P370/P470 Keyless RF Scanners

Product Reference Guide

P370/P470 Keyless RF Scanners
Product Reference Guide

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symbol®

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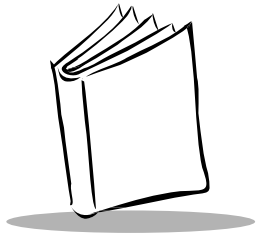

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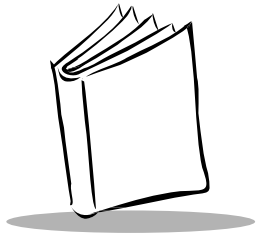

About This Manual

Introduction

The *P370/P470 Keyless RF Scanners Product Reference Guide* provides general instructions for setting up, operating, troubleshooting, maintaining and programming the P370 (industrial) and P470 (retail) cordless RF scanners.

Chapter Descriptions

- Chapter 1, *Getting Started*, describes the scanner and quick startup instructions.
- Chapter 2, *Operation*, explains how to operate the scanner.
- Chapter 3, *Maintenance And Specifications*, talks about the maintenance and the specifications of the scanner and the cradle.
- Chapter 4, *Parameter Menus*, has all the optional parameter bar codes for personalizing your scanner.
- Appendix A, *Bar Code Information*, has information about bar codes.
- Appendix B, *Radio Channels*, lists the available RF channels per Country.
- Appendix C, *Error Indications and Beeps*, describes possible error codes displayed on the scanner.

Notational Conventions

The following conventions are used in this document:

- Italics are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents.
- Bullets (•) indicate:

- action items
- lists of alternatives
- lists of required steps that are not necessarily sequential

- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Related Publications

- *P370/P470 Keyless RF Scanners Quick Reference Guide*, p/n 72-61497-xx
- *PL 370/470 Cradle Quick Reference Guide*, p/n 72-38494-xx
- *MCL Designer for Phaser Series User's Guide*, p/n 70-37689-xx
- *MCL-Designer Programming Requirements*, p/n 72-61838-xx.

Service Information

If you have a problem with your equipment, contact the *Symbol Support Center* for your region. See page xi for contact information. Before calling, have the model number, serial number, and several of your bar code symbols at hand.

Call the Support Center from a phone near the scanning equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and the problem is symbol readability, the Support Center will request samples of your bar codes for analysis at our plant.

If your problem cannot be solved over the phone, you may need to return your equipment for servicing. If that is necessary, you will be given specific directions.

Note: *Symbol Technologies is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact Symbol to have another sent to you.*

Symbol Support Center

For service information, warranty information or technical assistance contact or call the Symbol Support Center in:

United States [1]
Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
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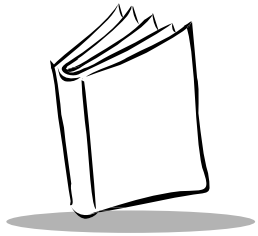
[1]Customer support is available 24 hours a day, 7 days a week.

If you purchased your Symbol product from a Symbol Business Partner, contact that Business Partner for service.

For the latest version of this guide go to:http://www.symbol.com/manuals.



Chapter 1
Getting Started

Introduction

The P370/P470 cordless RF scanners bring new flexibility and economy to data capture and data management in both industrial and retail operations. The scanner communicates with your host computer through radio transmission instead of through a cable. With the RF scanner, you are free to scan and transmit without a physical cable, from as far away as 100 feet (30.5 meters) even without a direct line of sight. This lets you take the scanner to where the work is, whether on the loading dock, the plant floor, the warehouse, or the POS checkout area. There are several versions available:

- P470: cordless retail scanner
- P370: cordless industrial scanner
- P370 ALR: cordless industrial long range scanner

Unless otherwise noted, the term Phaser refers to all versions of the scanner.

Accessories

Rechargeable Battery

In the handle of the scanner, there is a rechargeable lithium-ion battery. This provides all power to the scanner during cordless operation. It provides 10 hours of use in a typical application. When fully depleted, the battery can be recharged to full charge in about 3-1/2 hours.

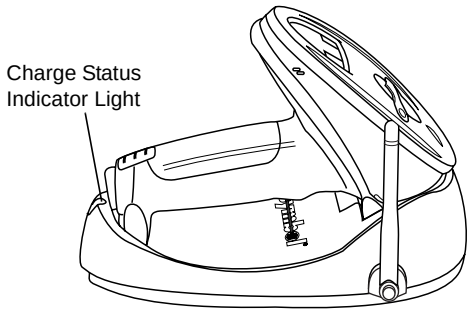
The Cradle

The PL 370/470 Cradle acts as a:

- stand
- 2-way RF transmitter
- communication interface with the host
- battery charger for the cordless scanner.

The cradle can sit on a desktop or be wall-mounted, whichever is more convenient. The cradle receives data from the scanner via the antenna on the side of the cradle. The cradle then transmits that data to the host device via an attached cable. It also acts as a holder for the scanner.

The cradle also provides power for charging the scanner's battery (in the scanner). The cradle has a charge status indicator light that shows the status of the battery charging (See *Charge Status LED Indications* on page 1-12).



Scanner and Cradle

There are two versions of the cradle:

- PL 470 Cradle: cordless retail version
- PL 370 Cradle: cordless industrial version.

Unless otherwise noted, the term Cradle refers to both versions of the cradle.

Unpacking

Remove the scanner from its packing and inspect it for damage. If the scanner was damaged in transit, call one of the telephone numbers listed in the section *Symbol Support Center* on page xi. KEEP THE PACKING. It is the approved shipping container and should be used if you ever need to return your equipment for servicing.

Setting Up the Cradle

The basic steps to set up the cradle are listed below and described in more detail in the following sections.

- connecting the cradle to a host
- mounting the cradle, if desired
- pairing the scanner to the cradle.

Connecting to a Host

With some host types, the scanner is unable to answer host terminal polls if the appropriate host type is not selected. This may result in an error message generated by the host. To correct this situation, select the proper parameter set and initialize the host terminal. See Chapter 4, *Parameter Menus* for more information.

There are two basic host communications options available:

- using an RS-232 cable
- using a Synapse cable.

RS-232 Connection

1. Make sure all host devices are powered down.
2. Plug the connector at the end of the cradle's cable into the appropriate RS-232 receiving port on the host device.

3. Plug the other end of the cable into the COM1 connector on the cradle.

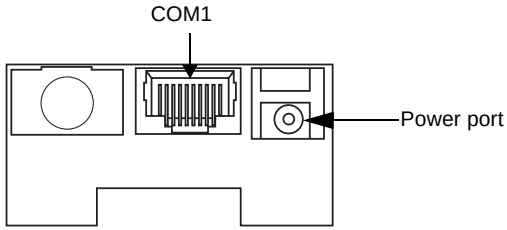


Figure 1-1. Ports on the Cradle

4. Connect the power connector of the power supply into the Power port on the cradle.
5. Connect the appropriate line cord to the power supply and into an AC receptacle.
6. The indicator light on the cradle blinks, signifying successful power-up.

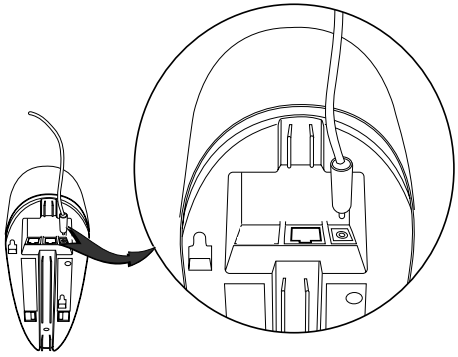


Figure 1-2. Power Supply Port

7. Rotate the antenna to the vertical position.

Using A Synapse Cable

1. Make sure all host devices are powered down.

WARNING

Before power is provided to the cradle (step 6), the following steps must be completed. The Synapse cable must be connected to the cradle (step 2) AND the flying power lead plugged in (step 4). If the cables are not connected in this sequence, the Synapse Interface Adapter will not operate properly.

2. Connect the Synapse cable to the cradle's COM 1 port (see Figure 1-1).
3. Connect the other end of the Synapse cable to the Synapse Interface adapter.
4. The Synapse cable has a flying power lead. Connect this lead to the receptacle in the Synapse Interface adapter, as shown in Figure 1-3. Refer to the Synapse guide for details.

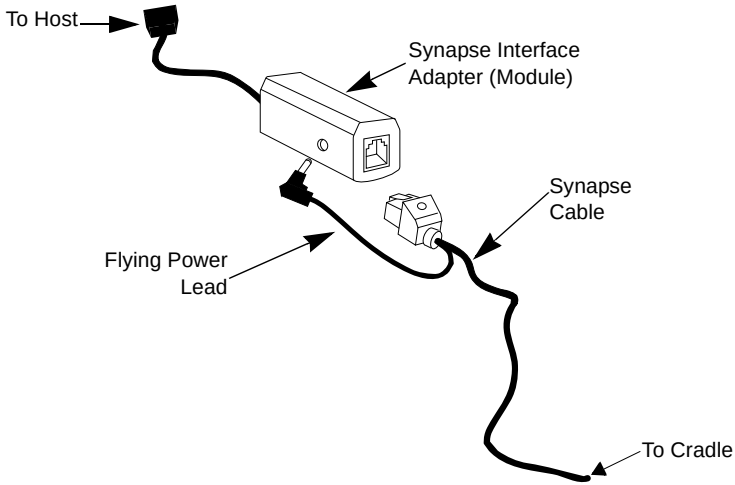


Figure 1-3. Synapse and Adapter Cable

5. Connect the Synapse Interface adapter to the host.
6. Connect the power supply to the cradle (see Figure 1-2).
7. Connect the appropriate line cord to the power supply and into an AC receptacle.

8. The indicator light on the cradle blinks, signifying successful power-up.
9. Scan the appropriate Synapse bar codes to set up the Synapse cable for your specifications.
10. Rotate the antenna to the vertical position.

Wand Emulation, OCIA, OCR, Keyboard Wedges

See the appropriate Synapse cable instructions. An adapter cable is required.

Wall Mounting

Before wall-mounting the cradle, the scanner support tab must be changed from the desk-mount position to the wall-mount position.

1. Lift the scanner support tab out of the top part of the cradle and replace it in the wall-mount position.

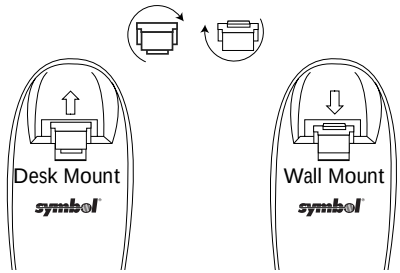


Figure 1-4. Scanner Support Tab

2. Seat the cables from the bottom of the cradle in the grooves along the length of it so that the bottom of the cradle is smooth.

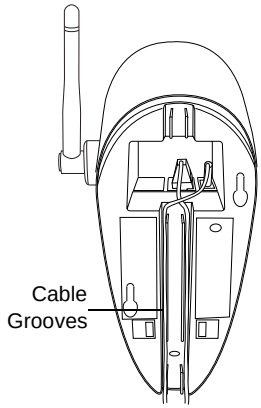


Figure 1-5. Placement of Cables

3. Fasten the two screws provided into the wall where the cradle will hang, leaving about 1/8" (0.3 cm) of the screw outside the wall for the cradle's wall mounting sockets (A template is provided for you in the *PL 370/470 Quick Reference Guide* p/n 72-38494-xx).
4. Place the cradle over the screw heads and slide down until it fits into place. Slight pressure upwards should not move the cradle.

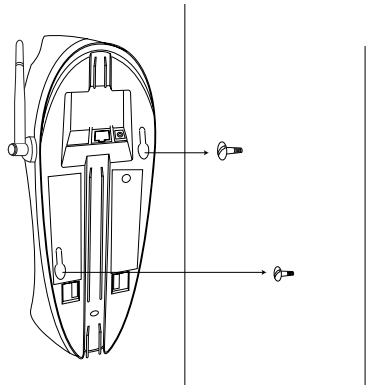


Figure 1-6. Securing Cradle to Wall

5. Position the antenna vertically (pointing toward the ceiling).
6. Place the scanner in the cradle.

Pairing the Scanner with the Cradle

The scanner and cradle must be paired for communication to occur.

Note: *If the cradle is attached to a new host, re-scan the pairing bar code.*

To pair the scanner with the cradle:

1. Scan the pairing bar code on the top of the cradle.

   To pair a long range scanner (P370 ALR) to a regular P370 cradle, attach the "spare pairing bar code" label to the cradle. This 15 mil bar code, packaged with the cradle, can be scanned by the P370 ALR at a distance of approximately two feet from the cradle.

2. Once the base is detected, information is exchanged (addressing, RF channels, etc.) between the scanner and the cradle.

Note: *It may take up to 30 seconds for the scanner to search for the base during over-the-air pairing. To reduce the pairing time, place the scanner in the cradle.*

---

3. After the exchange is complete, the scanner and cradle are paired.

   Successful pairing is indicated by a **warble** beep and the base's LED will flash. If pairing is unsuccessful, the scanner emits four beeps - Lo Hi Lo Hi.

   The pairing of a scanner to a cradle is one-to-one. Only one scanner can be paired to a cradle at any point in time. If you pair a second scanner to an in use cradle, the cradle's connection to the first scanner will be broken and the connection re-established with the second scanner.

To pair a scanner to a different cradle, scan its pairing bar code located on the top of the cradle.

Caution

If you cycle power to the base or reset (remove and reinstall the battery) the scanner, you must pair the scanner with the cradle again.

Optimizing RF Performance

Mounting

The RF scanner and cradle are equipped with a 2.4 GHz point-to-point radio that has an RF transmission range of 100 feet (30.5 meters) even without a direct line of sight.

In addition to being a 2-way RF transmitter, the cradle is a battery charger and should be mounted in an accessible location like on a table or desktop. For optimum RF performance, especially in difficult environments, mount the cradle on a wall as high as possible.

Coexistence in Spectrum24 Environments

If you operate your scanner or cradle in close proximity to a Spectrum24 device, maintain a buffer of 3 feet or greater between the transmitters. A Spectrum24 device includes but is not limited to a terminal with a Spectrum24 radio, PC with a Spectrum24 card, or a Spectrum24 Access Point. If a scanner or cradle is less than 3 ft. from a 2.4 GHz Spectrum24 transmitter (antenna), especially an Access Point, your communication performance may degrade.

Select a Channel Outside the Spectrum24 band

In the unlikely event that Spectrum24 radio traffic causes interference between the scanner and the cradle, you can change the scanner's RF channel to one that minimizes or eliminates the interference.

Phaser cordless scanners have three channels that are not within the Spectrum24 band, 81, 82, and 83*. As a rule of thumb, the Cordless systems operated closest to Spectrum24 devices should use these channels. For instructions on how to change the scanner's RF channel, see *System Setup Options* on page 2-3.

In applications with low scanning/data transmission duty cycles, you may assign the same channel to more than one cordless scanner.

After channels 81, 82 and 83, the next best channels to use are 60 through 80; the higher the channel the better. See Appendix B, *Radio Channels* for a list of available radio channels per country.

* Not available in some countries.

Phaser-to-Phaser Co-Existence

Up to three P470/370 scanners within listening range (100 feet) of each other can be operated on the same channel with little or no interference, assuming average scanning rates.

For higher than average scanning rates, P470/370 scanners within listening range (100 feet) of each other should be operated on different channels, set apart by at least one channel (for example, 2, 4, 6, etc.). Cordless Phaser scanners support up to 82 communication channels. Not all channels are available in all countries. Refer to Appendix B, *Radio Channels* for more information.

Increase the number of RF Retries

If the scanner's transmission is not received by the cradle or the base's acknowledgment response is not received by the scanner (see *Communication Errors* on page 2-2), the scanner retransmits the lost or corrupted data. The scanner attempts 4 RF Retries (default) but can be programmed to attempt up to 8.

Depending on your particular RF environment, additional retries may cause your scanner transaction time to increase in the presence of heavy Spectrum24 traffic.

Charging the Battery

Before its first use, the scanner's battery must be charged. It can be charged:

- using the cradle
- using the UBC 2000.

Note: *When the battery's charge is almost depleted, the scanner emits 4 Hi tone beeps, when the trigger is pulled, indicating that it must be recharged.*

Using the Cradle

1. Set up the cradle as described in *Setting Up the Cradle* on page 1-3.

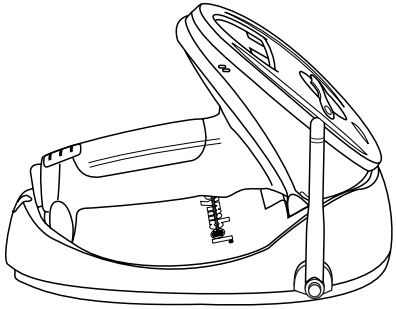


Figure 1-7. Placing the Scanner into the Cradle

2. Insert the scanner into the cradle so that the nose of the scanner and tip of the handle seat into the receptacles. The battery charges automatically. A full charge of a depleted battery takes approximately 3-1/2 hours.

For charging indications, see *Charge Status LED Indications* on page 1-12.

The cradle recharges batteries in the scanner only when the scanner is in the cradle. A scanner with a depleted battery starts charging immediately upon insertion into the cradle, whereas a scanner with a partially charged battery begins charging after approximately 15 minutes. Note that the scanner can be removed from the cradle at any time.

Using the UBC 2000

The battery can be charged using the Universal Battery Charger UBC 2000. The UBC adapter for the P370/P470 scanner battery is required. Refer to the *UBC 2000 Universal Battery Charger Product Guide* for information on recharging the battery using the UBC 2000.

Charge Status LED Indications

The LED indicator on the cradle uses flashing patterns to display the charger status, as shown in the table below.

Table 1-1. Cradle LED Indications

LED	Status
Off	The scanner is not in the cradle or has not been properly inserted into the cradle.
Blinking Slowly	The scanner is properly seated in the cradle and charging will begin shortly.
Blinking Rapidly	The battery is actively charging.
On	If scanner is in cradle - battery charging is complete. If scanner is not in cradle - base is locked up. Cycle power (power off then on) to the base.

Changing the Battery

Once a battery is fully charged, it will generally last up to 10 hours without being returned to the cradle. By returning it to the cradle during the day, you extend this time.

If a significant decrease in battery life is noticed and does not correspond to increased usage, consider replacing the battery.

Removing the Battery

1. Slide the release latch down using center indent and remove the cover. It may be useful to use a coin for extra leverage:

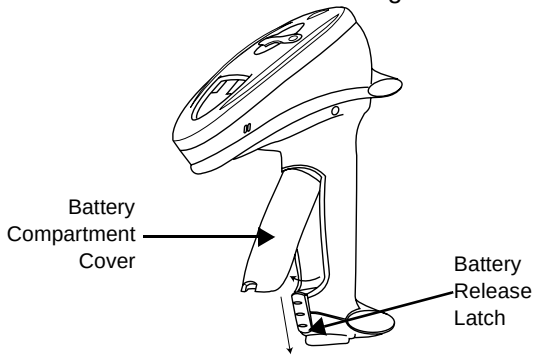


Figure 1-8. Removing the Battery Compartment Cover

2. Slide the battery toward the bottom of the scanner and then, using the pull tab, pull the bottom of the battery back and out of the scanner.

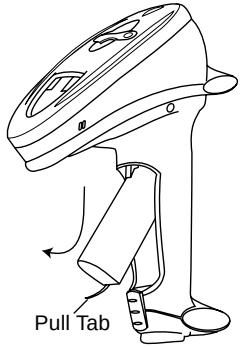
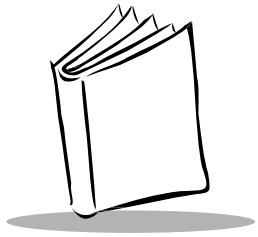


Figure 1-9. Pulling the Battery Out

Inserting the Battery

1. Place the top portion of the battery (curved side up, contacts toward top) into the scanner and then slide it up the handle.
2. Replace the battery compartment cover.
3. Slide the release latch up to secure the cover in place.



Chapter 2
Operation

Introduction

This chapter covers how to use the cordless Phaser scanner.

Default Application

The cordless scanner is shipped from the factory with a default scan and transmit application.

Initial Powerup

After initialization, the scanner enters the Scan & Transmit application. The default communication protocol is *RS232/Synapse*.

If a Synapse cable is attached, the scanner automatically overrides the default settings.

Scan and Transmit Application

The scan and transmit application allows you to transmit data to a host. Scanned bar codes are automatically transmitted to the cradle and then the host in real time.

Communication Errors

A communication error occurs when the scanner, cradle or host fails to properly communicate. When a communication error occurs using the default application, the scanner emits 4 beeps (long Lo). For a detailed list of all the error codes see Appendix C, *Error Indications and Beeps* and *Beeper Indications* on page 3-5.

Three types of communication errors can occur:

1. The RF transmitted data was NOT received by the cradle.
2. The cradle received the RF transmitted data, but the scanner did NOT receive a cradle's acknowledgment.
3. The host and cradle are not communicating properly.

RF Communication Errors

1. If the RF transmitted data was NOT received by the cradle, move the scanner closer to the cradle to reestablish communication, then re-scan the bar code. If the communication has been reestablished, the scanner will sound a good decode beep and no error beeps. Resume normal scanning.
2. If the cradle received the RF transmitted data, but the scanner did NOT receive a cradle's acknowledgment, move the scanner closer to the cradle to reestablish communication, then re-scan the bar code. If the communication has been reestablished, the scanner will sound a good decode beep and no error beeps. In this scenario data may have been transmitted to the host. If the cradle had previously sent data to the host, it will NOT pass this re-scanned data to the host. Resume normal scanning.

For additional information see *Optimizing RF Performance* on page 1-9.

Host / Cradle Communication Errors

If the host and cradle are not communicating properly, ensure the cabling is properly connected, baud rate is properly set, and correct COM port has been selected.

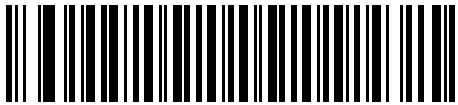
System Setup

This section allows the user to set up the operation of the scanner

System Setup Options

System Setup allows you to configure the scanner's basic settings such as setting an RF channel.

Option	Description
Set Com Protocol **-RS232/Synapse** **-MCL-NET**	Sets the communication protocol used by the default application. The options are MCL-Net or RS232/Synapse. If RS232/Synapse is selected, the scanner automatically identifies whether an RS-232 or Synapse interface is required. To select RS232/Synapse, scan the barcode below:  **RS232/SYNAPSE** To select MCL-NET, scan the barcode below:  **MCL-NET**

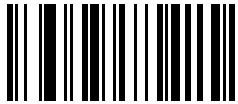
Option	Description
Set RF Channel	Allows the user to set/change the RF channel used for communication between the scanner and cradle. The cordless Phaser scanner operates on a single, programmable channel (frequency) between 2.402 GHz (channel 02) and 2.483 GHz (channel 83). A maximum of 81 channels are available. Not all channels are available in all countries. If a channel is not legal to use in your country, an error beep will be heard instead of a successful warble. For a list of Channel Availability by Country, see Appendix B, *Radio Channels*. To enter a range, scan the bar code below followed by 2 digits from the numeric bar code section (starting on page 4-98) to set the desired channel. It is recommended that each scanner/cradle pair be set to a different channel than neighboring scanner/cradle pairs.  **RF Channel**
Set Scanner ID	Scan the following barcode, followed by 3 digits from the numeric barcode section (starting on page 4-98), to set the scanner ID. The number of scanner ID's varies with the selected communication protocol. • RS-232/Synapse - range from 001 to 254 • MCL Link Lite (MCL Net) - range from 001 to 002 • MCL Link (MCL Net) - range from 001 to 254  **Scanner ID**

App. Control

App. Control allows you to control your application, specifically, load new applications on your scanner, reset your default applications, etc.

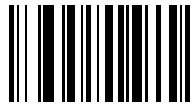
You can load a new application or system code by scanning the appropriate bar code.

Option	Description
Load App	Puts the scanner into a mode to receive MCL-Designer application downloads and MCL-Link commands from the host. To enter this mode from an application scan the bar code below.  **Load New MCL-Designer Application** **Note**: If this barcode is scanned accidentally, cradle the scanner and wait for a beep sequence. Remove the scanner and allow it to reset (you will hear a Lo-Med-Hi beep). Once the scanner resets, it will return to scan & transmit mode.
Set Default App	Reinstalls the default application and returns all parameters to their factory settings (values listed in Table 4-1). The default application overwrites any MCL-Designer application and/or ADF rules. This option may be used to restore functionality to a scanner which has been loaded with a defective application. To enter this mode from an application scan the bar code below.  **Reset Default Application** **(Clears previously programmed ADF rules and/or MCL-Designer applications)** If you entered the “Set Default App” mode using the bar code above, the default application will automatically be reset and the application re-initiated.

Option	Description
System Code	Updates the scanner operating system (Firmware). To enter this mode from an application scan the bar code below.  **System Code** Place the scanner in the cradle before initiating the download from the PC Utility. After the download is complete the application initiates.
Base Station Code	Updates the cradle's operating system (Firmware). To enter this mode from an application scan the bar code below.  **Base Station Code** To start the download to the cradle, press the start button on the PC Utility. **Note:** You will automatically return to the application after 15 seconds, even if the PC download is NOT initiated. To exit this mode and prevent the download of new firmware or if the PC download is not initiated, the power to the cradle must be cycled (powered off then on) before it will communicate with the scanner again. No action is required on the scanner side.

Parameter Control

Parameter Control allows you to control the scanner parameters such as Scan Parameters and Set Default Params.

Option	Description
1. Set Default Param	Restores the default parameters in the scanner. The default parameters overwrite any scanned parameters. To set default parameters, scan the barcode below:  **Set All Defaults**

Version

Firmware Version	This option displays the version of the scanner, MCL and cradle on the host. For example, when the barcode is scanned the following will display on the host: Scanner: NBRVMAAA MCL: 4.1x Cradle: NBRVCAAG To enter this mode from the default application scan the bar code below.  **Firmware Version**

MCL-Designer

MCL-Designer was originally written for a scanner having a keypad and a display. It can also be used for the P370/P470 Keyless RF Scanner, but the following guidelines should be followed:

- When writing a new application, do not use the following commands:
  - IK - Input Key
  - IC - Input Cash
  - ID - Input Date
  - IH - Input Time.
- When using an existing MCL application, be aware that the above listed commands as well as the display commands will be ignored by the scanner.
- If the scanner stops responding for any reason, return the scanner to its default application by doing the following:
  - Remove the scanner's battery.
  - While holding the scanner's trigger button, place the scanner in the cradle.
  - When a Lo-Hi beep is heard, release the trigger button.
  - When the default application reloads, a Lo-Med-Hi beep is heard. Remove the scanner from the cradle.
  - Reinsert the battery
  - Cycle power to the base.

  After troubleshooting your MCL application, download it again to continue using it.

For a list of MCL-Designer related errors, see *MCL-Code Errors* on page C-4. For detailed information about MCL-Designer refer to the *MCL-Designer for Phaser Series User's Guide*, p/n 70-37689-xx.

123Scan

123Scan is an intuitive Windows based utility that allows you to customize your scanner setup and generate Advanced Data Formatting (ADF) rules. An Advanced Data Formatting rule gives you the ability to modify the bar code data before sending it to the host such as appending a carriage return, or some other prefix/suffix value, to the bar code data. This enhances capability between bar code data and your host software, allowing you to program the scanner rather than modifying your host application. The cordless scanner can be programmed via a cordless (RF) download or by scanning 123Scan generated

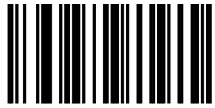
programming bar codes. Scanner programming is saved in a setup file which can be distributed electronically (Web site, floppy disk, E-mail, or fax).

A copy of 123Scan is on the CD included with your scanner. It is also available on the Symbol Web site ***http://www.symbol.com***. Use the web site's search tool to find "123Scan" and select the P470/370 product line.

Note: *Advanced data formatting rules created with 123Scan are for use with the default application only and will not work with applications created with MCL-Designer.*

To download a 123Scan generated ADF rule, scan the bar code below, then initiate the download on the PC utility.

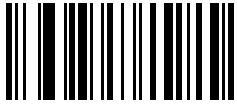
Note: *The scanner takes some time to initiate and will not be functional during this time.*



Load 123Scan File

Note: *If the* Load 123Scan File *barcode is scanned accidentally, cradle the scanner and wait for a beep sequence. Remove the scanner and allow it to reset (you will hear a Lo-Med-Hi beep). Once the scanner resets, it will return to scan & transmit mode.*

To remove previously programmed ADF rules from the scanner, scan the bar code below.



Reset Default Application
(Clears previously programmed ADF rules)

Suffix Values

123Scan generated programming bar codes for two commonly used suffixes (Enter and Tab) have been included in this *Product Reference Guide*.

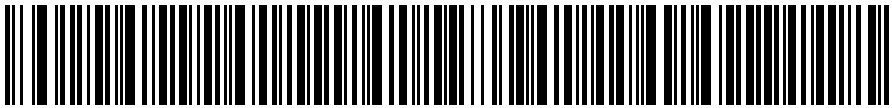
To append an Enter key* to the transmitted bar code data, scan all nine (9) ADF rule bar codes and then the Reset Scanner bar code, in that order.

* ASCII value 7013

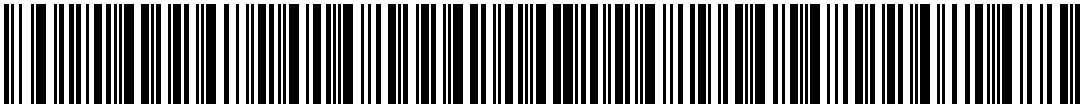
Note: *You will get a successful decode beep after each barcode you scan. If you get an error beep (three beeps - Lo Hi Lo or two beeps - Lo Hi), you must start scanning from the first barcode.*

ADF Rules

1/9



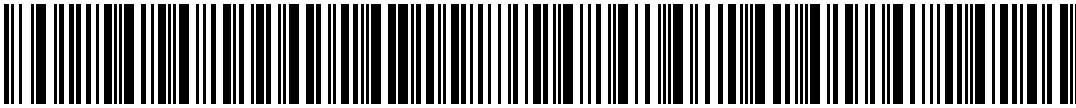
2/9



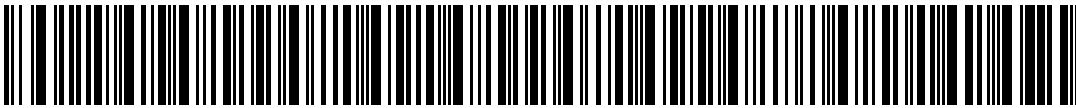
3/9

4/9

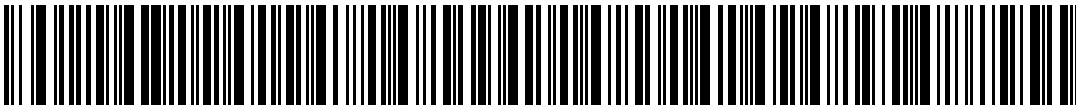
5/9



6/9

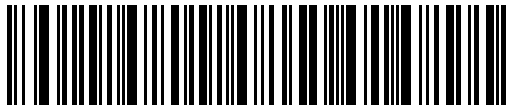


7/9



8/9

9/9



RESET SCANNER

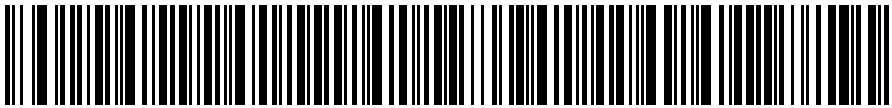
To append a Tab* to the transmitted bar code data, scan all nine (9) ADF rule bar codes and then the Reset Scanner bar code, in that order.

*ASCII value 7009

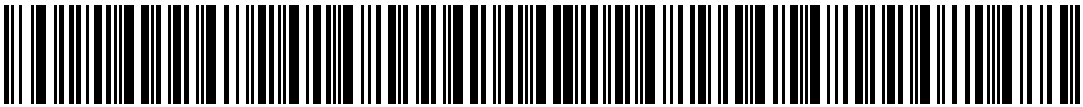
Note: *You will get a successful decode beep after each barcode you scan. If you get an error beep (three beeps - Lo Hi Lo or two beeps - Lo Hi), you must start scanning from the first barcode.*

ADF Rules

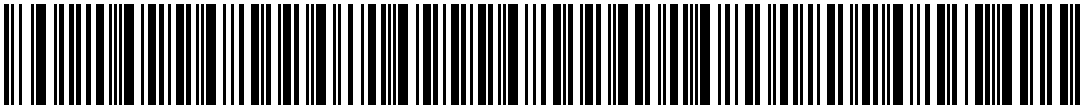
1/9



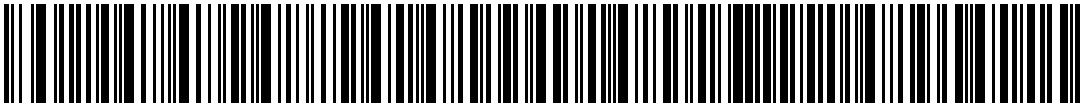
2/9



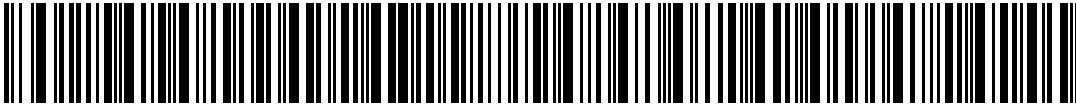
3/9



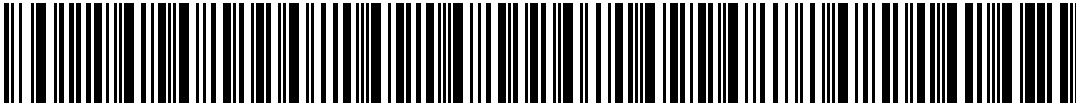
4/9



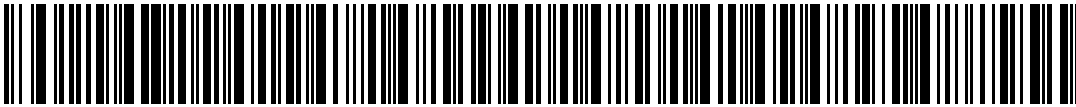
5/9



6/9

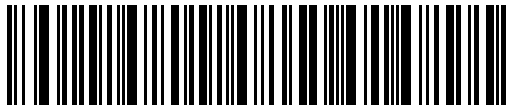


7/9



8/9

9/9



RESET SCANNER

Scanning

The scanner ships with the default application and default parameters and is ready-to-use right out of the box. If this is not what you need for your application, refer to the *MCL Designer Manual* for programming instructions and Chapter 4, *Parameter Menus* for scanning and communications parameters. If you need assistance, contact your local supplier or Symbol Support Center.

1. Make sure the bar code is in the correct scanning range. Aim and press the trigger. The scanner has read the symbol when:
   - You hear a beep.
   - The LED turns green.
   - The red laser turns off.

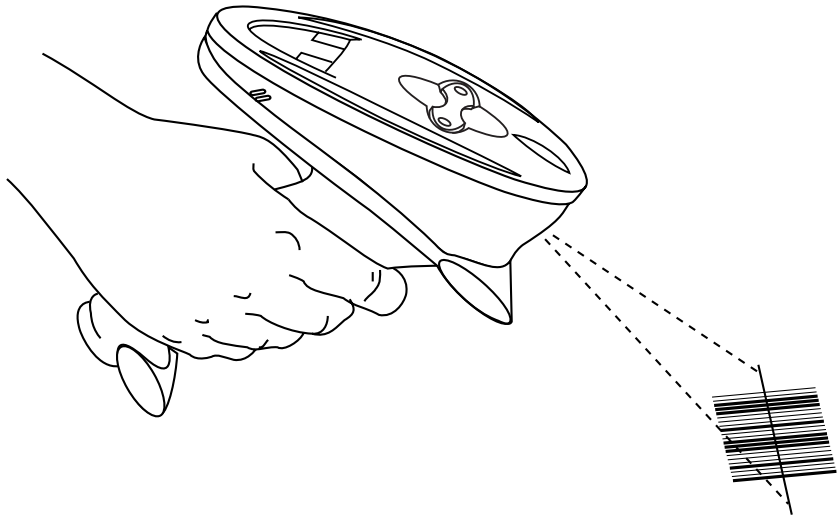


Figure 2-1. Scanning a Bar Code

Scan the Entire Symbol

- Your scan beam must cross every bar and space on the symbol.
- The larger the symbol, the farther away you should hold the scanner.
- Hold the scanner closer for symbols with bars that are close together.
- A short, Hi tone beep indicates a good decode.

Hold at an Angle

Do not hold the scanner directly over the bar code. Laser light reflecting directly back into the scanner from the bar code is known as specular reflection. This specular reflection can make decoding difficult.

You can tilt the scanner up to 65° forward or back and achieve a successful decode. Simple practice quickly shows what tolerances to work within.

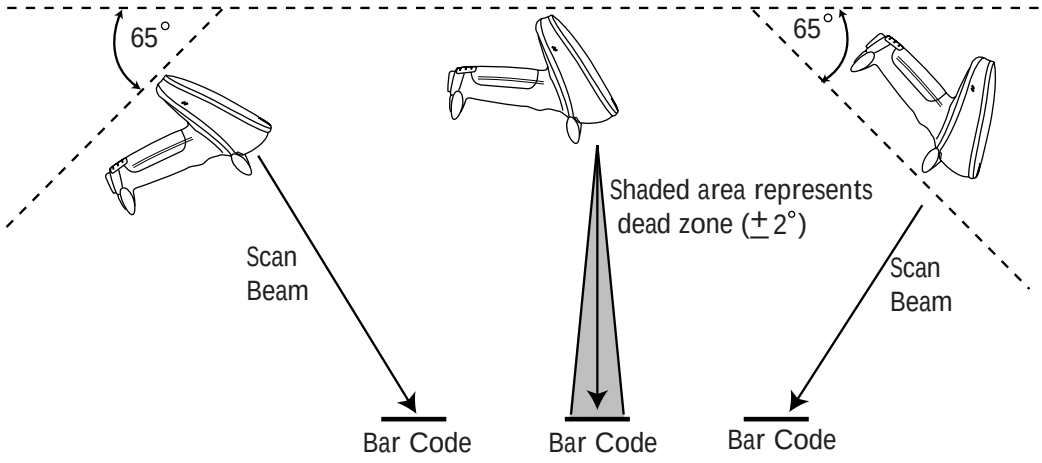


Figure 2-2. Maximum Tilt Angles and Dead Zone

Decode Zone

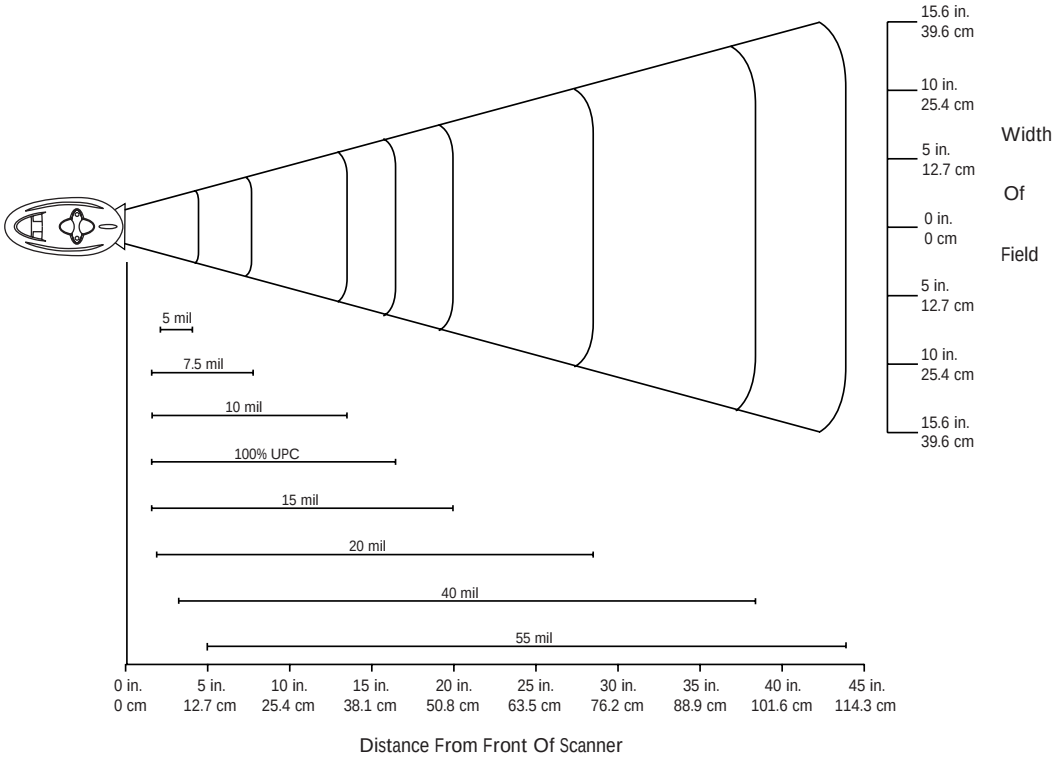


Figure 2-3. P370/P470 1D Scanner - Decode Zone

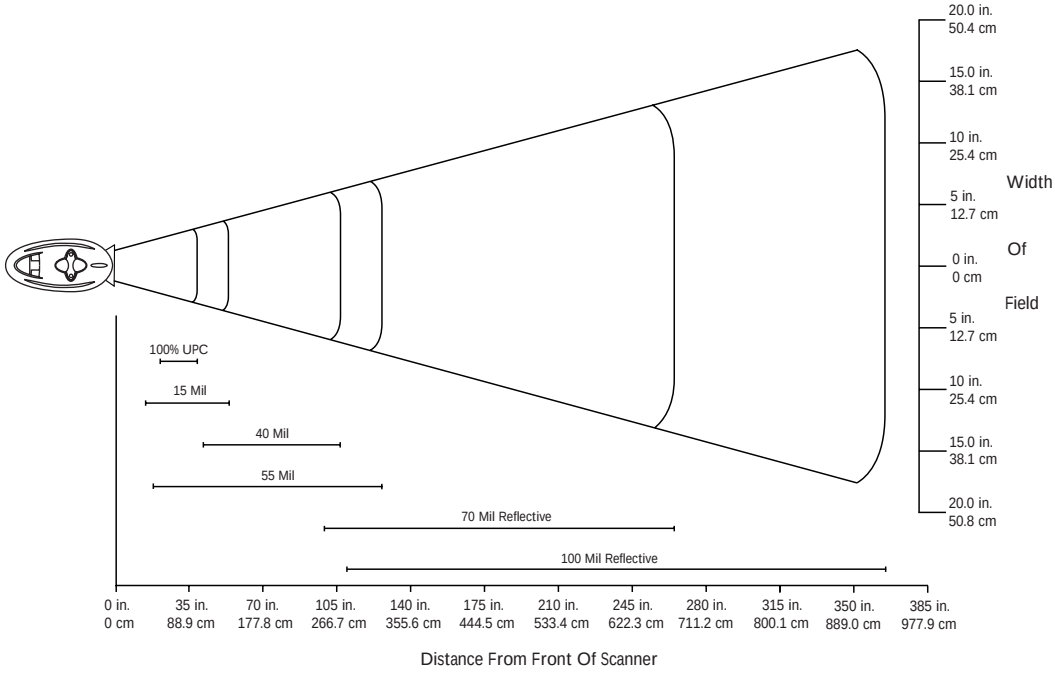
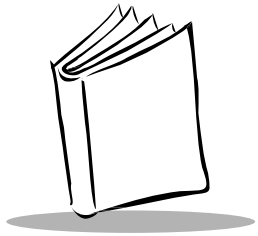


Figure 2-4. P370 1D ALR Scanner - Decode Zone



Chapter 3
Maintenance And Specifications

Introduction

This chapter explains how to maintain your scanner and the specifications for it.

Maintenance

- Do not allow any abrasive material to touch the scanner window.
- Remove any dirt particles with a damp cloth.
- Wipe the scanner window using a damp cloth, and if necessary, a non-ammonia based detergent.
- Do not spray water or other cleaning liquids directly into the scanner window.
- If the contacts between the scanner and cradle become dirty, clean them with either a pencil eraser or a cotton swab dampened with alcohol.
- If a significant decrease in battery life is noticed and does not correspond to increased usage, consider replacing the battery.

Troubleshooting

Refer to Appendix C, *Error Indications and Beeps* for additional troubleshooting information.

Table 3-1. Troubleshooting Table

Problem	Possible Causes	Possible Solutions
Scanner won't power up.	Battery not charged.	Charge or replace the battery in the scanner
	Battery not installed properly.	Ensure the battery is installed properly. See *Changing the Battery* on page 1-12.
LED on base is always on.	Base is locked up	Cycle power (power off then on) to the base.
Nothing happens when you follow the operating instructions, or the scanner displays erratic behavior (laser does not come on, scanner emits frequent beeps).	No power to the scanner.	Check the system power. Ensure the power supply is connected, if your configuration requires a power supply.
	Interface/power cables are loose.	Check for loose cable connections at the cradle, AC power supply, or host device.
No laser beam when trigger is pressed.	Failed to download firmware.	Reset the scanner (remove and reinsert the battery, see *Changing the Battery* on page 1-12) and try scanning again.
	Scanner is locked up.	Reset the scanner (remove and reinsert the battery, see *Changing the Battery* on page 1-12) and try scanning again.
Laser comes on but the symbol does not decode.	Scanner is not programmed for the correct bar code type.	Ensure the scanner is programmed to read the type of barcode you are scanning.
	Bar code symbol is unreadable.	Check the symbol to ensure it is not defaced. Try scanning test symbols of the same bar code type.
	Distance between scanner and bar code is incorrect.	Move the scanner closer to or further away from the bar code.
Symbol decodes but data is not transmitted to the host.	Scanner is not programmed for the correct host type.	Scan the appropriate host type bar code.

Table 3-1. Troubleshooting Table (Continued)

Problem	Possible Causes	Possible Solutions
Scanned data is incorrectly displayed on the host.	Scanner is not programmed to work with the host.	Ensure the proper host type is selected. Check the scanner host type parameters or editing options: • For RS-232, ensure the scanner's communication parameters match the host's settings.
The scanner emits error beeps after decoding a bar code.	Cradle is not powered up or cable connections are not secure.	Check that the cradle is powered up and that its cable connections are secure. See *Setting Up the Cradle* on page 1-3.
	Scanner and cradle are not successfully paired.	Check that the scanner is successfully paired with the cradle. See *Pairing the Scanner with the Cradle* on page 1-8.
	Scanner is too far from the base for proper transmission.	Move closer to the base and retransmit.
	Previously scanned data not transmitted to host.	Ensure you are within the proper RF transmission range.
Received a communication error beep while using a Synapse cable.	The cables connected to the cradle were not connected in the correct sequence.	Before power is applied to the cradle, the Synapse cable must be connected to the cradle AND the flying power lead plugged in. See *Using A Synapse Cable* on page 1-5 for more information
The scanner does not scan the programming bar codes in this guide.	Bar code symbol is unreadable.	Check the symbol to ensure it is not defaced. Try scanning test symbols of the same bar code type.
	Distance between scanner and bar code is incorrect.	Move the scanner closer to or further away from the bar code.

Table 3-1. Troubleshooting Table (Continued)

Problem	Possible Causes	Possible Solutions
The PC cannot download an application to the scanner.	Incorrect cable connection.	Check to ensure you are using an RS-232 cable. The application cannot be downloaded to a scanner using a Synapse cable.
	Scanner and cradle are not successfully paired.	Ensure the scanner and cradle are successfully paired.
	No power to the scanner.	Check to ensure the power supply is connected to the base. If the problem continues, cycle power to the base (power off then on).
The P370 ALR scanner will not pair with a PL370 cradle.	Incorrect set up for pairing scanner with the cradle.	To pair a long range P370 ALR scanner with a PL370 cradle, attach the spare pairing bar code label to the cradle and scan the bar code. For additional information, see *Pairing the Scanner with the Cradle* on page 1-8.
The Scanner will not load my ADF rule.	Unsuccessful pairing of scanner with cradle or incorrect cable connection.	Software download to the scanner while the scanner is running the default application. • Check that the scanner is successfully paired with the cradle (see page 1-8). • Check that the cradle and PC are connected using an RS-232 cable.
	The scanner is running an MCL-Designer generated application.	Software download or scanning a bar code sheet while the scanner is running an MCL-Designer generated application • Erase the MCL-Designer application from the scanner's memory by scanning the "Reset Default Application" bar code on page 4-7. • The default application is now reinstalled and an ADF rule can be loaded.

Note: *If after performing these checks the symbol still does not scan, contact your distributor or call the Symbol Support Center. See Symbol Support Center on page page xi for the telephone number.*

Beeper Indications

Table 3-2 lists beep sequences and their meanings for standard beeps programmed into the scanner. Other applications written for the scanner can have their own beep sequences and therefore are not listed in this table. See your System Administrator for additional beep sequences and their meanings.

For additional information on Error Codes, see *Communication Errors* on page 2-2.

Table 3-2. Beeper Indications

Beeper Sequence	Indication
Standard Use	
Short Hi tone	A bar code symbol was decoded (if decode beeper is enabled).
4 Beeps - long Lo	A host transmission error occurred. Data was not successfully sent to the host device. This occurs if a unit is not properly configured. Check option settings.
5 Beeps - Lo tone	Convert or format error.
Hi/Hi/Hi/Lo tone	RS-232 receive error.
4 Beeps - short Hi	Battery requires recharging.
4 Beeps - long Lo	An RF transmission error has occurred. Move closer to the cradle and re-scan the bar code.
Parameter Menu Scanning	
Short Hi tone	Correct entry scanned or correct menu sequence performed.
Long Lo/Long Hi tone	Input error, incorrect bar code or “Cancel” scanned, wrong entry, incorrect bar code programming sequence; remain in program mode.
Hi/Lo/Hi/Lo tone	Successful program exit with change in the parameter setting.
4 Beeps - Lo/Hi/Lo/Hi followed by 2 Beeps - Lo/Hi	Correct entry scanned or correct menu sequence performed in the scanner but communication error with cradle has occurred.

Technical Specifications

Table 3-3. Technical Specifications

Item	Description	
Decode Capability	The RF scanner can be programmed to decode the following code types: UPC/EAN, Bookland EAN, Code 11, Code 39, Code 39 Full ASCII, Trioptic Code 39, Code 93, Codabar, Interleaved 2 of 5, Code 128, EAN 128, Discrete 2 of 5, MSI Plessey, and Coupon Code. The RF scanner can auto-discriminate between all of the above code types except for Code 39 and Code 39 Full ASCII.	
Scanner Beeper Operation	User-selectable: Enabled, Disabled.	
Scan Repetition Rate	35 (± 5) scans/sec (bidirectional)	
Roll (Skew) Tolerance	± 30° from normal	
Pitch	± 65° from normal	
Yaw	± 60° from normal	
Decode Depth of Field	See *Decode Zone* on page 2-16.	
Print Contrast Minimum	20% absolute dark/light differential, measured at the wavelength of the laser diode.	
Ambient Light Immunity		
Artificial Lighting	450 ft. candles	4,844 lux
Sunlight	10,000 ft. candles	107,640 lux
Operating Temperature **P370 (Industrial)** **P470 (Retail)**	 -4° to 122°F 32° to 104°F	 -20° to 50°C 0° to 40°C
Storage Temperature	-40° to 140°F	-40° to 60°C
Sealing	P370: All components sealed to IP 54 specification against wind blown dust and rain.	
Humidity	5% to 95% (non-condensing)	
Durability (Scanner) **P370 (Industrial)** **P470 (Retail)**	 P370: 6-ft. (1.8 m) P470: 5-ft. (1.5 m) Drops to concrete over entire temperature range	

Table 3-3. Technical Specifications (Continued)

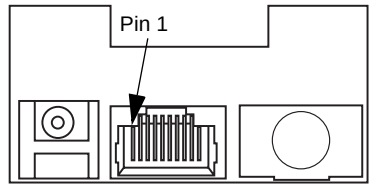
Item	Description
Dimensions	
Height	7.0 in. (17.8 cm)
Width	9.2 in. (13.5 cm)
Depth	3.5 in. (9.8 cm)
Laser Classifications	CDRH Class II, IEC Class 1, IEC Class 2

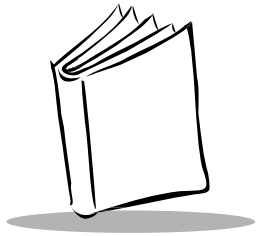
Cradle Pin-outs

The following table shows the pin-outs for COM1 on the cradle.

Table 3-4. Pin-outs

Pin	Cradle
1	Reserved
2	VCC (Out)
3	Ground
4	Synapse Data
5	Synapse Clock
6	RXD IN
7	TXD OUT
8	DTR (Tied HI)
9	CTS - IN
10	RTS - OUT





Chapter 4
Parameter Menus

Introduction

This chapter has the optional parameter bar codes necessary to program the RF scanner.

Operational Parameters

The RF scanner is shipped with the settings shown in Table 4-1. These default values are stored in non-volatile memory and are preserved even when the scanner is powered down. You can change these default values by scanning the appropriate bar codes included in this manual. These new values replace the standard default values in memory. The default parameter values can be recalled by scanning the bar code in the section *Set Default Parameter* on page 4-7.

The scanner automatically detects which cable the cradle is attached to, either an RS-232 or a Synapse cable. If it is attached to an RS-232 cable and has either an ICL, Nixdorf, or Fujitsu host interface, then scan the appropriate bar code from page 4-10 after power up. Any other RS-232 host interface works with the default setting.

If it is attached to a Synapse cable, plug everything together as described on page 1-5 and then follow the directions that come with the Synapse cable for setting up the host interface.

The following table lists the defaults for all parameters. If you wish to change any option, scan the appropriate bar code(s). An asterisk (*) next to a bar code indicates the default.

Table 4-1. Default Table

Parameter	Default	Page Number
Set Default Parameter	All Defaults	4-7
Communication Options		
Communication Protocol	RS232/Synapse	4-8
RS-232 Host Type	Standard	4-9
Host Response Timeout	5 seconds	4-12
RF Channel	No Default Setting	4-13
RF Retries	4	4-13
Beeper Options		
Beeper Tone	High Frequency	4-15
Beeper Volume	High	4-16
Power Detect Beep	Enabled	4-17
Beep After Good Decode	Enabled	4-18
Laser On Time	3.0 seconds	4-19
Decode Options		
Transmit “No Read” Message	Disabled	4-20
Linear Code Type Security Levels	1	4-21
Bi-directional Redundancy	Disabled	4-23
Autodiscriminate Response Time	1.0 second	4-24

Table 4-1. Default Table (Continued)

Parameter	Default	Page Number
UPC/EAN		
UPC-A	Enabled	4-25
UPC-E	Enabled	4-25
UPC-E1	Disabled	4-25
EAN-8	Enabled	4-26
EAN-13	Enabled	4-26
Bookland EAN	Disabled	4-27
Decode UPC/EAN Supplementals	Ignore	4-28
Decode UPC/EAN Supplemental Redundancy	7	4-29
Transmit UPC-A Check Digit	Enabled	4-30
Transmit UPC-E Check Digit	Enabled	4-30
Transmit UPC-E1 Check Digit	Enabled	4-30
UPC-A Preamble	System Character	4-31
UPC-E Preamble	System Character	4-32
UPC-E1 Preamble	System Character	4-33
Convert UPC-E to A	Disabled	4-34
Convert UPC-E1 to A	Disabled	4-35
EAN-8 Zero Extend	Disabled	4-36
Convert EAN-8 to EAN-13 Type	Type is EAN-13	4-37
UPC/EAN Security Levels	0	4-38
UPC/EAN Coupon Code	Disabled	4-40

Table 4-1. Default Table (Continued)

Parameter	Default	Page Number
Code 128		
Code 128	Enabled	4-41
UCC/EAN-128	Enabled	4-42
Code 39		
Code 39	Enabled	4-43
Trioptic Code 39	Disabled	4-44
Set Length(s) for Code 39	2 to 55	4-46
Code 39 Check Digit Verification	Disabled	4-47
Transmit Code 39 Check Digit	Disabled	4-48
Code 39 Full ASCII Conversion	Disabled	4-49
Convert Code 39 to Code 32	Disabled	4-50
Code 32 Prefix	Disabled	4-51
Code 93		
Code 93	Disabled	4-52
Set Length(s) for Code 93	4-55	4-53
Interleaved 2 of 5		
Interleaved 2 of 5	Enabled	4-55
Set Length(s) for I 2 of 5	14	4-56
I 2 of 5 Check Digit Verification	Disabled	4-58
Transmit I 2 of 5 Check Digit	Disabled	4-59
Convert I 2 of 5 to EAN 13	Disabled	4-60

Table 4-1. Default Table (Continued)

Parameter	Default	Page Number
Discrete 2 of 5		
Discrete 2 of 5	Disabled	4-61
Set Length(s) for D 2 of 5	12	4-62
Codabar		
Codabar	Disabled	4-64
Set Lengths for Codabar	5-55	4-66
CLSI Editing	Disabled	4-67
NOTIS Editing	Disabled	4-68
MSI Plessey		
MSI Plessey	Disabled	4-69
Set Length(s) for MSI Plessey	Any Length	4-71
MSI Plessey Check Digits	One	4-72
Transmit MSI Plessey Check Digit	Disabled	4-73
MSI Plessey Check Digit Algorithm	Mod 10/Mod 10	4-74
Data Options		
Transmit Code ID Character	None	4-76

Table 4-1. Default Table (Continued)

Parameter	Default	Page Number
RS-232C		
RS-232 Parameters	Standard	4-78
Baud Rate	9600	4-79
Parity	None	4-80
Check Receive Errors	Disabled	4-82
Hardware Handshaking	None	4-84
Software Handshaking	None	4-85
Host Serial Response Time-out	2 Sec.	4-87
RTS Line State (cable use only)	Lo	4-88
Stop Bit Select	1	4-89
ASCII Format	8-Bit	4-89
Intercharacter Delay	0	4-90
MCL-Net		
MCL-Net Baud Rate	38400	4-90
MCL-Net Hex Addressing Mode	Disabled	4-93
Scanner Address	001	4-94
MCL-Net Transmit Retries	3	4-94
MCL-Net Frame Timeout	500 ms	4-94
Scanner Decode Beep Type	1	4-95
Long Range Scanning Bar Codes		
Aim Mode	Trigger Pull to Scan	4-96
Aim Duration	0.8 Sec	4-97

Set Default Parameter

Scanning this bar code returns all parameters to the values listed in Table 4-1 (factory settings), but does not erase any programmed ADF rules.

SET ALL DEFAULTS

Communication Protocol

The bar codes below set the communication protocol used by the Scan & Transmit default application.

The communication options are RS232/Synapse or MCL-Net. If you select RS232/ Synapse, the scanner automatically identifies whether an RS232 or Synapse interface is required. MCL-Net allows the scanner to communicate with a host running MCL-Link or MCL-Link Lite.

This communication protocol is used for the real time scanning and transmission of data to a host when a cable is attached to the cradle.

***RS232/SYNAPSE**

MCL-NET

Note: *These communication protocol parameters only work with the default applications and will not work with applications created with MCL-Designer.*

Host Type

RS-232C Host Types

Most RS-232C hosts work fine with the default settings, however, three RS-232C hosts are set up with their own parameter default settings. Selecting the ICL, Fujitsu or Nixdorf RS-232C host interface sets the defaults listed below. These defaults take precedence over Standard RS-232 defaults. So, if you select the Fujitsu RS-232C first, and then select the Standard RS-232 defaults, the Fujitsu defaults still take precedence. To return to the factory set defaults, scan the **SET ALL DEFAULTS** bar code on page 4-7.

Table 4-2. Terminal Specific RS-232C

Parameter	Standard	ICL	FUJITSU	NIXDORF Mode A/ Mode B
Transmit Code ID	No	Yes	Yes	Yes
Data Transmission Format	Data as is	Data/Suffix	Data/Suffix	Data/Suffix
Suffix	CR/LF	CR	CR	CR
Baud Rate	9600	9600	9600	9600
Parity	None	Even	None	Odd
Hardware Handshaking	None	RTS/CTS Option 3	None	RTS/CTS Option 3
Software Handshaking	None	None	None	None
Serial Response Time-out	2 Sec.	9.9 Sec.	2 Sec.	9.9 Sec.
Stop Bit Select	One	One	One	One
ASCII Format	8-Bit	8-Bit	8-Bit	8-Bit
Beep On <BEL>	Disabled	Disabled	Disabled	Disabled
RTS Line State	Low	High	Low	*Low = No data to send

*In the Nixdorf Mode B, if CTS is Low, transmission of scan data is disabled. When CTS is High, bar code data is transmitted to the host.

Scan the appropriate bar code below to select an RS-232C Host Interface.

***STANDARD RS-232C**

ICL RS-232C

NIXDORF RS-232C Mode A

NIXDORF RS-232C Mode B

FUJITSU RS-232C

OPOS

Code ID Characters for RS232C Host Types

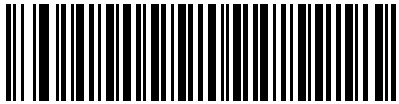
Selecting the ICL, Fujitsu, or Nixdorf RS-232C host interface enables the transmission of Code ID Characters as listed below. These Code ID Characters are not programmable and are separate from the Transmit Code ID feature. The Transmit Code ID feature should not be enabled for these hosts.

Table 4-3. Terminal Specific Code ID Characters

	ICL	FUJITSU	NIXDORF
UPC-A	“A”	“A”	“A”
UPC-E	“E”	“E”	“C0”
EAN-8	“FF”	“FF”	“B”
EAN-13	“F”	“F”	“A”
Code 39	“C” <len>	None	“M”
Codabar	“N” <len>	None	“N”
Code 128	“L” <len>	None	“K”
I 2 of 5	“I” <len>	None	“I”
Code 93	None	None	“L”
D 2 of 5	“H” <len>	None	“H”
UCC/EAN 128	“L” <len>	None	“P”
MSI/Plessey	None	None	“O”
Bookland EAN	“F”	“F”	“A”
Trioptic	None	None	None

Host Response Timeout

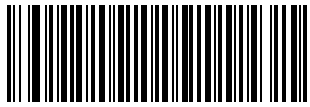
This parameter indicates how long the scanner will wait for a response from the cradle, after the cradle has sent its data to the attached host device. The timeout ranges from 5 seconds to 64 seconds, in 1 second increments. The default is 5 seconds.To change the timeout value, scan the bar code below, then scan two bar codes using the *Numeric Bar Codes* on page 4-98.



HOST RESPONSE TIMEOUT (RANGE OF 5 TO 64 SECONDS)

RF Channel

Selects the RF channel used for radio transmissions and reception. The channel ranges are nation dependent (see Appendix B, *Radio Channels* for a list of Channel Availability by Country). To enter a range, scan the bar code below followed by 2 digits from the numeric bar code section (starting on page 4-98) to set the desired channel. If the channel is not legal for your country, an error beep will be heard instead of a successful warble. It is recommended that each scanner/cradle pair be set to a different channel than neighboring scanner/cradle pairs.



RF Channel

RF Retries

On a transmission, the radio will try to send the data a certain number of times prior to giving up if the receiving cradle is not responding. The following parameter allows the user to select how many retries should be tried. For additional information, see *Increase the number of RF Retries* on page 1-10.

3 RETRIES

***4 RETRIES**

5 RETRIES

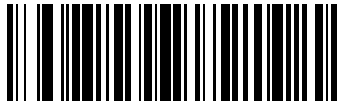
6 RETRIES

7 RETRIES

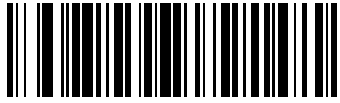
8 RETRIES

Beeper Tone

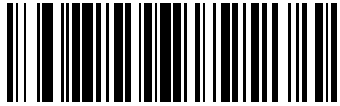
Scan the appropriate bar code below to select a decode beep frequency (tone). Choose LOW FREQUENCY, MEDIUM FREQUENCY, or HIGH FREQUENCY.



LOW FREQUENCY



MEDIUM FREQUENCY



***HIGH FREQUENCY**

Beeper Volume

Scan the appropriate bar code below to select a beeper volume. Choose LOW VOLUME, MEDIUM VOLUME, or HIGH VOLUME.

LOW VOLUME

MEDIUM VOLUME

***HIGH VOLUME**

Power Detect Beep

Scan the appropriate barcode below to enable or disable the Power Detection Beep.

POWER DETECT BEEP DISABLED

***POWER DETECT BEEP ENABLED**

Beep After Good Decode

Scan the appropriate bar code below to select whether or not the scanner beeps after a good decode. If DO NOT BEEP is selected, the beeper still operates during parameter menu scanning and indicates error conditions.

***BEEP AFTER GOOD DECODE**

DO NOT BEEP AFTER GOOD DECODE

Laser On Time

This parameter sets the maximum time decode processing continues during a scan attempt. It is programmable in 0.1 second increments from 0.5 to 9.9 seconds.

Scan the bar code below to set a Laser On Time. Next scan two numeric bar codes beginning on page 4-98 that correspond to the desired time. Time less than 1.0 second must have a leading zero. For example, to set a Time On of 0.5 seconds, scan the bar code below, then scan the “0” and “5” bar codes. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

Note: *Allowing the scanner to stay on longer than originally programmed may affect the battery life time for that session before needing a charge.*

LASER ON TIME

Transmit “No Read” Message

Scan the appropriate bar code below to select whether or not a “No Read” message is transmitted. When enabled, if a symbol does not decode, “NR” is transmitted. When disabled, if a symbol does not read, nothing is sent to the host.

ENABLE NO READ

***DISABLE NO READ**

Linear Code Type Security Level

The scanner offers four levels of decode security for linear code types (e.g., Code 39, Interleaved 2 of 5). Higher security levels are selected for decreasing levels of bar code quality. As security levels increase, the scanner's aggressiveness decreases.

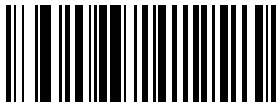
Select the security level appropriate for your bar code quality.

Note: *Does not apply to Code 128.*

Linear Security Level 1

The following code types must be successfully read twice before being decoded:

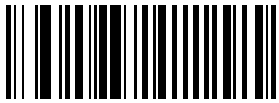
Code Type	Length
Codabar	All
MSI Plessey	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less



***LINEAR SECURITY LEVEL 1**

Linear Security Level 2

All code types must be successfully read twice before being decoded.



LINEAR SECURITY LEVEL 2

Linear Code Type Security Level (Continued)

Linear Security Level 3

Code types other than the following must be successfully read twice before being decoded. The following codes must be read three times:

Code Type	Length
MSI Plessey	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less

LINEAR SECURITY LEVEL 3

Linear Security Level 4

All code types must be successfully read three times before being decoded.

LINEAR SECURITY LEVEL 4

Bi-directional Redundancy

This parameter is used for added security to linear code type security levels. When enabled, a bar code must be successfully scanned in both directions (forward and reverse) before reporting a good decode.

ENABLE BI-DIRECTIONAL REDUNDANCY

***DISABLE BI-DIRECTIONAL REDUNDANCY**

Autodiscriminate Response Time

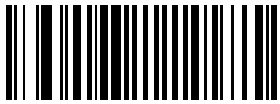
This parameter extends the length of time during which the scanner tries to detect which host it is connected to on power up.

***1 second**

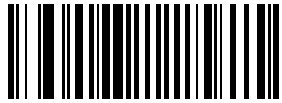
5 seconds

Enable/Disable UPC-E/UPC-A/UPC-E1

Scan the appropriate bar code below to enable or disable UPC-E or UPC-A.

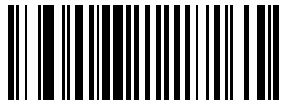


***ENABLE UPC-E**



DISABLE UPC-E

***ENABLE UPC-A**



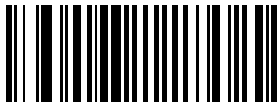
DISABLE UPC-A

ENABLE UPC-E1

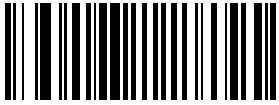
***DISABLE UPC-E1**

Enable/Disable EAN-8/EAN-13

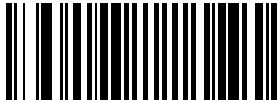
Scan the appropriate bar code below to enable or disable EAN-8 or EAN-13.



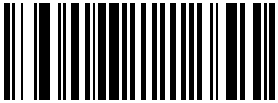
***ENABLE EAN-8**



DISABLE EAN-8



***ENABLE EAN-13**



DISABLE EAN-13

Enable/Disable Bookland EAN

Scan the appropriate bar code below to enable or disable Bookland EAN.

ENABLE BOOKLAND EAN

***DISABLE BOOKLAND EAN**

Decode UPC/EAN Supplementals

Supplementals are characters (either 2 or 5) that are added on according to specific code format conventions (e.g., UPC A+2, UPC E+2, EAN 8+2). Three options are available.

- If **Decode UPC/EAN with supplementals** is selected, UPC/EAN symbols without supplemental characters are not decoded.
- If **Ignore UPC/EAN with supplementals** is selected, UPC/EAN symbols with supplemental characters are decoded and the supplemental characters are ignored.
- If **Autodiscriminate UPC/EAN supplementals** is selected, UPC/EAN symbols, either with or without supplementals, are decoded. If selected, choose an appropriate *Decode UPC/EAN Supplemental Redundancy* value from the next page.

Note: *To minimize the risk of invalid data transmission, select whether to read or ignore supplemental characters.*

DECODE UPC/EAN WITH SUPPLEMENTALS

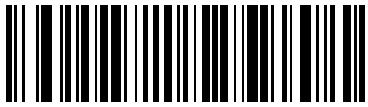
***IGNORE UPC/EAN WITH SUPPLEMENTALS**

AUTODISCRIMINATE UPC/EAN SUPPLEMENTALS

Decode UPC/EAN Supplemental Redundancy

With Autodiscriminate UPC/EAN Supplementals selected, this option adjusts the number of times a symbol without supplementals is decoded before transmission. The range is from two to 20 times. Five or above is recommended when decoding a mix of UPC/EAN symbols with and without supplementals, and the autodiscriminate option is selected.

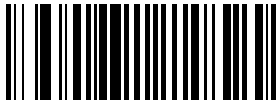
Scan the bar code below to select a decode redundancy value. Next scan two numeric bar codes beginning on page 4-98. Single digit numbers must have a leading zero. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.



DECODE UPC/EAN SUPPLEMENTAL REDUNDANCY

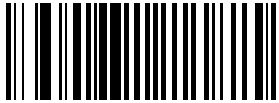
Transmit UPC-A/UPC-E/UPC-E1 Check Digit

Scan the appropriate bar code below to transmit the symbol with or without the UPC-A, UPC-E, or UPC-E1 check digit.

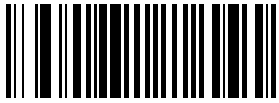


***TRANSMIT UPC-A CHECK DIGIT**

DO NOT TRANSMIT UPC-A CHECK DIGIT



***TRANSMIT UPC-E CHECK DIGIT**



DO NOT TRANSMIT UPC-E CHECK DIGIT

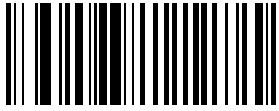
***TRANSMIT UPC-E1 CHECK DIGIT**

DO NOT TRANSMIT UPC-E1 CHECK DIGIT

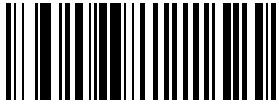
UPC-A Preamble

Three options are given for lead-in characters for UPC-A symbols transmitted to the host device: transmit system character only, transmit system character and country code (“0” for USA), and no preamble transmitted. The lead-in characters are considered part of the symbol.

NO PREAMBLE
(<DATA>)



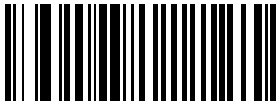
***SYSTEM CHARACTER**
(<SYSTEM CHARACTER> <DATA>)



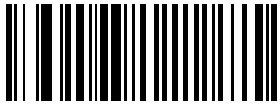
SYSTEM CHARACTER & COUNTRY CODE
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

UPC-E Preamble

Three options are given for lead-in characters for UPC-E symbols transmitted to the host device: Transmit system character only, transmit system character and country code (“0” for USA), and no preamble transmitted. The lead-in characters are considered part of the symbol.



NO PREAMBLE
(<DATA>)



***SYSTEM CHARACTER**
(<SYSTEM CHARACTER> <DATA>)

SYSTEM CHARACTER & COUNTRY CODE
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

UPC-E1 Preamble

Three options are given for lead-in characters for UPC-E1 symbols transmitted to the host device: Transmit system character only, transmit system character and country code (“0” for USA), and no preamble transmitted. The lead-in characters are considered part of the symbol.

NO PREAMBLE
(<DATA>)

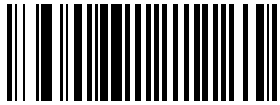
***SYSTEM CHARACTER**
(<SYSTEM CHARACTER> <DATA>)

SYSTEM CHARACTER & COUNTRY CODE
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

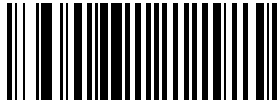
Convert UPC-E to UPC-A

This parameter converts UPC-E (zero suppressed) decoded data to UPC-A format before transmission. After conversion, data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Scanning **DO NOT CONVERT UPC-E TO UPC-A** allows you to transmit UPC-E (zero suppressed) decoded data.



CONVERT UPC-E TO UPC-A
(ENABLE)



***DO NOT CONVERT UPC-E TO UPC-A**
(DISABLE)

Convert UPC-E1 to UPC-A

This parameter converts UPC-E1 decoded data to UPC-A format before transmission. After conversion, data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Scanning **DO NOT CONVERT UPC-E1 TO UPC-A** allows you to transmit UPC-E1 decoded data.

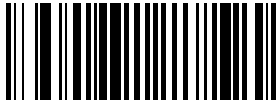
CONVERT UPC-E1 TO UPC-A
(ENABLE)

***DO NOT CONVERT UPC-E1 TO UPC-A**
(DISABLE)

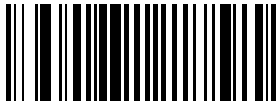
EAN-8 Zero Extend

If this parameter is enabled, five leading zeros are added to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols.

Disabling this parameter returns EAN-8 symbols to their normal format.



ENABLE EAN ZERO EXTEND



***DISABLE EAN ZERO EXTEND**

Convert EAN-8 to EAN-13 Type

When EAN Zero Extend is enabled, this parameter gives you the option of labeling the extended symbol as either an EAN-13 bar code, or an EAN-8 bar code.

When EAN Zero Extend is disabled, this parameter has no effect on bar code data.

***TYPE IS EAN-13**

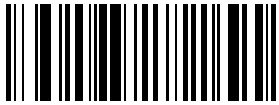
TYPE IS EAN-8

UPC/EAN Security Level

The scanner offers four levels of decode security for UPC/EAN bar codes. Increasing levels of security are provided for decreasing levels of bar code quality. There is an inverse relationship between security and scanner aggressiveness, so be sure to choose only that level of security necessary for any given application.

UPC/EAN Security Level 0

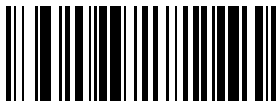
This is the default setting which allows the scanner to operate in its most aggressive state, while providing sufficient security in decoding “in-spec” UPC/EAN bar codes.



***UPC/EAN SECURITY LEVEL 0**

UPC/EAN Security Level 1

As bar code quality levels diminish, certain characters become prone to mis-decodes before others (i.e., 1, 2, 7, 8). If you are experiencing mis-decodes of poorly printed bar codes, and the mis-decodes are limited to these characters, select this security level.

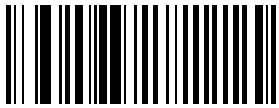


UPC/EAN SECURITY LEVEL 1

UPC/EAN Security Level (Continued)

UPC/EAN Security Level 2

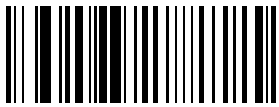
If you are experiencing mis-decodes of poorly printed bar codes, and the mis-decodes are not limited to characters 1, 2, 7, and 8, select this security level.



UPC/EAN SECURITY LEVEL 2

UPC/EAN Security Level 3

If you have tried Security Level 2, and are still experiencing misdecodes, select this security level. Be advised that selecting this option is an extreme measure against mis-decoding severely out of spec bar codes. Selection of this level of security significantly impairs the decoding ability of the scanner. If this level of security is necessary, you should try to improve the quality of your bar codes.



UPC/EAN SECURITY LEVEL 3

UPC/EAN Coupon Code

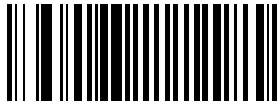
When this parameter is enabled, the scanner decodes UPC-A, UPC-A with 2 supplemental characters, UPC-A with 5 supplemental characters, and UPC-A/EAN128 bar codes. *AUTODISCRIMINATE UPC/EAN SUPPLEMENTALS* on page 4-28 must be enabled.

ENABLE UPC/EAN COUPON CODE

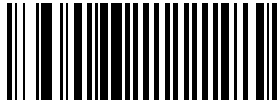
***DISABLE UPC/EAN COUPON CODE**

Enable/Disable Code 128

Scan the appropriate bar code below to enable or disable Code 128.



***ENABLE CODE 128**

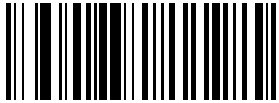


DISABLE CODE 128

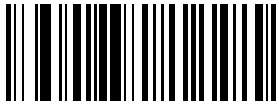
Note: *The "|" character and the NULL character cannot be embedded in the barcode to be scanned when using Code 128.*

Enable/Disable UCC/EAN-128

Scan the appropriate bar code below to enable or disable UCC/EAN-128. (See Appendix A, *Bar Code Information* for details on UCC/EAN-128.)



***ENABLE UCC/EAN-128**



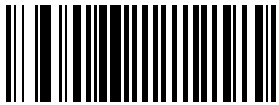
DISABLE UCC/EAN-128

Lengths for Code 128

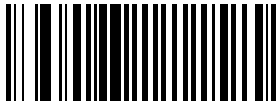
No length setting is required for Code 128. The default setting is Any Length.

Enable/Disable Code 39

Scan the appropriate bar code below to enable or disable Code 39.



***ENABLE CODE 39**



DISABLE CODE 39

Enable/Disable Trioptic Code 39

Trioptic Code 39 symbols always contain six characters. Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously. If you get an error beep when enabling Trioptic Code 39, disable Code 39 Full ASCII and try again. To enable or disable Trioptic Code 39, scan the appropriate bar code below.

ENABLE TRIOPTIC CODE 39

***DISABLE TRIOPTIC CODE 39**

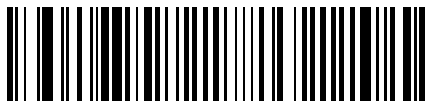
Set Lengths for Code 39

Lengths for Code 39 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. If Code 39 Full ASCII is enabled, **Length Within a Range** or **Any Length** are the preferred options.

One Discrete Length - This option allows you to decode only those codes containing a selected length. For example, if you select **Code 39 One Discrete Length**, then scan **1**, **4**, only Code 39 symbols containing 14 characters are decoded. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

CODE 39 - ONE DISCRETE LENGTH

Two Discrete Lengths - This option allows you to decode only those codes containing two selected lengths. For example, if you select **Code 39 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, only Code 39 symbols containing 2 or 14 characters are decoded. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.



CODE 39 - TWO DISCRETE LENGTHS

Set Lengths for Code 39 (Continued)

Length Within Range - This option allows you to decode a code type within a specified range. For example to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39 Length Within Range**. Then scan **0**, **4**, **1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

CODE 39 - LENGTH WITHIN RANGE

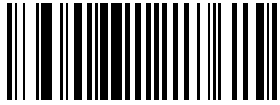
Any Length - Scanning this option allows you to decode Code 39 symbols containing any number of characters.

CODE 39 - ANY LENGTH

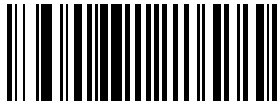
Code 39 Check Digit Verification

When enabled, this parameter checks the integrity of a Code 39 symbol to ensure it complies with specified algorithms.

Only those Code 39 symbols which include a modulo 43 check digit are decoded when this parameter is enabled.



ENABLE CODE 39 CHECK DIGIT



***DISABLE CODE 39 CHECK DIGIT**

Transmit Code 39 Check Digit

Scan the appropriate bar code below to transmit the data with or without the check digit.

TRANSMIT CODE 39 CHECK DIGIT (ENABLE)

***DO NOT TRANSMIT CODE 39 CHECK DIGIT (DISABLE)**

Enable/Disable Code 39 Full ASCII

Scan the appropriate bar code below to enable or disable Code 39 Full ASCII.

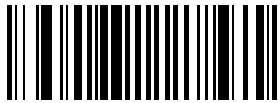
When enabled, the ASCII character set assigns a code to letters, punctuation marks, numerals, and most control keystrokes on the keyboard.

The first 32 codes are non-printable and are assigned to keyboard control characters such as BACKSPACE and RETURN. The other 96 are called printable codes because all but SPACE and DELETE produce visible characters.

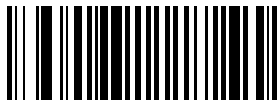
Code 39 Full ASCII interprets the bar code special character ($ + % /) preceding a Code 39 character and assigns an ASCII character value to the pair. For example, when Code 39 Full ASCII is enabled and a **+B** is scanned, it is interpreted as **b**, **%J** as **?**, and **$H** emulates the keystroke **BACKSPACE**. Scanning **ABC$M** will output the keystroke equivalent of **ABC ENTER**. Refer to the ASCII table in *Appendix A*.

Code 39 Full ASCII and Trioptic Code 39 cannot be enabled simultaneously. If you get an error beep when enabling Code 39 Full ASCII, disable Trioptic Code 39 and try again.

The scanner does not autodiscriminate between Code 39 and Code 39 Full ASCII.



ENABLE CODE 39 FULL ASCII



***DISABLE CODE 39 FULL ASCII**

Note: *The "|" character and the NULL character cannot be embedded in the barcode to be scanned when using Code 39 Full ASCII.*

Convert Code 39 to Code 32

Scan the appropriate bar code below to enable or disable converting Code 39 to Code 32.

Note: *Code 39 must be enabled in order for this parameter to function.*

CONVERT CODE 39 TO CODE 32
(ENABLE)

***DO NOT CONVERT CODE 39 TO CODE 32**
(DISABLE)

Code 32 Prefix

Scan the appropriate bar code below to enable or disable the prefix character “A” to all Code 32 bar codes.

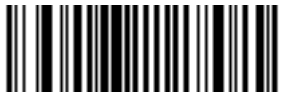
Note: *Convert Code 39 to Code 32 must be enabled for this parameter to function.*

ENABLE CODE 32 PREFIX

***DISABLE CODE 32 PREFIX**

Enable/Disable Code 93

Scan the appropriate bar code below to enable or disable Code 93.



ENABLE CODE 93

***DISABLE CODE 93**

Set Lengths for Code 93

Lengths for Code 93 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains.

One Discrete Length - This option allows you to decode only those codes containing a selected length. For example, if you select **Code 93 One Discrete Length**, then scan **1**, **4**, only Code 93 symbols containing 14 characters are decoded. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

CODE 93 - ONE DISCRETE LENGTH

Two Discrete Lengths - This option allows you to decode only those codes containing two selected lengths. For example, if you select **Code 93 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, only Code 93 symbols containing 2 or 14 characters are decoded. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

CODE 93 - TWO DISCRETE LENGTHS

Set Lengths for Code 93 (Continued)

Length Within Range - This option allows you to decode a code type within a specified range. For example to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 93 Length Within Range**. Then scan **0**, **4**, **1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

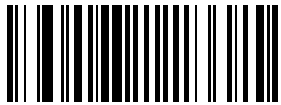
CODE 93 - LENGTH WITHIN RANGE

Any Length - Scanning this option allows you to decode Code 93 symbols containing any number of characters.

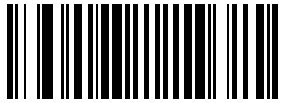
CODE 93 - ANY LENGTH

Enable/Disable Interleaved 2 of 5

Scan the appropriate bar code below to enable or disable Interleaved 2 of 5.



***ENABLE INTERLEAVED 2 OF 5**



DISABLE INTERLEAVED 2 OF 5

Set Lengths for Interleaved 2 of 5

Lengths for I 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains and includes check digits.

One Discrete Length - This option allows you to decode only those codes containing a selected length. For example, if you select **I 2 of 5 One Discrete Length**, then scan **1**, **4**, the only I 2 of 5 symbols decoded are those containing 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

I 2 of 5 - ONE DISCRETE LENGTH

Two Discrete Lengths - This option allows you to decode only those codes containing two selected lengths. For example, if you select **I 2 of 5 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only I 2 of 5 symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

I 2 of 5 - TWO DISCRETE LENGTHS

Set Lengths for Interleaved 2 of 5 (Continued)

Length Within Range - This option allows you to decode a code type within a specified range. For example to decode I 2 of 5 symbols containing between 4 and 12 characters, first scan **I 2 of 5 Length Within Range**. Then scan **0**, **4**, **1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

I 2 of 5 - LENGTH WITHIN RANGE

Any Length - Scanning this option allows you to decode I 2 of 5 symbols containing any number of characters.

Note: *Selecting this option may lead to mis-decodes for I 2 of 5 codes.*

I 2 of 5 - ANY LENGTH

I 2 of 5 Check Digit Verification

When enabled, this parameter checks the integrity of an I 2 of 5 symbol to ensure it complies with a specified algorithm, either USS (Uniform Symbology Specification), or OPCC (Optical Product Code Council).

***DISABLE**

USS CHECK DIGIT

OPCC CHECK DIGIT

Transmit I 2 of 5 Check Digit

Scan the appropriate bar code below to transmit the data with or without the check digit.

TRANSMIT I 2 of 5 CHECK DIGIT
(ENABLE)

***DO NOT TRANSMIT I 2 of 5 CHECK DIGIT**
(DISABLE)

Convert I 2 of 5 to EAN-13

This parameter converts a 14 character I 2 of 5 code into EAN-13, and transmits to the host as EAN-13. In order to accomplish this, the I 2 of 5 code must be enabled, one length must be set to 14, and the code must have a leading zero and a valid EAN-13 check digit.

CONVERT I 2 of 5 to EAN-13
(ENABLE)

***DO NOT CONVERT I 2 of 5 to EAN-13**
(DISABLE)

Enable/Disable Discrete 2 of 5

Scan the appropriate bar code below to enable or disable Discrete 2 of 5.

ENABLE DISCRETE 2 OF 5

***DISABLE DISCRETE 2 OF 5**

Set Lengths for Discrete 2 of 5

Lengths for D 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains, and includes check digits.

One Discrete Length - This option allows you to decode only those codes containing a selected length. For example, if you select **D 2 of 5 One Discrete Length**, then scan **1**, **4**, the only D 2 of 5 symbols decoded are those containing 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

D 2 of 5 - ONE DISCRETE LENGTH

Two Discrete Lengths - This option allows you to decode only those codes containing two selected lengths. For example, if you select **D 2 of 5 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only D 2 of 5 symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, *CANCEL* on page 4-100.

D 2 of 5 - TWO DISCRETE LENGTHS

Set Lengths for Discrete 2 of 5 (Continued)

Length Within Range - This option allows you to decode a code type within a specified range. For example to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5 Length Within Range**. Then scan **0**, **4**, **1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

D 2 of 5 - LENGTH WITHIN RANGE

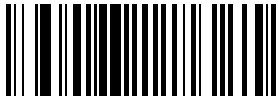
Any Length - Scanning this option allows you to decode D 2 of 5 symbols containing any number of characters.

Note: *Selecting this option may lead to mis-decodes for D 2 of 5 codes.*

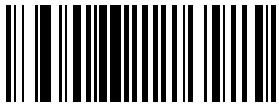
D 2 of 5 - ANY LENGTH

Enable/Disable Codabar

Scan the appropriate bar code below to enable or disable Codabar.



ENABLE CODABAR



***DISABLE CODABAR**

Set Lengths for Codabar

Lengths for Codabar may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains. It also includes any start or stop characters.

One Discrete Length - This option allows you to decode only those codes containing a selected length. For example, if you select **Codabar One Discrete Length**, then scan **1**, **4**, the only Codabar symbols decoded are those containing 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

CODABAR - ONE DISCRETE LENGTH

Two Discrete Lengths - This option allows you to decode only those codes containing two selected lengths. For example, if you select **Codabar Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only Codabar symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

CODABAR - TWO DISCRETE LENGTHS

Set Lengths for Codabar (Continued)

Length Within Range - This option allows you to decode a code type within a specified range. For example to decode Codabar symbols containing between 4 and 12 characters, first scan **Codabar Length Within Range**. Then scan **0**, **4**, **1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

CODABAR - LENGTH WITHIN RANGE

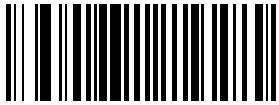
Any Length - Scanning this option allows you to decode Codabar symbols containing any number of characters.

CODABAR - ANY LENGTH

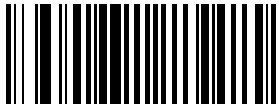
CLSI Editing

If enabled, this parameter strips the start and stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar symbol.

Note: *Symbol length does not include start and stop characters.*



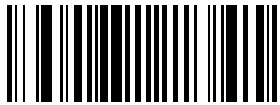
ENABLE CLSI EDITING



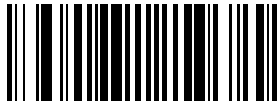
***DISABLE CLSI EDITING**

NOTIS Editing

If enabled, this parameter strips the start and stop characters from a decoded Codabar symbol.



ENABLE NOTIS EDITING



***DISABLE NOTIS EDITING**

Enable/Disable MSI Plessey

Scan the appropriate bar code below to enable or disable MSI Plessey.

ENABLE MSI PLESSEY

***DISABLE MSI PLESSEY**

Set Lengths for MSI Plessey

Lengths for MSI Plessey may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains, and includes check digits.

One Discrete Length - This option allows you to decode only those codes containing a selected length. For example, if you select **MSI Plessey One Discrete Length**, then scan **1**, **4**, the only MSI Plessey symbols decoded are those containing 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

MSI PLESSEY - ONE DISCRETE LENGTH

Two Discrete Lengths - This option allows you to decode only those codes containing two selected lengths. For example, if you select **MSI Plessey Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only MSI Plessey symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

MSI PLESSEY - TWO DISCRETE LENGTHS

Set Lengths for MSI Plessey (Continued)

Length Within Range - This option allows you to decode a code type within a specified range. For example to decode MSI Plessey symbols containing between 4 and 12 characters, first scan **MSI Plessey Length Within Range**. Then scan **0**, **4**, **1** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

MSI PLESSEY - LENGTH WITHIN RANGE

Any Length - Scanning this option allows you to decode MSI Plessey symbols containing any number of characters.

Note: *Selecting this option may lead to mis-decodes for MSI Plessey codes.*

***MSI PLESSEY - ANY LENGTH**

MSI Plessey Check Digits

These check digits at the end of the bar code verify the integrity of the data. At least one check digit is always required. Check digits are not automatically transmitted with the data.

***ONE MSI PLESSEY CHECK DIGIT**

TWO MSI PLESSEY CHECK DIGITS

Transmit MSI Plessey Check Digit

Scan the appropriate bar code below to transmit the data with or without the check digit.

TRANSMIT MSI PLESSEY CHECK DIGIT
(ENABLE)

***DO NOT TRANSMIT MSI PLESSEY CHECK DIGIT**
(DISABLE)

MSI Plessey Check Digit Algorithm

When the two MSI Plessey check digits option is selected, an additional verification is required to ensure integrity. Either of the two following algorithms may be selected.

MOD 10/MOD 11

***MOD 10/MOD 10**

Transmit Code ID Character

A code ID character identifies the code type of a scanned bar code. This may be useful when the scanner is decoding more than one code type. The code ID character precedes the decoded symbol.

The user may select no code ID character, a Symbol Code ID character, or an AIM Code ID character. The Symbol Code ID characters are listed below; see Appendix A, *Bar Code Information* for AIM Identifiers.

Symbol Code ID Characters

A = UPC-A, UPC-E, EAN-8, EAN-13

B = Code 39

C = Codabar

D = Code 128

E = Code 93

F = Interleaved 2 of 5

G = Discrete 2 of 5, or Discrete 2 of 5 IATA

J = MSI Plessey

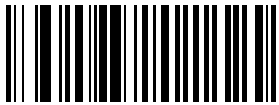
K = UCC/EAN-128

L = Bookland EAN

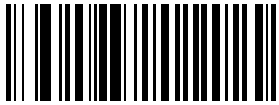
M = Trioptic Code 39

N = Coupon Code

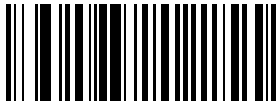
Transmit Code ID Character (Continued)



SYMBOL CODE ID CHARACTER



AIM CODE ID CHARACTER



***NONE**

Pause Duration

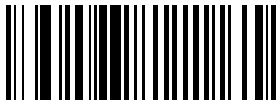
This parameter allows a pause to be inserted at any point in the data transmission. Pauses are set by scanning the bar code below followed by a two digit number (i.e. two bar codes), and are measured in 1/10 second intervals. For example, scanning bar codes “0” and “1” inserts a 1/10 second pause; “0” and “5” gives you a 1/2 second delay. Numeric bar codes begin on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

PAUSE DURATION

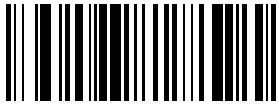
RS-232C Parameters

Baud Rate

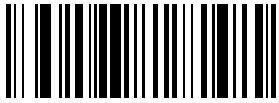
Baud rate is the number of bits of data transmitted per second. The scanner's baud rate setting should match the data rate setting of the host device. If not, data may not reach the host device or may reach it in distorted form.



BAUD RATE 600

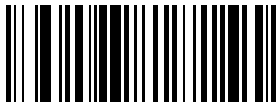


BAUD RATE 1200

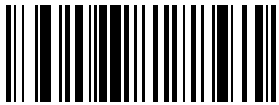


BAUD RATE 2400

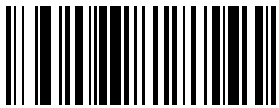
Baud Rate (Continued)



BAUD RATE 4800



***BAUD RATE 9600**



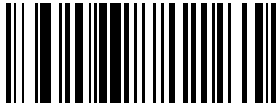
BAUD RATE 19,200

BAUD RATE 38,400

Parity

A parity check bit is the most significant bit of each ASCII coded character. Select the parity type according to host device requirements.

If you select **ODD** parity, the parity bit has a value 0 or 1, based on data, to ensure that an odd number of 1 bits are contained in the coded character.



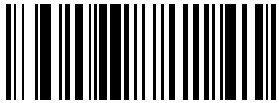
ODD

If you select **EVEN** parity, the parity bit has a value 0 or 1, based on data, to ensure that an even number of 1 bits are contained in the coded character.

EVEN

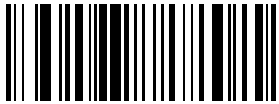
Parity (Continued)

Select **MARK** parity and the parity bit is always 1.



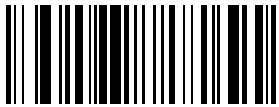
MARK

Select **SPACE** parity and the parity bit is always 0.



SPACE

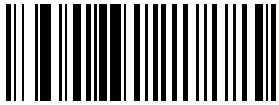
If no parity is required, select **NONE**.



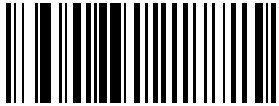
***NONE**

Check Receive Errors

Select whether or not the parity, framing, and overrun of received characters are checked. The type of parity used is selectable through the **PARITY** parameter.



CHECK FOR RECEIVED ERRORS



***DO NOT CHECK FOR RECEIVED ERRORS**

Hardware Handshaking

The data interface consists of an RS-232C port. The port has been designed to operate either with or without the hardware handshaking lines, RTS, *Request to Send*, and CTS, *Clear to Send*.

If Standard RTS/CTS handshaking is selected, scan data is transmitted according to the following sequence:

- The scanner reads the CTS line for activity. If CTS is asserted, the scanner waits up to two seconds for the host to negate the CTS line. If, after two seconds (default), the CTS line is still asserted, the scanner sounds a transmit error and any scanned data is lost.
- When the CTS line is negated, the scanner asserts the RTS line and waits up to two seconds for the host to assert CTS. When the host asserts CTS, data is transmitted. If, after two seconds (default), the CTS line is not asserted, the scanner sounds a transmit error and discards the data.
- When data transmission is complete, the scanner negates RTS 10 msec after sending the last character.
- The host should respond by negating CTS. The scanner checks for a negated CTS upon the next transmission of data.

During the transmission of data, the CTS line should be asserted. If CTS is deasserted for more than 50 ms between characters, the transmission is aborted, the scanner sounds a transmission error, and the data is discarded.

If the above communications sequence fails, the scanner issues an error indication. In this case, the data is lost and must be rescanned.

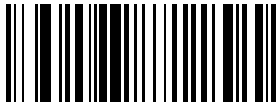
If Hardware Handshaking and Software Handshaking are both enabled, Hardware Handshaking will take precedence.

Note: *The DTR signal is jumpered active.*

Note: *When using RTS/CTS handshaking and a PL 370/470 cradle, there is an 8 ms delay for the information to travel between the host and the scanner. If this setup is necessary, scan the Intercharacter Delay bar code on page 4-90 and set the delay for 10 ms or more.*

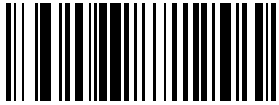
Hardware Handshaking (Continued)

Scan the bar code below if no Hardware Handshaking is desired.



***NONE**

Scan the bar code below to select Standard RTS/CTS Hardware Handshaking.



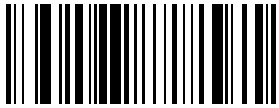
STANDARD RTS/CTS

When RTS/CTS Option 1 is selected, the cradle asserts RTS before transmitting and ignores the state of CTS. The scanner deasserts RTS when the transmission is complete.

RTS/CTS OPTION 1

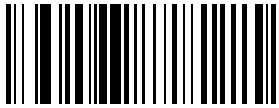
Hardware Handshaking (Continued)

When Option 2 is selected, RTS is always high or low (user-programmed logic level). However, the scanner waits for CTS to be asserted before transmitting data. If CTS is not asserted within two seconds (default), the scanner issues an error indication and discards the data.



RTS/CTS OPTION 2

When Option 3 is selected, the scanner asserts RTS prior to any data transmission, regardless of the state of CTS. The scanner waits up to two seconds (default) for CTS to be asserted. If CTS is not asserted during this time, the scanner issues an error indication and discards the data. The scanner deasserts RTS when transmission is complete.



RTS/CTS OPTION 3

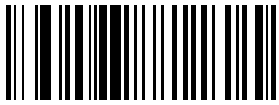
Software Handshaking

This parameter offers control of the data transmission process in addition to, or instead of, that offered by hardware handshaking. There are five options.

If Software Handshaking and Hardware Handshaking are both enabled, Hardware Handshaking takes precedence.

None

When this option is selected, data is transmitted immediately.



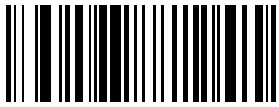
***NONE**

Software Handshaking (Continued)

ACK/NAK

When this option is selected, after transmitting data, the cradle expects either an ACK, *Acknowledge*, or NAK, *Negative Acknowledge*, response from the host. Whenever a NAK is received, the cradle transmits the same data again and waits for either an ACK or NAK. After three unsuccessful attempts to send data when NAKs are received, the cradle issues an error indication and discards the data.

The cradle waits up to the programmable Host Serial Response Time-out to receive an ACK or NAK. If the cradle does not get a response in this time, it issues an error indication and discards the data. There are no retries when a time-out occurs.



ACK/NAK

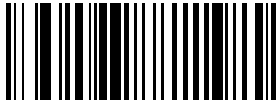
ENQ

When this option is selected, the cradle waits for an ENQ, *Enquiry*, character from the host before transmitting data. If an ENQ is not received within two seconds, the cradle issues an error indication and discards the data. The host must transmit an ENQ character at least every two seconds to prevent transmission errors.

ENQ

ACK/NAK with ENQ

This combines the two previous options.



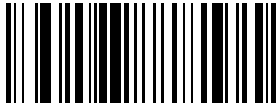
ACK/NAK with ENQ

Software Handshaking (Continued)

XON/XOFF

An XOFF, *Transmit Off*, character turns the scanner transmission off until the scanner receives an XON, *Transmit On*, character. There are two situations for XON/XOFF:

- XOFF is received before the scanner has data to send. When the scanner has data to send, it then waits for an XON character before transmission. The scanner waits up to two seconds to receive the XON. If the XON is not received within this time, the scanner issues an error indication and discards the data.
- XOFF is received during a transmission. Data transmission then stops after sending the current byte. When the scanner receives an XON character, it sends the rest of the data message. The scanner waits indefinitely for the XON.



XON/XOFF

Host Serial Response Time-out

This parameter specifies how long the scanner waits for an ACK, NAK or CTS before determining that a transmission error has occurred. This only applies when in one of the ACK/NAK Software Handshaking modes, or RTS/CTS Hardware Handshaking option.

The delay period can range from 0.0 to 9.9 seconds in 0.1 second increments. After scanning the bar code below, scan two numeric bar codes beginning on page 4-98. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

HOST SERIAL RESPONSE TIME-OUT

RTS Line State

Scan the appropriate bar code below to set the idle state of the Serial Host RTS line. Choose LOW RTS line state or HIGH RTS line state.

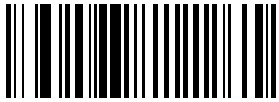
***HOST: LOW RTS**

HOST: HIGH RTS

Stop Bit Select

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream. The number of stop bits (one or two) selected depends on the number the receiving terminal is programmed to accommodate. Set the number of stop bits to match host device requirements.

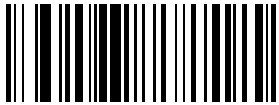
***1 STOP BIT**



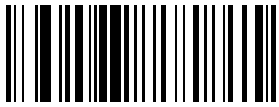
2 STOP BITS

ASCII Format

This parameter allows the cradle to interface with devices requiring a 7-bit or 8-bit ASCII protocol.



7-BIT



***8-BIT**

Intercharacter Delay

Select the intercharacter delay option matching host requirements. The intercharacter delay gives the host system time to service its receiver and perform other tasks between characters. The delay period can range from no delay to 99 ms in 1 ms increments (if you are using a cradle and RTS/CTS handshaking, the delay period can range from 5 ms to 99 ms). After scanning the bar code below, scan two bar codes beginning on page 4-98 to set the desired time-out. If you make an error, or wish to change your selection, scan *CANCEL* on page 4-100.

INTERCHARACTER DELAY

MCL-Net Parameters

MCL-Net Baud Rate

Baud rate is the number of bits of data transmitted per second. Scan the appropriate bar code below to set the MCL-Net baud rate. The default baud rate is 38400.

BAUD RATE 600

BAUD RATE 1200

BAUD RATE 2400

MCL-Net Baud Rate (Continued)

BAUD RATE 4800

BAUD RATE 9600

BAUD RATE 19200

***BAUD RATE 38400**

MCL-Net Hex Addressing Mode

Scan the appropriate bar code below to set the MCL-Net Hex addressing mode. The default mode is *Disabled*.

***MCL-NET HEX ADDRESSING DISABLED**

MCL-NET HEX ADDRESSING ENABLED

Scanner ID

Scan the following barcode, followed by 3 digits from the numeric barcode section (starting on page 4-98), to set the scanner ID.

The number of scanner ID's varies with the selected communication protocol.

- RS-232/Synapse range from 001 to 254
- MCL Link Lite (MCL Net) range from 001 to 002
- MCL Link (MCL Net) range from 001 to 254

SCANNER ID

MCL-Net Transmit Retries

Scan the following barcode, followed by 2 digits from the numeric barcode section (starting on page 4-98), to define the number of retries in the range 1 to 10.

MCL-NET RETRIES

MCL-Net Frame Timeout

Scan the following barcode, followed by 2 digits from the numeric barcode section (starting on page 4-98), to define the amount of time to wait for an ACK or NAK from the host before retransmitting. The timeout is in 100 ms increments in the range 100 ms to 3000 ms.

MCL-NET FRAME TIMEOUT

Scanner Decode Beep Type

Select the type of beep for the scanner. This parameter is useful when two or more systems are installed in proximity of each other. Unique patterns can be set up to distinguish each system's receipt of bar code data.

***BEEP TYPE 1**

BEEP TYPE 2

BEEP TYPE 3

BEEP TYPE 4

BEEP TYPE 5

Long Range Scanning Bar Codes

The P370 ALR (Long Range) scanner has an aiming feature which allows the positioning of the laser beam when scanning bar codes. Aiming mode and Aiming duration can be set using the bar codes below. You cannot program this feature into the standard range P370 scanner.

Aim Mode

There are two Aiming options supported by the Phaser ALR cordless scanner, trigger pull to scan (default) and trigger release to scan.

Option 1: Trigger Pull to Scan (Default)

When you pull the trigger, the aim dot will be active for a user-selectable duration of time. After this time, the aiming dot automatically turns into a standard laser scanning beam for a full decode session. After the aiming dot turns into a scanning beam, the laser will stay on until the user-selectable laser-on timeout occurs, a decode occurs, or the trigger is released. If the trigger is released during the aim mode, the laser shuts off and no decode session occurs.

***Trigger Pull to Scan (Default)**

Option 2: Trigger Release to Scan

When you pull the trigger, the aiming dot will appear. The aiming dot remains present while the trigger is pulled or until a 60 second timeout occurs. When the trigger is released, the aiming dot turns into a standard laser scanning beam for a full decode session. The laser stays on until a decode occurs or until the user-selectable laser-on timeout occurs. If the trigger is pulled again while in a decode session, the scanner returns to its aiming mode.

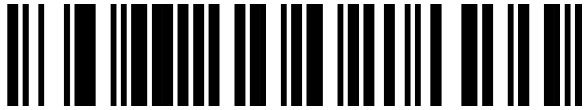
Trigger Release to Scan

Aim Duration

When the scanner is in Trigger Pull to Scan mode (default mode), Aim Duration sets the amount of time the aiming dot is seen before turning into a scanning beam. This parameter has no affect when the scanner is in the Trigger Release to Scan mode.

The Aim Duration is programmable in 0.1 second increments, from 0 to 9.9 seconds. If set to 0, no aiming pattern appears before a decode session. The default value is 0.8 seconds.

To set an aim duration, scan the barcode below. Then, scan two numeric barcodes, beginning on page 4-98, that correspond to the desired aim duration. Durations less than 1.0 second must have a leading zero. For example, to set an aim duration of 0.5 seconds, scan the barcode below, followed by the '0' and the '5' barcodes. If you make an error or wish to change your selection, scan the CANCEL barcode on page 4-100.

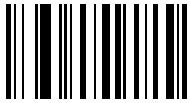


Aim Duration

Numeric Bar Codes

For parameters requiring specific numeric values, scan the appropriately numbered bar code(s).

0



1

2

3

4

Numeric Bar Codes (Continued)

5

6

7

8

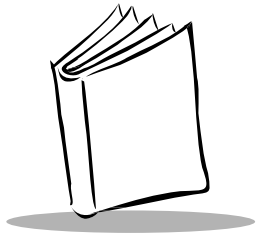
9

Numeric Bar Codes (Continued)

Cancel

If you make an error, or wish to change your selection, scan the bar code below.

CANCEL



Appendix A
Bar Code Information

UCC/EAN-128

UCC/EAN-128 is a convention for printing data fields with standard Code 128 bar code symbols. UCC/EAN-128 symbols are distinguished by a leading FNC 1 character as the first or second character in the symbol. Other FNC 1 characters are used to delineate fields.

When EAN-128 symbols are read, they are transmitted after special formatting strips off the leading FNC 1 character and replaces other FNC 1 characters with the ASCII 29 GS control character.

When AIM symbology identifiers are transmitted, the modifier character indicates the position of the leading FNC 1 character according to AIM guidelines. For example, **]c1** indicates a UCC/EAN-128 symbol with a leading FNC1 character.

Standard Code 128 bar codes which do not have a leading FNC 1 may still be used, but are not encoded according to the EAN-128 convention. Standard Code 128 and UCC/EAN-128 may be mixed in an application. The scanner autodiscriminates between these symbols and can enable or disable one or both code types via bar code menus. The following table indicates the behavior of the scanner in each of the four possible parameter settings.

Table A-1. Reading Standard Code128 & UCC/EAN 128

Standard Code 128	UCC/EAN-128	Effect and Example
Disable	Disable	No Code 128 symbols can be read.
Disable	Enable	Read only symbols with leading FNC 1. Examples: ^{FNC1}ABCD^{FNC1}E will be read as ABCD^{29}E A^{FNC1}BCD^{FNC1}E will be read as ABCD^{29}E ^{FNC1FNC1}ABCD^{FNC1}E will be read as ABCD^{29}E ABCD^{FNC1}E can not be read ABCDE can not be read
Enable	Disable	Read only symbols without leading FNC 1. Examples: ^{FNC1}ABCD^{FNC1}E can not be read A^{FNC1}BCD^{FNC1}E can not be read ^{FNC1FNC1}ABCD^{FNC1}E can not be read ABCD^{FNC1}E will be read as ABCD^{29}E ABCDE will be read as ABCDE
Enable	Enable	Read both types of symbols. Examples: ^{FNC1}ABCD^{FNC1}E will be read as ABCD^{29}E A^{FNC1}BCD^{FNC1}E will be read as ABCD^{29}E ^{FNC1FNC1}ABCD^{FNC1}E will be read as ABCD^{29}E ABCD^{FNC1}E will be read as ABCD^{29}E ABCDE will be read as ABCDE

AIM Code Identifiers

Each AIM Code Identifier contains the three-character string **]cm** where:

] = Flag Character (ASCII 93)
c = Code Character (see Table A-2)
m = Modifier Character (see Table A-3)

Table A-2. Code Characters

Code Character	Code Type
A	Code 39
C	Code 128/EAN-128
E	UPC/EAN
F	Codabar
G	Code 93
H	Code 11
I	Interleaved 2 of 5
M	MSI Plessey
S	D2 of 5, IATA 2 of 5
X	Bookland EAN, Code 39 Trioptic, Coupon Code

The modifier character is the sum of the applicable option values based on the following table.

Table A-3. Modifier Characters

Code Type	Option Value	Option
Code 39	0	No check character or Full ASCII processing.
	1	Reader has checked one check character.
	3	Reader has checked and stripped check character.
	4	Reader has performed Full ASCII character conversion.
	5	Reader has performed Full ASCII character conversion and checked one check character.
	7	Reader has performed Full ASCII character conversion and checked and stripped check character.
	Example: A Full ASCII bar code with check character W, **A+I+MI+DW**, is transmitted as **]A7**AimId where 7 = (3+4).	
Trioptic Code 39	0	No option specified at this time. Always transmit 0.
	Example: A Trioptic bar code 412356 is transmitted as **]X0**412356	
Code 128	0	Standard data packet, no Function code 1 in first symbol position.
	1	Function code 1 in first symbol character position.
	2	Function code 1 in second symbol character position.
	Example: A Code (EAN) 128 bar code with Function 1 character in the first position, FNC1 Aim Id is transmitted as **]C1**AimId	
I 2 of 5	0	No check digit processing.
	1	Reader has validated check digit.
	3	Reader has validated and stripped check digit.
	Example: An I 2 of 5 bar code without check digit, 4123, is transmitted as **]I0**4123	

Table A-3. Modifier Characters (Continued)

Code Type	Option Value	Option
Codabar	0	No check digit processing.
	1	Reader has checked check digit.
	3	Reader has stripped check digit before transmission.
	Example: A Codabar bar code without check digit, 4123, is transmitted as **]F0**4123	
Code 93	0	No options specified at this time. Always transmit 0.
	Example: A Code 93 bar code 012345678905 is transmitted as **]G0**012345678905	
MSI Plessey	0	Single check digit checked.
	1	Two check digits checked.
	2	Single check digit verified and stripped before transmission.
	3	Two check digits verified and stripped before transmission.
	Example: An MSI Plessey bar code 4123, with a single check digit checked, is transmitted as **]M0**4123	
D 2 of 5	0	No options specified at this time. Always transmit 0.
	Example: A D 2 of 5 bar code 4123, is transmitted as **]S0**4123	
UPC/EAN	0	Standard packet in full EAN country code format, which is 13 digits for UPC-A and UPC-E (not including supplemental data).
	1	Two-digit supplement data only.
	2	Five-digit supplement data only.
	4	EAN-8 data packet.
	Example: A UPC-A bar code 012345678905 is transmitted as **]E0**0012345678905	
Bookland EAN	0	No options specified at this time. Always transmit 0.
	Example: A Bookland EAN bar code 123456789X is transmitted as **]X0**123456789X	

According to AIM standards, a UPC with supplemental bar code is transmitted in one of the following formats:

]E0 (UPC chars) (terminator) **]E2** (supplemental) (terminator) or

]E2 (supplemental) (terminator) **]E0** (UPC chars) (terminator)

In the scanner, however, the format is changed to:

]E0 (UPC chars) **]E2** (supplemental)

Therefore, a UPC with two supplemental characters, 01234567890510, is transmitted to the host as a 21-character string, **]E0**0012345678905**]E1**10.

Table A-4. Symbol Code Identifier Characters

Code Type	Symbol Identifier
UPC-A, UPC-E, EAN-13, EAN-8	A
Code 39	B
Codabar	C
Code 128	D
Code 93	E
Interleaved 2 of 5	F
Discrete 2 of 5, D 2 of 5 IATA	G
MSI Plessey	J
UCC/EAN 128	K
Bookland EAN	L
Trioptic Code 39	M
PDF417, MicroPDF417	X

Table A-5. ASCII Character Set

ASCII Value	Full ASCII Code 39 Encode Char.	Keystroke	ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1000	%U	CTRL 2	1024	$X	CTRL X
1001	$A	CTRL A	1025	$Y	CTRL Y
1002	$B	CTRL B	1026	$Z	CTRL Z
1003	$C	CTRL C	1027	%A	CTRL [
1004	$D	CTRL D	1028	%B	CTRL \
1005	$E	CTRL E	1029	%C	CTRL]
1006	$F	CTRL F	1030	%D	CTRL 6
1007	$G	CTRL G	1031	%E	CTRL -
1008	$H	CTRL H	1032	Space	Space
1009	$I	CTRL I	1033	/A	!
1010	$J	CTRL J	1034	/B	‘
1011	$K	CTRL K	1035	/C	#
1012	$L	CTRL L	1036	/D	$
1013	$M	CTRL M	1037	/E	%
1014	$N	CTRL N	1038	/F	&
1015	$O	CTRL O	1039	/G	‘
1016	$P	CTRL P	1040	/H	(
1017	$Q	CTRL Q	1041	/I	)
1018	$R	CTRL R	1042	/J	*
1019	$S	CTRL S	1043	/K	+
1020	$T	CTRL T	1044	/L	,
1021	$U	CTRL U	1045	-	-
1022	$V	CTRL V	1046	.	.
1023	$W	CTRL W	1047	/	/

Table A-5. ASCII Character Set (Continued)

ASCII Value	Full ASCII Code 39 Encode Char.	Keystroke	ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1048	0	0	1073	I	I
1049	1	1	1074	J	J
1050	2	2	1075	K	K
1051	3	3	1076	L	L
1052	4	4	1077	M	M
1053	5	5	1078	N	N
1054	6	6	1079	O	O
1055	7	7	1080	P	P
1056	8	8	1081	Q	Q
1057	9	9	1082	R	R
1058	/Z	:	1083	S	S
1059	%F	;	1084	T	T
1060	%G	<	1085	U	U
1061	%H	=	1086	V	V
1062	%I	>	1087	W	W
1063	%J	?	1088	X	X
1064	%V	@	1089	Y	Y
1065	A	A	1090	Z	Z
1066	B	B	1091	%K	[
1067	C	C	1092	%L	\
1068	D	D	1093	%M	]
1069	E	E	1094	%N	^
1070	F	F	1095	%O	_
1071	G	G	1096	%W	‘
1072	H	H	1097	+A	a

Table A-5. ASCII Character Set (Continued)

ASCII Value	Full ASCII Code 39 Encode Char.	Keystroke	ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1098	+B	b	1113	+Q	q
1099	+C	c	1114	+R	r
1100	+D	d	1115	+S	s
1101	+E	e	1116	+T	t
1102	+F	f	1117	+U	u
1103	+G	g	1118	+V	v
1104	+H	h	1119	+W	w
1105	+I	i	1120	+X	x
1106	+J	j	1121	+Y	y
1107	+K	k	1122	+Z	z
1108	+L	l	1123	%P	{
1109	+M	m	1124	%Q	|
1110	+N	n	1125	%R	}
1111	+O	o	1126	%S	~
1112	+P	p	1127		Undefined

Table A-5. ASCII Character Set (Continued)

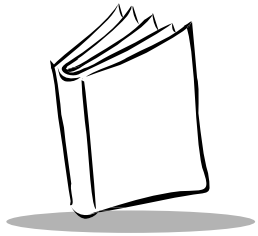
ALT Keys	Keystroke	ALT Keys	Keystroke	ALT Keys	Keystroke
2064	ALT 2	2075	ALT K	2086	ALT V
2065	ALT A	2076	ALT L	2087	ALT W
2066	ALT B	2077	ALT M	2088	ALT X
2067	ALT C	2078	ALT N	2089	ALT Y
2068	ALT D	2079	ALT O	2090	ALT Z
2069	ALT E	2080	ALT P	2091	ALT [
2070	ALT F	2081	ALT Q	2092	ALT \
2071	ALT G	2082	ALT R	2093	ALT]
2072	ALT H	2083	ALT S	2094	ALT 6
2073	ALT I	2084	ALT T	2095	ALT -
2074	ALT J	2085	ALT U		
Misc. Key	**Keystroke**	**Misc. Key**	**Keystroke**	**Misc. Key**	**Keystroke**
3001	PA 1	3009	CMD 7	3017	°
3002	PA 2	3010	CMD 8	3018	1/2
3003	CMD 1	3011	CMD 9	3019	¶
3004	CMD 2	3012	CMD 10	3020	§
3005	CMD 3	3013	¥	3021	|
3006	CMD 4	3014	£	3022	0/00
3007	CMD 5	3015	¤		
3008	CMD 6	3016	¬		

Table A-5. ASCII Character Set (Continued)

PF Keys	Keystroke	PF Keys	Keystroke	PF Keys	Keystroke
4001	PF 1	4009	PF 9	4017	PF 17
4002	PF 2	4010	PF 10	4018	PF 18
4003	PF 3	4011	PF 11	4019	PF 19
4004	PF 4	4012	PF 12	4020	PF 20
4005	PF 5	4013	PF 13	4021	PF 21
4006	PF 6	4014	PF 14	4022	PF 22
4007	PF 7	4015	PF 15	4023	PF 23
4008	PF 8	4016	PF 16	4024	PF 24
F Keys	**Keystroke**	**F Keys**	**Keystroke**	**F Keys**	**Keystroke**
5001	F 1	5014	F 14	5027	F 27
5002	F 2	5015	F 15	5028	F 28
5003	F 3	5016	F 16	5029	F 29
5004	F 4	5017	F 17	5030	F 30
5005	F 5	5018	F 18	5031	F 31
5006	F 6	5019	F 19	5032	F 32
5007	F 7	5020	F 20	5033	F 33
5008	F 8	5021	F 21	5034	F 34
5009	F 9	5022	F 22	5035	F 35
5010	F 10	5023	F 23	5036	F 36
5011	F 11	5024	F 24	5037	F 37
5012	F 12	5025	F 25	5038	F 38
5013	F 13	5026	F 26	5039	F 39

Table A-5. ASCII Character Set (Continued)

Numeric Keypad	Keystroke	Numeric Keypad	Keystroke	Numeric Keypad	Keystroke
6042	*	6049	1	6056	8
6043	+	6050	2	6057	9
6044	Undefined	6051	3	6058	Enter
6045	-	6062	4	6059	Num Lock
6046	.	6063	5	6060	00
6047	/	6064	6		
6048	0	6065	7		
Extended Keypad	**Keystroke**	**Extended Keypad**	**Keystroke**	**Extended Keypad**	**Keystroke**
7001	Break	7008	Backspace	7015	Up Arrow
7002	Delete	7009	Tab	7016	Dn Arrow
7003	Pg Up	7010	Print Screen	7017	Left Arrow
7004	End	7011	Insert	7018	Right Arrow
7005	Pg Dn	7012	Home	7019	Back Tab
7006	Pause	7013	Enter		
7007	Scroll Lock	7014	Escape		



Appendix B
Radio Channels

Cordless Phaser RF Channels Per Country

The cordless Phaser scanner operates continuously on a single, programmable channel (frequency) between 2.402 GHz (channel 02) and 2.483 GHz (channel 83).

A maximum of 82 channels are available. Not all channels are available in all countries. If a channel is not legal to use in your country, an error beep will be heard instead of a successful warble.

See Table B-1 for a list of channel availability by Country.

Note: *Although the cordless Phaser scanner has been certified for operation in all countries listed in Table B-1, not all country configurations are available for order. Consult your local Symbol reseller for more information.*

Table B-1. RF Channels Per Country

Country	Total Channels	First Channel	Last Channel
ARGENTINA	82	2	83
AUSTRALIA	82	2	83
AUSTRIA	82	2	83
BELGIUM	82	2	83

Table B-1. RF Channels Per Country (Cont'd)

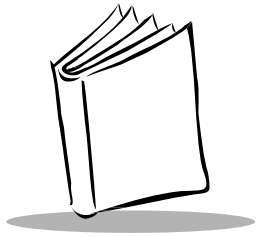
Country	Total Channels	First Channel	Last Channel
BOLIVIA	82	2	83
BRAZIL	82	2	83
CANADA	82	2	83
CHILE	82	2	83
COLOMBIA	82	2	83
COSTA RICA	82	2	83
CZECH REPUBLIC	82	2	83
DENMARK	82	2	83
DOMINICAN REPUBLIC	82	2	83
FINLAND	82	2	83
FRANCE	82	2	83
GERMANY	82	2	83
GREECE	82	2	83
GUATEMALA	82	2	83
HONDURAS	82	2	83
HONG KONG	82	2	83
HUNGARY	82	2	83
INDONESIA	82	2	83
ICELAND	82	2	83
IRELAND	82	2	83
ISRAEL	36	20	55
ITALY	82	2	83
JAPAN	80	2	81
KOREA	82	2	83

Table B-1. RF Channels Per Country (Cont'd)

Country	Total Channels	First Channel	Last Channel
LUXEMBOURG	82	2	83
MALAYSIA	82	2	83
MEXICO	32	52	83
NETHERLANDS	82	2	83
NEW ZEALAND	82	2	83
NICARAGUA	82	2	83
NORWAY	82	2	83
PERU	82	2	83
PHILIPPINES	82	2	83
POLAND	82	2	83
PORTUGAL	82	2	83
ROMANIA	82	2	83
RUSSIA	82	2	83
SAUDI ARABIA	82	2	83
SINGAPORE	82	2	83
SLOVENIA	82	2	83
SOUTH AFRICA	82	2	83
SPAIN	82	2	83
SWEDEN	82	2	83
SWITZERLAND	82	2	83
TAIWAN	80	2	81
THAILAND	82	2	83
TURKEY	82	2	83
UNITED ARAB EMIRATES	82	2	83

Table B-1. RF Channels Per Country (Cont'd)

Country	Total Channels	First Channel	Last Channel
UNITED KINGDOM	82	2	83
URUGUAY	82	2	83
UNITED STATES (US)	82	2	83
VENEZUELA	82	2	83



Appendix C
Error Indications and Beeps

Introduction

This Appendix contains information on error indications and beeps that may occur.

Indications

The scanner indicates when certain actions are performed by either beeps to LED sequences. If the scanner's indication is unfamiliar, contact the *Symbol Support Center* on page -xi.

Table C-1. Scanner Indications

Indications	Description
Scanner emits 4 beeps - Lo Hi Lo Hi and base LED does not flash after scanning the pairing bar code on the top of the base.	The scanner has not been successfully paired with the base (cradle). Try to pair the scanner and cradle again (see *Pairing the Scanner with the Cradle* on page 1-8).
Timeout error occurs on the PC from which you are downloading, if it does not receive an ACK back from the scanner/base.	Failed to initiate download or new firmware was not successfully downloaded to the device. Reset (remove and reinstall the battery) the scanner and cycle power (power off then on) to the base. Pair the scanner with the cradle and try to download again.
Scanner emits 4 beeps - short Hi	Battery is close to complete discharge. Recharge the battery. See *Charging the Battery* on page 1-10.

Communication Errors

Scanning Transmission Range

A communication error will occur when the scanner, cradle or host fails to properly communicate. When a communication error occurs while using the default application, the scanner emits 4 beeps (Lo Hi Lo Hi). For a complete list of error beeps, see Table C-2.

Table C-2. Error Beeps

Beep	Type	Description
5 Beeps - Lo tone	Serial Protocol Error	RS-232 host does not recognize character(s) transmitted from scanner.
4 Beeps - long Lo	Serial Protocol Error	Handshaking failure.
4 Beeps - Hi/ Hi/Hi/Lo	Serial Protocol Error	Scanner does not recognize character(s) transmitted from RS-232 host.
5 Beeps - Lo tone	SYNAPSE Error	Synapse host does not recognize character(s) transmitted from scanner.
4 Beeps - long Lo	SYNAPSE Error	Synapse transmission failed. Synapse cable may not be properly installed.
4 Beeps - long Lo	RF Communication Error	Scanner is out of range, not properly paired to a base or the base may have lost power.
4 Beeps - long Lo	RF Communication Error	The base to which the scanner is paired has been paired with another scanner.
4 Beeps - long Lo	RF Communication Error	Scanner is out of range.
3 Beeps - Lo/ Hi/Lo	MCL-Link Error	A Synapse cable cannot communicate with MCL-Link. Reconnect to the host using an RS-232 cable and then cycle power (power off then on) to the base.
4 Beeps - long Lo	RF Communication Error	The base is not responding. Cycle power (power off then on) to the base.
3 Beeps - Lo/ Hi/Lo	MCL-Link Error	MCL-Link responded with a busy message.

Table C-2. Error Beeps

Beep	Type	Description
3 Beeps - Lo/ Hi/Lo	MCL-Link Error	MCL-Link rejected the command.
3 Beeps - Lo/ Hi/Lo	MCL-Link Error	MCL-Link or 123Scan did not respond. The base may not be properly connected to the host. make sure the RS-232 cable is properly connected and the base is receiving power. If the problem persists, cycle power (power off then on) to the base.
Note: For users developing applications, these error codes are reported in System Variable 97 immediately after the execution of the offending command (SO, SI, NO or NI).		

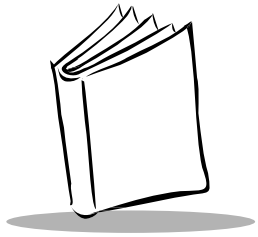
MCL-Code Errors

After the execution of an MCL-Code command, variable &99 generally reports the result of the command execution. The table below lists the standard error beeps used by the MCL-Code commands. Following an error beep sequence, the green LED blinks for 5 seconds and then the system automatically returns to the default application.

Beeps	Description
Hi-Lo	branch error • jump out of the scope of the current program • label not found, too long

Lo-Hi	syntax error in an MCL command
	• command code invalid
	• mandatory argument missing or invalid
	• bad number of arguments:
	  • check command syntax
	  • check if any variable contains " | " characters, if yes, use VE command to extract desired field
	  • check line length (max. 512 characters) after variable substitution (variables are replaced by their contents)

Hi-Lo-Hi	variable error • variable too big (in write command) • variable name invalid
Lo-Hi-Lo	serial error • attempt to execute SI or SO command on the Network communication port
Hi-Hi-Lo-Lo	run program error • too many RM commands without the associated QX command (max. 6 nested programs)



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Tell Us What You Think...

We'd like to know what you think about this Guide. Please take a moment to fill out this questionnaire and fax this form to: (631) 738-3318, or mail to:

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User's Guide Title:_____
(please include revision level)

How familiar were you with this product before using this guide?

☐ Very familiar ☐ Slightly familiar ☐ Not at all familiar

Did this guide meet your needs? If not, please explain.

_____
_____

What topics need to be added to the index, if applicable?

_____
_____

What topics do you feel need to be better discussed? Please be specific.

_____
_____

What can we do to further improve our guides?

_____
_____

Thank you for your input—We value your comments.

Quick Startup Instructions

Below is an index of startup instructions to help get you up and going quickly. The index is listed in a step-by-step order beginning with step 1, Setting up the System.

Mandatory steps are designated by an asterisk (*). If an item has multiple pages referenced, the most important reference is in bold.

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