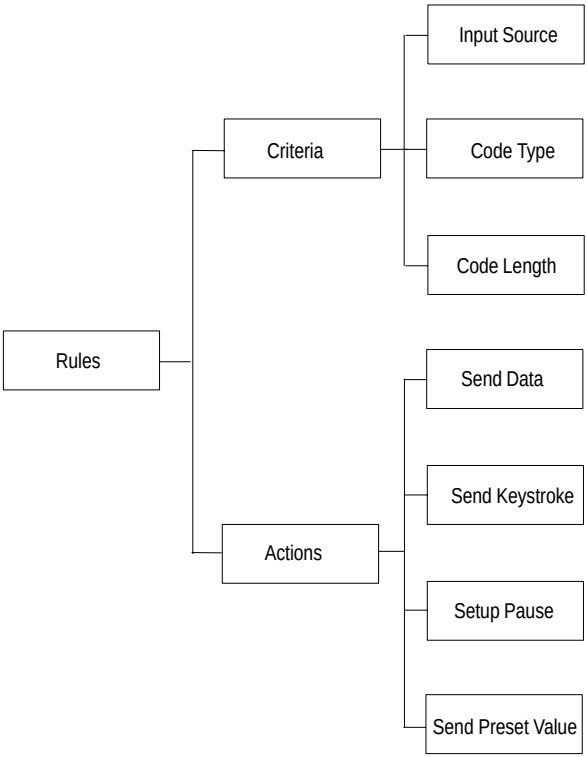
Advanced Data Formatting

This appendix describes how to use the Advanced Data Format (ADF) feature. Included are sections on:

- ADF overview
- rules hierarchy
- default rule
- listening for audible responses
- using ADF in a sorting application

ADF Overview

ADF allows you to customize input before it is transmitted to your host device. For example, instead of having a direct read of a bar code, you can now attach a message to it. ADF is implemented with a series of bar codes that have selectable parameters. [You do not have to type in the individual characters for your message but rather scan in the appropriate bar code located in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6).] This series of bar codes is called a Rule and is used to evaluate input from the scanner. Rules are comprised of Criteria and Actions. Criteria are composed of an Input Source, Code Type, and Code Length. Actions are composed of Send Data, Send Keystroke, Setup Pause, and Send Preset Value. Criteria, Actions, and entire Rules may be erased by scanning the appropriate bar code.



Criteria

Criteria are used to select the bar codes that the Actions act upon. Criteria are composed of an Input Source, Code Type, and Code Length. Input Source is the source affected by using using ADF and is selected prior to creating any ADF rules. Code Type is the symbology selected. All code types must be scanned in succession prior to selecting other criteria. If you don't select a code type, all code types are affected. Code Length allows you to define the number of characters the selected code type must contain. You can select multiple lengths for each rule. If you do not select a code length, selected code types of any length are affected.

Actions

Actions allow you to select how to format data for transmission. Actions are composed of Send Data, Send Keystroke, Setup Pause, and Send Preset Value. Send Data allows you to send all the data that follows, send all the data up to a specific character selected from the alphanumeric keyboard bar code, or send the next number of characters (1 to 254) selected from the alphanumeric keyboard. Send Keystroke allows you to scan the bar code for the keystroke you wish to send. Setup Pause allows you to set the pause duration parameter prior to entering ADF. Send Preset Value allows you to send values 1 or 2 by scanning the appropriate bar code.

- value 1 = scan suffix
- value 2 = scan prefix

Rules Hierarchy

The last rule entered is the first rule read by the scanner. The scanner reads the information and determines what needs to be accomplished. If the last rule read is valid, the scanner may not go on to the other rules so positioning of the rules is very important.

Default Rule

The default rule is Send All Data. If all the rules you create do not meet the criteria, all the data is sent.

Listening for an ADF Audible Response

When scanning an ADF bar code symbol, you hear beeps from the scanner. Refer to the following tables to determine the meaning of the beeps.

Beep Indicating Normal Operation

The duration of the following tones are short.

This Response	Indicates
2 Beeps (high–low tone)	Entry of a number is expected. Enter another digit. Add leading zeros to the front if needed.
2 Beeps (low–low tone)	Entry of a alphabetic character is expected. Enter another alphabetic character or scan the End of Message bar code.
2 Beeps (high–high tone)	Entry of a Criteria or Action is expected. Enter another Criteria or Action or scan the Save Rule bar code.
4 Beeps (high–low–high–low tone)	The Rule is saved. Rule entry mode is exited.
3 Beeps (high–low–low tone)	All Criteria and Actions were cleared for the Rule currently being entered. Continue entry of Rule.
1 Beep (low tone)	Last saved Rule was successfully deleted. The Rule presently being entered is unchanged.
3 Beeps (low–low–high tone)	All Rules are now deleted. The Rule presently being entered is left alone.

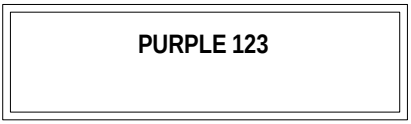
Beep Indicating Error

The duration of the following tones are long.

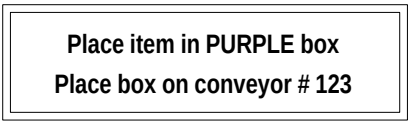
This Response	Indicates
4 Beeps (low–high–low–high tone)	Out of Rule memory. Erase some of the existing Rules, then try and save Rule again.
3 Beeps (low–high–low tone)	Cancel rule entry. Rule entry mode exited because of an error or you were asked to exit Rule entry.
2 Beeps (low–high tone)	The wrong bar code was scanned. Re–enter the Criteria or Action. All previously entered Criteria and Actions are retained. Criteria or Action list is too long for a Rule.

ADF Sorting Application Example

In this example, ADF is used to expand the message seen by assembly workers packing and sorting boxes on a conveyor line. Without ADF, the message reads:



With ADF, the message reads:



To expand the message by scanning the appropriate bar codes located in the *Hand-Held Cordless Bar Code Scanners Programming Guide* (Publication No. 2755-6.6), you need to:

1. Select the Input Source.
2. Select the Code Type.
3. Select the Code Length of **PURPLE 123** including spaces.
4. Send Keystrokes of **Place item in** including spaces.
5. Send Data of **PURPLE**.
6. Send Keystrokes of **box** including space.
7. Send Preset including carriage return line feed.
8. Send keystrokes of **Place box on conveyor #** including spaces.
9. Send Data of **123**.
10. Save Rule.

Glossary

A

ASCII
American Standard Code for Information Interchange. A 7-bit-plus-parity code representing 128 letters, numerals, punctuation marks, and control characters. ASCII is a standard data transmission code in the U.S.

B

Bit
Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

Byte
On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory can be used to store one ASCII character.

C

CDRH
Center for Devices and Radiological Health. This is a federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.

Check Digit
A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when an error is decoded.

Codabar
A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (- $: / , +).

Code 128
A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.

Code 3 of 9 (Code 39)
A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9, and 7 special characters (- . / + % $ and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.

D

Decode
To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.

Discrete 2 of 5
A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and start/stop characters may be encoded.

E

EAN
European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

H

Host Computer
A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs, and network control.

I

Interleaved Bar Code
A bar code in which characters are paired together, using bars to represents the first character and the intervening spaces to represent the second.

Interleaved 2 of 5
A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar/spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and start/stop characters may be encoded.

L

Laser
An acronym for Light Amplification by Stimulated Emission of Radiation. The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.

Laser Diode
A gallium-arsenide semiconductor type of laser connected to a power source to generate a laser beam. This laser type is a compact source of coherent light.

P

Parameter
A variable that can have different values assigned to it.

S

Scanner
An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are:

- light source (laser or photoelectric cell) - illuminates a bar code.
- photodetector - registers the difference in reflected light (more light reflected from spaces).
- signal conditioning circuit - transforms optical detector output into a digitized bar pattern.

Symbol
A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters, and check characters.

Symbology
The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39).

U

UPC
Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which can be one of four widths. This is the standard symbology for retail food packages in the United States.

Numbers

A

B

C

G

I

L

M

O

P

R

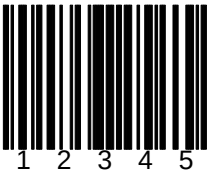
S

T

U

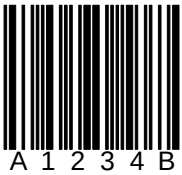
W

TEST SYMBOLS

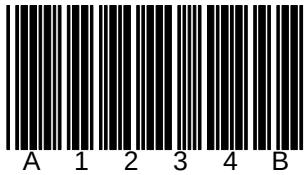


Code 128

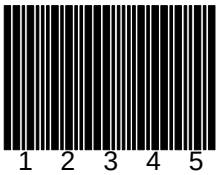
Code 93



Codabar



Code 39



Discrete 2 of 5

EAN 128

EAN 13

EAN 8

Interleaved 2 of 5

UPC A

UPC E

Rockwell *Automation*

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