Cyclone™ M2000 Series

Product Reference Guide

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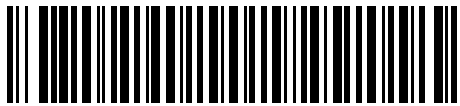

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Symbol Technologies, Inc. One Symbol Plaza, Holtsville N.Y. 11742

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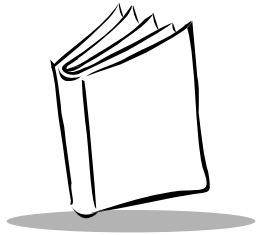
Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
http://www.symbol.com



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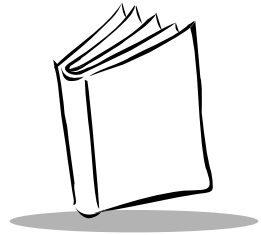


About This Guide

The *Cyclone™ M2000 Series Product Reference Guide* provides general information about setting up, programming, and operating the M2000 Scanner.

Chapter Descriptions

Following are brief descriptions of each chapter in this guide.

- Chapter 1, *Setting Up Your Scanner* provides information on connecting the scanner to the host.
- Chapter 2, *Scanning* describes how to use the scanner, defines operator feedback, and provides maintenance and troubleshooting tips.
- Chapter 3, *Parameter Menus* provides all the bar codes necessary to program your scanner.
- Chapter 4, *Advnaced Data Formatting (ADF)* explains how to customize scanned data before transmission to your host.
- Appendix A, *Programming Reference* contains useful reference material such as ASCII tables and AIM code identifiers.
- Appendix B, *Specifications* provides the technical specifications, decode zones, and cable pinouts for the scanner.

Notational Conventions

The following conventions are used in this document:

- M2000 refers to all models of the M2000 Series scanners (M2004, M2005, and M2007).

- 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.

Service Information

If you have a problem with your equipment, contact the *Symbol Support Centers*. 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 Centers

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

United States	**Canada**
Symbol Technologies, Inc.	Symbol Technologies Canada, Inc.
One Symbol Plaza	2540 Matheson Boulevard East
Holtsville, New York 11742-1300	Mississauga, Ontario, Canada L4W 4Z2
1-800-653-5350	905-629-7226

United Kingdom

Symbol Technologies
Symbol Place
Winnersh Triangle, Berkshire RG41 5TP
United Kingdom
0800 328 2424 (Inside UK)
+44 208 945 7529 (Outside UK)

Asia/Pacific

Symbol Technologies Asia, Inc.
230 Victoria Street #04-05
Bugis Junction Office Tower
Singapore 188024
337-6588 (Inside Singapore)
+65-337-6588 (Outside Singapore)

Australia

Symbol Technologies Pty. Ltd.
432 St. Kilda Road
Melbourne, Victoria 3004
1-800-672-906 (Inside Australia)
+61-3-9866-6044 (Outside Australia)

Austria

Symbol Technologies Austria GmbH
Prinz-Eugen Strasse 70
Suite 3
2.Haus, 5.Stock
1040 Vienna, Austria
1-505-5794 (Inside Austria)
+43-1-505-5794 (Outside Austria)

Denmark

Symbol Technologies AS
Gydevang 2,
DK-3450 Allerod, Denmark
7020-1718 (Inside Denmark)
+45-7020-1718 (Outside Denmark)

Europe/Mid-East Distributor Operations

Contact your local distributor or call
+44 208 945 7360

Finland

Oy Symbol Technologies
Kaupintie 8 A 6
FIN-00440 Helsinki, Finland
9 5407 580 (Inside Finland)
+358 9 5407 580 (Outside Finland)

France

Symbol Technologies France
Centre d'Affaire d'Antony
3 Rue de la Renaissance
92184 Antony Cedex, France
01-40-96-52-21 (Inside France)
+33-1-40-96-52-50 (Outside France)

Germany
Symbol Technologies GmbH
Waldstrasse 68
D-63128 Dietzenbach, Germany
6074-49020 (Inside Germany)
+49-6074-49020 (Outside Germany)

Italy
Symbol Technologies Italia S.R.L.
Via Cristoforo Columbo, 49
20090 Trezzano S/N Navigilo
Milano, Italy
2-484441 (Inside Italy)
+39-02-484441 (Outside Italy)

Latin America Sales Support
7900 Glades Road
Suite 340
Boca Raton, Florida 33434 USA
1-800-347-0178 (Inside United States)
+1-561-483-1275 (Outside United States)

Mexico
Symbol Technologies Mexico Ltd.
Torre Picasso
Boulevard Manuel Avila Camacho No 88
Lomas de Chapultepec CP 11000
Mexico City, DF, Mexico
5-520-1835 (Inside Mexico)
+52-5-520-1835 (Outside Mexico)

Netherlands
Symbol Technologies
Kerkplein 2, 7051 CX
Postbus 24 7050 AA
Varsseveld, Netherlands
315-271700 (Inside Netherlands)
+31-315-271700 (Outside Netherlands)

Norway
Symbol Technologies
Trollasveien 36
Postboks 72
1414 Trollasen, Norway
66810600 (Inside Norway)
+47-66810600 (Outside Norway)

South Africa
Symbol Technologies Africa Inc.
Block B2
Rutherford Estate
1 Scott Street
Waverly 2090 Johannesburg
Republic of South Africa
11-4405668 (Inside South Africa)
+27-11-4405668 (Outside South Africa)

Spain
Symbol Technologies S.A.
Edificioi la Piovera Azul
C. Peonias, No. 2 - Sexta Planta
28042 Madrid, Spain
9-1-320-39-09 (Inside Spain)
+34-9-1-320-39-09 (Outside Spain)

Sweden
Symbol Technologies AB
Albygatan 109D
Solna
Sweden
84452900 (Inside Sweden)
+46 84452900 (Outside Sweden)

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

Warranty

Symbol Technologies, Inc ("Symbol") manufactures its hardware products in accordance with industry-standard practices. Symbol warrants that for a period of twelve (12) months from date of shipment, products will be free from defects in materials and workmanship.

This warranty is provided to the original owner only and is not transferable to any third party. It shall not apply to any product (i) which has been repaired or altered unless done or approved by Symbol, (ii) which has not been maintained in accordance with any operating or handling instructions supplied by Symbol, (iii) which has been subjected to unusual physical or electrical stress, misuse, abuse, power shortage, negligence or accident or (iv) which has been used other than in accordance with the product operating and handling instructions. Preventive maintenance is the responsibility of customer and is not covered under this warranty.

Wear items and accessories having a Symbol serial number, will carry a 90-day limited warranty. Non-serialized items will carry a 30-day limited warranty.

Warranty Coverage and Procedure

During the warranty period, Symbol will repair or replace defective products returned to Symbol's manufacturing plant in the US. For warranty service in North America, call the Symbol Support Center at 1-800-653-5350. International customers should contact the local Symbol office or support center. If warranty service is required, Symbol will issue a Return Material Authorization Number. Products must be shipped in the original or comparable packaging, shipping and insurance charges prepaid. Symbol will ship the repaired or replacement product freight and insurance prepaid in North America. Shipments from the US or other locations will be made F.O.B. Symbol's manufacturing plant.

Symbol will use new or refurbished parts at its discretion and will own all parts removed from repaired products. Customer will pay for the replacement product in case it does not return the replaced product to Symbol within 3 days of receipt of the replacement product. The process for return and customer's charges will be in accordance with Symbol's Exchange Policy in effect at the time of the exchange.

Customer accepts full responsibility for its software and data including the appropriate backup thereof.

Repair or replacement of a product during warranty will not extend the original warranty term.

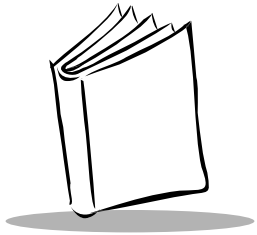
Symbol's Customer Service organization offers an array of service plans, such as on-site, depot, or phone support, that can be implemented to meet customer's special operational requirements and are available at a substantial discount during warranty period.

General

Except for the warranties stated above, Symbol disclaims all warranties, express or implied, on products furnished hereunder, including without limitation implied warranties of merchantability and fitness for a particular purpose. The stated express warranties are in lieu of all obligations or liabilities on part of Symbol for damages, including without limitation, special, indirect, or consequential damages arising out of or in connection with the use or performance of the product.

Seller's liability for damages to buyer or others resulting from the use of any product, shall in no way exceed the purchase price of said product, except in instances of injury to persons or property.

Some states (or jurisdictions) do not allow the exclusion or limitation of incidental or consequential damages, so the proceeding exclusion or limitation may not apply to you.



Chapter 1
Setting Up Your Scanner

Introduction

The Cyclone™ M2000 Series scanner combines the benefits of multiple scan patterns (omnidirectional, semi-omni, 2D raster, and single scan-line) with a light-weight, hands-free/ hand-held design. The scanner's built-in stand seamlessly accommodates both counter-top and hand-held use. The scanner can be programmed to emit the preferred scan pattern for both counter-top and hand-held use.

The M2000 successfully reads most bar code symbologies, densities, and colors, produced by a wide range of printing techniques.

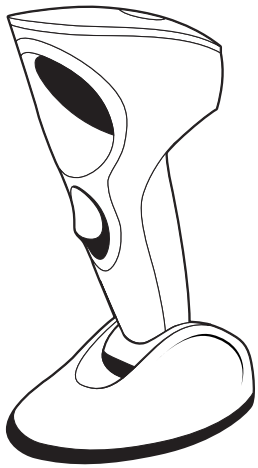


Figure 1-1. Cyclone M2000 Series Scanner

The M2000 scanner supports the following interfaces:

- M2004-I000 (RS-232C) contains on-board discrete RS-232C communications for connecting to RS-232C asynchronous terminals and host systems. It also accommodates Synapse™ "Smart Cables" which allow you to connect to a wide variety of host systems.
- M2004-I100 (RS-232C with EAS) also supports Checkpoint VII Electronic Article Surveillance (EAS).
- M2005-I000 (IBM 468X/469X) is fully compatible with the entire line of IBM 468X/469X terminals. It also accommodates Synapse Smart Cables.
- M2005-I100 (IBM 468X/469X with EAS) provides additional signal lines for EAS deactivation (Checkpoint VII).
- M2007-I000 (USB) connects to USB-capable host systems, including:
  - Desktop PCs and Notebooks
  - Apple™ iMac, G4, iBooks
  - IBM SurePOS terminals
  - Network computers.

  It also accommodates Synapse Smart Cables.
- M2007-I100 (USB with EAS) provides additional signal lines for EAS deactivation (Checkpoint VII).

Unpacking

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

Connecting your Scanner to a Host

To connect the M2000 to your host:

1. Power down the host.
2. Connect the interface cable to the receptacle in the back of the M2000 base. Listen for a click.

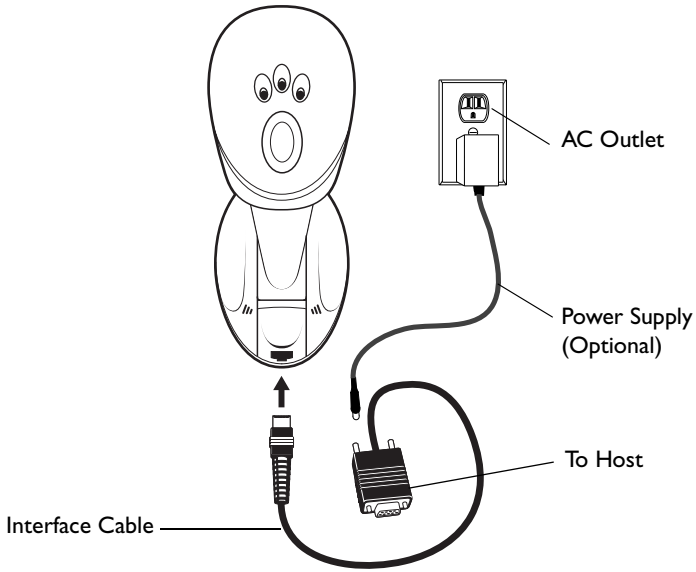


Figure 1-1. Plugging Connector into Scanner

1. Gently tug the cable to ensure the connector is properly secured.
2. Connect the other end of the interface cable to the host (refer to your terminal manual to locate the correct port).
3. If necessary, plug the power supply into the power jack on the interface cable. Plug the other end of the power supply into an AC outlet.
4. If you are using a Synapse cable, the scanner autodetects your host. If you are using another cable, set the M2000 to communicate with your particular POS host by scanning the appropriate bar code(s) in Chapter 3, *Parameter Menus*.
5. Power up the host.
6. Three power-up beeps sound and all three LEDs light, indicating the scanner is operational.

7. Verify that the scanner is successfully reading bar codes and transmitting their content to the host.

See *Troubleshooting on page 2-9* if you are having problems after completing these steps.

Setting Up the M2007 (USB) Scanner

The M2007 connects through the USB and operates with USB capable hosts including:

- Desktop PCs and Notebooks
- Apple™ iMac, G4, iBooks
- IBM SurePOS terminals
- Network computers.

The following operating systems support the M2007 through USB:

- Windows 98, 2000, ME, NT 5.0
- MacOS 8.0 and above
- 4690 OS v2.3 and above.

Ask your vendor if your host supports USB, and if your version of the operating system supports USB. For more information on USB technology, hosts, and peripheral devices, visit *www.usb.org*.

Bus Power

An additional power supply is not required to operate the M2007 since the USB host or self-powered hub provides enough power.

To set up your M2007:

1. Connect the cable to the scanner.
2. Plug the series A connector in the USB host or hub, or plug the power+ connector in the IBM SurePOS terminal.
3. Select the USB device type. See ***USB Device Type*** on page 3-107.
4. On first installation when using Windows, the software prompts you to select or install the USB device driver. Follow the installation instructions on the screen. The scanner powers up during this installation.
5. If you are not using a North American keyboard, scan the appropriate country bar code under ***Country Selection*** on page 3-109.

If you are having any problems with your system, see *Troubleshooting on page 2-9*.

Switching Cables

Different cables are required for different hosts. To change the scanner cable:

1. Unplug the installed cable's modular connector by depressing the connector clip through the access hole on the bottom of the scanner with a screwdriver or paper clip.

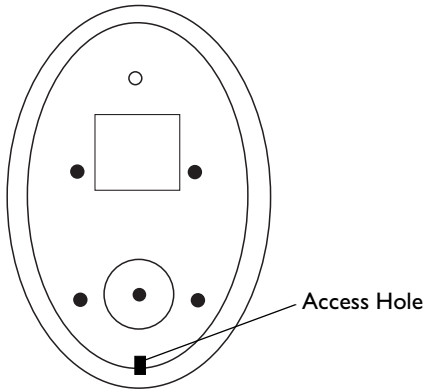


Figure 1-2. Bottom of M2000 Scanner

2. Carefully slide out the cable.
3. Follow the previous steps to connect a new cable.

Caution

Be sure you are using the correct cable for your host. Using a cable incompatible with the host may cause damage to your scanner or host.

Wall Mounting the Scanner

An optional wall-mount bracket is available for using the M2000 in presentation applications. To wall-mount the M2000:

1. Place the bracket in its desired location on the wall, and place a pencil mark on the wall through each keyhole in the bracket.
2. Remove the bracket, and insert the screws provided into the pencil marks on wall. Do not tighten them all the way; leave enough space for the bracket's keyholes to slide onto.

3. Insert the bracket's keyholes over the screws, and slide the bracket down to secure. If necessary, tighten the screws.

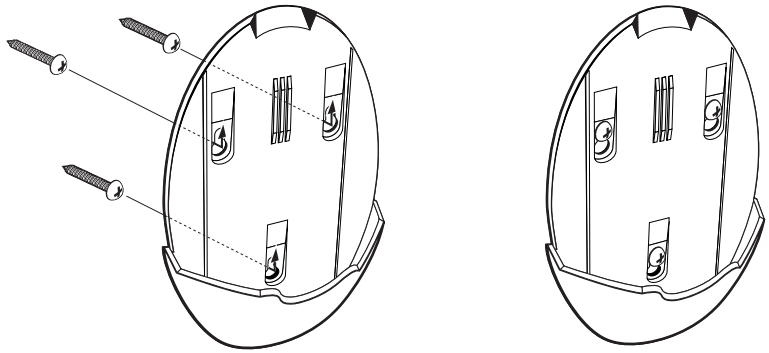


Figure 1-3. Installing the Wall Mount Bracket

4. Slide the base of the scanner into the bracket, oriented so the scan window faces down.

Accessories

Required Accessories

These items must be included to complete the system, and are available through contacting your local Symbol representative or business partner.

- Host interface cables for RS-232 operation (available in 6-foot and 8.5-foot lengths.)
  - 25-Pin Male D Connector (TxD on Pin 3)
  - 25-Pin Male D Connector (TxD on Pin 2)
  - 25-Pin Female D Connector (TxD on Pin 3)
  - 25-Pin Female D Connector (TxD on Pin 2)
  - 9-Pin Female D Connector (PC AT: TxD on Pin 3)
- 16-foot Synapse cable
- Synapse adapter cable
- Power supply (select one):
  - 115 VAC Power Supply
  - 220/240 VAC Power Supply (Europe)

- 100 VAC Power Supply (Japan)
- User documentation (*Cyclone™ M2000 Series Product Reference Guide*).

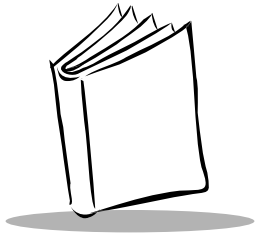
Optional Accessories

An optional Wall Mount Bracket is not included in the standard configuration, and is available through contacting your local Symbol representative or business partner.

Electronic Article Surveillance (EAS) (Optional)

Because there are several Checkpoint EAS systems available, your local Checkpoint representative should install the EAS cable. To contact your local Checkpoint representative inside the U.S. call 800-257-5540, ext. 4300. Outside the U.S., call (609) 848-1800, ext. 4300.

If you are using an EAS cable, refer to the Universal Cable EAS Installation Sheet (Symbol p/n 70-32824-xx).



Chapter 2
Scanning

Introduction

This chapter describes the various laser patterns and scanning modes available in the M2000 scanner, provides instructions and tips for scanning, and lists beeper and LED indications.

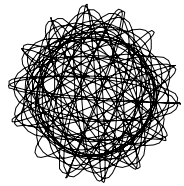
Scanning Modes

The M2000 may be used on the counter-top or in a hand-held orientation. In hand-held use, the scanner operates in triggered mode where you pull the trigger to activate the scan pattern and decode the bar code. In counter-top use, the scanner operates in continuous (constant-on) mode, where it automatically decodes a bar code presented in its field of view.

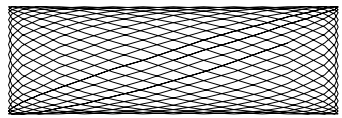
Laser Patterns

The scanner emits one of four laser patterns:

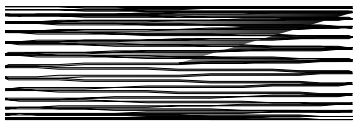
- **Cyclone Omnidirectional Pattern** is a highly efficient scan pattern which decodes 1D and EAN/UCC reduced space symbologies in any orientation.



- **Cyclone Semi-omnidirectional Pattern,** an alternative to the full omnidirectional pattern, scans highly truncated bar codes. The bar code must be presented horizontally with up to 20° tilt.



- **Raster Laser Pattern** directly opens the laser to a raster pattern for scanning 1D, PDF417, RSS, and composite codes.



- **Slab Laser Pattern** creates a slab raster pattern (optimal for 1D, small PDF417, and RSS codes) which opens vertically for PDF417 symbols using the Smart Raster feature. This feature autodetects the type of bar code being scanned and adjusts its pattern accordingly. This provides optimal performance on 1D, PDF417, EAN/UCC, RSS and composite codes.

One pattern can be selected for counter-top mode and another for hand-held mode via programming bar code in Chapter 3, *Parameter Menus*. For hand-held mode, you may alternatively select a pattern by pressing the Scan Pattern Mode Selector button when the scanner is lifted off the counter.

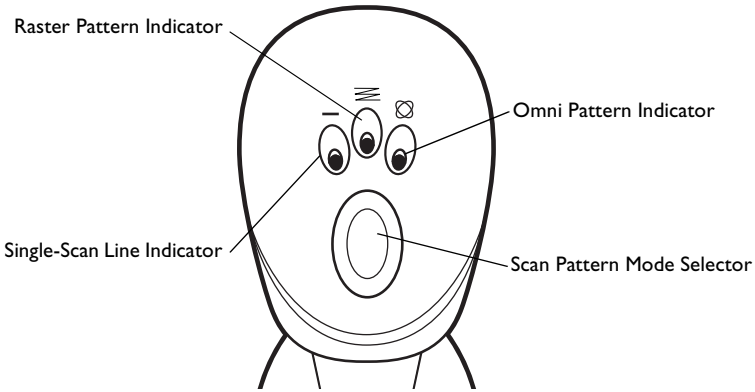


Figure 2-1. Top of M2000 Scanner

To scan in hand-held mode, pick up the scanner and hold it within the scanning range for the bar code. A sensor on the bottom of the scanner's stand detects when the scanner is lifted off the counter, and automatically switches to the programmed hand-held laser pattern.

Smart Raster

In Smart Raster operation, a trigger pull causes a slab raster pattern to appear. If the target is a 1-D bar code, the scanner decodes the symbol. If the target bar code is a 2-D bar code, the scanning patterns open up to a full, optimized raster pattern as soon as the scanner is properly aligned over the bar code.

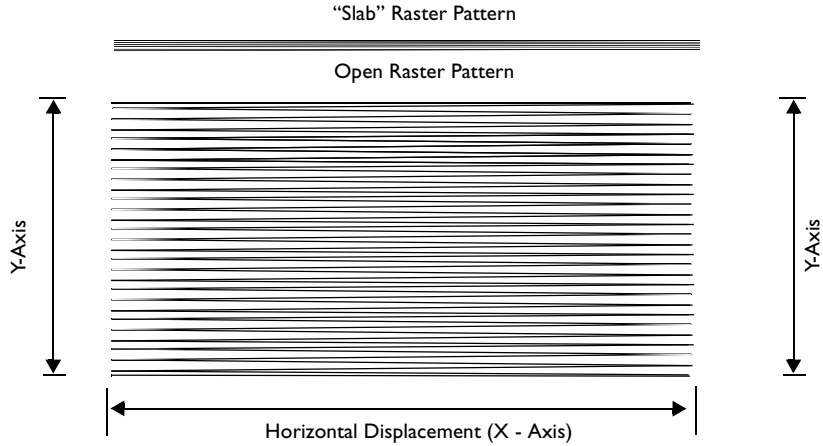


Figure 2-2. M2000 Scanning Patterns

Scanning 1D or 2D Bar Codes

When scanning a bar code:

- Keep the scan pattern parallel to the symbol's rows.
- Hold the scanner as still as possible.
- Hold the scanner at an angle which does not cause specular reflection (see *Specular Reflection* on page 2-5).
- Hold the scanner close for dense symbols, and farther away for large symbols. Practice shows what works.

- When using the raster pattern, if the pattern does not cover the top and bottom of a 2D symbol, pull the scanner back until it does. Make sure the scan pattern extends *at least three quarters of an inch* beyond the edges of the bar code.

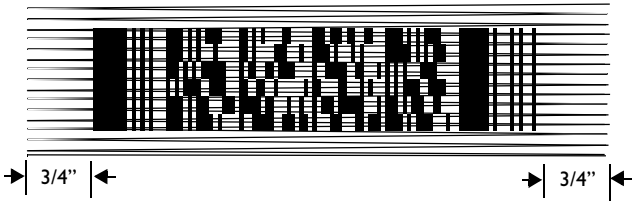


Figure 2-3. Raster Pattern Expanded Over PDF417 Symbol

- If the vertical scan pattern is not high enough to cover a "tall" PDF417 symbol, move the scanner slowly down toward the bottom of the symbol, keeping the beam horizontal to the rows, and then slowly back upward to the top.

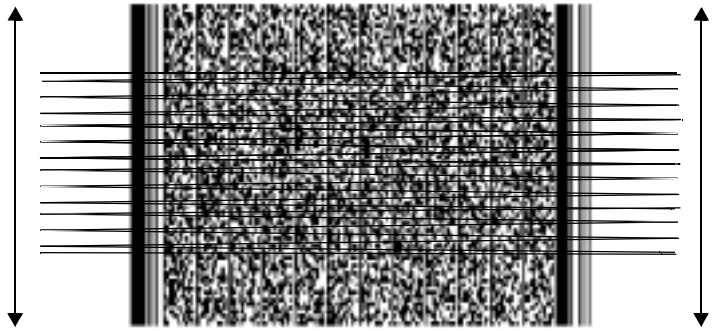


Figure 2-4. Moving Scan Pattern Upward and Downward on "Tall" PDF Symbol

- The scan beam does not have to be *perfectly* parallel with the top and bottom of the symbol (up to a 4^{o} tilt is permitted).
- Be sure the symbol is in good condition.

The scanner emits a short, high-tone beep and lights the three green LEDs to indicate a successful decode. Decoded data is transmitted to the host device. Be sure that the RS-232C or IBM 4683 parameters (e.g., baud rate, parity) are set properly. Communication parameters are described in Chapter 3, *Parameter Menus*.

Specular Reflection

When laser beams reflect *directly* back into the scanner from the bar code, they can "blind" the scanner and make decoding difficult. This is specular reflection.

To avoid this, scan the bar code so that the beam does not bounce *directly* back. But don't scan at too oblique an angle; the scanner needs to collect scattered reflections from the scan to make a successful decode. Practice quickly shows what tolerances to work within.

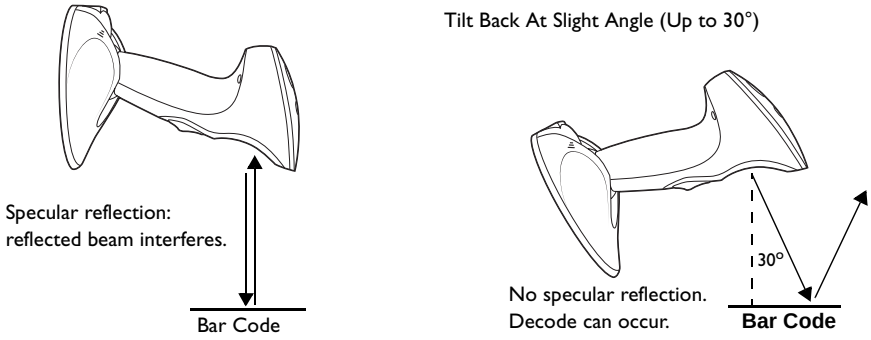


Figure 2-5. Avoiding Specular Reflection

When scanning a 1D bar code, there is only a small specular dead zone to avoid (± 2° from the direct laser beam). The specular dead zone is larger for scanning PDF417 (± 9° from the direct laser beam). However, the scanner is not effective if its beams hit the bar code's surface at an angle greater than 30° from the normal to that surface.

Beeper Definitions

Table 2-1 provides standard beeper definitions.

Table 2-1. Standard Beeper Definitions

Beeper Sequence	Indication
Standard Use	
Short high tone	A non-composite bar code symbol was decoded (if decode beeper is enabled).
3 short high tones	Power-on or reset. Occurs immediately after the scanner is turned on, indicating that the system software is working properly. If three beeps occur during normal operation, it is due to a reset and any work in progress is lost. If this occurs often, contact the Symbol Services Division.
Parameter Menu Scanning	
2 short high tones	Correct entry scanned or correct menu sequence performed.
High/low tone	Keyboard parameter selected. Enter value using numeric bar codes.
High/low/high/low tone	Successful program exit with change in the parameter setting.
Low/high tone	Input error, incorrect bar code, or "Cancel" scanned, wrong entry, incorrect bar code programming sequence; remain in program mode.
Communication	
4 short low tones	Communication error.
High/high/high/low tone	Receive error.
Low/high/low tone	ADF transmit error.

Macro PDF

Table 2-2 provides beeper definitions for Macro PDF mode. See *Macro PDF Features* on page 3-116 for an explanation of Macro PDF.

Table 2-2. Macro PDF Beeper Indications

Beeper Sequence	Indication
Error	
Long low tone	Hi-level decode error caused by incorrect symbol.
2 long low tones	File ID error. A bar code not in the current MPDF sequence was scanned.
3 long low tones	Out of memory. There is not enough buffer space to store the current MPDF symbol.
4 long low tones	Bad symbology. You scanned a 1-D or 2-D bar code in an MPDF sequence, a duplicate MPDF label, an incorrect sequence, or are trying to transmit an empty or illegal MPDF field.
5 long low tones	Flushing buffer.
Fast warble tone	Successful parameter scanned.
Decode Beep Sequence	
Short tone	Standard decode and transmit beep for all symbols.
Short low tone	1D portion of composite code was decoded. Decode beep follows when entire composite code is decoded.
Short high tone	2D portion of composite code was decoded. Decode beep follows when entire composite code is decoded.
Double short tone	MPDF symbol is buffered. A single beep indicates transmission of the buffered data.

LED Indications

The lit LED indicates the selected scan pattern for hand-held and counter-top mode. In hand-held mode, pressing the Scan Pattern Mode Selector button selects the next pattern, and lights the corresponding LED. (The counter-top laser pattern is selectable only via programming bar code.) When a bar code is successfully decoded, all three LEDs light momentarily.

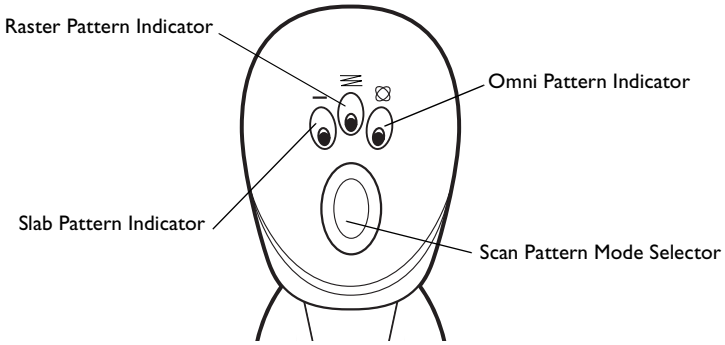


Figure 2-6. Laser Pattern Indicators

Maintenance

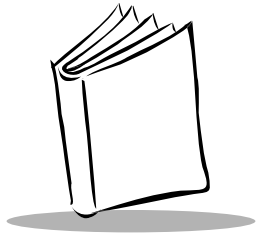
The M2000 scanner is designed to provide reliable service over an extended period of time. The only maintenance required is cleaning the exit window.

- Do not allow any abrasive material to touch the window.
- Remove any dirt particles with a damp cloth.
- Wipe the window using a tissue moistened with ammonia/water.
- Do not spray water or other cleaning liquids directly into the window.

Troubleshooting

Table 2-3. Troubleshooting

Problem	Possible Solution
Nothing happens when you follow the operating instructions.	Check the system power. Make sure you are using the correct interface cable for the host device. Check for loose cable connections. Make sure the scanner is programmed to read the symbology you are trying to read. See *Chapter 3, Parameter Menus*. Check the label to make sure it is not defaced; if damaged beyond its error correction capability, it will not decode. Try scanning a test symbol of the symbology you are trying to read.
Your scanner operates but scanned data is not displayed correctly.	Check the system power. Check for loose cable connections. Check that the communication parameters (baud rate, parity, stop bits, etc.) are set properly for the host device. If you're working with a Synapse cable, refer to your *Interface Guide*.
The laser does not activate, which is followed by a beep sequence.	You may be scanning in an inappropriately hot environment. Remove the scanner from the environment, or allow the laser to cool down.
Transmitting PDF bar code data through a scanner/wand emulation Synapse cable causes transmit errors.	The scanner / wand emulation Synapse cable has a transmission limit of approximately 46 characters. This does not apply to other Synapse cables.
For the M2007 (USB), no data transmits, or incorrect data transmits, or a low/low/low/low tone sounds.	Check cable connection to scanner and host. Make sure the correct device options and country code parameters are set for the currently attached scanner. Increase Intercharacter Delay.
USB parameters are not working.	Make sure you've selected the correct parameter set. If you scanned a Set Defaults bar code, re-enter your parameters.



Chapter 3
Parameter Menus

Introduction

The M2000 Series Scanner can be programmed to perform various functions, or activate different features. This chapter describes each feature and provides the programming bar codes necessary for selecting these features for your scanner. Before programming, follow the setup instructions in Chapter 1, *Setting Up Your Scanner*.

The M2000 Series Scanner is shipped with the default settings shown in Table 3-1 on page 3-2. These default values are stored in non-volatile memory and are preserved even when the scanner is powered down.

You can change the default values by scanning single bar codes or short bar code sequences in this chapter. These new values replace the standard default values in memory. The default parameter values can be recalled by scanning the *Set All Defaults* bar code on page 3-10.

Scanning Sequence Examples

In most cases you need only scan one bar code to set a specific parameter. For example, if you want to set the baud rate to 9600, simply scan the **9600** bar code listed under *Baud Rate on page 3-93*. The scanner issues a warble tone, signifying a successful parameter entry.

If you want to set specific code lengths or specify Serial Response Time-Out, you have to scan several bar codes. This procedure is described later in this chapter.

Errors While Scanning

If you make an error during a scanning sequence, just rescan the correct parameter.

Default Table

Table 3-1 lists the defaults for all parameters, and the page number each parameter appears on. If you wish to change any option, scan the appropriate bar code(s).

Table 3-1. Default Table

Parameter	Default	Page #
Set Default Parameter	All Defaults	3-10
Host Type	See page 3-11	3-11
Scanning Options		
Hand-Held Scan Pattern Mode	Smart Raster	3-15
Hand-Held Scan Pattern Mode Selector	Enable	3-16
Counter-top Scan Pattern Mode	Cyclone	3-17
Raster Height	15	3-18
Raster Expansion Rate	11	3-18
Aiming Mode	Slab Raster	3-19
Trigger Mode	Level	3-20
Time-out Between Same Symbol	0.6 sec	3-21
Time-out Between Different Symbols	0.0 sec	3-21
Laser On Time	5.0 sec	3-22
Time Delay to Low Power Mode	30 Minutes	3-22
Beep After Good Decode	Enable	3-23
Beeper Volume	High Volume	3-23
Beeper Tone	High Frequency	3-24
Transmit “No Decode” Message	Disable	3-24

Table 3-1. Default Table (continued)

Parameter	Default	Page #
Linear Code Type Security Levels: Hand Held Counter-top	 2 1	3-25
Bi-directional Redundancy	Disable	3-27
Autodiscriminate Response Time	1.0 second	3-27
Composite Codes CC-C	Disable	3-28
Composite Codes CC-A/B	Disable	3-29
UPC/EAN		
UPC-A	Enable	3-30
UPC-E	Enable	3-30
UPC-E1	Disable	3-31
EAN-8	Enable	3-31
EAN-13	Enable	3-32
Bookland EAN	Disable	3-32
UPC/EAN Coupon Code	Disable	3-33
Decode UPC/EAN Supplementals	Ignore	3-33
Decode UPC/EAN Supplemental Redundancy	12	3-35
Transmit UPC-A Check Digit	Enable	3-35
Transmit UPC-E Check Digit	Enable	3-36
Transmit UPC-E1 Check Digit	Enable	3-36
UPC-A Preamble	System Character	3-37
UPC-E Preamble	System Character	3-38

Table 3-1. Default Table (continued)

Parameter	Default	Page #
UPC-E1 Preamble	System Character	3-39
Convert UPC-E to A	Disable	3-40
Convert UPC-E1 to A	Disable	3-41
EAN-8 Zero Extend	Disable	3-42
EAN Zero Extend Type	Type is EAN-13	3-42
UPC/EAN Security Level	0	3-43
Linear UPC/EAN Decode	Disable	3-45
UPC Half Block Stitching	Enable	3-45
Linked 1D Send Mode	Disable	3-46
UPC Composite Mode	Always Linked	3-47
Code 128		
Code 128	Enable	3-48
UCC/EAN-128	Enable	3-48
ISBT 128	Disable	3-49
Code 128 Decode Performance	Enable	3-50
Code 128 Decode Performance Level	Level 1	3-51
Code 39		
Code 39	Enable	3-52
Trioptic Code 39	Disable	3-52
Convert Code 39 to Code 32	Disable	3-53
Code 32 Prefix	Enable	3-54

Table 3-1. Default Table (continued)

Parameter	Default	Page #
Set Length(s) for Code 39	Length within Range: 01-55	3-55
Code 39 Check Digit Verification	Disable	3-57
Transmit Code 39 Check Digit	Disable	3-57
Code 39 Full ASCII Conversion	Disable	3-58
Code 39 Decode Performance	Enable	3-59
Code 39 Decode Performance Level	Level 1	3-60
Code 93		
Code 93	Disable	3-61
Set Length(s) for Code 93	Length within Range: 04-55	3-62
Interleaved 2 of 5		
Interleaved 2 of 5	Disable	3-64
Set Length(s) for I 2 of 5	1 Discrete Length: 14	3-65
I 2 of 5 Check Digit Verification	Disable	3-67
Transmit I 2 of 5 Check Digit	Disable	3-68
Convert I 2 of 5 to EAN 13	Disable	3-69
Discrete 2 of 5		
Discrete 2 of 5	Disable	3-70
Set Length(s) for D 2 of 5	1 Discrete Length: 12	3-71
Codabar		
Codabar	Disable	3-73

Table 3-1. Default Table (continued)

Parameter	Default	Page #
Set Lengths for Codabar	Length within Range: 05-55	3-74
CLSI Editing	Disable	3-76
NOTIS Editing	Disable	3-76
MSI Plessey		
MSI Plessey	Disable	3-77
Set Length(s) for MSI Plessey	Length Within Range: 06 - 55	3-78
MSI Plessey Check Digits	One	3-80
Transmit MSI Plessey Check Digit	Disable	3-80
MSI Plessey Check Digit Algorithm	Mod 10/Mod 10	3-81
PDF417/MicroPDF417		
PDF417	Enable	3-82
MicroPDF417	Disable	3-82
MicroPDF Performance	Standard	3-83
Code 128 Emulation	Enable	3-84
RSS Codes		
RSS-14	Disable	3-85
RSS-Limited	Disable	3-85
RSS-Expanded	Disable	3-86
Data Options		
Transmit Code ID Character	None	3-87

Table 3-1. Default Table (continued)

Parameter	Default	Page #
Prefix/Suffix Values Prefix Suffix	 Enter Enter	3-89
Scan Data Transmission Format	Data as is	3-90
Decode Buffering	Slab/Raster: Enable Omni: Disable	3-92
RS-232 Options		
Baud Rate	9600	3-93
Parity	None	3-95
Check Parity	Enable	3-97
Hardware Handshaking	None	3-98
Software Handshaking	None	3-101
Stop Bit Select	1	3-103
Intercharacter Delay	0	3-103
Host Serial Response Time-out	2 sec	3-104
Host Serial RTS Line State	Low RTS	3-104
Beep on <BEL>	Disable	3-105
Data Transmission Format	8-bit	3-105
USB (M2007 only)		
Set USB Defaults	--	3-106
USB Device Type	IBM Hand-Held USB	3-107
Country Selection	North American, Standard	3-109

Table 3-1. Default Table (continued)

Parameter	Default	Page #
Keystroke Delay	No Delay (0 ms)	3-113
CAPS LOCK	Disable	3-114
Ignore Unknown Characters	Send Bar Codes with Unknown Characters	3-115
Macro PDF		
Macro PDF Transmit/Decode Mode	Buffer All Symbols/ Transmit Macro PDF when Complete	3-117
Transmit Each Symbol in Codeword Format	Disable	3-119
Transmit Unknown Codewords	Disable	3-120
Escape Character	None	3-121
ECI		
Delete Character Set ECIs	Enable	3-122
ECI Decoder	Enable	3-123
Transmit Macro PDF User-Selected Field		
Transmit File Name	Disable	3-124
Transmit Block Count	Disable	3-125
Transmit Time Stamp	Disable	3-125
Transmit Sender	Disable	3-126
Transmit Addressee	Disable	3-126
Transmit Checksum	Disable	3-127
Transmit File Size	Disable	3-127
Transmit Macro PDF Control Header	Disable	3-128

Table 3-1. Default Table (continued)

Parameter	Default	Page #
Last Block Marker	Disable	3-128
Flush Macro Buffer	N/A	3-129
Abort Macro PDF Entry	N/A	3-129

Set Default Parameter

Scanning this bar code returns all parameters to the values listed in Table 3-1 on page 3-2.

Set All Defaults

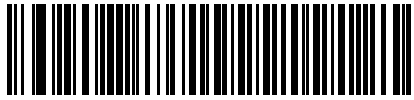
Host Type

If you're using a Synapse cable, your host is autodetected, so you don't have to scan a host bar code. If not, select an IBM 46XX or RS-232 host from the following bar code menus.

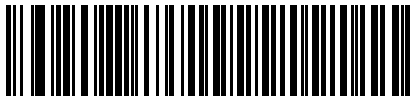
IBM 46XX Host Types

To select one of the following as a POS Interface, scan the appropriate bar code below.

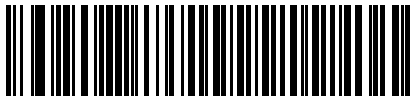
Note: *To properly communicate with 468X/9X terminals, the driver corresponding to the port being used must be loaded and enabled when you are configuring your terminal system. See your terminal's operating manual for details.*



Port 5B



Port 9B



Port 17/9E

RS-232C Host Types

Three RS-232C hosts are set up with their own parameter default settings (Table 3-2). Selecting the ICL, Fujitsu, or Nixdorf RS-232C terminal sets the defaults listed below. These defaults take precedence over standard defaults. So if you select Fujitsu RS-232C, then select the standard defaults, the Fujitsu defaults still apply.

Table 3-2. Terminal Specific RS-232C

Parameter	ICL	Fujitsu	Nixdorf Mode A/Mode B
Transmit Code ID	Yes	Yes	Yes
Data Transmission Format	Data/Suffix	Data/Suffix	Data/Suffix
Suffix	CR (1013)	CR (1013)	CR (1013)
Baud Rate	9600	9600	9600
Parity	Even	None	Odd
Hardware Handshaking	RTS/CTS Option 3	None	RTS/CTS Option 3
Software Handshaking	None	None	None
Serial Response Time-out	9.9 Sec.	2 Sec.	9.9 Sec.
Stop Bit Select	One	One	One
ASCII Format	8-Bit	8-Bit	8-Bit
Beep On <BEL>	Disabled	Disabled	Disabled
RTS Line State	High	Low	*Low = No data to send

*In the Nixdorf Mode B, if CTS is Low, scanning is disabled. When CTS is High, the user can scan bar codes.

RS-232C Host Types (continued)

Selecting the ICL, Fujitsu, or Nixdorf RS-232C terminal enables the transmission of Code ID characters as listed in Table 3-3. 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 terminals.

Note: *These Code IDs do not apply when Standard RS-232C is selected.*

Table 3-3. Terminal-Specific Code ID Characters

Code Type	ICL	Fujitsu	Nixdorf
UPC-A	A	A	A0
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
UCC/EAN 128	L <len>	None	P
Bookland EAN	F	F	A

RS-232C Host Types (continued)

To select an RS-232C host interface, scan one of the following bar codes.

Standard RS-232C

ICL RS-232C

OPOS

Nixdorf RS-232C Mode A

Nixdorf RS-232C Mode B

Fujitsu RS-232C

Scanning Options

Hand-Held Scan Pattern Mode

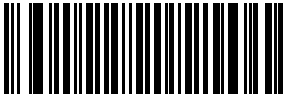
Select one of the following scan pattern options to use when the scanner is in hand-held use (see *Scanning Modes* on page 2-1 for descriptions):

Smart Raster

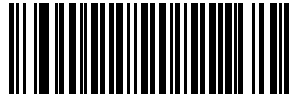
Always Raster

Programmable Raster

Slab Pattern



Omnidirectional Cyclone Pattern

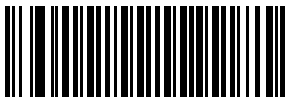


Semi-omni Pattern

Scan Pattern Mode Selector

Select whether the user can select the hand-held laser pattern via the Scan Pattern Mode Selector button.

Enable Mode Selector Button



Disable Mode Selector Button

Countertop Scan Pattern Mode

Select one of the following scan pattern options to remain on when the scanner is in countertop (hands-free) use (see *Scanning Modes* on page 2-1 for descriptions).

Smart Raster

Always Raster

Omnidirectional Cyclone Pattern

Semi-omni Pattern

Programmable Raster Height And Raster Expansion Speed

This parameter selects the laser pattern's height and rate of expansion, and is only used when Programmable Raster or Always Raster is enabled. This parameter is intended for very specific applications, and is usually not necessary.

Select the laser pattern's height and/or rate of expansion.

1. Scan the bar code for either **Raster Height** or **Raster Expansion Speed** below.
2. Scan two numeric bar codes beginning on page 3-130 that represent a two-digit value. Valid values are between 01 and 15.
3. If you make an error, or wish to change your selection, scan **Cancel**.

Raster Height (Default 15)

Raster Expansion Speed (Default 11)

Aiming Mode

For hand-held mode only, select either slab raster for aiming, or an aiming dot to appear for a normal or extended period of time.

Slab Raster
(No Aiming Dot)

Aiming Dot
Normal (200 ms) Timeout

Aiming Dot
Extended (400 ms) Timeout

Triggering Modes

Choose one of the options below to set the operation of the trigger.

- Level - A trigger pull activates the laser and decode processing. The laser remains on, and decode processing continues until a trigger release, a valid decode, or the Laser On Time-out is reached.
- Pulse - A trigger pull activates the laser and decode processing. The laser remains on and decode processing continues until a valid decode, or the Laser On Time-out is reached.
- Continuous - The laser is always on and decoding.

Level

Pulse

Continuous

Timeout Between Decodes

Timeout Between Decodes, Same Symbol

This option is used in continuous-on mode to prevent the beeper from continuously beeping when a symbol is left in the scanner's field of view. It is programmable in 0.1 second increments from 0.0 to 9.9 seconds. The recommended interval is 0.6 seconds.

Timeout Between Decodes, Different Symbol

Timeout Between Decodes, Different Symbols is used in continuous-on mode to prevent the beeper from beeping when a different symbol appears in the scanner's field of view before the timeout period between decodes expires. This is programmable in 0.1 second increments from 0.0 to 9.9 seconds. The recommended value is 0.0 seconds.

Select the timeouts between decodes for the same or different symbols.

1. Scan the option bar code you wish to set.
2. Scan two numeric bar codes beginning on page 3-130 which correspond to the desired interval, in 0.1 second increments.
3. If you make an error, or wish to change your selection, scan **Cancel**.

Timeout Between Decodes - Same Symbol

Timeout Between Decodes - Different Symbols

Laser On Time

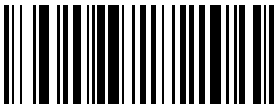
This parameter sets the maximum time decode processing continues during a scan attempt. It is programmable in 0.1 second increments from 0.5 to 9.9 seconds.

To set a Laser On Time, scan the bar code below. Next scan two numeric bar codes beginning on page 3-130 that correspond to the desired on time. Times less than 1.0 second must have a leading zero. For example, to set an on time 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 the *Cancel* bar code on page 3-132.

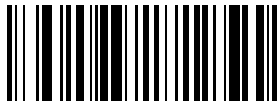
Laser On Time

Time Delay to Low Power Mode

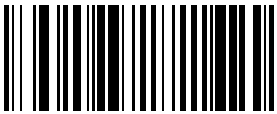
This parameter sets the time the scanner remains active after any scanning activity. Scan one of the four options. Depending on the selection, the scanner enters a low power mode 15, 30, 60 or 90 minutes after the last attempted decode. To awaken the scanner, present the bar code you wish to scan to the scan window.



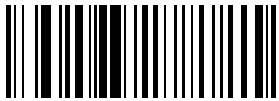
15 Minutes



30 Minutes



60 Minutes



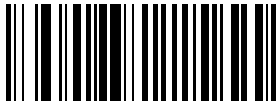
90 Minutes

Beep After Good Decode

Scan this symbol if you want the scanner to beep after a good decode.

Beep After Good Decode

Scan this symbol if you do not want the scanner to beep after a good decode. The beeper still operates during parameter menu scanning and indicates error conditions.



Do Not Beep After Good Decode

Beeper Volume

To select a decode beep volume, scan the **Low Volume, Medium Volume,** or **High Volume** bar code.

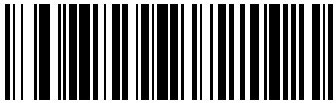
Low Volume

Medium Volume

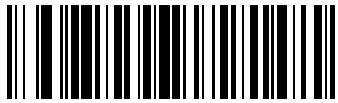
High Volume

Beeper Tone

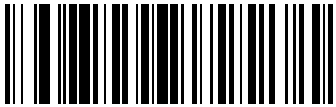
To select a decode beep frequency (tone), scan the appropriate bar code.



Low Frequency



Medium Frequency



High Frequency

Transmit "No Read" Message

When enabled, if a symbol does not decode, "NR" is transmitted. Any enabled prefix or suffixes are appended around this message.

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

Note: *Does not apply to Code 128.*

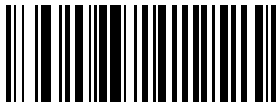
The M2000 offers four levels of decode security for linear code types (e.g., Code 39, Interleaved 2 of 5). Select a higher security level for poor quality bar codes. As security levels increase, the scanner's aggressiveness decreases.

Select the security level appropriate for your bar code quality.

Linear Security Level 1

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

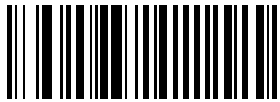
Code Type	Length
Codabar	All
MSI Plessey	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less



Linear Security Level 1

Linear Security Level 2

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

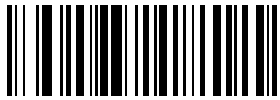


Linear Security Level 2

Linear 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:

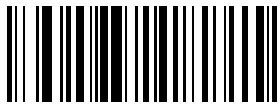
Code Type	Length
MSI Plessey	4 or less
D 2 of 5	8 or less
I 2 of 5	8 or less



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 only valid when a *Linear Code Type Security Level* is enabled (see page 3-25). When this parameter is enabled, a bar code must be successfully scanned in both directions (forward and reverse) before being decoded.

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.

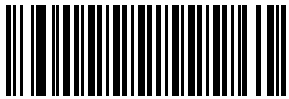
1 second

5 seconds

Composite CC-C

Scan a bar code below to enable or disable composite bar codes of type CC-C. If you select Enable, EAN-128 (the associated 1D symbology) must also be enabled.

Enable CC-C



Disable CC-C

Composite CC-A/B

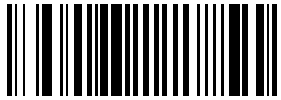
Scan a bar code below to enable or disable composite bar codes of type CC-A/B. To specify which CC-A/B composites are decoded, you may enable or disable the associated 1D symbology. For example, to allow all CC-A/B types, enable UPC-A, UPC-E, EAN-8, EAN-13, EAN-128, RSS-14, RSS-14 Limited and RSS-14 Expanded. Disabling any of these prevents that type of CC-A symbol from being decoded.

Enable CC-A/B

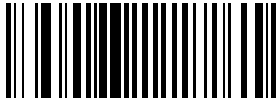
Disable CC-A/B

UPC/EAN

Enable/Disable UPC-A



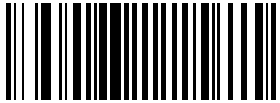
Enable UPC-A



Disable UPC-A

Enable/Disable UPC-E

Enable UPC-E



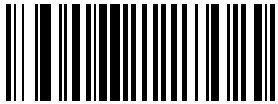
Disable UPC-E

Enable/Disable UPC-E1

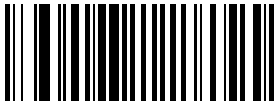
Enable UPC-E1

Disable UPC-E1

Enable/Disable EAN-8

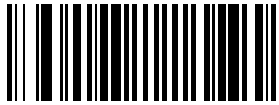


Enable EAN-8

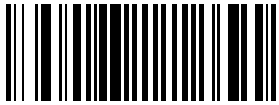


Disable EAN-8

Enable/Disable EAN-13



Enable EAN-13



Disable EAN-13

Enable/Disable Bookland EAN

Enable Bookland EAN

Disable Bookland EAN

UPC/EAN Coupon Code

When enabled, this parameter 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 must be selected.

Enable UPC/EAN Coupon Code

Disable UPC/EAN Coupon Code

Decode UPC/EAN Supplementals

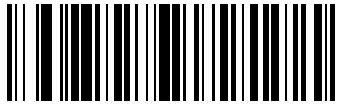
Supplementals are additionally appended characters (2 or 5) according to specific code format conventions (e.g., UPC A+2, UPC E+2, EAN 8+2). Three options are available.

- If UPC/EAN with supplemental characters is selected, UPC/EAN symbols without supplemental characters are not decoded.
- If UPC/EAN without supplemental characters is selected, and the M2000 is presented with a UPC/EAN plus supplemental symbol, the UPC/EAN is decoded and the supplemental characters ignored.
- An autodiscriminate option is also available. If this option is selected, scan *Decode UPC/EAN Supplemental Redundancy* on page 3-35, then select a value from the numeric bar codes beginning on page 3-130. A value of 5 or more is recommended.

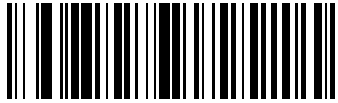
Note: *To minimize the risk of invalid data transmission, we recommend that you select whether to read or ignore supplemental characters.*

Select the desired option by scanning one of the bar codes on the following page.

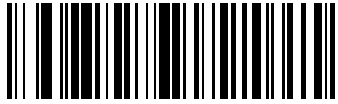
Decode UPC/EAN Supplementals (continued)



Decode UPC/EAN With Supplementals



Ignore UPC/EAN With Supplementals

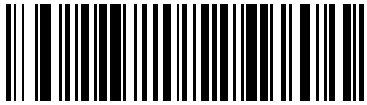


Autodiscriminate UPC/EAN Supplementals

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 2 to 20 times. Five or above is recommended when decoding a mix of UPC/EAN symbols with and without supplementals.

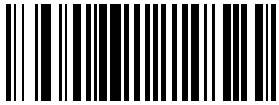
Scan the bar code below to select a decode redundancy value. Next scan two numeric bar codes beginning on page 3-130. Single digit numbers must have a leading zero. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.



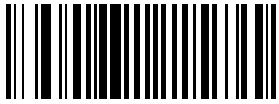
Decode UPC/EAN Supplemental Redundancy

Transmit UPC-A Check Digit

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



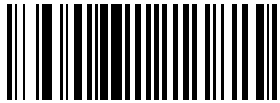
Transmit UPC-A Check Digit



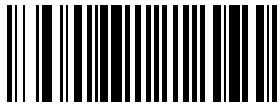
Do Not Transmit UPC-A Check Digit

Transmit UPC-E Check Digit

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



Transmit UPC-E Check Digit



Do Not Transmit UPC-E Check Digit

Transmit UPC-E1 Check Digit

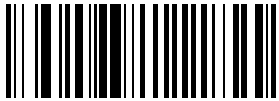
Scan the appropriate bar code below to transmit the symbol with or without the UPC-E1 check digit.

Transmit UPC-E1 Check Digit

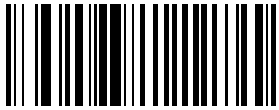
Do Not Transmit UPC-E1 Check Digit

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>)

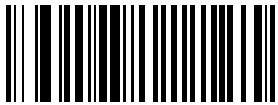


System Character
(<SYSTEM CHARACTER> <DATA>)

System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

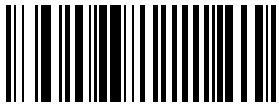
UPC-E Preamble

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>)

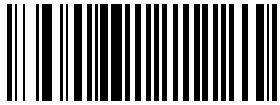
System Character
(<SYSTEM CHARACTER> <DATA>)

System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)

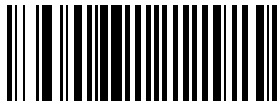
Convert UPC-E to UPC-A

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 (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-E1 TO UPC-A** allows you to transmit UPC-E1 (zero suppressed) decoded data.

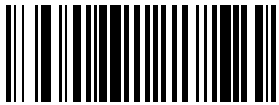
Convert UPC-E1 To UPC-A (Enable)

Do Not Convert UPC-E1 To UPC-A (Disable)

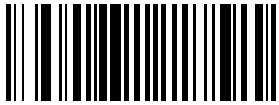
EAN Zero Extend

When 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

EAN Zero Extend 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. This affects *Transmit Code ID Character* and *DECODE_DATA* message.

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

Type Is EAN-8

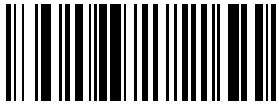
Type Is EAN-13

UPC/EAN Security Level

The M2000 offers four levels of decode security for UPC/EAN bar codes. Select a higher level of security for poor quality bar codes. 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

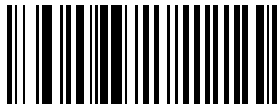
UPC/EAN Security Level 1

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

UPC/EAN Security Level 1

UPC/EAN Security Level 2

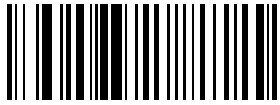
If you are experiencing misdecodes of poorly printed bar codes, and the misdecodes are not limited to characters 1, 2, 7, and 8, select this security level.



UPC/EAN Security Level 2

UPC/EAN Security Level 3

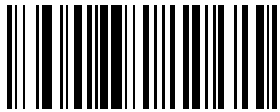
If you have tried Security Level 2, and are still experiencing misdecodes, select this security level. Be advised, selecting this option is an extreme measure against misdecoding severely out of spec bar codes. Selection of this level of security significantly impairs the decoding ability of the scanner.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



UPC/EAN Security Level 3

Linear UPC/EAN Decode

This option applies to code types containing two adjacent blocks (e.g., UPC-A, EAN-8, EAN-13). When enabled, a bar code is transmitted only when both the left and right blocks are successfully decoded within one laser scan. Enable this option when bar codes are in proximity to each other.

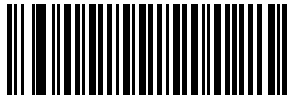


Enable Linear UPC/EAN Decode

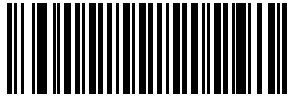
Disable Linear UPC/EAN Decode

UPC Half Block Stitching

This parameter enables UPC Half Block Stitching for the M2000 omnidirectional scanner only.



Enable UPC Half Block Stitching



Disable UPC Half Block Stitching

Linked 1D Send Mode

1D symbols can be "linked" with a 2D symbol during transmission as if they were one symbol. Select Enable to allow composite linked linear bar codes to be transmitted if the 2D portion is not found. If you select Disable, linked linear bar codes are not transmitted unless the 2D portion is found.

Enable Linked 1D Send

Disable Linked 1D Send

UPC Composite Mode

UPC symbols can be "linked" with a 2D symbol during transmission as if they were one symbol. Three options are offered for these symbols:

- If **UPC Never Linked** is selected, UPC bar codes are transmitted regardless of whether a 2D symbol is detected.
- If **UPC Always Linked** is selected, UPC bar codes are only transmitted when the 2D portion is detected.
- If **Autodiscriminate UPC Composites** is selected, the scanner determines if there is a 2D portion, then transmits the UPC portion only.

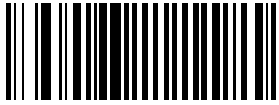
UPC Never Linked

UPC Always Linked

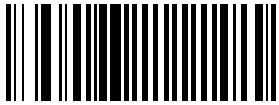
Autodiscriminate UPC Composites

Code 128

Enable/Disable Code 128

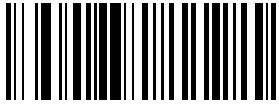


Enable Code 128

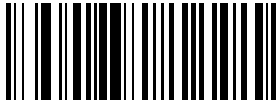


Disable Code 128

Enable/Disable UCC/EAN-128



Enable UCC/EAN-128



Disable UCC/EAN-128

Enable/Disable ISBT 128

Enable ISBT 128

Disable ISBT 128

Lengths for Code 128

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

Code 128 Decode Performance

This option offers three levels of decode performance or "aggressiveness" for Code 128 symbols. Increasing the performance level reduces the amount of required bar code orientation, which is useful if you are scanning very long and/or truncated bar codes. Increased levels reduce decode security.

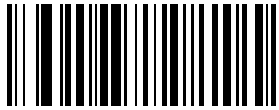
If you enable this option, you may select a Decode Performance level from the next page to suit your performance needs.

Enable Code 128 Decode Performance

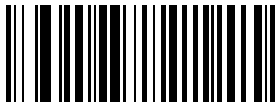
Disable Code 128 Decode Performance

Code 128 Decode Performance Level

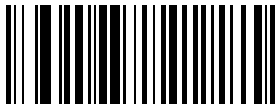
Select a level of decode performance.



Code 128 Decode Performance Level 1



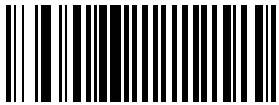
Code 128 Decode Performance Level 2



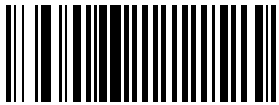
Code 128 Decode Performance Level 3

Code 39

Enable/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 should not be enabled simultaneously.

Enable Trioptic Code 39

Disable Trioptic Code 39

Convert Code 39 to Code 32

Scan a symbol below to select whether or not to convert 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

Enable this parameter to add the prefix character “A” to all Code 32 bar codes. *Convert Code 39 to Code 32* must be enabled for this parameter to function.

Enable Code 32 Prefix

Disable Code 32 Prefix

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. See Table A-3 on page A-6 for ASCII equivalents.

- **One Discrete Length** - Only codes containing a selected length are decoded. For example, if you select **Code 39 One Discrete Length**, then scan **1**, **4**, only Code 39 symbols containing 14 characters are decoded.
- **Two Discrete Lengths** - Only codes containing two selected lengths are decoded. 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.
- **Length Within Range** - A code type within a specified range is decoded. 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).
- **Any Length** - Code 39 symbols containing any number of characters can be decoded.

Numeric bar codes begin on page 3-130. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Set Lengths for Code 39 (continued)

Code 39 - One Discrete Length

Code 39 - Two Discrete Lengths

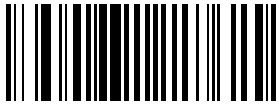
Code 39 - Length Within Range

Code 39 - Any Length

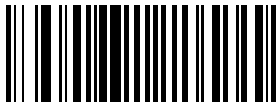
Code 39 Check Digit Verification

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 a symbol below to select whether 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

To enable or disable Code 39 Full ASCII, scan the appropriate bar code below.

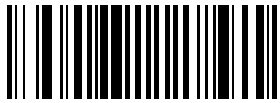
When enabled, the ASCII character set assigns a code to letters, punctuation marks, numerals, and most control keystrokes on the keyboard.

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.

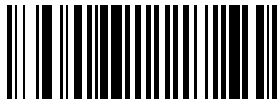
Code 39 Full ASCII interprets the bar code special character ($ + % /) preceding a Code 39 character and assigns an ASCII character value to the pair. For example, when Code 39 Full ASCII is enabled and a **+B** is scanned, it is interpreted as **b**, **%J** as **?**, and **$H** emulates the keystroke **BACKSPACE**. Scanning **ABC$M** outputs the keystroke equivalent of **ABC ENTER**. Refer to the Table A-3 on page A-6.

Code 39 Full ASCII and Trioptic Code 39 should not be enabled simultaneously.

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



Enable Code 39 Full ASCII



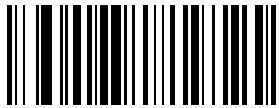
Disable Code 39 Full ASCII

Code 39 Decode Performance

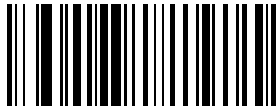
Note: *This option only applies when Code 39 One Discrete Length is selected.*

This option offers three levels of decode performance or "aggressiveness" for Code 39 symbols. Increasing the performance level reduces the amount of required bar code orientation, which is useful if you are scanning very long and/or truncated bar codes. Increased levels reduce decode security.

If you enable this option, you may select a Decode Performance level from the next page to suit your performance needs.



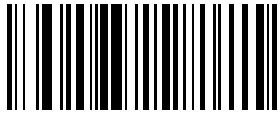
Enable Code 39 Decode Performance



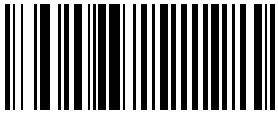
Disable Code 39 Decode Performance

Code 39 Decode Performance Level

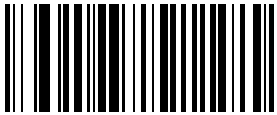
Select a level of decode performance.



Code 39 Decode Performance Level 1



Code 39 Decode Performance Level 2



Code 39 Decode Performance Level 3

Code 93

Enable/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. See Table A-3 on page A-6 for ASCII equivalents.

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

Numeric bar codes begin on page 3-130. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Set Lengths for Code 93 (continued)

Code 93 - One Discrete Length

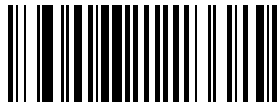
Code 93 - Two Discrete Lengths

Code 93 - Length Within Range

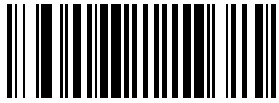
Code 93 - Any Length

Interleaved 2 of 5

Enable/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. See Table A-3 on page A-6 for ASCII equivalents.

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

Numeric bar codes begin on page 3-130. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Set Lengths for Interleaved 2 of 5 (continued)

I 2 of 5 - One Discrete Length

I 2 of 5 - Two Discrete Lengths

I 2 of 5 - Length Within Range

Note: *Selecting this option may lead to misdecodes.*

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 a symbol 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. To accomplish this, the I 2 of 5 code must be enabled, lengths must be set to decode 14-character symbols, 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)

Discrete 2 of 5

Enable/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. See Table A-3 on page A-6 for ASCII equivalents.

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

Numeric bar codes begin on page 3-130. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Set Lengths for Discrete 2 of 5 (continued)

D 2 of 5 - One Discrete Length

D 2 of 5 - Two Discrete Lengths

D 2 of 5 - Length Within Range

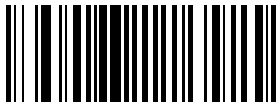
Note: *Selecting this option may lead to misdecodes.*

D 2 of 5 - Any Length

Codabar

Enable/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. See Table A-3 on page A-6 for ASCII equivalents.

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

Numeric bar codes begin on page 3-130. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Set Lengths for Codabar (continued)

Codabar - One Discrete Length

Codabar - Two Discrete Lengths

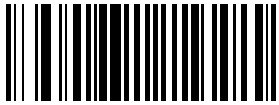
Codabar - Length Within Range

Codabar - Any Length

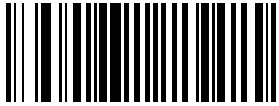
CLSI Editing

When 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.*



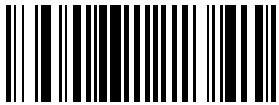
Enable CLSI Editing



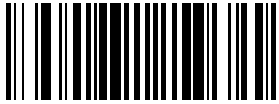
Disable CLSI Editing

NOTIS Editing

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



Enable NOTIS Editing



Disable NOTIS Editing

MSI Plessey

Enable/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. See Table A-3 on page A-6 for ASCII equivalents.

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

Numeric bar codes begin on page 3-130. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Set Lengths for MSI Plessey

MSI Plessey - One Discrete Length

MSI Plessey - Two Discrete Lengths

MSI Plessey - Length Within Range

Note: *Selecting this option may lead to misdecodes.*

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.

If two check digits is selected, an *MSI Plessey Check Digit Algorithm* must also be selected. See page 3-81.

One MSI Plessey Check Digit

Two MSI Plessey Check Digit

Transmit MSI Plessey Check Digit

Scan a symbol 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

PDF417/MicroPDF417

Enable/Disable PDF417

Enable PDF417

Disable PDF417

Enable/Disable MicroPDF417

Enable MicroPDF417

Disable MicroPDF417

MicroPDF Performance

If your scanner is having trouble decoding MicroPDF symbols, select Selective Performance. Note that this may decrease decoding aggressiveness on some symbols.

Standard Performance for MicroPDF

Selective Performance for MicroPDF

Code 128 Emulation

When this parameter is enabled, the scanner transmits data from certain MicroPDF417 symbols as if it was encoded in Code 128 symbols. Transmit AIM Symbology Identifiers must be enabled for this parameter to work.

If Code 128 Emulation is enabled, these MicroPDF417 symbols are transmitted with one of the following prefixes:

]C1 if the first codeword is 903-907, 912, 914, 915

]C2 if the first codeword is 908 or 909

]C0 if the first codeword is 910 or 911

If disabled, they are transmitted with one of the following prefixes:

]L3 if the first codeword is 903-907, 912, 914, 915

]L4 if the first codeword is 908 or 909

]L5 if the first codeword is 910 or 911

Scan a bar code below to enable or disable Code 128 Emulation.

Enable Code 128 Emulation

Disable Code 128 Emulation

RSS Codes

RSS-14

Enable RSS-14

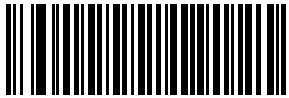
Disable RSS-14

RSS-Limited

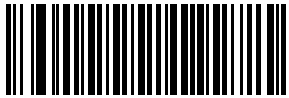
Enable RSS-Limited

Disable RSS-Limited

RSS-Expanded



Enable RSS-Expanded



Disable RSS-Expanded

Data Options

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. If a prefix is selected, the code ID character is sent after the prefix and before the decoded symbol.

You may select no code ID character, a Symbol code ID character, or an AIM ID character. Symbol code ID characters are listed below. AIM ID characters are listed in *AIM Code Identifiers* on page A-1.

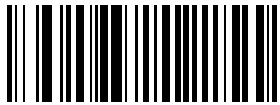
Table 3-4. Symbol Code ID Characters

Code Type	Symbol Identifier
UPC-A, UPC-E, UPC-E1, EAN-13, EAN-8	A
Code 39, Code 32	B
Codabar	C
Code 128, ISBT 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
Coupon Code	N
RSS Family Codes	R
PDF417, MicroPDF	X

Transmit Code ID Character (continued)

Symbol Code ID Character

AIM Code ID Character



None

Prefix/Suffix Values

A prefix and/or one or two suffixes may be appended to scan data for use in data editing. These values are set by scanning a four digit number (i.e., four bar codes) that corresponds to key codes for various terminals. See the Table A-3 on page A-6 for ASCII values.

Note: *If a keyboard interface is being used, refer to the Synapse "Smart Cable" Interface Guide for keystroke values to be used as prefix/suffix values.*

To set a PREFIX/SUFFIX value:

1. Scan the option bar code you wish to set.
2. Scan four *Numeric Bar Codes* beginning on page 3-130 which correspond to the ASCII value or keystroke value you wish to assign. The ENTER key is the default for all options.
3. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Scan Suffix (Value 1)

Scan Prefix (Value 2)

Note: *In order to use Prefix/Suffix values, the Scan Data Transmission Format must be set. See page 3-90.*

Scan Data Transmission Format

You may select one of the following options for scan data formats:

Standard: <data>
Option 1: <data> <SUFFIX>
Option 2: <PREFIX> <data> <SUFFIX>
Option 3: <PREFIX> <data>

<data> = scanned bar code data

<PREFIX> and <SUFFIX> as selected by the user.

To select a data transmission format:

1. Scan the **Scan Options** bar code.
2. Scan the bar code corresponding to the desired converted data format.
3. Scan **Enter**.
4. If you make a mistake, scan **Cancel** on the next page.

Note: *RS-232C hosts treat the extended keypad default suffix (7013) as ASCII data.*

Scan Options

Data As Is

<DATA> <SUFFIX>

Scan Data Transmission Format (continued)

<PREFIX> <DATA> <SUFFIX>

<PREFIX> <DATA>

Enter

Cancel

Decode Buffering

This option permits the scanner to store decoded data until the host device is ready to receive them. If the scanner reaches its capacity to store decoded symbols before the host is ready, subsequent trigger pulls have no effect until space is available.

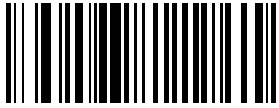
Enable Decode Buffering

Disable Decode Buffering

RS-232 Options

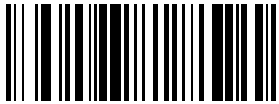
Baud Rate

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.

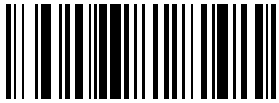


Baud Rate 300

Baud Rate 600

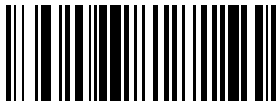


Baud Rate 1200

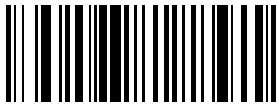


Baud Rate 2400

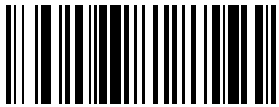
Baud Rate (continued)



Baud Rate 4800



Baud Rate 9600



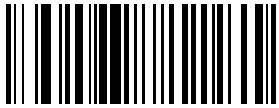
Baud Rate 19,200

Baud Rate 38,400

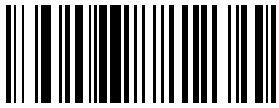
Parity

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

- **Odd** parity - the parity bit has a value 0 or 1, based on data, to ensure that an odd number of 1 bits is contained in the coded character.
- **Even** parity - the parity bit has a value 0 or 1, based on data, to ensure that an even number of 1 bits is contained in the coded character.
- **Mark** parity - the parity bit is always 1.
- **Space** parity - the parity bit is always 0.
- **None** - no parity is required.

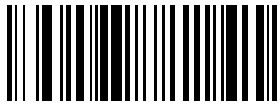


Odd

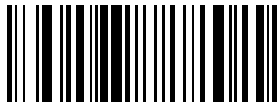


Even

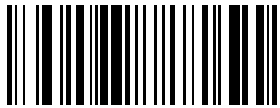
Parity (continued)



Mark



Space



None

Check Parity

Select whether or not the parity of received characters is checked. The type of parity used is selectable through the *Parity* parameter.

Check Parity

Do Not Check Parity

Hardware Handshaking

The host exchanges data with the scanner via a serial port, either with or without the hardware handshaking lines, *Request to Send (*RTS*)*, and *Clear to Send (*CTS*)*.

Standard RTS/CTS

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

- The CTS line must initially be deasserted by the host. If the scanner detects that CTS is asserted (indicating that the host may still be receiving a previous transmission), the scanner waits up to 2 seconds for the host to deassert the CTS line. If, after 2 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 deasserted, the scanner asserts the RTS line and waits up to 2 seconds for the host to assert CTS. When the host asserts CTS, the scanner transmits the data. If, after 2 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 deasserts RTS 10 msec after sending the last character.
- The host responds by deasserting CTS. The scanner checks for a deasserted CTS upon the next transmission of data.

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

Note: *The **DTR** signal is jumpered active.*

Other RTS/CTS Options

The following options offer alternatives to Standard RTS/CTS Handshaking.

- **RTS/CTS Option 1**: The scanner asserts RTS before transmitting and ignores the state of CTS. The scanner deasserts RTS when the transmission is complete.
- **RTS/CTS Option 2**: 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, the scanner issues an error beep and discards the data.
- **RTS/CTS Option 3**: The scanner asserts RTS before transmitting, regardless of the state of CTS. The scanner waits up to two seconds for CTS to be asserted. If CTS is not asserted during this time, the scanner issues an error beep and discards the data. The scanner deasserts RTS when transmission is complete.
- **RTS/CTS PC**: Standard RTS/CTS hardware handshaking used by the PC. The host can deassert CTS to prevent the scanner from transmitting, and the scanner can deassert RTS to prevent the host from transmitting.

Hardware Handshaking (continued)

***None**

Standard RTS/CTS

RTS/CTS Option 1

RTS/CTS Option 2

RTS/CTS Option 3

RTS/CTS PC

Software Handshaking

This parameter offers control of the data transmission process. It may be used instead of, but not in conjunction with, hardware handshaking. **ACK/NAK** handshaking may be combined with **ENQ** handshaking.

- **No Software Handshaking:** Data is transmitted immediately.
- **ACK/NAK Only:** When this option is selected, after transmitting data, the scanner expects either an ACK or NAK response from the host. When a NAK is received, the scanner 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 scanner issues an error indication and discards the data.
- **ENQ Only**: When this option is selected, the scanner waits for an ENQ character from the host before transmitting data. If an ENQ is not received within 2 seconds, the scanner issues an error indication and discards the data. The host must transmit an ENQ character at least every 2 seconds to prevent transmission errors.
- **ACK/NAK with ENQ**: This combines the two previous handshaking options.
- **XON/XOFF**: An XOFF character turns the scanner transmission off until the scanner receives an XON 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 2 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.

Select the type of RS-232C software handshaking protocol.

Software Handshaking (Continued)

None

ACK/NAK

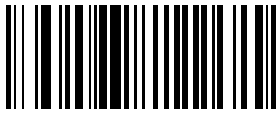
ACK/NAK with ENQ

ENQ Only

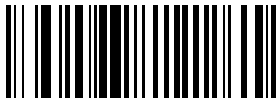
XON/XOFF

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 selected (one or two) 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

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 msec in 1 msec increments. After scanning the bar code below, scan two bar codes beginning on page 3-130 to set the desired time-out. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Intercharacter Delay

Host Serial Response Time-out

This parameter specifies how long the scanner waits for an ACK or NAK before resending. Also, if the scanner wants to send, and the host has already been granted permission to send, the scanner waits for the designated time-out before declaring an error.

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 3-130. Time durations of less than 1.0 second require a leading zero. If you make an error, or wish to change your selection, scan the *Cancel* bar code on page 3-132.

Host Serial Response Time-out

Host Serial RTS Line State

This parameter sets the default host serial RTS line state to either high or low.

Host: Low RTS

Host: High RTS

Beep On <BEL>

When this parameter is enabled, the scanner issues a beep when a <BEL> character is detected on the serial data line. <BEL> alerts the user that an illegal entry or other important event has occurred.

Select whether to enable or disable this parameter.

Beep On <BEL> Character

Do Not Beep On <BEL> Character

Data Transmission - 7 or 8-Bit ASCII Data Format

This parameter determines whether data transmissions occur in the 7-bit or 8-bit ASCII format. Select this parameter according to the requirement of the receiving device. The default value is 8-bit ASCII.Select either 7-bit or 8-bit ASCII format for RS-232C communications.

7-Bit

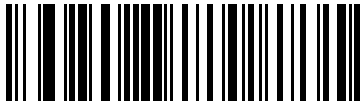
8-Bit

USB Parameters (M2007)

The following USB parameters apply to the M2007 (with or without Synapse) only.

Set USB Defaults

Scan the bar code below to set USB defaults for the parameters on the following pages.



Set USB Defaults

USB Device Type

The M2007 attaches to a USB host or hub and supports the USB device options below, depending on the host type and desired mode of operation.

The mode of operation can be dynamically changed. However, the scanner resets and re-enumerates each time a new mode is selected. The re-enumeration process can take a few seconds to complete, during which the scanner turns off, disconnects, and reconnects to the host.

HID Keyboard Emulation

In this mode, the scanned data is presented to the system as if coming from a USB HID (Human Interface Device) keyboard. Most operating systems have native support for this device, so no additional driver installation is required.

IBM SurePOS Hand-Held Bar Code Reader

This mode is supported by an IBM hand-held bar code reader driver on IBM SurePOS terminals.

IBM SurePOS Tabletop Bar Code Reader

This mode is supported by an IBM tabletop bar code reader driver on IBM SurePOS terminals.

Symbol Native Bar Code Reader

This mode is supported by a Symbol bar code reader driver and provides maximal flexibility and control over the scanner. The software will prompt you to select or install the driver. Follow the instructions on the screen.

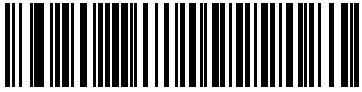
Symbol COM Port Emulation

In this mode, scanned data is presented to the host as if it originated in a COM port. A Symbol driver is required to support this mode, but it provides compatibility for an application which supports a bar code reader attached to a COM port. The software will prompt you to select or install the driver. Follow the instructions on the screen.

Select the desired type of USB device. The default is IBM Hand-Held USB.

Note: *When changing USB Device Types, the M2007 turns off briefly and re-enumerates to properly communicate with the host.*

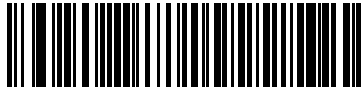
Default USB Type



IBM Hand-Held USB (Default)

IBM Table Top USB

HID Keyboard Emulation



Symbol Native USB

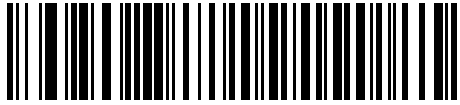
Symbol COM Port Emulation

Country Selection

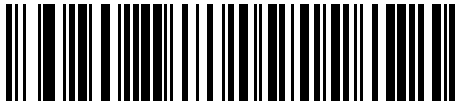
This setting applies only to the HID Keyboard Emulation device. The MacOS and Windows implement international keyboards differently. Select the desired country according to the USB host device. If your host platform does not appear here, select the Windows settings.

Note: *When changing the Country Selection, the M2007 turns off briefly and re-enumerates to properly communicate with the host.*

North American, Standard USB Keyboard

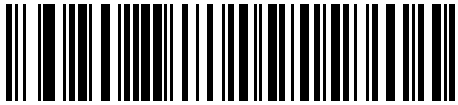


French, Windows



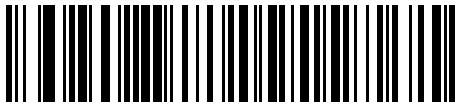
German, Windows

German, MacOS



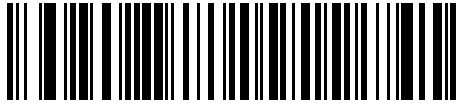
French Canadian, Windows

French Canadian, MacOS



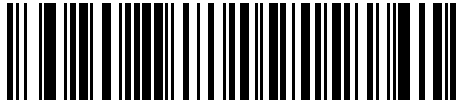
Spanish (Traditional), Windows

Spanish ISO, MacOS



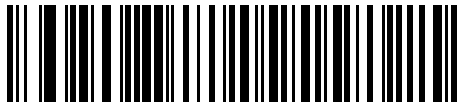
Italian, Windows

Italian, MacOS

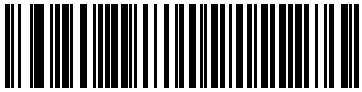


Swedish, Windows

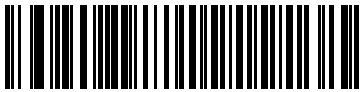
Swedish, MacOS



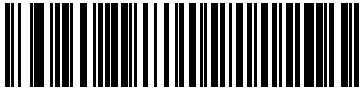
UK English, Windows



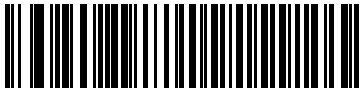
UK English, MacOS



French, MacOS



Japanese, Windows



Japanese, MacOS

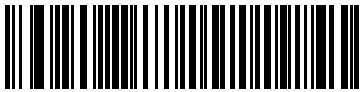
Keyboard Emulation

Keystroke Delay

This option applies only to the HID Keyboard Emulation device. Select the desired delay between transmitted keystrokes. Only change this setting for slower host PCs that cannot accommodate the speed of data transmitted.

No Delay (0 ms)

Medium Delay (20 ms)



Long Delay (40 ms)

Keyboard Emulation - CAPS LOCK

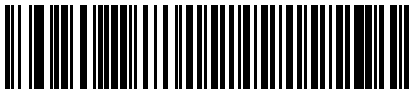
This option applies only to the HID Keyboard Emulation device. By default, if a bar code is scanned, Caps Lock Override is disabled and the case of the bar code data is not preserved. For example, if the CAPS LOCK is off and an uppercase character is transmitted, the host reads this as a lowercase character. By selecting "Enable Caps Lock Override", the caps lock is turned off during transmission to preserve the case of the bar code data, then restored after transmission.

Disable Caps Lock Override

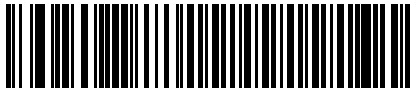
Enable Caps Lock Override

Keyboard Emulation and IBM - Ignore Unknown Characters

This option applies only to the HID Keyboard Emulation device and IBM device. Unknown characters are characters the host does not recognize. When "Send Bar Codes With Unknown Characters" is selected, all bar code data is sent except for unknown characters, and no error beeps sound. When "Do Not Send Bar Codes With Unknown Characters" is selected, bar codes containing at least one unknown character are not sent to the host, and an error beep sounds.



Send Bar Codes With Unknown Characters



Do Not Send Bar Codes With Unknown Characters

Macro PDF Features

This section discusses programmable Macro PDF features fully supported by the M2000. Macro PDF is a special feature for concatenating multiple PDF symbols into one file. The M2000 can decode symbols that are encoded with this feature, however, the 64K version cannot buffer large sets of macro PDF symbols.

Caution

When printing, keep each Macro PDF sequence separate, as each sequence has unique identifiers. Do not mix bar codes from several Macro PDF sequences, even if they encode the same data. When scanning Macro PDF sequences, scan the entire sequence without interruption. If you scan a mixed sequence, you get two long low beeps for inconsistent file ID or inconsistent symbology error.

Program the required generic decode and data transmission parameters using the bar codes on the following pages. Use the same programming method for setting Macro PDF features as used for standard features.

Note that all parameter settings are stored in non-volatile memory and so are retained after powerdown.

Macro PDF Transmit / Decode Mode Symbols

Select only one of the four options below for handling the decoding of Macro PDF. The scanner can handle up to 64K bytes of decoded data, including any optional field information, except in the mode Transmit Each Macro PDF Symbol Decoded in Sequential Order, where there is no limit to the size of the Macro PDF set.

- Buffer All Symbols / Transmit Macro PDF When Complete activates transmission of all decode data from an entire Macro PDF sequence. Transmission does not occur until the entire Macro PDF sequence is scanned and decoded. This is the default option.

  If the decode data exceeds the limit of 64 symbols or 64K bytes, there is no transmission because the entire sequence has not been scanned. Use the parameter Flush Macro PDF Buffer to purge the buffer.
- Transmit Any Symbol in Set / No Particular Order causes transmission of data from up to 1024 Macro symbols as decoded, whether it is in sequential order or not.
- Scan in Sequence Only / Transmit in Sequence Without Buffering causes transmission of data from up to 1024 symbols within the Macro PDF sequence as decoded, provided the Macro PDF symbols are scanned in order. If you do not scan the symbols in order, an error occurs.
- When Buffer Scans Out of Order / Transmit Scans in Order is enabled, decode data from each symbol within the Macro PDF sequence is transmitted when decoded, provided that the Macro PDF symbols are scanned in order. Decode data from symbols out of order in the Macro PDF sequence is buffered. The scanner can buffer up to 64 symbols or 64K bytes.

Macro PDF Transmit / Decode Mode Symbols (Continued)

Buffer All Symbols /
Transmit When Complete

Transmit Any Symbol In Set /
No Particular Order

Scan In Sequence Only /
Transmit In Sequence Without Buffering

Buffer Scans Out Of Order/
Transmit Scans In Order

Transmit Symbols in Codeword Format

Enabling this activates transmission of each PDF symbol as directly decoded data codewords, whether that symbol is part of a macro PDF sequence or not. Note that data is output as codeword values — not as interpreted data.

"Codeword values" is an ASCII representation of a number from 000 to 928 for each codeword, preceded by an escape character. This escape character is a backslash by default, but the user may change this value. For example, the codeword value 005 is sent to the host in the form of \005 for GLIs, and \C005C for ECIs. This output format is based on the AIM USA Uniform Symbology Specification for PDF417 (1994).

All output codewords take up exactly 4 characters for GLIs and 6 characters for ECIs. However, there may be nondecodable characters in the PDF symbol, such as a GLI sequence. This special codeword sequence activates a certain kind of interpretation to the encoded data. Non-decodable codewords like GLIs are embedded in the output stream just like any other codeword, e.g., \927\001.

Because GLIs are indistinguishable from other codewords in the output data stream, the host must intelligently recognize them as GLIs and process their interpretations.

Note that when a macro PDF sequence is transmitted, the last character in the last block of data transmitted is always \922 (if selected). This indicates the end of that macro PDF transmission.

Enable Transmit In Codeword Format

Disable Transmit In Codeword Format

Transmit Unknown Codewords

This enables using the output codeword format for transmitting any non-GLI or non-macro PDF codeword. If this is not enabled and an unknown codeword is found, a decode error beep sounds.

Transmit Unknown Codewords

Do Not Transmit Unknown Codewords

Escape Characters

This enables the backslash (\) character as an Escape character for systems that can process transmissions containing special data sequences. Scan a bar code below to either format special data (e.g., GLI escapes, MacroPDF417 Control Block optional fields) according to the GLI (Global Label Identifier) protocol or the ECI (Extended Channel Interpretation) protocol, or to disable this parameter.

ECI Protocol

GLI Protocol

None

Delete Character Set ECIs

This parameter enables the scanner to delete any escape sequences representing Character Set ECIs (also known as GLIs) from its buffer before transmission. In many receiving systems, Character Set ECIs can be removed without affecting the way data is displayed or processed.

When deletion is selected, the scanner transmits data from PDF417 and MicroPDF417 bar codes containing Character Set ECIs, even when the ECI Protocol is disabled.

Scan a bar code to delete or transmit character set ECIs.

Delete Character Set ECIs

Transmit Character Set ECIs

ECI Decoder

This parameter enables the scanner to interpret any Extended Channel Interpretations (ECIs) that are supported by the scanner firmware. This parameter has no effect on symbols that were not encoded using ECIs. This version of the product supports ECIs 000900 through 000913, used for efficient encoding of Common Data Syntax Format 00-99. If this parameter is disabled, and a symbol is scanned that was encoded using an ECI escape, the scanner transmits the ECI escape followed by the uninterpreted data.

Scan a bar code to enable or disable this option.

Enable ECI Decoder

Disable ECI Decoder

Transmit Macro PDF User-Selected Fields

When enabled, the following parameters cause transmission of the specified field in subsequently scanned Macro PDF417 symbols. Unless transmission of a specific field is enabled, it is not transmitted. The options cannot be changed in the middle of a Macro PDF set entry. All user-selected fields are prefixed by \923 for GLIs, and \C923C for ECIs. Tags and examples in the following parameters demonstrate GLI protocol, but the ECI tag (\C923C) can be used instead if ECI protocol is enabled.

Transmit File Name

Transmit File Name activates transmission of the file name field. The field character tag is \923\000. For example, the filename MANHOURS.WK1 is sent as: \923\000MANHOURS.WK1.

Enable File Name Transmit

Disable File Name Transmit

Transmit Block Count

Transmit Block Count activates transmission of the block count field. The field character tag is \923\001. For example, the field may be: \923\0011856.

Enable Transmit Block Count

Disable Transmit Block Count

Transmit Time Stamp

Transmit Time Stamp activates transmission of the time stamp field. The field character tag is \923\002. For example, the field may be: \923\0022123443243234.

Enable Transmit Time Stamp

Disable Transmit Time Stamp

Transmit Sender

Transmit Sender activates transmission of the sender field. The field character tag is \923\003. For example, the field may be: \923\003Symbol TechnologiesHoltsville, NY.

Enable Sender Transmit

Disable Sender Transmit

Transmit Addressee

Transmit Addressee activates transmission of the addressee field. The field character tag is \923\004. For example, the field may be: \923\004AIM USA.

Enable Addressee Transmit

Disable Addressee Transmit

Transmit Checksum

Transmit Checksum activates transmission of the checksum field. The field character tag is \923\006. For example, the field may be: \923\00663823.

Enable Checksum Transmit

Disable Checksum Transmit

Transmit File Size

Transmit File Size activates transmission of the file size field. The field character tag is \923\005. For example, the field may be: \923\005179234.

Enable File Size Transmit

Disable File Size Transmit

Transmit Macro PDF Control Header

Transmit Macro PDF Control Header activates transmission of the control header, which contains the segment index and the file ID. For example, the field may be: \92800000\725\120\343. The five digits after the \928 are the segment index (or block index), and \725\120\343 is the file ID.

Enable Macro PDF Control Header Transmit

Disable Macro PDF Control Header Transmit

Last Blocker Marker

Enable / Disable Last Block Marker enables marking the last block in the set by the codeword \922.

Enable Last Block Marker

Disable Last Block Marker

Flush Macro Buffer

This flushes the buffer of all decoded Macro PDF data stored to that point, transmits it to the host device, and aborts from Macro PDF mode.

Flush Macro PDF Buffer

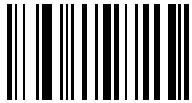
Abort Macro PDF Entry

This clears all currently-stored Macro PDF data in the buffer without transmission and aborts from Macro PDF mode.

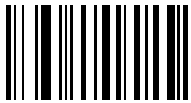
Abort Macro PDF Entry

Numeric Bar Codes

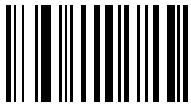
For parameters requiring specific numeric values, scan the appropriately numbered bar code(s).



0



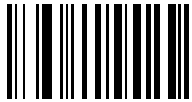
1



2

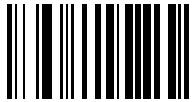
3

Numeric Bar Codes (continued)

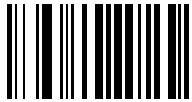


4

5

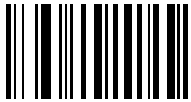


6

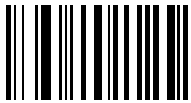


7

Numeric Bar Codes (continued)



8

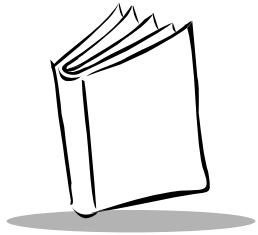


9

Cancel

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

Cancel



Chapter 4
Advanced Data Formatting (ADF)

Introduction

Advanced Data Formatting (ADF) is a means of customizing, or editing, the data scanned by the scanner before transmitting the data to your host device. Scanned data can be edited to suit your particular requirements.

ADF is implemented by scanning a related series of bar codes to create rules to apply to the scanned data. These bar codes appear later in this chapter.

Rules: Criteria Linked to Actions

In ADF, data is customized through **rules**. These rules perform specific actions when the data meets certain criteria. One rule may consist of single or multiple actions applied to single or multiple criteria.

For instance, a data formatting rule could be the following:

Criteria: *When scan data is Code 39, length 12,*
and data at the start position is the string "129",

Actions: *pad all sends with zeros to length 8,*
send all data up to X,
send a space.

In this example, if a Code 39 bar code of 1299X1559828 is scanned, the following is transmitted: 00001299<space>. If a Code 39 bar code of 1299X15598 is scanned, this rule is ignored because the length (10 characters) does not pass the criteria.

The rule specifies the editing conditions and requirements before data transmission occurs.

Using ADF Bar Codes

When you program a rule, make sure the rule is logically correct. Plan ahead before you start scanning.

To program each data formatting rule:

1. **Start the Rule.** Scan the **Begin New Rule bar code on page 4-11**.
2. **Criteria.** Scan the bar codes for all pertinent criteria. Criteria can include code type (e.g., Code 128), code length, or data that contains a specific character string (e.g., the digits "129"). These options are described in *Criteria on page 4-14*.
3. **Actions.** Scan all actions related to, or affecting, these criteria. The actions of a rule specify how to format the data for transmission. These options are described in *Actions on page 4-25*.
4. **Save the Rule.** Scan the **Save Rule bar code on page 4-11**. This places the rule in the "top" position in the rule buffer.

If you make errors during this process, some special-purpose bar codes may be useful: **Erase Criteria and Start Again**, **Erase Actions and Start Again**, **Erase Previously Saved Rule**, and **Erase All Rules**. See *Erase* on page 4-12.

Beeper Definitions for ADF on page 4-8 help guide you through the programming steps.

ADF Bar Code Menu Example

This section provides an example of how to enter an ADF rule to apply to scanned data.

An auto parts distribution center wants to encode manufacturer ID, part number, and destination code into their own Code 128 bar codes. The distribution center also has products that carry UPC bar codes, placed there by the manufacturer. The Code 128 bar codes have the following format:

MMMMMPPPPPDD

Where: M = Manufacturer ID

P = Part Number

D = Destination Code

The distribution center uses a PC with dedicated control characters for manufacturer ID <CTRL M>, part number <CTRL P>, and destination code <CTRL D>. At this center the UPC data is treated as manufacturer ID code.

The following rules need to be entered:

When scanning data of code type Code 128, send the next 5 characters, send the manufacturer ID key <CTRL M>, send the next 5 characters, send the part number key <CTRL P>, send the next 2 characters, send the destination code key <CTRL D>.

When scanning data of code type UPC/EAN, send all data, send the manufacturer ID key <CTRL M>.

To enter these rules, follow these steps:

Rule 1: The Code 128 Scanning Rule

Table 4-1. Code 128 Scanning Rule

Step	Bar Code	On Page	Beep Indication
1	Begin New Rule	4-11	High High
2	Code 128	4-14	High High
3	Send next 5 characters	4-26	High High
4	Send <CTRL M>	4-51	High High
5	Send next 5 characters	4-26	High High
6	Send <CTRL P>	4-51	High High
7	Send next 2 characters	4-25	High High
8	Send <CTRL D>	4-49	High High
9	Save Rule	4-11	High Low High Low

Rule 2: The UPC Scanning Rule

Table 4-2. UPC Scanning Rule

Step	Bar Code	On Page	Beep Indication
1	Begin New Rule	4-11	High High
2	UPC/EAN	4-15	High High
3	Send all remaining data	4-25	High High
4	Send <CTRL M>	4-51	High High
5	Save Rule	4-11	High Low High Low

If you made any mistakes while entering this rule, scan the **Quit Entering Rules** bar code on page 4-12. If you already saved the rule, scan the **Erase Previously Saved Rule** bar code on page 4-12.

Alternate Rule Sets

ADF rules may be grouped into one of five alternate sets that can be turned on and off when needed. This is useful when you want to format the same message in different ways. For example, a Code 128 bar code contains the following information:

Class (2 digits), Stock Number (8) digits, Price (5 digits)

This bar code might look like this:

245671243701500

where:

Class = 24

Stock Number = 56712437

Price = 01500

Ordinarily you would send this data as follows:

24 (class key)

56712437 (stock key)

01500 (enter key)

But, when there is a sale, you may want to send only the following:

24 (class key)

56712437 (stock key)

and the cashier keys the price manually.

To implement this, first enter an ADF rule that applies in the normal situation. This rule may look like this:

When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key, send the data that remains, send the Enter key.

The "sale" rule may look like this:

When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key.

To switch between the two sets of rules, a "switching rule" must be programmed. This rule specifies what type of bar code must be scanned to switch between the rule sets. For example,

in the case of the “sale” rule above, the rule programmer wants the cashier to scan the bar code “M” before a sale. To do this, a rule can be entered as follows:

When scanning a bar code of length 1 that begins with “M”, select rule set number 1.

Another rule could be programmed to switch back.

When scanning a bar code of length 1 that begins with “N”, turn off rule set number 1.

The switching back to normal rules can also be done in the “sale” rule. For example, the rule may look like this:

When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key, turn off rule set 1.

It is recommended that you scan the **Disable All Rule Sets** bar code after programming a rule belonging to an alternate rule set.

In addition to enabling and disabling rule sets within the rules, you can disable them by scanning the appropriate bar codes in *Disable Rule Set* on page 4-13.

Rules Hierarchy (in Bar Codes)

The order of programming individual rules is important. The most general rule should be programmed first.

All programmed rules are stored in a buffer. As they are programmed, they are stored at the “top” of a rules list. If three rules have been created, the list would be configured as follows:

Third Rule

Second Rule

First Rule

When data is scanned, the rules list is checked from top to bottom to determine if the criteria matches (and therefore, if the actions should occur). Input is modified into the data format specified by the first matching set of criteria it finds. Be sure that your most general rule is the first one programmed.

For example, if the THIRD rule states:

When scanning a bar code of any length, send all data, then send the ENTER key.

And the SECOND rule states:

When scanning a Code 128 bar code of length 12, send the first four characters, then send the ENTER key, then send all remaining data.

If a Code 128 bar code of length 12 were scanned, the THIRD rule would be in effect. The SECOND rule would appear to not function.

Note also that ADF rules are actually created when you use the standard data editing functions. Scan options are entered as ADF rules, and the hierarchy mentioned above also applies to them. For the M2000, this applies to prefix/suffix programming in the parameter *Scan Data Transmission Format*.

These rules reside in the same "rule list" as ADF Rules, so the order of their creation is also important.

Default Rules

Every unit has a default rule to send all scan data. Units with custom software may have one or more default rules burned in. The rules hierarchy checks user programmable rules first, then the default rules. Default rules can be disabled by entering the following general rule in the user programmable buffer:

When receiving scan data, send all data.

Since this rule always applies, ADF will never go into the default rules.

Beeper Definitions for ADF

The following table defines beep sequences that occur during rule entry.

Table 4-3. Beeper Definitions

Beeper Sequence	Indication
Normal Data Entry. Duration of tones are short.	
High-Low	Entry of a number is expected. Enter another digit. Add leading zeros to the front if necessary.
Low-Low	Entry of an alphabetic character is expected. Enter another character or scan the End of Message bar code.
High-High	Entry of Criterion/Action is expected. Enter another criterion or action, or scan the Save Rule bar code.
High-Low-High-Low	Rule saved. Rule entry mode exited.
High-Low-Low	All criteria or actions were cleared for rule currently being entered; continue entry of rule.
Low	Last saved rule was successfully deleted. The rule presently being entered is left intact.
Low-High-High	All rules are now deleted. The rule presently being entered is left intact. (This beep sequence has a different meaning outside of ADF.)
Error Indications. Duration of tones are very long.	
Low-High-Low-High	Out of rule memory. Erase some existing rules, then try to save rule again. (The current rule need not be re-entered.)
Low-High-Low	Cancel rule entry. Rule entry mode exited because of an error or the user asked to exit rule entry.
Low-High	Entry error, wrong bar code scanned. Re-enter criterion or action. All previously entered criteria and actions are retained. Criteria or action list is too long for a rule.

ADF Bar Codes

The following table helps you locate the bar codes you need to create an ADF rule.

Table 4-4. ADF Bar Codes

Bar Code	Description	Page
Special Commands		
Begin New Rule	Starts data formatting rule.	4-11
Save Rule	Completes and saves rule.	4-11
Erase	Erases criteria, actions, or rules.	4-12
Quit Entering Rules	Quits entering rules.	4-12
Disable Rule Set	Disables rule sets.	4-13
Criteria		
Code Types	Selects code types to be affected by rule.	4-14
Code Lengths	Defines the number of characters each code type must contain.	4-17
Message Containing A Specific Data String	Select whether formatting affects data that begins with or contains a specific character or data string.	4-22
Numeric Keypad	Used for specifying a data string.	4-23
Rule Belongs To Set	Selects which set a rule belongs to.	4-24
Actions		
Send Data	Sends all data that remains, sends all data up to a specific character, or sends N characters.	4-25
Send Pause	Inserts a pause.	4-29
Setup Field(s)	Moves the cursor in relation to a specified character.	4-29
Send Preset Value	Sends prefix and suffix values.	4-36

Table 4-4. ADF Bar Codes

Bar Code	Description	Page
Modify Data	Modifies data as follows:	4-36
♦ Remove All Spaces	♦ Removes all spaces in the send commands.	4-36
♦ Crunch All Spaces	♦ Leaves one space between words.	4-36
♦ Stop Space Removal	♦ Stops space removal.	4-37
♦ Remove Leading Zeros	♦ Removes all leading zeros.	4-37
♦ Stop Zero Removal	♦ Stops removal of zeros.	4-37
♦ Pad Data With Spaces	♦ Pads data to the left with spaces.	4-38
♦ Pad Data With Zeros	♦ Pads data to the left with zeros.	4-43
Beeps	Selects beep sequence for each rule.	4-48
Send Keystroke	Specifies control and keyboard characters to send.	4-49
♦ Control Characters	♦ Sends control characters.	4-49
♦ Keyboard Characters	♦ Sends keyboard characters.	4-54
♦ Send ALT Characters	♦ Sends ALT characters.	4-66
♦ Send Command Characters	♦ Sends command characters.	4-70
♦ Send Special Characters	♦ Sends special characters.	4-72
♦ Send Keypad Characters	♦ Sends keypad characters.	4-73
♦ Send Function Keys	♦ Sends function keys.	4-77
Turn On/Off Rule Sets	Turns rule sets on and off.	4-83
Alphanumeric Keyboard	Used to specify characters and strings when creating a rule.	4-84

Special Commands

Bar codes and explanations of the following special commands are provided on the next few pages.

- Begin New Rule
- Save Rule
- Erase
- Quit Entering Rules
- Disable Rule Set

Begin New Rule

Scan this bar code to start entering a new data formatting rule.

<FN3>7B1211

Begin New Rule

Save Rule

Scan this bar code to complete and save the rule you entered.

<FN3>4

Save Rule

Erase

Use these bar codes to erase criteria, actions, or rules.

<FN3>6C-

Erase Criteria And Start Again

<FN3>6A-

Erase Actions And Start Again

<FN3>81

Erase Previously Saved Rule

<FN3>80

Erase All Rules

Quit Entering Rules

Scan this bar code to quit entering rules.

<FN3>6Q

Quit Entering Rules

Disable Rule Set

Use these bar codes to disable rule sets.

<FN3>01

Disable Rule Set 1

<FN3>02

Disable Rule Set 2

<FN3>03

Disable Rule Set 3

<FN3>04

Disable Rule Set 4

<FN3>00

Disable All Rule Sets

Criteria

Code Types

Select any number of code types to be affected. All selected codes must be scanned in succession, prior to selecting other criteria. If you don't select a code type, all code types are affected.

<FN3>6C13D01

Code 39

<FN3>6C13D02

Codabar

<FN3>6C13D03

Code 128

<FN3>6C13D07

Code 93

<FN3>6C13D06

I 2 Of 5

<FN3>6C13D04

D 2 Of 5

Code Types (continued)

<FN3>6C13D08

UPC-A

<FN3>6C13D09

UPC-E

<FN3>6C13D10

UPC-E1

<FN3>6C13D0A

EAN-8

<FN3>6C13D0B

EAN-13

<FN3>6C13D0F

EAN 128

Code Types (continued)

<FN3>6C13D05

IATA 2 Of 5

<FN3>6C13D0E

MSI Plessey

<FN3>6C13D11

Bookland EAN

<FN3>6C13D12

Trioptic Code 39

<FN3>6C13D00

PDF417

<FN3>6C13D1A

ADF for Macro PDF417
(Applies rule to each block in MPDF set.)

Code Lengths

Define the number of characters the selected code type must contain. Select one length per rule only. If you don't select a code length, selected code types of any length are affected.

Note: *These codes are used to set the code length only; this is not a keypad.*

<FN3>6C13701

1

<FN3>6C13702

2

<FN3>6C13703

3

<FN3>6C13704

4

<FN3>6C13705

5

<FN3>6C13706

6

Code Lengths (continued)

<FN3>6C13707

7

<FN3>6C13708

8

<FN3>6C13709

9

<FN3>6C1370A

10

<FN3>6C1370B

11

<FN3>6C1370C

12

Code Lengths (continued)

<FN3>6C1370D

13

<FN3>6C1370E

14

<FN3>6C1370F

15

<FN3>6C13710

16

<FN3>6C13711

17

<FN3>6C13712

18

Code Lengths (continued)

<FN3>6C13713

19

<FN3>6C13714

20

<FN3>6C13715

21

<FN3>6C13716

22

<FN3>6C13717

23

<FN3>6C13718

24

Code Lengths (continued)

<FN3>6C13719

25

<FN3>6C1371A

26

<FN3>6C1371B

27

<FN3>6C1371C

28

<FN3>6C1371D

29

<FN3>6C1371E

30

Message Containing A Specific Data String

Select whether the formatting affects data that begins with a specific character or data string, or contains a specific character or data string.

Specific String at Start

To apply formatting to data that begins with a specific character or data string:

1. Scan the bar code below.
2. Enter a string representing the desired character or characters (up to a total of 8) using the *Alphanumeric Keyboard* beginning on page 4-84.
3. Scan **End Of Message** on page 4-93.

<FN3>6C201

Specific String At Start

Specific String, Any Location

To apply formatting to data that contains a specific character or data string:

1. Scan the bar code below.
2. Scan a two-digit number representing the ***position*** (include a leading "zero" if necessary) using the *Numeric Keypad* on page 4-23.
3. Enter the desired character or characters (up to a total of 8) using the *Alphanumeric Keyboard* beginning on page 4-84.
4. Scan **End Of Message** on page 4-93.

<FN3>6C200

Specific String Any Location

Any Message OK

By not scanning any bar code, all selected code types are formatted, regardless of information contained.

Numeric Keypad

Bar codes on this page should not be confused with those on the alphanumeric keyboard.

<FN3>A0
0

<FN3>A1
1

<FN3>A2
2

<FN3>A3
3

<FN3>A4
4

<FN3>A5
5

<FN3>A6
6

<FN3>A7
7

<FN3>A8
8

<FN3>A9
9

<FN3>A-
Cancel

Rule Belongs To Set

Scan a bar code below to select which set a rule belongs to.

<FN3>6C12A1

Rule Belongs To Set 1

<FN3>6C12A2

Rule Belongs To Set 2

<FN3>6C12A3

Rule Belongs To Set 3

<FN3>6C12A4

Rule Belongs To Set 4

Actions

Select how to format the data meeting the defined criteria before transmission.

Send Data

Use the following bar codes to send all data that remains, send all data up to a specific character selected from the *Alphanumeric Keyboard* on page 4-84, or send the next N characters. N = any number from 1 to 254, selected from the *Alphanumeric Keyboard* on page 4-84.

<FN3>6A5211

Send Data Up To Character

<FN3>6A110

Send All Data That Remains

<FN3>6A141001

Send Next Character

<FN3>6A141002

Send Next 2 Characters

<FN3>6A141003

Send Next 3 Characters

Send Data (continued)

<FN3>6A141004

Send Next 4 Characters

<FN3>6A141005

Send Next 5 Characters

<FN3>6A141006

Send Next 6 Characters

<FN3>6A141007

Send Next 7 Characters

<FN3>6A141008

Send Next 8 Characters

<FN3>6A141009

Send Next 9 Characters

<FN3>6A14100A

Send Next 10 Characters

<FN3>6A14100B

Send Next 11 Characters

Send Data (continued)

<FN3>6A14100C

Send Next 12 Characters

<FN3>6A14100D

Send Next 13 Characters

<FN3>6A14100E

Send Next 14 Characters

<FN3>6A14100F

Send Next 15 Characters

<FN3>6A141010

Send Next 16 Characters

<FN3>6A141011

Send Next 17 Characters

Send Data (continued)

<FN3>6A141012

Send Next 18 Characters

<FN3>6A141013

Send Next 19 Characters

<FN3>6A141014

Send Next 20 Characters

<FN3>6A141032

Send Next 50 Characters

<FN3>6A141064

Send Next 100 Characters

<FN3>6A141096

Send Next 150 Characters

<FN3>6A1410C8

Send Next 200 Characters

<FN3>6A1410FA

Send Next 250 Characters

Send Pause

Send Pause

Setup Field(s)

Use the following bar codes to move the cursor in relation to a specified character.

Note: *If there is no match when the rule is interpreted and the rule fails, the next rule is checked.*

Move Cursor To a Character

Scan the **Move Cursor To Character** bar code, then any printable ASCII character from the *Alphanumeric Keyboard* on page 4-84. This moves the cursor to the position after the matching character. If the character is not there, the rule fails and ADF tries the next rule.

<FN3>6A5230

Move Cursor To Character

Move Cursor to Start of Data

Scan this bar code to move cursor to the beginning of the data.

<FN3>6A1231

Move Cursor To Start

Move Cursor Past a Character

This parameter moves the cursor past all sequential occurrences of a selected character. Scan the **Move Cursor Past Character** bar code on page 4-30, then select a character from the *Alphanumeric Keyboard* on page 4-84. If the character is not there, the cursor does not move (i.e., has no effect).

<FN3>6A5235

Move Cursor Past Character

Skip Ahead "N" Characters

Scan one of these bar codes to select the number of positions ahead you wish to move the cursor.

<FN3>6A143301

Skip Ahead 1 Character

<FN3>6A143302

Skip Ahead 2 Characters

<FN3>6A143303

Skip Ahead 3 Characters

<FN3>6A143304

Skip Ahead 4 Characters

Skip Ahead (continued)

<FN3>6A143305

Skip Ahead 5 Characters

<FN3>6A143306

Skip Ahead 6 Characters

<FN3>6A143307

Skip Ahead 7 Characters

<FN3>6A143308

Skip Ahead 8 Characters

<FN3>6A143309

Skip Ahead 9 Characters

<FN3>6A14330A

Skip Ahead 10 Characters

Skip Ahead (continued)

<FN3>6A143332

Skip Ahead 50 Characters

<FN3>6A143364

Skip Ahead 100 Characters

<FN3>6A143396

Skip Ahead 150 Characters

<FN3>6A1433C8

Skip Ahead 200 Characters

<FN3>6A1433FA

Skip Ahead 250 Characters

Skip Back "N" Characters

Scan one of these bar codes to select the number of positions back you wish to move the cursor.

<FN3>6A143401

Skip Back 1 Characters

<FN3>6A143402

Skip Back 2 Characters

<FN3>6A143403

Skip Back 3 Characters

<FN3>6A143404

Skip Back 4 Characters

Skip Back (continued)

<FN3>6A143405

Skip Back 5 Characters

<FN3>6A143406

Skip Back 6 Characters

<FN3>6A143407

Skip Back 7 Character

<FN3>6A143408

Skip Back 8 Characters

<FN3>6A143409

Skip Back 9 Characters

<FN3>6A14340A

Skip Back 10 Characters

Skip Back (continued)

<FN3>6A143432

Skip Back 50 Characters

<FN3>6A143464

Skip Back 100 Characters

<FN3>6A143496

Skip Back 150 Characters

<FN3>6A1434C8

Skip Back 200 Characters

<FN3>6A1434FA

Skip Back 250 Characters

Send Preset Value

Use these bar codes to send preset values.

<FN3>6A1271

Send Value 1

<FN3>6A1272

Send Value 2

Modify Data

Modify data in the ways listed. The following actions work for all send commands that follow it within a rule. If you program *pad zeros to length 6, send next 3 characters, stop padding, send next 5 characters*, three zeros are added to the first send, and the next send is unaffected by the padding. These options do not apply to the **Send Keystroke** or **Send Preset Value** options.

Remove All Spaces

To remove all spaces in the send commands that follow, scan this bar code.

<FN3>6A1260

Remove All Spaces

Crunch All Spaces

To leave one space between words, scan this bar code. This also removes all leading and trailing spaces.

<FN3>6A1261

Crunch All Spaces

Stop Space Removal

Scan this bar code to disable space removal.

<FN3>6A1262

Stop Space Removal

Remove Leading Zeros

Scan this bar code to remove all leading zeros.

<FN3>6A1264

Remove Leading Zeros

Stop Zero Removal

Scan this bar code to disable the removal of zeros.

<FN3>6A1265

Stop Zero Removal

Pad Data With Spaces

To pad data to the left, scan the bar code containing the desired number of spaces. This parameter is activated by Send commands.

<FN3>6A146301

Pad Spaces To Length 1

<FN3>6A146302

Pad Spaces To Length 2

<FN3>6A146303

Pad Spaces To Length 3

<FN3>6A146304

Pad Spaces To Length 4

<FN3>6A146305

Pad Spaces To Length 5

<FN3>6A146306

Pad Spaces To Length 6

Pad Data with Spaces (continued)

<FN3>6A146307

Pad Spaces To Length 7

<FN3>6A146308

Pad Spaces To Length 8

<FN3>6A146309

Pad Spaces To Length 9

<FN3>6A14630A

Pad Spaces To Length 10

<FN3>6A14630B

Pad Spaces To Length 11

<FN3>6A14630C

Pad Spaces To Length 12

Pad Data with Spaces (continued)

<FN3>6A14630D

Pad Spaces To Length 13

<FN3>6A14630E

Pad Spaces To Length 14

<FN3>6A14630F

Pad Spaces To Length 15

<FN3>6A146310

Pad Spaces To Length 16

<FN3>6A146311

Pad Spaces To Length 17

<FN3>6A146312

Pad Spaces To Length 18

Pad Data with Spaces (continued)

<FN3>6A146313

Pad Spaces To Length 19

<FN3>6A146314

Pad Spaces To Length 20

<FN3>6A146315

Pad Spaces To Length 21

<FN3>6A146316

Pad Spaces To Length 22

<FN3>6A146317

Pad Spaces To Length 23

<FN3>6A146318

Pad Spaces To Length 24

Pad Data with Spaces (continued)

<FN3>6A146319

Pad Spaces To Length 25

<FN3>6A14631A

Pad Spaces To Length 26

<FN3>6A14631B

Pad Spaces To Length 27

<FN3>6A14631C

Pad Spaces To Length 28

<FN3>6A14631D

Pad Spaces To Length 29

<FN3>6A14631E

Pad Spaces To Length 30

<FN3>6A146300

Stop Pad Spaces

Pad Data With Zeros

To pad data to the left, scan the bar code containing the desired number of zeros. This parameter is activated by Send commands. Use these bar codes to pad data with zeros.

<FN3>6A146601

Pad Zeros To Length 1

<FN3>6A146602

Pad Zeros To Length 2

<FN3>6A146603

Pad Zeros To Length 3

<FN3>6A146604

Pad Zeros To Length 4

<FN3>6A146605

Pad Zeros To Length 5

<FN3>6A146606

Pad Zeros To Length 6

Pad Data With Zeros (continued)

<FN3>6A146607

Pad Zeros To Length 7

<FN3>6A146608

Pad Zeros To Length 8

<FN3>6A146609

Pad Zeros To Length 9

<FN3>6A14660A

Pad Zeros To Length 10

<FN3>6A14660B

Pad Zeros To Length 11

<FN3>6A14660C

Pad Zeros To Length 12

Pad Data With Zeros (continued)

<FN3>6A14660D

Pad Zeros To Length 13

<FN3>6A14660E

Pad Zeros To Length 14

<FN3>6A14660F

Pad Zeros To Length 15

<FN3>6A146610

Pad Zeros To Length 16

<FN3>6A146611

Pad Zeros To Length 17

<FN3>6A146612

Pad Zeros To Length 18

Pad Data With Zeros (continued)

<FN3>6A146613

Pad Zeros To Length 19

<FN3>6A146614

Pad Zeros To Length 20

<FN3>6A146615

Pad Zeros To Length 21

<FN3>6A146616

Pad Zeros To Length 22

<FN3>6A146617

Pad Zeros To Length 23

<FN3>6A146618

Pad Zeros To Length 24

Pad Data With Zeros (continued)

<FN3>6A146619

Pad Zeros To Length 25

<FN3>6A14661A

Pad Zeros To Length 26

<FN3>6A14661B

Pad Zeros To Length 27

<FN3>6A14661C

Pad Zeros To Length 28

<FN3>6A14661D

Pad Zeros To Length 29

<FN3>6A14661E

Pad Zeros To Length 30

<FN3>6A146600

Stop Pad Zeros

Beeps

Select a beep sequence for each ADF rule.

<FN3>6A13A01

Beep Once

<FN3>6A13A02

Beep Twice

<FN3>6A13A03

Beep Three Times

Send Keystroke (Control Characters and Keyboard Characters)

Scan the "Send __" bar code for the keystroke you wish to send.

Control Characters

Scan these bar codes to send control characters.

<FN3>6A144100

Send Control 2

<FN3>6A144101

Send Control A

<FN3>6A144102

Send Control B

<FN3>6A144103

Send Control C

<FN3>6A144104

Send Control D

<FN3>6A144105

Send Control E

Control Characters (continued)

<FN3>6A144106

Send Control F

<FN3>6A144107

Send Control G

<FN3>6A144108

Send Control H

<FN3>6A144109

Send Control I

<FN3>6A14410A

Send Control J

<FN3>6A14410B

Send Control K

Control Characters (continued)

<FN3>6A14410C

Send Control L

<FN3>6A14410D

Send Control M

<FN3>6A14410E

Send Control N

<FN3>6A14410F

Send Control O

<FN3>6A144110

Send Control P

<FN3>6A144111

Send Control Q

Control Characters (continued)

<FN3>6A144112

Send Control R

<FN3>6A144113

Send Control S

<FN3>6A144114

Send Control T

<FN3>6A144115

Send Control U

<FN3>6A144116

Send Control V

<FN3>6A144117

Send Control W

<FN3>6A144118

Send Control X

Control Characters (continued)

<FN3>6A144119

Send Control Y

<FN3>6A14411A

Send Control Z

<FN3>6A14411B

Send Control [

<FN3>6A14411C

**Send Control **

<FN3>6A14411D

Send Control]

<FN3>6A14411E

Send Control 6

<FN3>6A14411F

Send Control -

Keyboard Characters

Use these bar codes to send keyboard characters.

<FN3>6A144120

Send Space

<FN3>6A144121

Send !

<FN3>6A144122

Send “

<FN3>6A144123

Send #

<FN3>6A144124

Send $

<FN3>6A144125

Send %

<FN3>6A144126

Send &

<FN3>6A144127

Send ‘

Keyboard Characters (continued)

<FN3>6A144128

Send (

<FN3>6A144129

Send)

<FN3>6A14412A

Send *

<FN3>6A14412B

Send +

<FN3>6A14412C

Send ,

<FN3>6A14412D

Send -

<FN3>6A14412E

Send .

<FN3>6A14412F

Send /

Keyboard Characters (continued)

<FN3>6A144130

Send 0

<FN3>6A144131

Send 1

<FN3>6A144132

Send 2

<FN3>6A144133

Send 3

<FN3>6A144134

Send 4

<FN3>6A144135

Send 5

<FN3>6A144136

Send 6

<FN3>6A144137

Send 7

Keyboard Characters (continued)

<FN3>6A144138

Send 8

<FN3>6A144139

Send 9

<FN3>6A14413A

Send :

<FN3>6A14413B

Send ;

<FN3>6A14413C

Send <

<FN3>6A14413D

Send =

<FN3>6A14413E

Send >

<FN3>6A14413F

Send ?

Keyboard Characters (continued)

<FN3>6A144140

Send @

<FN3>6A144141

Send A

<FN3>6A144142

Send B

<FN3>6A144143

Send C

<FN3>6A144144

Send D

<FN3>6A144145

Send E

<FN3>6A144146

Send F

<FN3>6A144147

Send G

Keyboard Characters (continued)

<FN3>6A144148

Send H

<FN3>6A144149

Send I

<FN3>6A14414A

Send J

<FN3>6A14414B

Send K

<FN3>6A14414C

Send L

<FN3>6A14414D

Send M

<FN3>6A14414E

Send N

<FN3>6A14414F

Send O

Keyboard Characters (continued)

<FN3>6A144150

Send P

<FN3>6A144151

Send Q

<FN3>6A144152

Send R

<FN3>6A144153

Send S

<FN3>6A144154

Send T

<FN3>6A144155

Send U

<FN3>6A144156

Send V

<FN3>6A144157

Send W

Keyboard Characters (continued)

<FN3>6A144158

Send X

<FN3>6A144159

Send Y

<FN3>6A14415A

Send Z

<FN3>6A14415B

Send [

<FN3>6A14415C

**Send **

<FN3>6A14415D

Send]

<FN3>6A14415E

Send ^

<FN3>6A14415F

Send _

Keyboard Characters (continued)

<FN3>6A144160

Send ‘

<FN3>6A144161

Send a

<FN3>6A144162

Send b

<FN3>6A144163

Send c

<FN3>6A144164

Send d

<FN3>6A144165

Send e

<FN3>6A144166

Send f

<FN3>6A144167

Send g

Keyboard Characters (continued)

<FN3>6A144168

Send h

<FN3>6A144169

Send i

<FN3>6A14416A

Send j

<FN3>6A14416B

Send k

<FN3>6A14416C

Send l

<FN3>6A14416D

Send m

<FN3>6A14416E

Send n

<FN3>6A14416F

Send o

Keyboard Characters (continued)

<FN3>6A144170

Send p

<FN3>6A144171

Send q

<FN3>6A144172

Send r

<FN3>6A144173

Send s

<FN3>6A144174

Send t

<FN3>6A144175

Send u

<FN3>6A144176

Send v

<FN3>6A144177

Send w

Keyboard Characters (continued)

<FN3>6A144178

Send x

<FN3>6A144179

Send y

<FN3>6A14417A

Send z

<FN3>6A14417B

Send {

<FN3>6A14417C

Send |

<FN3>6A14417D

Send }

<FN3>6A14417E

Send ~

Send ALT Characters

Use these bar codes to send ALT characters

<FN3>6A144240

Send ALT 2

<FN3>6A144241

Send ALT A

<FN3>6A144242

Send ALT B

<FN3>6A144243

Send ALT C

<FN3>6A144244

Send ALT D

<FN3>6A144245

Send ALT E

<FN3>6A144246

Send ALT F

<FN3>6A144247

Send ALT G

Send ALT Characters (continued)

<FN3>6A144248

Send ALT H

<FN3>6A144249

Send ALT I

<FN3>6A14424A

Send ALT J

<FN3>6A14424B

Send ALT K

<FN3>6A14424C

Send ALT L

<FN3>6A14424D

Send ALT M

<FN3>6A14424E

Send ALT N

<FN3>6A14424F

Send ALT O

Send ALT Characters (continued)

<FN3>6A144250

Send ALT P

<FN3>6A144251

Send ALT Q

<FN3>6A144252

Send ALT R

<FN3>6A144253

Send ALT S

<FN3>6A144254

Send ALT T

<FN3>6A144255

Send ALT U

<FN3>6A144256

Send ALT V

S<FN3>6A144257

end ALT W

Send ALT Characters (continued)

<FN3>6A144258

Send ALT X

<FN3>6A144259

Send ALT Y

<FN3>6A14425A

Send ALT Z

<FN3>6A14425B

Send ALT [

<FN3>6A14425C

**Send ALT **

<FN3>6A14425D

Send ALT]

<FN3>6A14425E

Send ALT 6

<FN3>6A14425F

Send ALT -

Send Command Characters

<FN3>6A144301

Send PA 1

<FN3>6A144302

Send PA 2

<FN3>6A144303

Send CMD 1

<FN3>6A144304

Send CMD 2

<FN3>6A144305

Send CMD 3

<FN3>6A144306

Send CMD 4

Send Command Characters (continued)

<FN3>6A144307

Send CMD 5

<FN3>6A144308

Send CMD 6

<FN3>6A144309

Send CMD 7

<FN3>6A14430A

Send CMD 8

<FN3>6A14430B

Send CMD 9

<FN3>6A14430C

Send CMD 10

Send Special Characters

<FN3>6A14430D

Send Yen Character

<FN3>6A14430E

Send Pound Sterling Character

<FN3>6A14430F

Send Bomb Character

<FN3>6A144310

Send Hook Character

<FN3>6A144311

Send Bullet Character

<FN3>6A144312

Send 1/2 Character

<FN3>6A144313

Send Paragraph Character

<FN3>6A144314

Send Section Character

<FN3>6A144315

Send Vertical Character

Send Keypad Characters

<FN3>6A14462A

Send Keypad *

<FN3>6A14462B

Send Keypad +

<FN3>6A14462D

Send Keypad -

<FN3>6A14462E

Send Keypad .

<FN3>6A14462F

Send Keypad /

<FN3>6A144630

Send Keypad 0

<FN3>6A144631

Send Keypad 1

<FN3>6A144632

Send Keypad 2

<FN3>6A144633

Send Keypad 3

<FN3>6A144634

Send Keypad 4

Send Keypad Characters (continued)

<FN3>6A144635

Send Keypad 5

<FN3>6A144636

Send Keypad 6

<FN3>6A144637

Send Keypad 7

<FN3>6A144638

Send Keypad 8

<FN3>6A144639

Send Keypad 9

<FN3>6A14463A

Send Keypad ENTER

<FN3>6A14463B

Send Keypad NUM LOCK

Send Keypad Characters (continued)

<FN3>6A144701

Send Break Key

<FN3>6A144702

Send Delete Key

<FN3>6A144703

Send Page Up Key

<FN3>6A144704

Send End Key

<FN3>6A144705

Send Page Down Key

<FN3>6A144706

Send Pause Key

<FN3>6A144707

Send Scroll Lock Key

<FN3>6A144708

Send Backspace Key

<FN3>6A144709

Send Tab Key

<FN3>6A14470A

Send Print Screen Key

Send Keypad Characters (continued)

<FN3>6A14470B

Send Insert Key

<FN3>6A14470C

Send Home Key

<FN3>6A14470D

Send Enter Key

<FN3>6A14470E

Send Escape Key

<FN3>6A14470F

Send Up Arrow Key

<FN3>6A144710

Send Down Arrow Key

<FN3>6A144711

Send Left Arrow Key

<FN3>6A144712

Send Right Arrow Key

<FN3>6A144713

Send Back Tab Character

Send Function Keys

<FN3>6A144501

Send F1 Key

<FN3>6A144502

Send F2 Key

<FN3>6A144503

Send F3 Key

<FN3>6A144504

Send F4 Key

<FN3>6A144505

Send F5 Key

<FN3>6A144506

Send F6 Key

<FN3>6A144507

Send F7 Key

<FN3>6A144508

Send F8 Key

<FN3>6A144509

Send F9 Key

<FN3>6A14450A

Send F10 Key

Send Function Keys (continued)

<FN3>6A14450B

Send F11 Key

<FN3>6A14450C

Send F12 Key

<FN3>6A14450D

Send F13 Key

<FN3>6A14450E

Send F14 Key

<FN3>6A14450F

Send F15 Key

<FN3>6A144510

Send F16 Key

<FN3>6A144511

Send F17 Key

<FN3>6A144512

Send F18 Key

<FN3>6A144513

Send F19 Key

<FN3>6A144514

Send F20 Key

Send Function Keys (continued)

<FN3>6A144515

Send F21 Key

<FN3>6A144516

Send F22 Key

<FN3>6A144517

Send F23 Key

<FN3>6A144518

Send F24 Key

<FN3>6A144519

Send F25 Key

<FN3>6A14451A

Send F26 Key

<FN3>6A14451B

Send F27 Key

<FN3>6A14451C

Send F28 Key

<FN3>6A14451D

Send F29 Key

<FN3>6A14451E

Send F30 Key

Send Function Keys (continued)

<FN3>6A144401

Send PF1 Key

<FN3>6A144402

Send PF2 Key

<FN3>6A144403

Send PF3 Key

<FN3>6A144404

Send PF4 Key

<FN3>6A144405

Send PF5 Key

<FN3>6A144406

Send PF6 Key

<FN3>6A144407

Send PF7 Key

<FN3>6A144408

Send PF8 Key

<FN3>6A144409

Send PF9 Key

<FN3>6A14440A

Send PF10 Key

Send Function Keys (continued)

<FN3>6A14440B

Send PF11 Key

<FN3>6A14440C

Send PF12 Key

<FN3>6A14440D

Send PF13 Key

<FN3>6A14440E

Send PF14 Key

<FN3>6A14440F

Send PF15 Key

<FN3>6A144410

Send PF16 Key

<FN3>6A144411

Send PF17 Key

<FN3>6A144412

Send PF18 Key

<FN3>6A144413

Send PF19 Key

<FN3>6A144414

Send PF20 Key

Send Function Keys (continued)

<FN3>6A144415

Send PF21 Key

<FN3>6A144416

Send PF22 Key

<FN3>6A144417

Send PF23 Key

<FN3>6A144418

Send PF24 Key

<FN3>6A144419

Send PF25 Key

<FN3>6A14441A

Send PF26 Key

<FN3>6A14441B

Send PF27 Key

<FN3>6A14441C

Send PF28 Key

<FN3>6A14441D

Send PF29 Key

<FN3>6A14441E

Send PF30 Key

Turn On/Off Rule Sets

Use these bar codes to turn rule sets on and off within a rule.

<FN3>6A13911

Turn On Rule Set 1

<FN3>6A13921

Turn On Rule Set 2

<FN3>6A13931

Turn On Rule Set 3

<FN3>6A13941

Turn On Rule Set 4

<FN3>6A13910

Turn Off Rule Set 1

<FN3>6A13920

Turn Off Rule Set 2

<FN3>6A13930

Turn Off Rule Set 3

<FN3>6A13940

Turn Off Rule Set 4

Alphanumeric Keyboard

<FN3>B20

Space

<FN3>B23

#

<FN3>B24

$

<FN3>B25

%

<FN3>B2A

*****

<FN3>B2B

+

<FN3>B2D

-

<FN3>B2E

.

Alphanumeric Keyboard (continued)

<FN3>B2F

/

<FN3>B21

!

<FN3>B22

“

<FN3>B26

&

<FN3>B27

‘

<FN3>B28

(

<FN3>B29

)

<FN3>B3A

:

Alphanumeric Keyboard (continued)

<FN3>B3B

;

<FN3>B3C

<

<FN3>B3D

=

<FN3>B3E

>

<FN3>B3F

?

<FN3>B40

@

Alphanumeric Keyboard (continued)

<FN3>B5B

[

<FN3>B5C

****

<FN3>B5D

]

<FN3>B5E

^

<FN3>B5F

_

<FN3>B60

`

Alphanumeric Keyboard (continued)

Bar codes on this page should not be confused with those on the numeric keypad.

<FN3>B30

0

<FN3>B31

1

<FN3>B32

2

<FN3>B33

3

<FN3>B34

4

<FN3>B35

5

Alphanumeric Keyboard (continued)

Bar codes on this page should not be confused with those on the numeric keypad.

<FN3>B36

6

<FN3>B37

7

<FN3>B38

8

<FN3>B39

9

Alphanumeric Keyboard (continued)

<FN3>B41

A

<FN3>B42

B

<FN3>B43

C

<FN3>B44

D

<FN3>B45

E

<FN3>B46

F

<FN3>B47

G

<FN3>B48

H

Alphanumeric Keyboard (continued)

<FN3>B49

I

<FN3>B4A

J

<FN3>B4B

K

<FN3>B4C

L

<FN3>B4D

M

<FN3>B4E

N

<FN3>B4F

O

<FN3>B50

P

Alphanumeric Keyboard (continued)

<FN3>B51

Q

<FN3>B52

R

<FN3>B53

S

<FN3>B54

T

<FN3>B55

U

<FN3>B56

V

Alphanumeric Keyboard (continued)

<FN3>B57

W

<FN3>B58

X

<FN3>B59

Y

<FN3>B5A

Z

<FN3>B-

Cancel

<FN3>B+

End Of Message

Alphanumeric Keyboard (continued)

<FN3>B61

a

<FN3>B62

b

<FN3>B63

c

<FN3>B64

d

<FN3>B65

e

<FN3>B66

f

<FN3>B67

g

<FN3>B68

h

Alphanumeric Keyboard (continued)

<FN3>B69

i

<FN3>B6A

j

<FN3>B6B

k

<FN3>B6C

l

<FN3>B6D

m

<FN3>B6E

n

<FN3>B6F

o

<FN3>B70

p

Alphanumeric Keyboard (continued)

<FN3>B71

q

<FN3>B72

r

<FN3>B73

s

<FN3>B74

t

<FN3>B75

u

<FN3>B76

v

<FN3>B77

w

<FN3>B78

x

Alphanumeric Keyboard (continued)

<FN3>B79

y

<FN3>B7A

z

<FN3>B7B

{

<FN3>B7C

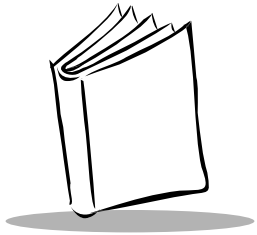
|

<FN3>B7D

}

<FN3>B7E

~



Appendix A
Programming Reference

AIM Code Identifiers

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

] = Flag Character (ASCII 93)
c = Code Character
m = Modifier Character

Table A-1. AIM Code Identifiers

Code Character	Code Type
A	Code 39
C	Code 128, ISBT 128, EAN128
E	UPC/EAN
e	RSS Family, EAN/UCC Composites (RSS & UCC/EAN-128 only)
F	Codabar
G	Code 93
I	Interleaved 2 of 5
L	PDF417, MicroPDF417
M	MSI Plessey
S	D 2 of 5, IATA 2 of 5

Table A-1. AIM Code Identifiers (continued)

Code Character	Code Type
X	Code 39 Trioptic, Bookland EAN

The modifier character is the sum of the applicable option values based on Table A-2.

Table A-2. Modifier Characters

Code Type	Option Value	Option
Code 39	0 1 2 4	No Check character or Full ASCII processing. Reader has checked one check character. Reader has stripped check character. Reader has performed Full ASCII character conversion. Example: A Full ASCII bar code with check character W, **A+I+MI+DW**, can be transmitted as]**A7**AimId where 7 = (1+2+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 93	0	No option specified at this time. Always transmit 0. Example: A Code 39 bar code 012345678905 is transmitted as]**G0**012345678905.
Code 128	0 1 2	Standard data packet, No Function code 1 in first symbol position. Function code 1 in first symbol character position. Function code 1 in second symbol character position. Example: A Code (EAN) 128 bar code with Function 1 character in the first position, **Fcnt1**AimId is transmitted as]**C1**AimId.

Table A-2. Modifier Characters (continued)

Code Type	Option Value	Option
EAN/UPC	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.
Interleaved 2 of 5	0	No check digit processing.
	1	Reader has checked check digit.
	2	Reader has stripped check digit before transmission.
		Example: An I 2 of 5 bar code without check digit, 4123, will be transmitted as]**I0**4123.
Discrete 2 of 5	0	No option specified at this time. Always transmit 0.
		Example: A D 2 of 5 bar code 4123 is transmitted as]**S0**4123.
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.
Bookland EAN	0	No option specified at this time. Always transmit 0.
		Example: A Bookland EAN bar code 123456789X is transmitted as]**X0**123456789X.

Table A-2. Modifier Characters (continued)

Code Type	Option Value	Option
PDF417, MicroPDF417	0	Reader set to conform to protocol defined in 1994 PDF417 symbology specifications. **Note:** When this option is transmitted, the receiver cannot reliably determine whether ECIs have been invoked or whether data byte 92_{DEC} has been doubled in transmission.
	1	Reader set to follow the ECI protocol (Extended Channel Interpretation). All data characters 92_{DEC} are doubled.
	2	Reader set for Basic Channel operation (no escape character transmission protocol). Data characters 92_{DEC} are not doubled. **Note:** When decoders are set to this mode, unbuffered Macro symbols and symbols requiring the decoder to convey ECI escape sequences cannot be transmitted.
		The bar code contains a UCC/EAN-128 symbol, and the first codeword is 903-907, 912, 914, 915.
	3	The bar code contains a UCC/EAN-128 symbol, and the first codeword is in the range 908-909.
	4	The bar code contains a UCC/EAN-128 symbol, and the first codeword is in the range 910-911.
	5	Example: A PDF417 bar code ABCD, with no transmission protocol enabled, is transmitted as]L2ABCD
RSS Family Note: In UCC/EAN-128 emulation mode, RSS is transmitted using Code 128 rules (i.e.,]C1).	0	No option specified at this time. Always transmit 0. RSS-14 and RSS-Limited transmit with an Application Identifer “01”. Example: An RSS-14 bar code 100123456788902 is transmitted as]e0011001234567889 02.
EAN.UCC Composites (RSS, UCC/EAN-128, 2D portion of UPC composite) Native mode transmission. Note: UPC portion of composite is transmitted using UPC rules.	0	Standard data packet.
	1	Data packet containing the data following an encoded symbol separator character.
	2	Data packet containing the data following an escape mechanism character. The data packet does not support the ECI protocol.
	3	Data packet containing the data following an escape mechanism character. The data packet supports the ECI protocol.

Table A-2. Modifier Characters (continued)

Code Type	Option Value	Option
EAN.UCC Composites (RSS, UCC/EAN-128, 2D portion of UPC composite) UCC/EAN-128 emulation Note: UPC portion of composite is transmitted using UPC rules.	1	Data packet is a UCC/EAN-128 symbol (i.e., data is preceded with]JC1).

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 M2000, 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]**E2**10.

Prefix / Suffix Values

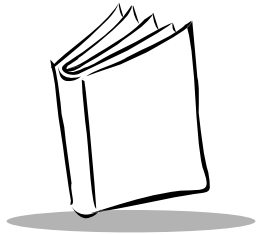
The following values can be assigned as prefixes or suffixes to scanned data. If you're using a keyboard interface, refer to the *Synapse "Smart Cable" Interface Guide* for keystroke prefix/suffix values.

Table A-3. Prefix/Suffix Values

Prefix/Suffix Value	Full ASCII Code 39 Encode Char.	ASCII Character	Prefix/Suffix Value	Full ASCII Code 39 Encode Char.	ASCII Character
1000	%U	NUL	1030	%D	RS
1001	$A	SOH	1031	%E	US
1002	$B	STX	1032	Space	Space
1003	$C	ETX	1033	/A	!
1004	$D	EOT	1034	/B	"
1005	$E	ENQ	1035	/C	#
1006	$F	ACK	1036	/D	$
1007	$G	BELL	1037	/E	%
1008	$H	BCKSPC	1038	/F	&
1009	$I	HORIZ TAB	1039	/G	‘
1010	$J	LF/NW LN	1040	/H	(
1011	$K	VT	1041	/I	)
1012	$L	FF	1042	/J	*
1013	$M	CR/ENTER	1043	/K	+
1014	$N	SO	1044	/L	,
1015	$O	SI	1045	-	-
1016	$P	DLE	1046	.	.
1017	$Q	DC1	1047	/	/
1018	$R	DC2	1048	0	0
1019	$S	DC3	1049	1	1
1020	$T	DC4	1050	2	2
1021	$U	NAK	1051	3	3
1022	$V	SYN	1052	4	4
1023	$W	ETB	1053	5	5
1024	$X	CAN	1054	6	6
1025	$Y	EM	1057	7	7
1026	$Z	SUB	1056	8	8
1027	%A	ESC	1057	9	9
1028	%B	FS	1058	/Z	:
1029	%C	GS	1059	%F	;

Table A-3. Prefix/Suffix (continued)

Prefix/Suffix Value	Full ASCII Code 39 Encode Char.	ASCII Character	Prefix/Suffix Value	Full ASCII Code 39 Encode Char.	ASCII Character
1060	%G	<	1095	%O	_
1061	%H	=	1096	%W	`
1062	%I	>	1097	+A	a
1063	%J	?	1098	+B	b
1064	%V	@	1099	+C	c
1065	A	A	1100	+D	d
1066	B	B	1101	+E	e
1067	C	C	1102	+F	f
1068	D	D	1103	+G	g
1069	E	E	1104	+H	h
1070	F	F	1105	+I	i
1071	G	G	1106	+J	j
1072	H	H	1107	+K	k
1073	I	I	1108	+L	l
1074	J	J	1109	+M	m
1075	K	K	1110	+N	n
1076	L	L	1111	+O	o
1077	M	M	1112	+P	p
1078	N	N	1113	+Q	q
1079	O	O	1114	+R	r
1080	P	P	1115	+S	s
1081	Q	Q	1116	+T	t
1082	R	R	1117	+U	u
1083	S	S	1118	+V	v
1084	T	T	1119	+W	w
1085	U	U	1120	+X	x
1086	V	V	1121	+Y	y
1087	W	W	1122	+Z	z
1088	X	X	1123	%P	{
1089	Y	Y	1124	%Q	|
1090	Z	Z	1125	%R	}
1091	%K	[	1126	%S	~
1092	%L	\	1127		Undefined
1093	%M	]			
1094	%N	^	7013		ENTER



Appendix B
Specifications

M2000 Scanner Specifications

Table 2-1 lists the specifications for the M2000 scanner.

Table 2-1. Scanner Specifications

Item	Description
Power Requirements	5.2 VDC ± 5% @ 300 mA nominal
Laser Diode Power	0.7 mW, max.
Scan Pattern	
Start Time	0.065 sec. to 75% of steady state horizontal amplitude; 0.50 sec. to 90% of steady state vertical amplitude
Scan Amplitude	Horizontal: 34° ±1.5° Vertical (Omni): 34° ±1.5° Vertical (Raster): 12.5° ±1.5°
Scan Frequency	Horizontal: 320 Hz ±5 Hz Vertical (Omni): 295 Hz ±5 Hz Vertical (Raster): 10 Hz ±1 Hz
Frame Rate	25 frames/sec. 12.5 Hz ±1 Hz (vertical)
Optical Resolution	Can decode a 6.0 mil (minimum X-dimension) symbol (PDF417); *Y-dimension must be 2X or greater.*
Angular Orientation Tolerances	
Pitch Tolerance	± 30° (“front to back”)
Skew	± 15° from plane parallel to symbol (“side-to-side”)

Table 2-1. Scanner Specifications (continued)

Item	Description
Rotational Tolerance (Raster)	± 4° (for scanning PDF benchmark label, assuming 3:1 codeword aspect ratio). 1D code types depend on height of symbol.
Rotational Tolerance (Omnidirectional)	360° for 1D symbol
Rotational Tolerance (Semi-omni)	± 20° from horizontal
Dead Zone/Optical Throw	± 2° *(1-D symbologies)* or ± 9°*(PDF417)* from beam direction
Print Contrast Resolution	35% *(1-D symbologies)* or 45% *(PDF417)* absolute dark/light reflectance differential, measured at 650 nm.
Ambient Light Immunity	Up to 8000 ft-candles of sunlight
Humidity	5 - 95% (non-condensing)
Shock	Multiple 4-ft/1.2m drops to concrete
Operating Temperature	0° to 40° C; 32° to 104° F
Storage Temperature	-40° to 60° C; -40° to 140° F
Scanner Connector (see *Cable Pinouts on page B-5* for host-end connector of cables)	**10-pin modular** connector at base of handle: **Pin # / RS-232/IBM/Synapse / USB/Synapse** **1** Synapse clock/Flash download RxD (4683) / Synapse clock **2** + 5V / + 5V **3** Ground / Ground 4 Transmit (TxD)/RS-485A / VDD 5 Receive (RxD) / D+ 6 Ready to Send (RTS)/ RS-485B/ Synapse Data/Flash Download TxD (4683) / Synapse Data 7 Clear to Send (CTS) / D- 8 Download / Download 9 EAS / EAS 10 EAS / EAS
Coil Cable Length	6 ft.; 183 cm
Weight	12 oz; 340 gm
Height	7.8 in.; 198 mm
Depth	5.4 in.; 137 mm

Table 2-1. Scanner Specifications (continued)

Item	Description
Width	3.4 in.; 86 mm
Decode Capability	1-D Symbologies: UPC/EAN, Bookland EAN, Code 39, Code 39 Full ASCII, Code 93, Code 128, Codabar, Interleaved 2 of 5, Discrete 2 of 5, MSI Plessey. Cannot autodiscriminate between Code 39 and Code 39 Full ASCII. 2-D Symbology: PDF417, MicroPDF Composite Codes: UCC/EAN, RSS Code
Memory	64K x 16 RAM, 256K x 16 Flash

Decode Zones

Following are the decode distances for the M2000 scanner raster and omnidirectional patterns.

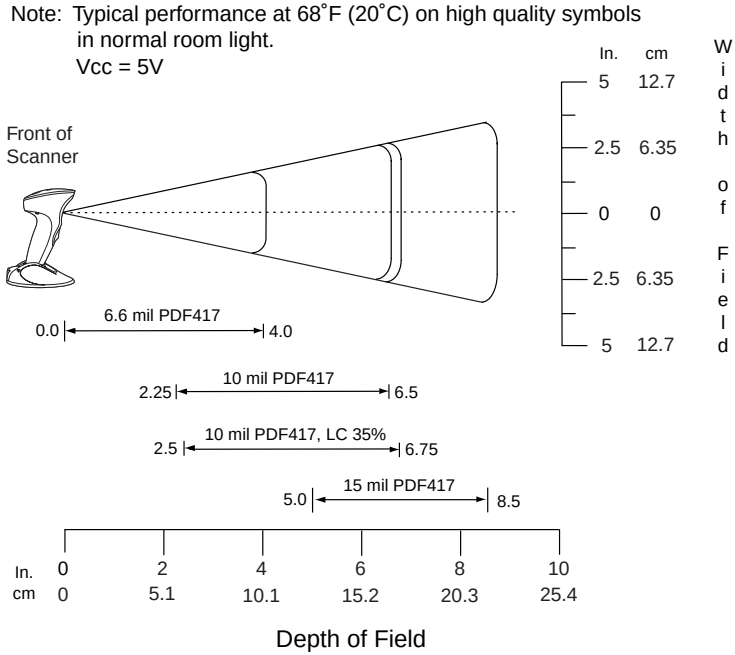


Figure B-1. M2000 Raster Pattern Decode Zone

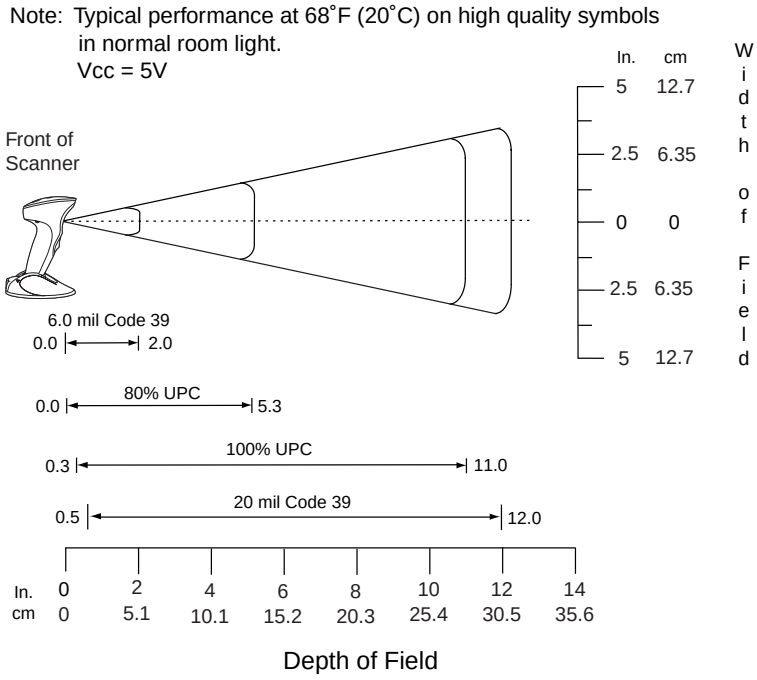


Figure B-2. M2000 Omnidirectional Pattern Decode Zone

Cable Pinouts

The following tables describe the pinouts for connector cables.

RS-232 Cable Pinouts

Table 2-2. Single-Port RS-232C, 9-Pin Female D-Type Connector P/N 25-32465-01, -02

Pin	Signal	Function
2	RxD	Serial data receive input. Driven by the serial data transmit output on the device communicating with the scanner.
3	TxD	Serial data transmit output. Drives the serial data receive input on the device communicating with the scanner.
5	Ground	Power supply input ground pin and reference for both output signals. Must be capable of sinking all return current.
6	DTR	Data Terminal Ready. This signal is hardwired active.
7	RTS	Request-to-send handshaking output line. May be used optionally by the scanner to signal another device that data is available to send. Used only in conjunction with CTS line.
8	CTS	Clear-to-send handshaking input line. Used optionally by another device to signal the scanner that it may commence transmitting data. Used only in conjunction with RTS line.

Table 2-3. Single-Port RS-232C, 8-Pin Female Siemens Nixdorf P/N 25-32469-01, -02

Pin	Signal	Function
SHELL	DRAIN	
1	+12V	Converted to +5V.
2	RxD	Serial data receive input. Driven by the serial data transmit output on the device communicating with the scanner.
3	TxD	Serial data transmit output. Drives the serial data receive input on the device communicating with the scanner.
5	Ground	Power supply input ground pin and reference for both output signals. Must be capable of sinking all return current.
6	DTR	Data Terminal Ready. This signal is hardwired active.
7	RTS	Request-to-send handshaking output line. Used optionally by the scanner to signal another device that data is available to send. Used only in conjunction with the CTS line.
8	CTS	Clear-to-send handshaking input line. Used optionally by another device to signal the scanner that it may commence transmitting data. Used only in conjunction with RTS line.

IBM 46XX Cable Pinouts

Table 2-4. IBM 46XX Port 5B 8-Pin SDL Connector P/N 25-32466-01, -02

Pin	Signal	Function
3	GND	Power supply ground pin and reference for both output signals. Must be capable of sinking all return current.
4	Serial I/O A	Differential driver output/receiver input.
5	Serial I/O B	Differential driver output/receiver input.
6	+5V	Power.

Table 2-5. IBM 46XX Port 9B 4-Pin SDL Connector P/N 25-32467-01, -02

Pin	Signal	Function
1	GND	Power supply ground pin and reference for both output signals. Must be capable of sinking all return current.
2	Serial I/O A	Differential driver output/receiver input.
3	Serial I/O B	Differential driver output/receiver input.
4	+12V	Power.

Table 2-6. IBM 46XX Port 17 16-Pin SDL Connector P/N 25-32468-01, -02

Pin	Signal	Function
2	GND	Power supply ground pin and reference for both output signals. Must be capable of sinking all return current.
5	+5V	Power.
7	RS485 A	Differential driver output/receiver input.
8	RS485 B	Differential driver output/receiver input.
SHELL	DRAIN	

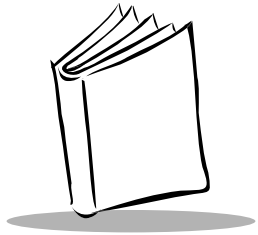
Table 2-7. IBM Sure One, 8-Pin Connector P/N 25-32470-01, -02

Pin	Signal	Function
2	RxD	Serial data receive input. Driven by the serial data transmit output on the device communicating with the scanner.
3	TxD	Serial data transmit output. Drives the serial data receive input on the device communicating with the scanner.
5, 6, 11	Ground	Power supply input ground pin and reference for both output signals. Must be capable of sinking all return current.
7, 10	+5V / +12V	Power.
12	DTR	Data Terminal Ready. This signal is hardwired active.
13	RTS	Request-to-send handshaking output line. Used optionally by the scanner to signal another device that data is available to send. Used only in conjunction with CTS line.
14	CTS	Clear-to-send handshaking input line. Used optionally by another device to signal the scanner that it may commence transmitting data. Used only in conjunction with RTS line.
FERRULE	DRAIN	

Synapse Cable Pinouts

Table 2-8. 6-Pin Male Modular Connector for Synapse Cable P/N 25-32463-01, -02

Pin	Signal	Function
1	SYNDATA	Synapse-compatible data line. Bi-directional.
2	SYNCLK	Synapse-compatible clock line. Bi-directional.
3	VCC	Power.
4	GND	Power supply ground pin and reference for both output signals. Must be capable of sinking all return current.



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_____

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_____

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_____
_____

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