MK1000
MicroKiosk

Product Reference Guide

MK1000 MicroKiosk
Product Reference Guide

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symbol®

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

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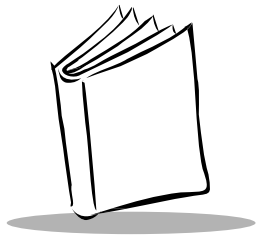

About This Guide

Introduction

The *MK1000 Product Reference Guide* provides information about installing, operating, and programming the MK1000.

Note: *Unless otherwise noted, the term MK1000 refers to all configurations of the device.*

Chapter Descriptions

Following are brief descriptions of each chapter in this guide.

- Chapter 1, *About Your MK1000* provides an overview of the MK1000 that includes quick start-up procedures, parts of the MK1000, features, and scanning modes.
- Chapter 2, *Setup and Installation: Mechanical* describes the hardware setup and installation of the MK1000.
- Chapter 3, *Setup and Installation: Communication* describes the steps required to establish communication between the MK1000 and a host.
- Chapter 4, *Software and Applications* describes loading applications and files on to the MK1000.
- Chapter 5, *PCK Emulation* describes how to use the MK1000 PCK emulation application.
- Appendix A, *Configuration Menu Programming Bar Codes* provides system navigation bar codes used in system and PCK emulation configuration modes.

- Appendix B, *PCK Configuration Programming Bar Codes* provides bar codes used in PCK emulation configuration mode.
- Appendix C, *Scanning Mode Programming Bar Codes* provides bar codes used to change the laser scan mode.
- Appendix D, *MK1000 Fonts* provides MK1000 fonts.
- Appendix E, *Technical Specifications* provides technical information about your MK1000 and troubleshooting information.
- Appendix F, *Troubleshooting* provides troubleshooting information for your MK1000.
- Appendix G, *Table of MK1000 Communication Interfaces* provides information about the communication interfaces supported by the MK1000.

Notational Conventions

- Bullets (•) indicate:
  - action items
  - lists of alternatives
  - lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Related Publications

The following is a list of documents that you may find useful if you want to know more about programming the MK1000.

- *MK1000 Quick Reference Guide* (p/n 72-52968-xx)
- *VT 220 Terminal Emulation Program Programmer's User Guide (*p/n SSS-9000-04).

Service Information

If you have a problem with your equipment, contact the Symbol Support Center. Before calling, have the model number and serial number at hand.

Call the Support Center from a phone near the equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and

the problem is symbol readability, the Support Center will request samples of your bar codes for analysis at our plant.

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

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

Symbol Support Center

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1-800-653-5350

Canada
Symbol Technologies Canada, Inc.
2540 Matheson Boulevard East
Mississauga, Ontario, Canada L4W 4Z2
905-629-7226

United Kingdom
Symbol Technologies
Symbol Place
Winnersh Triangle, Berkshire RG41 5TP
United Kingdom
0800 328 2424 (Inside UK)
+44 118 945 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/Österreich
Symbol Technologies Austria GmbH
Prinz-Eugen Strasse 70 / 2.Haus
1040 Vienna, Austria
01-5055794-0 (Inside Austria)
+43-1-5055794-0 (Outside Austria)

Denmark/Danmark
Symbol Technologies AS
Dr. Neergaardsvej 3
2970 Hørsholm
7020-1718 (Inside Denmark)
+45-7020-1718 (Outside Denmark)

Europe/Mid-East Distributor Operations
Contact your local distributor or call
+44 118 945 7360

Finland/Suomi
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/Deutchland
Symbol Technologies GmbH
Waldstrasse 66
D-63128 Dietzenbach, Germany
6074-49020 (Inside Germany)
+49-6074-49020 (Outside Germany)

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

Norway/Norge
Symbol's registered and mailing address:
Symbol Technologies Norway
Hoybratenveien 35 C
N-1055 OSLO, Norway

Symbol's repair depot and shipping address:
Symbol Technologies Norway
Enebakkveien 123
N-0680 OSLO, Norway

+47 2232 4375

South Africa
Symbol Technologies Africa Inc.
Block B2
Rutherford Estate
1 Scott Street
Waverly 2090 Johannesburg
Republic of South Africa
11-809 5311 (Inside South Africa)
+27-11-809 5311 (Outside South Africa)

Spain/España
Symbol Technologies S.L.
C/ Peonias, 2
Edificio Piovera Azul
28042 Madrid, Spain
91 324 40 00 (Inside Spain)
+34 91 324 40 00 (Outside Spain)

Sweden/Sverige
“Letter” address:
Symbol Technologies AB
Box 1354
S-171 26 SOLNA
Sweden

Visit/shipping address:
Symbol Technologies AB
Solna Strandväg 78
S-171 54 SOLNA
Sweden

Switchboard: 08 445 29 00 (domestic)
Call Center: +46 8 445 29 29 (international)
Support E-Mail:
Sweden.Support@se.symbol.com

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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.

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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.

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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 preceding exclusion or limitation may not apply to you.

Chapter 1
About Your MK1000

Overview

The MK1000 is a scanning system that allows retail shoppers to easily verify prices on bar coded merchandise and obtain up-to-the-minute information on in-store promotions -- while they shop.

The MK1000 does more than price verification. Its large easy-to-read display can be used as an electronic billboard for instant in-store merchandising and comes complete with the ability to display graphics and text messages to promote seasonal sales, in-store promotions, and upcoming events. The programmable function buttons can enhance in-store applications and allow for customer interaction.

Unpacking Your MK1000

Remove the MK1000 from its packing and inspect it for damage. If the device was damaged in transit, call the *Symbol Support Center* at one of the telephone numbers listed on page xi. **KEEP THE PACKING**. It is the approved shipping container and should be used if you ever need to return your equipment for servicing.

Quick Startup Instructions

This index of instructions highlights key installation topics. Mandatory steps are noted by an asterisk (*). If multiple pages are referenced, the key reference is bolded.

Product Features

- Buttons and Controls — 1-4, 3-18, **3-19,** 3-21
- Bar code Scanning Modes — **1-6**, C-1, 5-14

Mechanical Installation: Cables, Power and Mounting

- Overview***** — 2-1
  - Ethernet Installation
    - Wired: Power via AC Outlet — 1-12, **2-2**
    - Wired: Power via Power-Over-Ethernet — 1-12, **2-3**
    - Wireless: Power via AC Outlet — 1-12, **2-4**
    - Wireless: Power via Power-Over-Ethernet — 1-12, **2-5**
  - RS-485 Installation — 2-6
  - RS-232 Installation — 2-9
- Mounting***** — 2-11
- Cable Pin-outs — **2-13**, 2-14, 2-15, 2-16

Establishing Communication with your Host

- Selecting a Communicating Interface***** — **3-2**, G-1
- Methods of Configuring a MK1000***** — 3-3
  - PCK Configuration Menu — 3-2, 3-3, **3-4**
    - MAP of Menu Structure — **3-5**, 3-7
    - Entering, Navigating and Saving Changes — **3-6**, 3-9, B-1
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PCK Emulation Protocol — **3-2**, 5-1

Troubleshooting — F-1

Parts of the MK1000

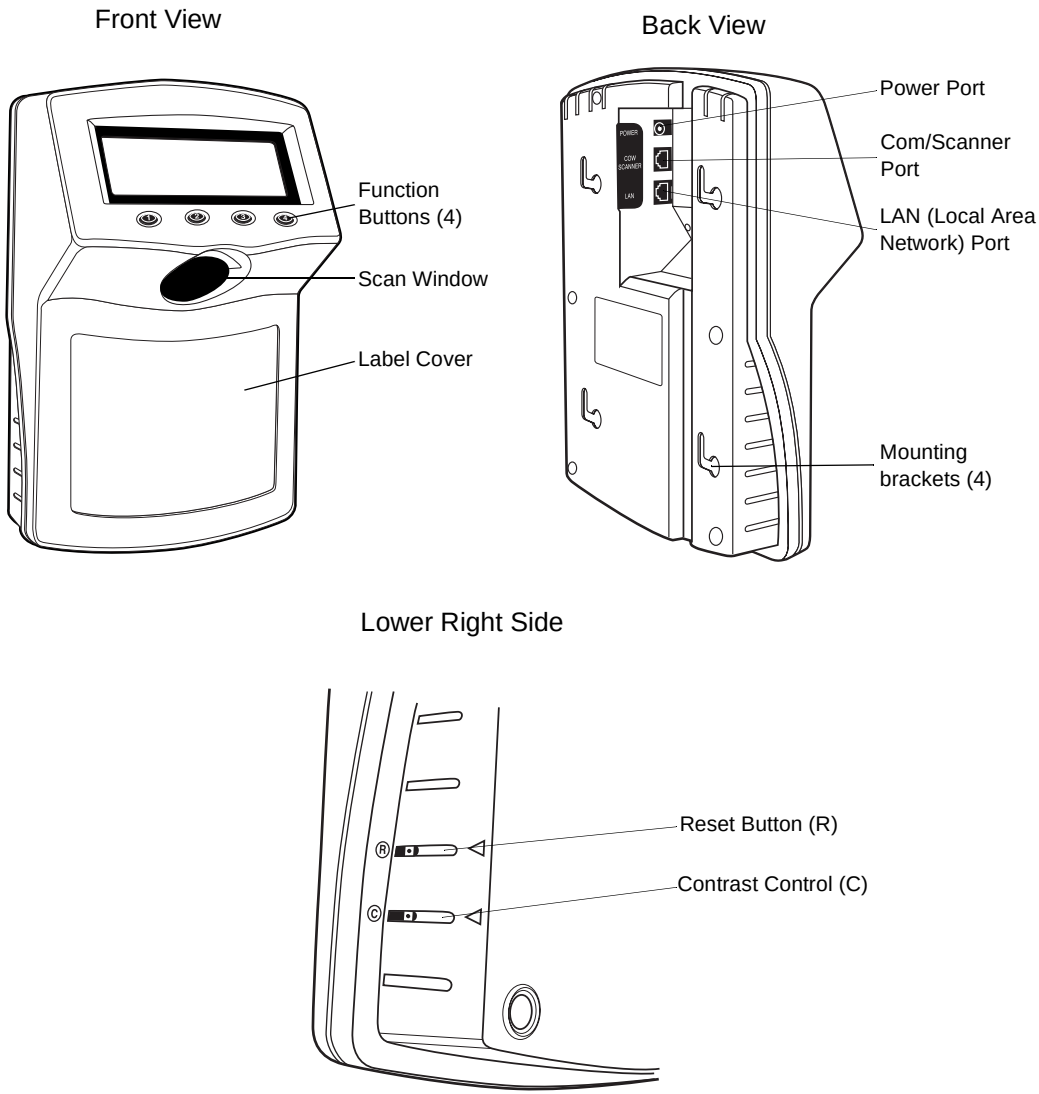


Figure 1-1. Parts of the MK1000

Features of the MK1000

Buttons and Controls

Programmable Function Buttons

The MK1000 has four programmable function buttons (shown in Figure 1-1 on page 1-3). These buttons can be programmed to allow the user to perform various tasks such as navigating through an application and making decisions when prompted.

Note: *For details on how to navigate MK1000 screens, see Navigating the MK1000 Configuration Menu on page 3-19.*

For details on how to enter alphanumeric values while in the MK1000 Configuration menu, see Entering Alphanumeric Values on page 3-21.

Reset Button

The Reset button (shown in Figure 1-1 on page 1-3) can be used to reset the system. The Reset button is located on the lower right-hand side of the unit and marked with ®. Use a paper clip to push the switch.

Contrast Control Button

The display Contrast Control button is located below the Reset button (shown in Figure 1-1 on page 1-3) and marked with ©. Use the tip of a small screwdriver to make contrast adjustments, if required.

Label/Message Window

You can display labels and messages on the front of the MK1000.

To remove the plastic label cover, press from one side to bow the label cover, then lift off.

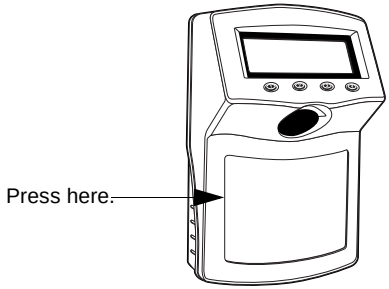


Figure 1-2. Removing the Label Cover

To install the plastic label cover:

1. Insert the tabs of one end of the label cover into the slots on the front of the MK1000.
2. Bow the plastic cover and insert the tabs of the other side of the label cover into the slots on the other end of the MK1000.

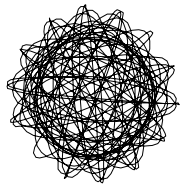
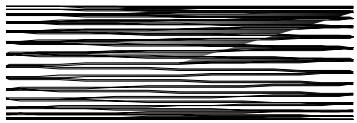
Bar Code Scanning

The MK1000 automatically decodes a bar code presented in its field of view. It can decode all standard 1-dimensional bar codes plus PDF, micro-PDF, and composite bar codes.

Scanning Modes

The MK1000 can operate in a number of different scanning modes. Three of the most commonly used modes are described in Table 1-1 below.

Table 1-1. Common Scan Modes

Scan Mode	Description	Scan Pattern
Cyclone Omnidirectional 1D Scan Pattern (factory default)	This is a highly efficient scan pattern which decodes 1D and EAN/UCC reduced space symbologies in any orientation Note: While in this mode, the MK1000 does not decode 2D bar codes like PDF.	
"Always Raster" Scan Pattern	Directly opens the laser to a full sized raster pattern. Decodes 1D, PDF-417, RSS, and Composite Codes.	
Smart Raster Scan Pattern	Creates a single scan line which opens vertically for PDF-417 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, PDF-417, EAN/UCC, RSS and Composite Codes.	

Changing Scanning Modes

You can change the scanning mode using any of the following methods.

- Modify the “scan mode” setting via the MK1000’s Configuration menu.
- Send a host transmitted SSI (Simple Serial Interface) command, specifying which scan pattern/scanning mode the MK1000 should use. For more information on this, see *Scan Engine Commands* on page 5-14.
- Scan a programming bar code (refer to Appendix C, *Scanning Mode Programming Bar Codes*). Any changes made by scanning a programming bar code are in effect until the unit is powered off. At the unit’s next power up, the scanner returns to its default scan mode setting.

Scanning Guidelines

When scanning a bar code:

- Keep the scan pattern parallel to the bar code’s rows.
- Hold the bar coded item as still as possible.
- Hold the bar code at an angle which does not cause specular reflection (see *Specular Reflection* on page 1-10).
- Hold the bar coded item close for small bar codes, and farther away for large bar codes.

Smart Raster

In Smart Raster operation, a trigger pull causes a single scan line 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.

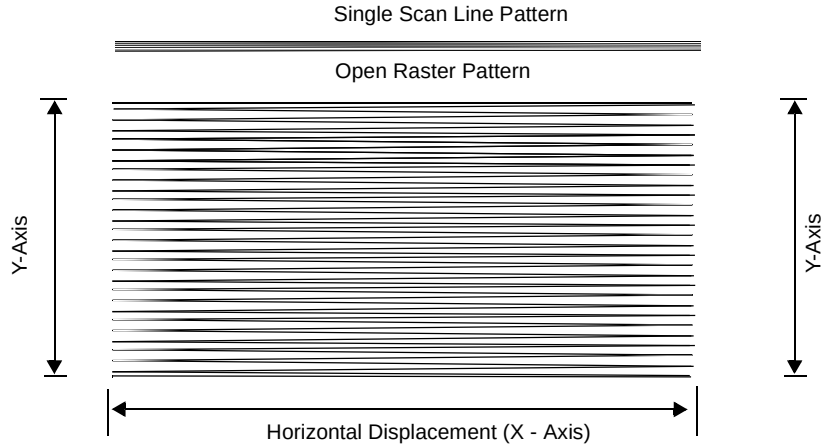


Figure 1-3. Smart Raster Scanning Pattern

- 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.

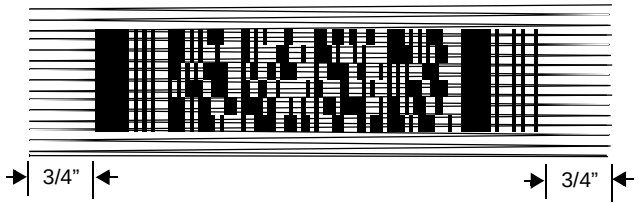


Figure 1-4. Raster Pattern Expanded Over PDF-417 Symbol

- If the vertical scan pattern is not high enough to cover a “tall” PDF-417 symbol, move the bar code slowly down toward the bottom of the symbol, keeping the beam horizontal to the rows, and then slowly back upward to the top. Alternatively, move the bar code further away from the scanner until the scan pattern covers a larger portion of the bar code in the vertical direction.

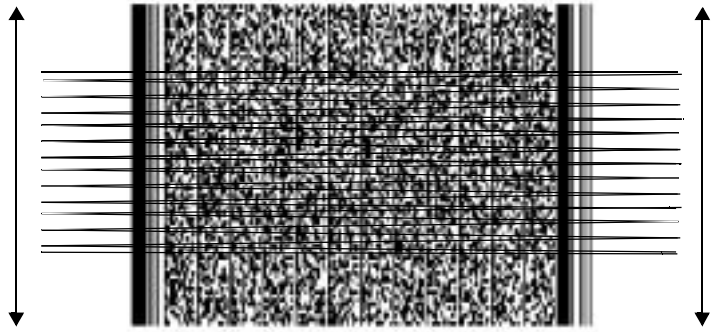


Figure 1-5. Moving Scan Pattern Upward and Downward on "Tall" PDF Symbol

- 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.

Scanning Composite (2D) Bar Codes

Composite Code is a combination of a 1D symbol (RSS, UPC/EAN or UPC/EAN-128) and a 2D symbol (CC-A, CC-B or CC-C).

When scanning a bar code:

- Keep the scan pattern parallel to the 2D symbol's rows.
- Hold the bar code as still as possible.
- Hold the bar coded item at an angle which does not cause specular reflection (see *Specular Reflection* on page 1-10).
- Hold the scanner close for small bar codes, and farther away for large bar codes.
- When using the single scan line pattern, aim the scan line at the middle of the 2D portion. The scan pattern will open up to an optimized raster pattern and decode both the 2D and 1D portion of the Composite Code.

Aim the single scan line at the center of the 2D portion

Raster pattern will expand to decode both portions

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 phenomenon is called 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.

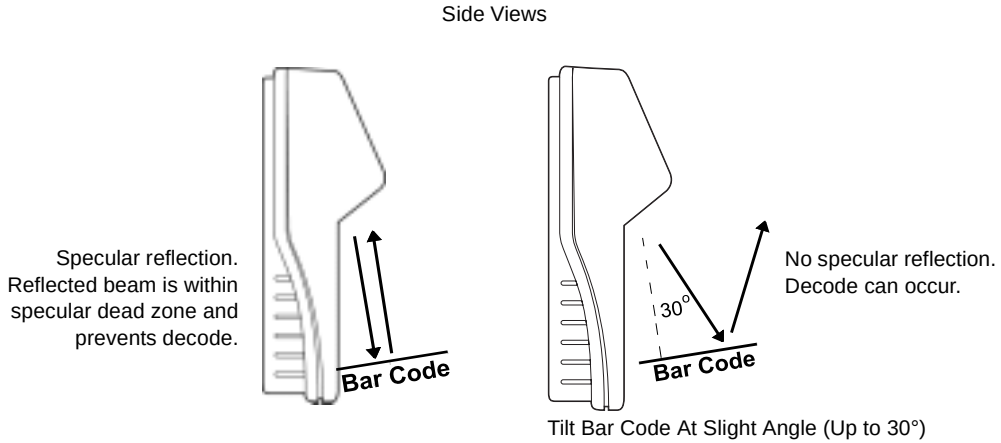


Figure 1-6. Avoiding Specular Reflection

When scanning a 1D bar code, there is only a small specular dead zone to avoid ($\pm$ 2^o from the direct laser beam). The specular dead zone is larger for scanning PDF-417 ($\pm$ 9^o 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^o from the normal to that surface.

Using the Display (LCD)

The MK1000 has a back lit 240 x 64 pixel Liquid Crystal Display (LCD). The display’s colors are white on blue. The MK1000’s display can handle both text and graphics. The LCD’s contrast is adjustable.

Memory

Flash Memory

The MK1000 system contains 1MB of Flash Memory. This non-volatile Flash Memory is responsible for storing the system firmware.

Static Random Access Memory (SRAM)

The system contains 1MB of SRAM. The SRAM is used for storage of system parameters, user programs and data, and for use by the system as a whole during normal program executions. Items such as bitmaps can also be stored here and easily retrieved for later use.

External Ports

The MK1000 is equipped with three external ports located at the rear of the unit (see Figure 1-1 on page 1-3). The external ports are:

- Power
- Com/Scanner
- LAN.

The ports are located in a recessed area to allow for flush mounting of the MK1000 against a flat surface.

Power Port

The MK1000 can be powered by either an external power supply plugged into an AC outlet or by Power-over-Ethernet. If an external power supply is used, it plugs into the power port on the rear of the MK1000 via a 2.0mm barrel jack. The center pin of the jack is positive and the outer tab is ground.

The universal power supply provided with your MK1000 is compatible with the following power systems:

- 120V 60Hz (North America)
- 230V 50Hz (International excluding Japan)
- 100V 50/60Hz (Japan).

Com/Scanner Port

The connection to the Com/Scanner port is provided through an RJ-45 jack (10 conductor). This port has dual functionality and can be used for Serial communication with a host, connection of an external device like a decoded scanner, or connection of an undecoded external scanner. It is important to confirm your cable's pin-out before attaching a cable. For cable pin-outs, see *RS-232 Connectors - Com/Scanner Port* on page 2-16.

LAN (Local Area Network) Port

The connection to this port is provided through an RJ-45 jack.

The LAN port supports the following network topologies listed and described below.

- Ethernet (10Base-T)
  - Power via AC Outlet
  - Power via Power-over-Ethernet
- RS-485 (Serial/Cable)

Wired Ethernet: Power via AC Outlet

The LAN port can be used for an Ethernet data connection., either a 10-conductor RJ-45 plug or 8-conductor RJ-45 plug can be used. With this Ethernet installation the MK1000 receives power via the power supply plugged into an AC outlet.

Wired Ethernet: Power via Power-over-Ethernet

The MK1000 supports Power-over-Ethernet (Symbol Technologies' Bias-T functionality). When an Ethernet (10Base-T) cable is connected to the LAN port, in addition to being the conduit for data exchange, it can also be used as a conduit to provide power to the MK1000.

RS-485

RS-485 is sometimes termed the Multidrop LAN since it can connect several devices in a LAN network environment. These devices are all connected to a single pair wire (i.e., transmit and receive share the same two wires).

When the LAN port is used as an RS-485 connection, only a 10-conductor RJ-45 plug can be used.

Chapter 2
Setup and Installation: Mechanical

Overview

This chapter describes the hardware setup and installation of the MK1000.

Topics covered in this chapter include mounting, providing power, and connecting communication cables (if required) for the following four MK1000 communication interfaces:

- Wireless Ethernet (2Mb or 11Mb RF)
  - Power via AC outlet
  - Power via Power-over-Ethernet
- Wired Ethernet (10Base-T cable)
  - Power via AC outlet
  - Power via Power-over-Ethernet
- Wired RS-485 (Serial cable)
- Wired RS-232 (Serial cable).

Note: *After completing the mechanical installation of the MK1000, refer to Chapter 3, Setup and Installation: Communication to establish communication with the host.*

Wired Ethernet Setup

The MK1000 can communicate with a host via a wired Ethernet connection (10Base-T cable).

When communicating in this manner the MK1000 can be powered either using the MK1000's power supply connected to an AC outlet, or by receiving Power-over-Ethernet through the Ethernet cable.

Wired Ethernet: Power via AC Outlet

With this installation option, the MK1000 communicates to the host via a 10Base-T Ethernet cable and receives power via a power supply plugged into an AC outlet.

To install the MK1000, follow the instructions below.

1. Provide power to the MK1000 using its power supply.
   - Insert the round barrel connector at the end of the power supply cable into the MK1000's Power port. (See Figure 1-1 on page 1-3 for port locations.)
   - Plug the power supply into a wall outlet.
2. Attach the Ethernet cable.
   - Connect the Ethernet cable to the LAN port on the MK1000. (See Figure 1-1 on page 1-3 for port locations.) Ensure the Ethernet cable is terminated according to the *Ethernet Pin-Outs: Obtaining Power via AC Power Supply* described in *Table 2-1 and Table 2-2.*
   - Plug the other end of the Ethernet cable into the host system's LAN port.
3. To mount the MK1000, see *Mounting the MK1000* on page 2-11.

After completing the mechanical installation of the MK1000, refer to Chapter 3, *Setup and Installation: Communication* to establish communication with the host.

Wired Ethernet: Power via Power-over-Ethernet

With this installation option, in addition to the MK1000 communicating to the host via a 10Base-T Ethernet cable, the MK1000 also simultaneously receives its power via the same Ethernet cable.

Note: *Power-over-Ethernet should NOT be used in conjunction with an external power supply connected to the power port on the MK1000 otherwise damage can occur to the MK1000 and/or network.*

To install the MK1000, follow the instructions below.

1. Attach the Ethernet cable.
   - Connect the Ethernet cable to the LAN port on the MK1000. (See Figure 1-1 on page 1-3 for port locations.) Ensure the Ethernet cable is terminated according to the *Ethernet Pin-Outs: Obtaining Power via Power-over-Ethernet* described in *Table 2-3 and Table 2-4.*
   - Plug the other end of the Ethernet cable into the Bias-T (Power-over-Ethernet) module.
2. Connect a patch cable from the Bias-T (Power-over-Ethernet) module to your host system's LAN port.
3. To mount the MK1000, see *Mounting the MK1000* on page 2-11.

After completing the mechanical installation of the MK1000, refer to Chapter 3, *Setup and Installation: Communication* to establish communication with the host.

Wireless Ethernet Setup

The MK1000 can communicate with a host via a wireless (RF) Ethernet connection.

When communicating in this manner the MK1000 can be powered either using the MK1000's power supply connected to an AC outlet, or by receiving Power-over-Ethernet via cable.

Wireless Ethernet: Power via AC Outlet

With this installation option, the MK1000 communicates to the host via a wireless (RF) connection and receives power via a power supply plugged into an AC outlet.

To install the MK1000, follow the instructions below.

1. Provide power to the MK1000 using its power supply.
   - Insert the round barrel connector at the end of the power supply cable into the MK1000's Power port. (See Figure 1-1 on page 1-3 for port locations.)
   - Plug the power supply into a wall outlet.
2. To mount the MK1000, see *Mounting the MK1000* on page 2-11.

After completing the mechanical installation of the MK1000, refer to Chapter 3, *Setup and Installation: Communication* to establish communication with the host.

Wireless Ethernet: Power via Power-over-Ethernet

With this installation option, the MK1000 communicates to the host via a wireless (RF) connection and receives power via an Ethernet cable.

Note: *This Ethernet cable does NOT provide data to the MK1000.*

To install the MK1000, follow the instructions below.

1. Attach the Ethernet cable to provide power to the MK1000.
   - Connect the Ethernet cable to the LAN port on the MK1000. (See Figure 1-1 on page 1-3 for port locations.) Ensure the Ethernet cable is terminated according to the *Ethernet Pin-Outs: Obtaining Power via Power-over-Ethernet* described in *Table 2-3 and Table 2-4.*
   - Plug the other end of the Ethernet cable in the hub.
2. Connect a patch cable from the Bias-T (Power-over-Ethernet) module to your host system's LAN port.
3. To mount the MK1000, see *Mounting the MK1000* on page 2-11.

After completing the mechanical installation of the MK1000, refer to Chapter 3, *Setup and Installation: Communication* to establish communication with the host.

Wired RS-485 Setup

The MK1000 can communicate with a host via a wired RS-485 Serial connection while receiving power via a power supply plugged into an AC outlet.

For MK1000 devices installed where pre-existing PCK 9100 wiring exists, an RS-485 pin-out converter can be used. This pin-out converter maps the PCK 9100 signals into the required MK1000 pin-out and attaches to the existing PCK 9100 wiring, and then into the MK1000.

RS-485 is a two-wire differential signal: RS-485 signal and RS-485 inverted signal. See Figure 2-2 on page 2-8 for an illustration of the two-wire differential signal.

When installing an RS-485 configuration, ensure each MK1000 is connected directly to the RS-485 bus (see Figure 2-1).

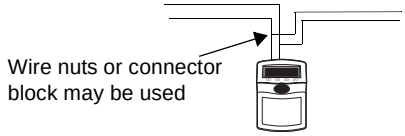


Figure 2-1. Connector Block

The cable required for an RS-485 installation should meet or exceed the following specifications:

- 1 twisted pair 26 AWG (7/34) tinned copper
- twisted pair foil wrapped - 100% coverage
- nominal impedance 120 ohms
- capacitance between twisted pair 10-25 pf per foot
- capacitance between conductors & shield 20-35 pf per foot
- DC resistance of each conductor 45 ohms per 1000 feet
- DC resistance of shield 10 ohms per 1000 feet.

If your host does not support RS-485 and you wish to use RS-485 as your communication interface, an RS-232 to RS-485 conversion box is required. The conversion box must be sourced locally and is not available from Symbol Technologies.

To install the MK1000 with a host that does not support RS-485, follow the instructions below.

1. Provide power to the MK1000 using its power supply.
   - Insert the round barrel connector at the end of the power supply cable into the MK1000's Power port. (See Figure 1-1 on page 1-3 for port locations.)
   - Plug the power supply into a wall outlet.
2. Connect the conversion box to the host using an RS-232 cable.
3. Attach the RS-485 Serial cable.
   - Connect the RS-485 Serial cable to the LAN port on the MK1000. (See Figure 1-1 on page 1-3 for port locations.) Ensure the Serial cable is terminated according to the *RS-485 Connectors - LAN Port* described in *Table 2-5.*
   - Plug the other end of the RS-485 Serial cable into the converter box.
4. To mount the MK1000, see *Mounting the MK1000* on page 2-11.

After completing the mechanical installation of the MK1000, refer to Chapter 3, *Setup and Installation: Communication* to establish communication with the host.

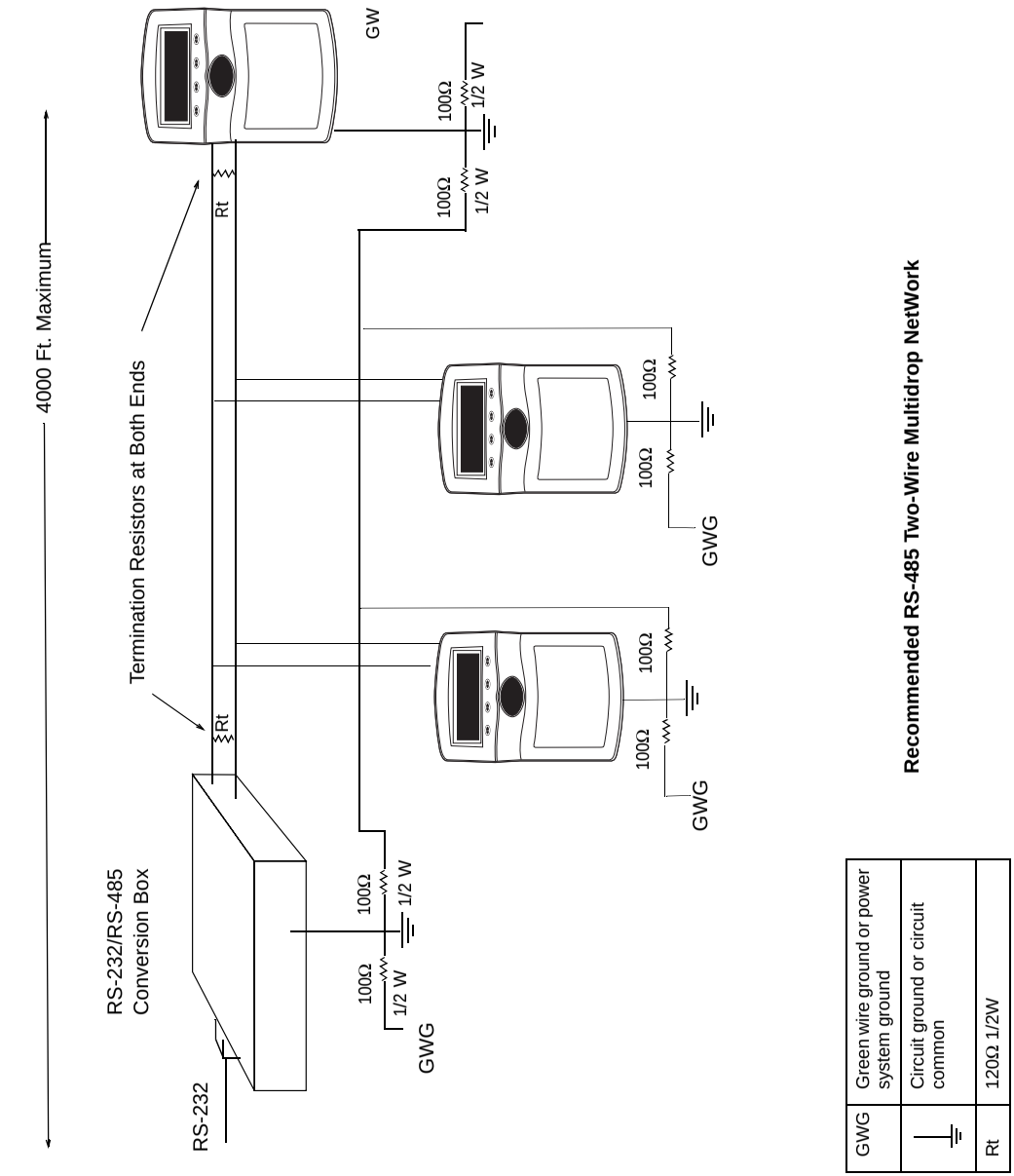


Figure 2-2. RS-485 Two-Wire Serial Network

Wired RS-232 Setup

The MK1000 can communicate with a host via a Serial cable connected to the Com/Scanner port while receiving power via a power supply plugged into and AC outlet.

To install the MK1000, follow the instructions below.

1. Provide power to the MK1000 using its power supply.
   - Insert the round barrel connector at the end of the power supply cable into the MK1000's Power port. (See Figure 1-1 on page 1-3 for port locations.)
   - Plug the power supply into a wall outlet.
2. Attach the RS-232 Serial cable.
   - Connect the RS-232 Serial cable to the Com/Scanner port on the MK1000. (See Figure 1-1 on page 1-3 for port locations.) Ensure the Serial cable is terminated according to the *Serial/RS-232 Communication* pin-outs described in *Table 2-6.*
   - Plug the other end of the Serial cable into the host.
3. To mount the MK1000, see *Mounting the MK1000* on page 2-11.

After completing the mechanical installation of the MK1000, refer to Chapter 3, *Setup and Installation: Communication* to establish communication with the host.

Connecting an Auxiliary Device to the Com/Scanner Port

If the Com/Scanner port is not being used for communication with the host, an external device, such as a scanner (decoded or undecoded), can be attached to the Com/Scanner port. (See Figure 1-1 on page 1-3 for port locations.) The auxiliary device can pull power from the MK1000.

To connect an external device, follow the instructions below.

1. Attach the auxiliary device's cable to the Com/Scanner port on the MK1000. (See Figure 1-1 on page 1-3 for port locations.) Ensure the auxiliary device's cable is terminated properly.
   - For *Serial/RS-232 Communication* pin-outs see *Table 2-6.*
   - *For Undecoded Wand/Wand Emulation Communication* pin-outs see *Table 2-7.*
2. Plug the other end of the cable into the auxiliary device.
3. To mount the MK1000, see *Mounting the MK1000* on page 2-11.

After completing the mechanical installation of the MK1000, refer to Chapter 3, *Setup and Installation: Communication* to establish communication with the host.

Mounting the MK1000

The MK1000 can be mounted on a wall, pole or counter top. Separately sold mounting accessories are listed below.

- Wall Mount Kit
- Pole Mount Kit
- Counter Top Stand

The MK1000 can also be mounted without the accessories listed above. To mount the MK1000 on a wall without using the wall mount kit, follow the instructions below.

1. Determine the MK1000 mounting location.
2. Using a pencil, mark the mounting screw location. Refer to the mounting template provided in the MK1000 Quick Reference Guide (p/n 72-52968-xx) included with every MK1000. The screws must be 5 inches (12.7 cm) apart, left to right: and, 6 inches (15.3 cm) apart, top to bottom.

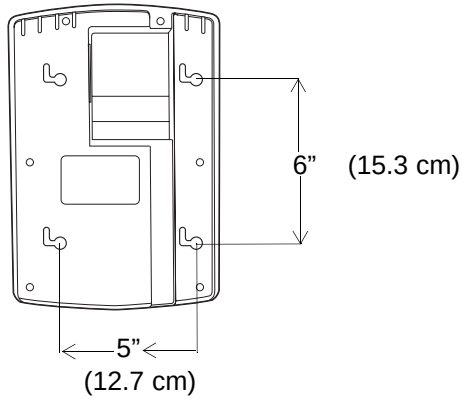


Figure 2-3. Mounting Dimensions

There must be a clearance of at least 9/16 of an inch (14.3mm) between the center of the right side mount holes and nearest object.

1. Install the mounting screws in the markings on the wall, leaving room for the mounting holes on the back of the MK1000 to slide onto. Ensure the screws are securely anchored to the wall.
2. Place the MK1000 on the wall, aligning the notches on the back of the unit with the mounting screws. Ensure all cables lie neatly in the channel provided on the back of the unit.
3. Slide the MK1000 to the left and down to secure in place.

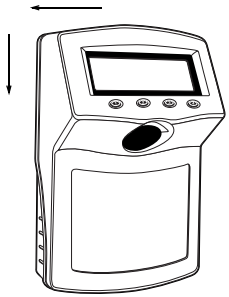


Figure 2-4. Mounting Directions

Cable Pin-Outs

Table 2-1 through Table 2-7 describe the CABLE termination required for attaching an external cable to the MK1000.

Figure 2-5. 8-Pin and 10-Pin Connectors

Ethernet Connectors - LAN Port

Ethernet Pin-Outs: Obtaining Power via AC Power Supply

Table 2-1. Ethernet 10Base-T Cable: 8-Pin

Pin	Description
Pin 1	TXD (+)
Pin 2	TXD (-)
Pin 3	RXD (+)
Pin 6	RXD (-)
Pin 7	GND
Pin 8	GND

Table 2-2. Ethernet 10Base-T Cable: 10-Pin

Pin	Description
Pin 2	TXD (+)
Pin 3	TXD (-)

Table 2-2. Ethernet 10Base-T Cable: 10-Pin (Continued)

Pin	Description
Pin 4	RXD (+)
Pin 7	RXD (-)
Pin 8	GND
Pin 9	GND

Ethernet Pin-Outs: Obtaining Power via Power-over-Ethernet

Power-over-Ethernet pin-out connectors allow ethernet signals and power supply voltage to be supplied to the MK1000 through a single Ethernet cable.

If power to the MK1000 is being provided via Power-over-Ethernet, do NOT plug the power supply into the MK1000 as well.

Table 2-3. Power-over-Ethernet Cable: 8-Pin

Pin	Description
Pin 1	TXD (+)
Pin 2	TXD (-)
Pin 3	RXD (+)
Pin 4	Bias-T (+)
Pin 5	Bias-T (-)
Pin 6	RXD (-)
Pin 7	GND
Pin 8	GND

Table 2-4. Power-over-Ethernet Cable: 10-Pin

Pin	Description
Pin 2	TXD (+)
Pin 3	TXD (-)
Pin 4	RXD (+)
Pin 5	Bias-T (+)
Pin 6	Bias-T (+)
Pin 7	RXD (-)
Pin 8	GND
Pin 9	GND

RS-485 Connectors - LAN Port

Table 2-5. RS-485 Cable: 10-Pin

Pin	Description
Pin 1	RS-485 (+)
Pin 8	GND
Pin 10	*****RS-485 (-)
***** Inverted Signal	

RS-232 Connectors - Com/Scanner Port

Serial/RS-232 Communication

This cable pin-out can be used for both Serial communication from the host to the MK1000 and/or communication between an external hand held decoded scanner and the MK1000.

Table 2-6. RS-232 Cable: 10-Pin

Pin	Description
Pin 1	+5V @ 500mA maximum (output)
Pin 3	RXD (input)
Pin 5	RTS (output)
Pin 6	Ground
Pin 7	CTS (input)
Pin 9	TXD (output)

Undecoded Wand/Wand Emulation Communication

Table 2-7. Undecoded Auxiliary Device Cable: 10-Pin

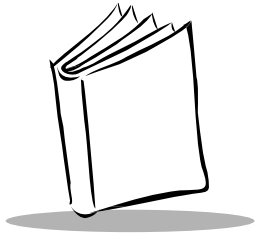
Pin	Description
Pin 1	Power +5V@200mA maximum
Pin 2	Laser On
Pin 4	***DBP**
Pin 6	GND
Pin 8	Trigger
***** Digital Bar Code Pattern	

MK1000 LAN Port Pin-Outs

Table 2-8 describes the MK1000's pin-outs for its LAN port and is given for general starting information only. To generate a cable to attach to the MK1000, see *Cable Pin-Outs* on page 2-13.

Table 2-8. MK1000 LAN Port: RJ-45 10-Pin

Pin	Description
Pin 1	RS-485 TXD/RXD (+)
Pin 2	10BaseT TXD (+)
Pin 3	10BaseT TXD (-)
Pin 4	10BaseT RXD (+)
Pin 5	BIAS-T (+)
Pin 6	BIAS-T (+)
Pin 7	10BaseT RXD (-)
Pin 8	GND
Pin 9	GND
Pin 10	RS-485 TXD/RXD (-)



Chapter 3
Setup and Installation: Communication

Overview

This chapter describes the steps required to establish communication between the MK1000 and a host.

Note: *The host must be able to support either the RS-232 or Ethernet communication interface. Common host operating systems that support these interfaces include Windows, Unix, DOS, and IBM 468x/469x.*

Topics covered in this chapter include:

- Communication protocol (PCK emulation) overview
- Selecting a communication interface
- Configuring for host communication via the MK1000 Configuration menu
- Configuring for host communication via the PCK Configuration menu
- Configuring for host communication via a Telnet client.

Before communications with the host is established, you must determine which communication interface to use.

Communication Protocol Overview

The MK1000 is shipped with the PCK emulation communication protocol on-board.

The Symbol PCK emulation application* is a PCK9100/9140 emulator for the Symbol MK1000. The Symbol PCK emulation application uses a proprietary command set developed by Symbol Technologies for use with its Kiosk Scanning Solutions. The PCK emulation application allows the MK1000 to behave like a Symbol PCK9100/9140 and interact with PCK9100/9140 compatible applications on the host. For more information on the PCK emulation application see Chapter 5, *PCK Emulation*.

Note: **The MK1000's PCK emulation application is not compatible with pre-existing PCK9142/9144/9130 applications.*

Communication Interface Overview

Before establishing communications with the host you must determine which communication interface to use. Your MK1000 may support up to four communication interfaces. The four types of interfaces are listed in Table 3-1.

The number and type of communication interfaces your unit has is specified in its model number. For a list of MK1000 model numbers and their supported onboard communication interfaces see the Appendix F, *Troubleshooting*.

Table 3-1. Communication Interfaces Versus Communication Protocols

	Communication Protocol
Communication Interface	PCK Emulation
Ethernet - Wireless (2 Mbps or 11 Mbps RF)	x
Ethernet - Wired (10Base-T Cable)	x
RS-485 (Wired Serial)	x
RS-232 (Wired Serial)	x

Configuring the MK1000 for Host Communication

Now that the communication interface has been selected, you are ready to configure the MK1000 for communication with your host. Table 3-2 shows the different methods available for configuring the MK1000.

Table 3-2. Methods of Configuring the MK1000

	Remote	Local		
	Computer	Bar codes	Bar codes and 4 Buttons	**Comments**
- PCK Configuration Menu		X		- See Notes 1 and 4
- MK1000 Configuration Menu			X	- See Notes 2 and 5
- Telnet Session	X			- See Notes 2 and 3

Notes:

1. From the PCK Configuration menu the following parameters cannot be configured: the RF Settings, ESS ID, Encryption, Key ID, and Key Management. These parameters can be configured from the MK1000 Configuration menu and/or a Telnet Session.
2. From the MK1000 Configuration menu and/or a Telnet session the following PCK emulation parameters cannot be configured: the PCK communication interface (Change/Select Host Type), software handshaking, and RS-485 Net ID. These parameters can be configured from the PCK Configuration menu.
3. Telnet sessions require an Ethernet connection between the host and the MK1000.
4. PCK Configuration programming bar codes are located in Appendix B, *PCK Configuration Programming Bar Codes*.
5. MK1000 Configuration menu programming bar codes are available in Appendix A, *Configuration Menu Programming Bar Codes*.

Configuring via the PCK Configuration Menu

Overview

The MK1000 can be configured for operation with PCK based applications using the PCK Configuration menu. The PCK Configuration menu can be accessed locally by scanning programming barcodes, which are available in Appendix B, *PCK Configuration Programming Bar Codes*.

From the PCK Configuration menu all MK1000 parameters can be accessed except the RF Settings, ESS ID, Encryption, Key ID, and Key Management. These parameters can only be accessed from the MK1000 Configuration menu and/or a Telnet session. For information on alternate methods of configuring the MK1000, see page 3-3.

MAP: PCK Configuration Menu

The following map can be used to assist in the navigation of the PCK application.

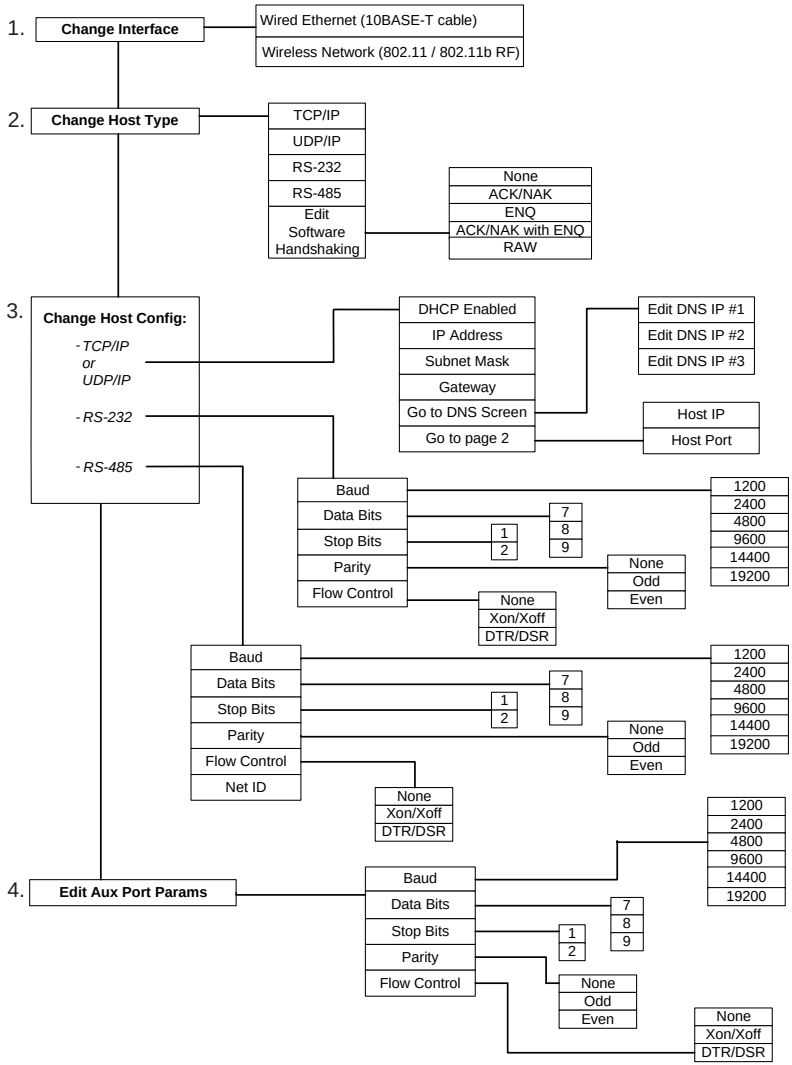


Figure 3-1. Navigating the PCK Configuration Menus/Screens

Entering, Navigating & Saving Changes

Entering the PCK Configuration Menu

To access the PCK Configuration menu scan the **Enter PCK Configuration Menu** programming bar code, available in Appendix B, *PCK Configuration Programming Bar Codes*.

When the bar code is scanned, the following menu displays:

```
      PCK Configuration

Current Host: TCP/IP, 10BASET

1. Change Interface
2. Change Host Type
3. Change Host Config
4. Edit Aux Port Params
   Scan 1-4 to Select Item
```

Figure 3-2. PCK Configuration Menu

Navigating the Main Menu

To navigate the main menu, scan the numeric programming bar code in Appendix B, *PCK Configuration Programming Bar Codes* that corresponds to the menu option (parameter) you wish to review/change. For example, if you wish to change the host type, you can access the Select Host Type screen by scanning the “2” bar code at the PCK Configuration menu.

Saving Changes

After you have navigated through the necessary screens and made your desired changes, you can save the changes by scanning the **Save & Exit** bar code on page B-4.

Escaping a Screen Without Saving Changes

If you have accidentally entered a screen and wish to exit it WITHOUT making ANY changes, scan the **Cancel** bar code on page B-5.

Exiting the PCK Configuration Menu

When all desired changes are made, scan the **Exit and Save Changes** bar code on page B-3 to exit PCK emulation configuration.

Selecting an Option (Parameter) from a List of Options

To select an parameter from a list, scan the numeric programming bar code in Appendix B, *PCK Configuration Programming Bar Codes* that corresponds to the parameter you wish to select.

For example, to change the communication interface to wired Ethernet, navigate the main menu and make your communication interface selection as follows:

1. Scan the **Enter PCK Configuration Menu** bar code to access the PCK Configuration menu.
2. Scan the number “1” bar code to access the Select Interface Type screen.
3. Scan the number “1” bar code to choose *Wired Ethernet (10BaseT*) as your communication interface.
4. When the number “1” bar code is scanned and *Wired Ethernet (10BaseT*) is selected, you are returned to the PCK Configuration menu.
5. Continue with additional changes by scanning the appropriate numeric bar code to access another screen, or to initiate operation of the MK1000 in PCK emulation mode, scan the **Save & Exit** bar code.

Note: *Scan the **Cancel** bar code to exit WITHOUT saving ANY of your changes.*

Entering Field Data (Numeric Values)

Data fields, such as IP Address, require the user to enter a combination of numeric values. On the appropriate screen, enter the numeric values by scanning the bar codes that correspond to the data you wish to enter.

For example, to enter a numeric value such as an IP Address:

1. Scan the **Enter PCK Configuration Menu** bar code to access the PCK Configuration menu.
2. Ensure the communication interface is set to Ethernet. Your “current (communication interface) host setting” is displayed on the second line of the PCK Configuration menu.

- If your current setting is Ethernet (wired or wireless and TCP/IP or UDP/IP), no change is necessary.
- If your current setting is not Ethernet, scan the “1” bar code to change the interface and scan the “1” bar code again to select Ethernet.

3. Once your communication interface is confirmed, check and change the MK1000’s IP address by scanning the number “3” bar code (*Change Host Config*) at the PCK Configuration menu to access the `TCP/IP Configuration Page 1`.
4. Scan the number “1” bar code (*TCP/IP*) to access TCP/IP Configuration Page 1 screen.
5. Scan the number “2” bar code (*IP Address*) to access the IP address data field. This screen displays the current IP address field (*Curr IP Addr*) and the new IP address field (*New IP Addr*).
6. To enter a new IP address, scan the numeric bar codes that correspond to the IP address you desire. Note that the IP address field requires you to scan three digits for each segment in the address for the segment separator "dots" to be applied correctly (see *Example: Entering an Numeric Value -- IP Address* on page 3-9).
7. When you have completed scanning the IP address via numeric bar codes, scan the **Save & Exit** bar code to save your changes and exit the current screen. The MK1000 changes its IP address to the new value you entered and returns you to the previous screen.

   or

   If you do not wish to change the current (IP address) setting, scan the **Cancel** bar code to exit the WITHOUT saving your changes.

Example: Entering an Numeric Value -- IP Address

To enter a new IP address of 234.239.5.16, scan the following programming bar codes in this order:

Scan Bar Code	Screen Display
2	2
3	23
4	234
2	234.2
3	234.23
9	234.239
0	234.239.0
0	234.239.00
5	234.239.005
0	234.239.005.0
1	234.239.005.01
6	234.239.005.016
Save & Exit	Previous screen (I/P address changed)
Save & Exit	Main menu
Save & Exit	Exit main menu and initiate operation of the MK1000 in PCK emulation mode.

PCK Configuration Menu

The main PCK Configuration menu displays when the **Enter PCK Configuration Menu** programming bar code is scanned (see Figure 3-2).

Selecting an Interface Type

Change Interface - PCK Configuration Menu Option 1

To select or change the interface type that the MK1000 uses to talk to a host, choose *Change Interface* at the PCK Configuration menu by scanning the "1" bar code located in the section *Numeric Bar Codes* on page B-7.

The Select Interface Type screen displays.

```
     Select Interface Type:

1. Wired Ethernet (10BaseT)
2. Wireless Network



   Scan 1 or 2 to Select Item
```

Figure 3-3. Select Interface Type Screen

Scanning a "1" or "2" bar code sets the type (10BaseT or Wireless) and returns you to the PCK Configuration menu.

Selecting a Host Type

Change Host Type- PCK Configuration Menu Option 2

To select or change the host type, choose *Change Host Type* at the PCK Configuration menu by scanning the "2" bar code located in the section *Numeric Bar Codes* beginning on page B-6 to display the Select Host Type screen.

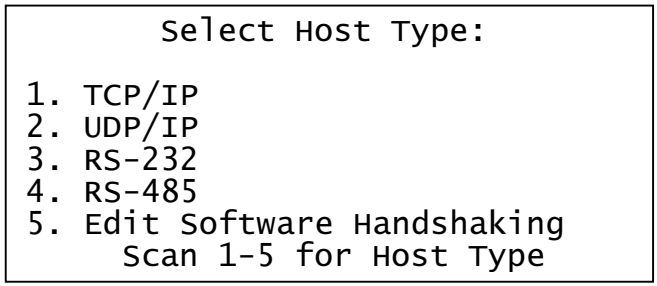


Figure 3-4. Select Host Type Screen

Scanning a "1", "2", “3”, or “4” bar code selects the corresponding host type and returns you to the PCK Configuration menu.

Scan the “5” bar code to edit Software Handshaking.

Editing Software Handshaking

Note: *Software Handshaking configuration supported in PCK emulation versions 1.06 and greater.*

When you scan the “5” bar code at the Select Host Type screen, the Software Handshaking Config screen displays.

```
  Software Handshaking Config
Current HS: ACK/NAK
1. None
2. ACK/NAK
3. ENQ
4. ACK/NAK with ENQ
5. RAW
  Scan 1-5 for S/W HS Type
```

Figure 3-5. Software Handshaking Config Screen

Scan the numeric bar code corresponding to the type of Software Handshaking desired. Once scanned, you are returned to the Select Host Type screen.

Changing Host Configuration

Change Host Config- PCK Configuration Menu Option 3

To select or change the settings for a particular host type, choose *Change Host Config* at the PCK Configuration menu by scanning the "3" bar code located in the section *Numeric Bar Codes* on page B-7.

This system displays a host configuration screen that matches the host type currently selected. If it is inappropriate, scan the **Cancel** bar code to return to the main PCK Configuration menu and scan the “2” bar code (*Change Host Type*) to set the correct host type.

The host configuration screen displayed can be a Serial type (RS-232 or RS-485), or an Ethernet host. If an Ethernet host, either a TCP/IP configuration or UDP/IP configuration screen displays. Ensure this setting is correct. If not, correct it before you proceed. Both host types (Serial and Ethernet) have two pages of parameters to set, and both are handled similarly.

TCP/IP Configuration

When the TCP/IP option is scanned for TCP/IP configuration, the following screen displays:

```
  TCP/IP Configuration Page 1
1.DHCP Enabled:  No
2.IP Address: 192.168.0.1
3.Subnet Mask:255.255.255.0
4.Gateway:    255.255.255.255
5.Go to DNS Screen
6.Go to Page 2
   Scan item number to edit
```

Figure 3-6. TCP/IP Configuration Page 1

Scan the number "6" bar code to display the second TCP/IP screen.

```
  TCP/IP Configuration Page 2
1.Host IP:    0.0.0.0
2.Host Port:  0

3.Go Back to Page 1


   Scan item number to edit
```

Figure 3-7. TCP/IP Configuration Page 2

Scan the required numeric bar code(s) to enter data in any field, as necessary. For Host IP addresses, you must enter three digits for each segment for "dots" to be supplied correctly. For example, if you want to set the address 10.10.1.2, you must enter 010.010.001.002. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

UDP/IP Configuration

When the UDP/IP option is scanned for UDP/IP configuration, the following screen displays (scan the number "6" bar code to display the second UDP/IP screen):

```
  UDP/IP Configuration Page 1
1.DHCP Enabled:  No
2.IP Address: 192.168.0.1
3.Subnet Mask:255.255.255.0
4.Gateway:    255.255.255.255
5.Go to DNS Screen
6.Go to Page 2
   Scan item number to edit
```

```
  UCP/IP Configuration Page 2
1.Host IP:    0.0.0.0
2.Host Port:  0

3.Go Back to Page 1


   Scan item number to edit
```

Figure 3-8. UDP/IP Configuration Pages 1 & 2

Scan the required numeric bar code(s) to enter data in any field, as necessary. For Host IP addresses, you must enter three digits for each segment for "dots" to be supplied correctly. For example, if you want to set the address 10.10.1.2, you must enter 010.010.001.002. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

Auxiliary Port Parameters

Edit Aux Port Params - PCK Configuration Menu Option 4

To select or change the auxiliary port parameters, choose *Edit Aux Port Params* at the PCK Configuration menu by scanning the "4" bar code located in the section *Numeric Bar Codes* beginning on page B-6.

The following RS-232 Configuration screen displays:

```
      RS-232 Configuration

1.Baud: 9600
2.Data Bits: 7
3.Stop Bits: 2
4.Parity: Even
5.Flow Cntrl: None
  Scan Item Number to Edit
```

Figure 3-9. RS-232 Configuration Screen

Scan the numeric bar code that matches the selection you wish to edit.

Note: *When you have completed entering numeric values on any screen, scan the "Enter" bar code. Successive scans of the "Enter" bar code return you to the main PCK Configuration menu where you must scan "Exit PCK Config" to save changes.*

*If you wish to exit any screen without completing your entries, scan the **Cancel** bar code to return to the parent screen. Any changes made in the present screen are discarded.*

Configuring via the MK1000 Configuration Menu

Overview

The MK1000 can be configured for operation with PCK based applications using the MK1000 Configuration menu. In addition, if running a custom application not based on PCK emulation, the MK1000 Configuration menu is the only method for configuring the unit.

The MK1000 Configuration menu can be accessed locally using the MK1000 function buttons, locally by scanning programming bar codes, or remotely via a Telnet client.

From the MK1000 Configuration menu all MK1000 parameters can be accessed except the PCK communication interface (Change/Select Host Type), software handshaking, and RS-485 Net ID. These parameters can only be accessed from the PCK Configuration menu. For information on alternate methods of configuring the MK1000, see page 3-3.

MAP: MK1000 Configuration Menu

Upon entering the menu system, Figure 3-10 is used for navigation.

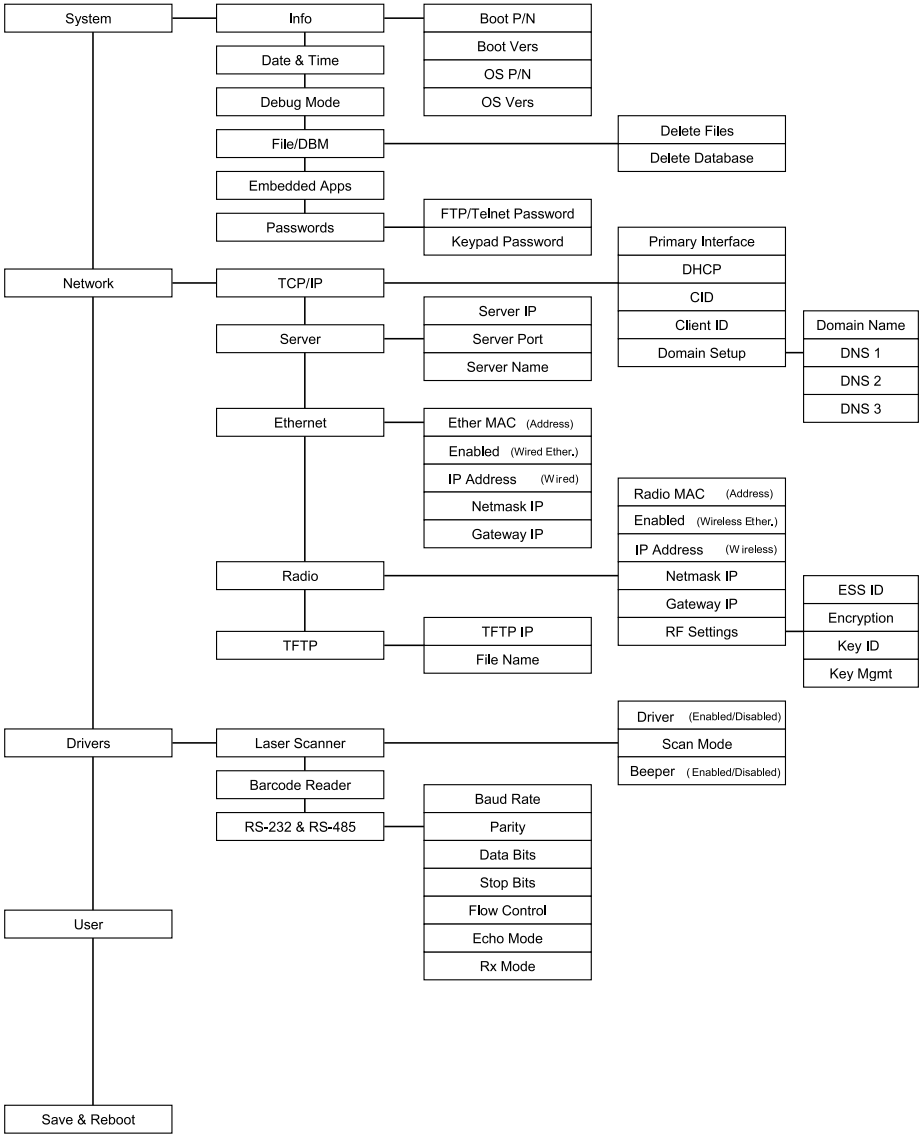


Figure 3-10. MK1000 Configuration Menus/Screens

Entering, Navigating & Saving Changes

Entering the MK1000 Configuration Menu

There are three ways to access the MK1000 Configuration menu:

- locally using the MK1000 function buttons
- locally by scanning bar codes
- remotely via Telnet.

For information about accessing Configuration menus/screens remotely via Telnet, refer to *Configuration via a Telnet Session* on page 3-47.

To use the MK1000 function buttons to access the first configuration menu:

1. Press the '1' and '4' buttons simultaneously to display the Password screen.

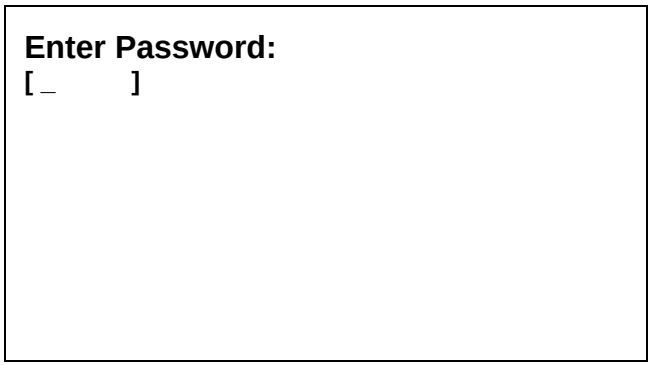


Figure 3-11. Password Screen

2. Using the four function buttons, enter the password '44213'.

Note: *If you enter the wrong 5-digit password, the system returns to the Out of Service screen. Press the '1' and '4' buttons simultaneously to start over.*

If you enter less than 5-digits and want to start over, enter five random digits to fill the buffer and return to the Out of Service screen.

---

3. When the password is entered successfully, the MK1000 Configuration menu displays:

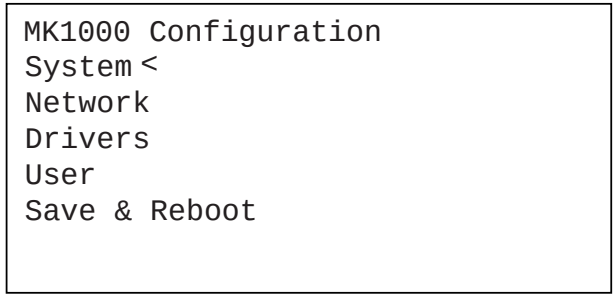


Figure 3-12. MK1000 Configuration Menu

When the MK1000 Configuration menu displays, other system activity related to application programs is suspended. Also, while the menus and screens are active, a timeout mechanism is in effect. If no button is pressed for two minutes, the menu system automatically terminates and resumes the application process(es) that was/were previously active.

Navigating the MK1000 Configuration Menu

The MK1000 has four function buttons located on the front panel. (See *Parts of the MK1000* on page 1-3 for button locations.) These buttons can be used to navigate the configuration menu and configure system parameters.

Note: *In addition to the four function buttons, the bar codes in Appendix A, Configuration Menu Programming Bar Codes can be used for menu navigation.*

The use of the four buttons are described below.

Table 3-3. Navigating The Configuration Menus/Screens Using Function Buttons

Button	Button Use	Description
Button 1	Escape	Returns to the previous screen.
Button 2	Previous	Moves the cursor (designated by the "<" symbol) up to any selectable menu item or alterable field.
Button 3	Next	Moves the cursor (designated by the "<" symbol) down to any selectable menu item or alterable field.
Button 4	Enter	Activates the selection to which the arrow (designated by the < symbol) points. In the case of editable fields, pressing Enter may change a value to one of several in a list or may enter a scrolling-edit mode where the user may enter multiple characters and or digits to complete the field edit.

In addition to the button functions described in Table 3-3, the buttons also allow you to enter alphanumeric values in data entry fields on the configuration screens. For more information, refer to *Entering Alphanumeric Values*.

Saving Changes

Exiting the MK1000 Configuration menu via the Save & Reboot option saves any changes made. Changes made while navigating the MK1000 Configuration screens are NOT saved or applied UNLESS the MK1000 Configuration menu is exited through its Save & Reboot option. Upon exiting in this manner, the unit reboots and applies the changes.

If the MK1000 Configuration menu is exited by pressing the ‘1’ button (Escape), changes will NOT be saved and the original settings are retained.

To save changes:

1. Access the MK1000 Configuration menu.
2. Press the Previous or Next buttons to move the "<" cursor to the Save & Reboot option.
3. Press the Enter button to save changes and reboot.

Entering Alphanumeric Values

To enter alphanumeric values when you want to change the contents of a field, such as an IP address:

1. Select the field using Previous and Next buttons.
2. Press the Enter button (i.e., button ‘4’) to enter "scroll-edit" mode. The field clears, and the first character of the field displays. For instance, when changing an IP address, the field is cleared and a zero ("0") displays at the first position with a blinking line under it.
3. Press the Previous and Next buttons to rotate through all possible values (0-9, ".").
4. When you reach the desired value, press the Enter button to lock it in and move to the next position.
5. If the desired value is entered into a position and you are finished data entry, press the Escape button to leave scroll-edit mode.
6. Press Enter to make the change permanent. The "<" cursor points to the field you just changed.
7. Press the Escape button to return to the main menu.
8. Select Save & Reboot to save your changes.

Note: *If you enter an incorrect value in a numeric data field (e.g., IP address) and want to start over, press the ‘1’ button (Escape) twice to replace the original data.*

The System Configuration Menu

From the MK1000 Configuration menu (see Figure 3-10 on page 3-17), press the Previous or Next buttons to move the "<" cursor to the System option and press the Enter button.

The System Configuration menu displays:

```
System Configuration
Info <
Date & Time
Debug Mode = DISABLED
File/DBM
Embedded Apps = ENABLED
Passwords
```

Figure 3-13. System Configuration Menu

Table 3-4. System Configuration Menu Definitions

Field Name	Description
Info	When selected, the Info option displays the *System Information* screen (see Figure 3-14). This screen displays the boot part number, boot version, operating system part number, and the operating system version.
Date & Time	**For future use.** This field allows you to set the system time.
Debug Mode	The Debug option can be used by programmers to allow dumping output from their programs to either a Serial port, or through a Telnet connection. If Serial port is selected, the output goes to the Com/Scanner port. (For programmer's, that's C_SID_IO_UART1.) While debugging using the Serial port, that port cannot be used by the user's application for any other purpose. The default Debug Mode for the MK1000 is DISABLED.

Table 3-4. System Configuration Menu Definitions (Continued)

Field Name	Description
File/DBM	When selected, the File/DBM option displays the *File Sys/DBM Management* screen (see Figure 3-15). From this screen it is possible to delete files located in RAM, or delete database memory which constitutes user stored values in the system DBM or GL. Deleting the database also returns all driver configuration settings to their defaults.
Embedded Apps	Toggle this field by pressing the Enter button. Enabling Embedded Apps allows the PCK emulation to run or, if configured, the built in Demo and Factory Test programs. Disabling Embedded Apps allows a downloaded user application to operate without interference from any application programs that are embedded. The default Embedded Apps value for the MK1000 is ENABLED.
Passwords	When selected, the Passwords option displays the *Change Passwords* screen (see Figure 3-16). From this screen you can set and change the FTP/Telnet and keypad passwords.

System Information Screen

From the System Configuration menu (see Figure 3-13 on page 3-22), press the Previous or Next buttons to move the "<" cursor to the Info option and press the Enter button. To return to the System Configuration menu, press the '1' button to escape.

The System Information screen displays:

```
System Information
Boot P/N  : S-14-00D-0N-09 <
Boot Vers : V01.12.09
OS P/N    : S-14-001-11-0Fx
OS Vers   : V4.06.08
```

Figure 3-14. System Information Screen

Table 3-5. System Information Screen Definitions

Field Name	Description
Boot P/N	This field represents the CTC boot block part number. The default Boot P/N for the MK1000 is S-14-00D-0N-09.
Boot Vers	The MK1000 boot block version number is V01.12.09.
OS P/N	This field represents the CTC operating system part number. The default OS P/N for the MK1000 is S-14-001-11-0Fx.
OS Vers	The MK1000 OS (Firmware) version number is V4.06.08.

File Sys/DBM Management Screen

From the System Configuration menu (see Figure 3-13 on page 3-22), press the Previous or Next buttons to move the "<" cursor to the File/DBM option and press the Enter button. To return to the System Configuration menu, press the ‘1’ button to escape.

The File Sys/DBM Management screen displays:

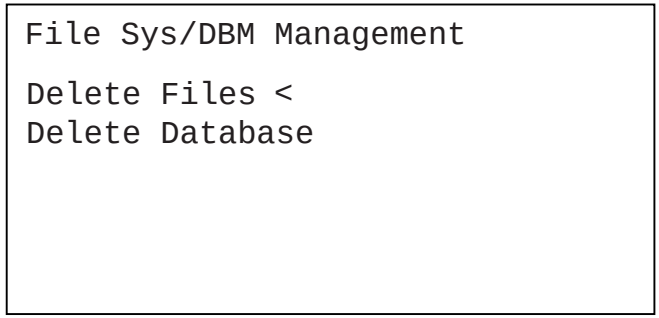


Figure 3-15. File Sys/DBM Management Screen

Table 3-6. File Sys/DBM Management Screen Definitions

Field Name	Description
Delete Files	When this option is selected, all files in RAM are deleted and the MK1000 reboots. This option must be executed before loading new Firmware (OS), if an upgraded version of the PCK emulation application was loaded.
Delete Database	When this option is selected, the database is deleted.

Change Passwords Screen

From the System Configuration menu (see Figure 3-13 on page 3-22), press the Previous or Next buttons to move the "<" cursor to the Passwords option and press the Enter button. To return to the System Configuration menu, press the ‘1’ button to escape.

The Change Passwords screen displays:

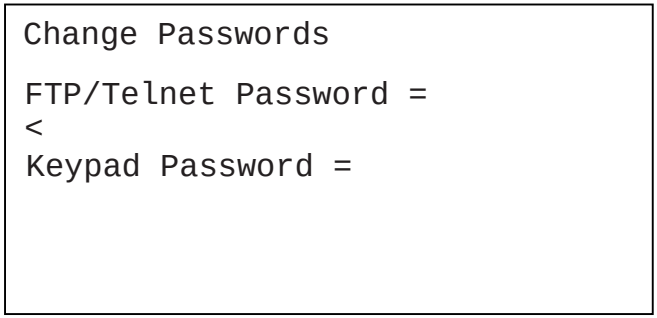


Figure 3-16. Change Passwords Screen

Table 3-7. Change Passwords Screen Definitions

Field Name	Description
FTP/Telnet Password	Press the Previous or Next buttons to move the "<" cursor to this field and enter the password required for FTP/Telnet operation.
Keypad Password	Press the Previous or Next buttons to move the "<" cursor to this field and enter the password required for user keypad operation.

The Network Configuration Menu

From the MK1000 Configuration menu (see Figure 3-10 on page 3-17), press the Previous or Next buttons to move the "<" cursor to the Network option and press the Enter button.

The Network Configuration menu displays:

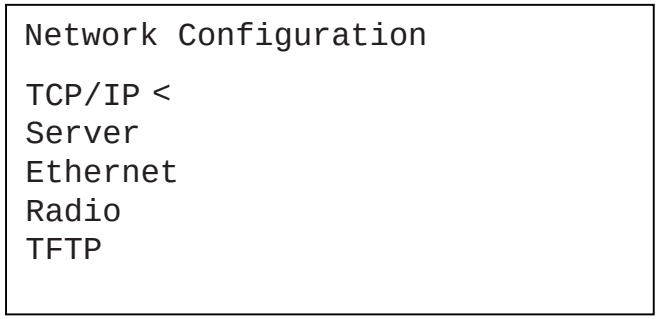


Figure 3-17. Network Configuration Menu

Note: *If DHCP mode is disabled and the IP address for either Ethernet or Radio is set to 0.0.0.0 (all zeros), then that interface attempts a BOOTP operation to obtain its IP address, Netmask and Gateway IP. Once a DHCP or BOOTP operation is successfully performed, the appropriate fields for the requesting device are filled in with the obtained values.*

Table 3-8. Network Configuration Menu Definitions

Field Name	Description
TCP/IP	When selected, the TCP/IP option displays the *TCP/IP Configuration* screen (see Figure 3-18). From this screen it is possible to configure the primary interface (Ethernet or Radio) that is used for establishing a TCP/UDP/IP connection and enabling DHCP mode. The primary interface is the first device that is started when the protocol stack begins operation. If both devices are enabled and both have the same subnet, outgoing communications are sent out by the primary interface even though the incoming packets may have arrived on the secondary interface. Therefore, it is necessary to ensure that the two interfaces are not setup on the same subnet. Configuring DHCP mode enables DHCP upon startup for either or both interfaces, if enabled.
Server	When selected, the Server option displays the *Server Configuration* screen (see Figure 3-20).The fields on this screen can be used to provide information to an application running on the MK1000. Configurable items on this screen are Server IP, Server Port and Server Name.
Ethernet	When selected, the Ethernet option displays the *Ethernet Configuration* screen (see Figure 3-21).This screen allows configuration of the Ethernet port. The port can be enabled or disabled, if not being used. Also on this screen the user can modify the IP address associated with this port along with the Netmask (i.e., Subnet Mask) and default Gateway IP addresses.

Table 3-8. Network Configuration Menu Definitions (Continued)

Field Name	Description
Radio	When selected, the Radio option displays the *Radio Configuration* screen (see Figure 3-22). The configuration screen for the Radio is nearly identical in function to that of the Ethernet port. The MAC address of the Radio (if present) is displayed at the top of the configuration screen (also factory assigned). Also on this screen is a link to RF Settings (see Figure 3-23) that allows configuration of Radio specific parameters such as ESS ID, Encryption type, Key ID and Key Management. From the Key Management screen it is possible to enter the various key (button) values in Hexadecimal form.
TFTP	**Not implemented.** In the future, this option will be used to specify a host system from which OS Firmware updates may be obtained.

TCP/IP Configuration Screen

From the Network Configuration menu (see Figure 3-17 on page 3-27), press the Previous or Next buttons to move the "<" cursor to the TCP/IP option and press the Enter button. To return to the Network Configuration menu, press the ‘1’ button to escape.

The TCP/IP Configuration screen displays:

```
TCP/IP Configuration
Primary Interface  =  RADIO    <
DHCP = DISABLED   CID = DISABLED
Client ID =
<
Domain Setup
```

Figure 3-18. TCP/IP Configuration Screen

Table 3-9. TCP/IP Configuration Screen Definitions

Field Name	Description
Primary Interface	Press the Previous or Next buttons to move the "<" cursor to this field and select the interface type (Ethernet or Radio). To toggle the field setting, press the Enter button. The default Primary Interface for the MK1000 is RADIO.
DHCP	Press the Previous or Next buttons to move the "<" cursor to this field and select the Dynamic Host Configuration Protocol. To toggle the field setting, press the Enter button. The default DHCP for the MK1000 is DISABLED.
CID	Press the Previous or Next buttons to move the "<" cursor to this field and select the option to enable or disable the Client ID (see Client ID below). To toggle the field setting, press the Enter button. The default CID for the MK1000 is DISABLED.
Client ID	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Client ID.
Domain Setup	When selected, the Domain Setup option displays the *Domain Settings* screen (see Figure 3-19). From this screen the user can set 3 domain server addresses.

Domain Settings

From the TCP/IP Configuration screen (see Figure 3-18 on page 3-29), press the Previous or Next buttons to move the "<" cursor to the Domain Setup option and press the Enter button. To return to the TCP/IP Configuration screen, press the ‘1’ button to escape.

The Domain Settings screen displays:

```
Domain Settings

Domain Name =
<
DNS #1  =  255.255.255.255
DNS #2  =  255.255.255.255
DNS #3  =  255.255.255.255
```

Figure 3-19. Domain Settings Screen

Table 3-10. Domain Settings Screen Definitions

Field Name	Description
Domain Name	Press the Previous or Next buttons to move the "<" cursor to this field and enter the local domain name.
DNS #1	Enter the domain address for the first domain server. The default Domain Server address for DNS #1 is 255.255.255.255.
DNS #2	Enter the domain address for the second domain server. The default Domain Server address for DNS #2 is is 255.255.255.255.

Table 3-10. Domain Settings Screen Definitions (Continued)

Field Name	Description
DNS #3	Enter the domain address for the third domain server. The default Domain Server address for DNS #3 is is 255.255.255.255.

Server Configuration Screen

From the Network Configuration menu (see Figure 3-17 on page 3-27), press the Previous or Next buttons to move the "<" cursor to the Server option and press the Enter button. To return to the Network Configuration menu, press the ‘1’ button to escape.

The Server Configuration Screen displays:

```
Server Configuration

Server IP = 192.168. 1. 1   <
Server Port = 4050
Server Name =
```

Figure 3-20. Server Configuration Screen

Table 3-11. Server Configuration Screen Definitions

Field Name	Description
Server IP	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Server IP address. The default Server IP address for the MK1000 is 192.168.1.1.

Table 3-11. Server Configuration Screen Definitions (Continued)

Field Name	Description
Server Port	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Server port. The default Server Port for the MK1000 is 4050.
Server Name	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Server name.

Ethernet Configuration Screen

From the Network Configuration menu (see Figure 3-17 on page 3-27), press the Previous or Next buttons to move the "<" cursor to the Ethernet option and press the Enter button. To return to the Network Configuration menu, press the ‘1’ button to escape.

The wired Ethernet Config screen displays:

```
Ethernet Config
Ether Mac = 00:60:A3:00:2D:BD <
Enabled = NO
IP Address = 192.168.0.1
Netmask IP = 255.255.255.0
Gateway IP = 255.255.255.255
```

Figure 3-21. Ethernet Config Screen

Table 3-12. Ethernet Config Screen Definitions

Field Name	Description
Ether MAC	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Ether MAC address. The default Ether MAC address for the MK1000 is 00:60:A3:00:2D:BD. This address is configured at the factory and cannot be altered.
Enabled	The port can be enabled or disabled, if not being used. The default for the MK1000 is NO (disabled). To toggle the field setting, press the Enter button.
IP Address	Press the Previous or Next buttons to move the "<" cursor to this field to modify the IP address associated with this port. The default wired Ethernet IP address for the MK1000 is 192.168.0.1.
Netmask IP	Press the Previous or Next buttons to move the "<" cursor to this field to modify the Netmask IP address associated with this port. The default Netmask IP address for the MK1000 is 255.255.255.0.
Gateway IP	Press the Previous or Next buttons to move the "<" cursor to this field to modify the Gateway IP address associated with this port. The default Gateway IP address for the MK1000 is 255.255.255.255.

Radio Configuration Screen

From the Network Configuration menu (see Figure 3-17 on page 3-27), press the Previous or Next buttons to move the "<" cursor to the Radio option and press the Enter button. To return to the Network Configuration menu, press the '1' button to escape.

The (wireless Ethernet) Radio Config screen displays:

```
Radio Config
Radio Mac = 00:A0:F8:2A:A6:37 <
Enabled = YES
IP Address = 192.168.0.2
Netmask IP = 255.255.255.0
Gateway IP = 255.255.255.255
RF Settings =
```

Figure 3-22. Radio Config Screen

Table 3-13. Radio Config Screen Definitions

Field Name	Description
Radio MAC	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Radio MAC address. The default Radio MAC address for the MK1000 (if present) is00:A0:F8:2A:A6:37. This address is configured at the factory and cannot be altered.
Enabled	The port can be enabled or disabled, if not being used. The default for the MK1000 is YES (enabled). To toggle the field setting, press the Enter button.

Table 3-13. Radio Config Screen Definitions (Continued)

Field Name	Description
IP Address	Press the Previous or Next buttons to move the "<" cursor to this field to modify the IP address associated with this port. The default wireless Ethernet IP address for the MK1000 is 192.168.0.2.
Netmask IP	Press the Previous or Next buttons to move the "<" cursor to this field to modify the Netmask IP address associated with this port. The default Netmask IP address for the MK1000 is 255.255.255.0.
Gateway IP	Press the Previous or Next buttons to move the "<" cursor to this field to modify the Gateway IP address associated with this port. The default Gateway IP address for the MK1000 is 255.255.255.255.
RF Settings	When selected, the RF Settings option displays the second Radio Configuration screen for RF Settings (see Figure 3-23). From this screen the user can configure Radio specific parameters such as ESS ID, Encryption type, Key ID and Key Management.

RF Settings

From the Radio Configuration screen (see Figure 3-22 on page 3-35), press the Previous or Next buttons to move the "<" cursor to the RF Settings option and press the Enter button. To return to the Radio Configuration screen, press the ‘1’ button to escape.

The Radio Config screen (for RF settings) displays:

```
Radio Config

ESS ID =
101   <
Encryption =  DISABLED
Key ID = 1
Key Management
```

Figure 3-23. Radio Config ‘RF Settings’ Screen

Table 3-14. RF Settings Screen Definitions

Field Name	Description
ESS ID	Press the Previous or Next buttons to move the "<" cursor to this field to set the ESS ID. The default ESS ID for the MK1000 is 101.
Encryption	Press the Previous or Next buttons to move the "<" cursor to this field to set the encryption mode. The default encryption mode for the MK1000 is DISABLED. To toggle the field setting to select 40-Bit or 128-Bit modes, press the Enter button.
Key ID	Press the Previous or Next buttons to move the "<" cursor to this field to set the active key. The default active Key ID for the MK1000 is key (button) ‘1’. To toggle the field setting to select key ‘2’, ‘3’, or ‘4’, press the Enter button.
Key Management	When selected, the Key Management option displays the *Encryption Keys* screen. From this screen the user can set various key (button) values in Hexadecimal form.

TFTP Configuration Screen

From the Network Configuration menu (see Figure 3-17 on page 3-27), press the Previous or Next buttons to move the "<" cursor to the TFTP option and press the Enter button. To return to the Network Configuration menu, press the ‘1’ button to escape.

The TFTP Configuration screen displays:

```
TFTP Configuration

TFTPIP = 0.0.0.0
File Name =
<
```

Figure 3-24. TFTP Configuration Screen

Table 3-15. TFTP Configuration Screen Definitions

Field Name	Description
TFTP IP	Press the Previous or Next buttons to move the "<" cursor to this field to enter the TFTP IP address. The default TFTP IP address for the MK1000 is ‘no address’ (all zeros).
File Name	Press the Previous or Next buttons to move the "<" cursor to this field to enter the TFTP file name.

The Driver Configuration Menu

From the MK1000 Configuration menu (see Figure 3-10 on page 3-17), press the Previous or Next buttons to move the "<" cursor to the Drivers option and press the Enter button.

The Driver Configuration menu displays:

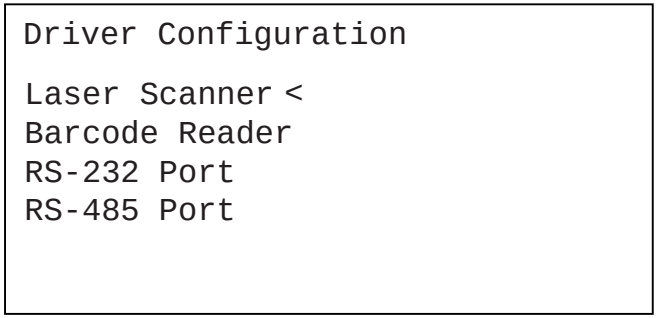


Figure 3-25. Driver Configuration Menu

Table 3-16. Driver Configuration Menu Definitions

Field Name	Description
Laser Scanner	When selected, the Laser Scanner option displays the *Laser Scanner Config* screen (see Figure 3-26). For the MK1000's onboard internal laser scanner, the driver can be enabled or disabled and the default scan mode can be changed. (See Appendix C, *Scanning Mode Programming Bar Codes* for a list of the scan modes.) If the driver is disabled then the scanner is not initialized and it becomes possible for a user application to communicate with the scanner directly using the appropriate Com driver (i.e., C_SID_IO_UART2).
Barcode Reader	This option requires no modifications to support an undecoded external scanner. If an external decoded scanner is connected to the MK1000, the RS-232 port must be configured to match the scanner's communication settings. (See the RS-232 Port description below for more information.)

Table 3-16. Driver Configuration Menu Definitions (Continued)

Field Name	Description
RS-232 Port	When selected, the RS-232 Port option displays the *RS-232 Config* screen (see Figure 3-27). This screen allows configuration of various RS-232 port settings including: Baud Rate, Parity, Data Bits, Stop Bits, Flow Control, Echo Mode, and Rx Mode. These parameters must be set to the same settings used by the host or auxiliary RS-232 device (such as a decoded scanner).
RS-485 Port	When selected, the RS-485 Port option displays the *RS-485 Config* screen (see Figure 3-28).The RS-485 screen is the same in structure as the RS-232 screen above. The main difference is in the available number of Data Bits as well as extra modes in the Rx Mode configuration option. Hardware support exists for both 10-bit and 11-bit serial frames (start bit, data bits, parity, stop bits) only.

Laser Scanner Configuration Screen

From the Driver Configuration menu (see Figure 3-25 on page 3-39), press the Previous or Next buttons to move the "<" cursor to the Laser Scanner option and press the Enter button. To return to the Driver Configuration menu, press the ‘1’ button to escape.

The Laser Scanner Config screen displays:

```
Laser Scanner Config

Driver = ENABLED  <
Scan Mode = CYCLONE
Beeper = DISABLED
```

Figure 3-26. Laser Scanner Config Screen

Table 3-17. Laser Scanner Config Screen Definitions

Field Name	Description
Driver	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to enable or disable the scanner driver. If the driver is disabled then the scanner is not initialized and it becomes possible for a user application to communicate with the scanner directly using the appropriate Com driver (i.e., C_SID_IO_UART2). The default laser scanner driver setting for the MK1000 is ENABLED.
Scan Mode	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the scan mode. The default scan mode for the MK1000 is CYCLONE. (See Appendix C, *Scanning Mode Programming Bar Codes* for a list of the scan modes.)
Beeper	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to enable or disable the MK1000 beeper. When enabled, a beep sounds upon a successful decode. The default beeper setting for the MK1000 is DISABLED.

RS-232 Configuration Screen

From the Driver Configuration menu (see Figure 3-25 on page 3-39), press the Previous or Next buttons to move the "<" cursor to either the RS-232 Port option and press the Enter button. To return to the Driver Configuration menu, press the '1' button to escape.

The RS-232 Config screen displays:

```
RS-232 Config
Baud = 9600  <     Echo = OFF
Parity = NONE      Rx   = XPT
Data = 8 BITS
Stops = 1 BIT
Flow = DTR/DSR
```

Figure 3-27. RS-232 Config Screen

Table 3-18. RS-232 Config Screen Definitions

Field Name	Description
Baud Rate	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Baud Rate. The default Baud Rate for MK1000 RS-232 port settings is 9600. Available Baud Rates: 110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, or 38400.
Parity	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select Parity. The default Parity for MK1000 RS-232 port settings is NONE. Available Parity settings: NONE, ODD, or EVEN.

Table 3-18. RS-232 Config Screen Definitions (Continued)

Field Name	Description
Data Bits	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Data Bits. The default Data Bits setting for MK1000 RS-232 port settings is 8 BITS. Available Data Bits settings: 7 BITS or 8 BITS.
Stop Bits	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Stop Bits. The default Stop Bits setting for MK1000 RS-232 port settings is 1 BIT. Available Stop Bits settings: 1 BIT or 2 BITS.
Flow Control	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Flow Control. The default Flow Control setting for MK1000 RS-232 port settings is DTR/DSR. Available Flow Control settings: DTR/DSR, BUSY, NONE, or XON/OFF.
Echo Mode	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Echo Mode. The default Echo Mode setting for MK1000 RS-232 port settings is OFF. Available Echo Mode settings: ON or OFF.
Rx Mode	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Rx Mode. The default Rx Mode setting for MK1000 RS-232 port settings is XPT. Available Rx Mode settings: PRTR, CMDL, or XPT.

RS-485 Configuration Screen

From the Driver Configuration menu (see Figure 3-25 on page 3-39), press the Previous or Next buttons to move the "<" cursor to either the RS-485 Port option and press the Enter button. To return to the Driver Configuration menu, press the ‘1’ button to escape.

The RS-485 Config screen displays:

```
RS-485 Config
Baud = 9600  <     Echo = OFF
Parity = NONE      Rx   = XPT
Data = 8 BITS
Stops = 1 BIT
Flow = DTR/DSR
```

Figure 3-28. RS-485 Config Screen

The RS-485 Config screen includes the same structure and field definitions as the RS-232 Config screen with a slight difference: RS-485 includes extra Rx modes, and hardware support exists for 10-bit and 11-bit serial frames (start bit, data bits, parity, stop bits) only.

Table 3-19. RS-485 Config Screen Definitions

Field Name	Description
Baud Rate	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Baud Rate. The default Baud Rate for MK1000 RS-485 port settings is 9600. Available Baud Rates: 110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, or 38400.

Table 3-19. RS-485 Config Screen Definitions (Continued)

Field Name	Description
Parity	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select Parity. The default Parity for MK1000 RS-485 port settings is NONE. Available Parity settings: NONE, ODD, or EVEN.
Data Bits	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Data Bits. The default Data Bits setting for MK1000 RS-485 port settings is 8 BITS. Available Data Bits settings: 7 BITS or 8 BITS.
Stop Bits	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Stop Bits. The default Stop Bits setting for MK1000 RS-485 port settings is 1 BIT. Available Stop Bits settings: 1 BIT or 2 BITS.
Flow Control	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Flow Control. The default Flow Control setting for MK1000 RS-485 port settings is DTR/DSR. Available Flow Control settings: DTR/DSR, BUSY, NONE, or XON/OFF.
Echo Mode	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Echo Mode. The default Echo Mode setting for MK1000 RS-485 port settings is OFF. Available Echo Mode settings: ON or OFF.

Table 3-19. RS-485 Config Screen Definitions (Continued)

Field Name	Description
Rx Mode	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Rx Mode. The default Rx Mode setting for MK1000 RS-485 port settings is XPT. Available Rx Mode settings: PRTR, CMDL, or XPT.

The User Menu

This menu will (in a future version) allow the user to use the same menu-interface for configuring options available within the user application.

Configuration via a Telnet Session

Overview

A Telnet client can be used to remotely connect to the MK1000 and remotely access the MK1000 Configuration menu. And, as mentioned in the MK1000 Configuration menu overview, the MK1000 Configuration menu is used to configure the unit for operation with PCK based applications. The MK1000 Configuration menu can also be used to configure the unit for operation with a custom application not based on PCK emulation.

From the MK1000 Configuration menu, all MK1000 parameters can be accessed except the PCK communication interface (Change/Select Host Type), software handshaking, and RS-485 Net ID. These parameters can only be accessed from the PCK Configuration menu. For information on alternate methods of configuring the MK1000, see page 3-3.

MAP: Telnet Menu

Upon initiating the Telnet session, the following screen appears.

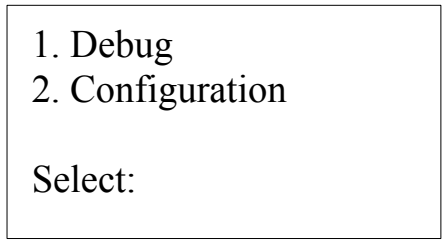


Figure 3-29. Telnet Session Menu

Press the ‘2’ button to enter the MK1000 Configuration menu.

From this point on, screens appear as they do when navigating the MK1000 Configuration menu as shown on page 3-16.

Entering, Navigating & Saving Changes

Entering the Telnet Session

To a initiate a Telnet session with the MK1000 from a computer running a Window's operating system, type the following command (using your MK1000's IP address) from a DOS/Command prompt and press Enter:

telnet 192.168.0.1

In the example above, 192.168.0.1 represents the MK1000's IP address. If you need assistance determining your MK1000's IP address see the troubleshooting section.

Next, you may be asked to "ENTER PASSWORD". Type in '44213' and press Enter*. Note while typing in the password, the cursor remains stationary while continuing to blink.

*Some Telnet clients may require a simultaneous Ctrl Enter.

Navigating the Telnet Menu

To navigate within the Telnet session, use the following buttons.

Table 3-20. Telnet Navigation Buttons

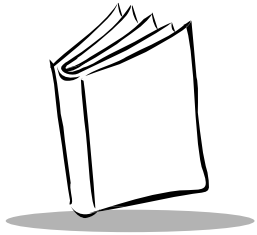
Button	Description
↑	- Moves the cursor up.
↓	- Moves the cursor down.
Enter	- Selects the highlighted item. - Enters a value that has been typed in.
Esc	- Exits the current screen and returns to the previously displayed screen. - Escapes a data entry field.
Ctrl-D	Exits the Telnet session, WITHOUT saving any changes.

To properly navigate the MK1000 Configuration screens, the Telnet client must be configured to Keyboard Mapping = VT100 / ANSI terminal emulation.

If running a Telnet session from a laptop, you may need to turn off the "Num Lock" key.

Saving Changes and Exiting the Telnet Session

After you have navigated through the necessary screens and made your desired changes, you can save these changes by highlighting the "Save & Reboot" option from the MK1000 Configuration menu and then pressing the Enter key.



Chapter 4
Software and Applications

Overview

This chapter describes loading applications and files on to the MK1000. Topics covered include:

- The MK1000 on-board Demo application

Demo Application

The demo application mode is useful when there is a desire is to demonstrate the basic functionality of the MK1000 without connecting to a network and host.

Several aspects of the MK1000 can be demonstrated, including button functions and bar code lookups.

- Button ‘1’ puts the scanner into smart raster mode for reading PDF and composite codes.
- Button ‘2’ puts the scanner into 1 Dimension bar code omni-direction decode mode.
- Buttons ‘3’ and ‘4’ displays custom developed messages on the screen.

Entering/Exiting Demo Mode

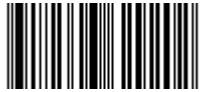
With the communication protocol set to PCK emulation application, scan the **Enter/Exit Demo Mode** bar code below to enter or exit demo mode.

Enter/Exit Demo Mode

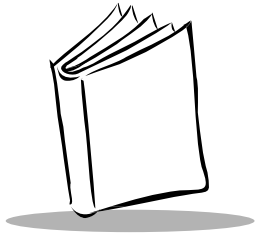
While in demo mode, scan a demonstration bar code below to emulate a product look up.

Aspirin (English)

Vitamin C Tablets (French)



Halls Cough Drops (Spanish)



Chapter 5
PCK Emulation

Overview

This chapter describes how to use the MK1000 PCK emulation application.

The Symbol PCK emulation application* is a PCK9100/9140 emulator for the Symbol MK1000. The application allows the MK1000 (wired or wireless) to connect to a host computer and behave like a Symbol PCK9100/9140. The Symbol PCK emulation application uses a proprietary command set developed by Symbol Technologies for use with its Kiosk Scanning Solutions.

While running this application, the MK1000 can interact with PCK9100/9140 compatible applications on the host. It receives commands and data from the host and displays them on the MK1000's screen.

The PCK emulation application has operating parameters that can be modified by the user. The user can set these parameters using menu screens displayed on the MK1000, or they can be preset in an "ini" style configuration file that can be loaded via FTP transfer.

Note: * *The MK1000's PCK emulation application is not compatible with pre-existing PCK9142/9144/9130 applications.*

New PCK Emulation Functionality on the MK1000

The differences between the MK1000 PCK emulation and Symbol's PCK9100/9140 architecture are listed in Table 5-1.

Table 5-1. MK1000 PCK Emulation Versus PCK91XX Architecture

MK1000 PCK Emulation	PCK9100/9140 Architecture
The MK1000's operating system supports multiple communication interfaces (Wireless RF, cabled Ethernet, RS-485 and RS-232) co-existing on a single unit.	The PCK9100/9140 was one interface per unit.
The MK1000 can be configured via a PC file that can be FTPed to the unit.	The PCK9100/9140 could not.
The MK1000 has four programmable function buttons	The PCK9100/9140 did not.
Maximum resource file size is 128k.	Maximum resource file size was 74k.

Host Communication Commands

Table 5-2 lists the commands used in host communications.

Table 5-2. Host Communication Commands

Control Character	Hex Representation	Description
<STX>	02	ASCII Start of Text
<ETX>	03	ASCII End of Text
<SOH>	01	ASCII Start of Header
<EOT>	04	ASCII End of Transmission
<DATA>	00-FF	Data packet. This is the actual data being sent to the MK1000. The maximum size of the packet is 300 bytes, but under 50 is recommended for accurate communication.
<LRC>	00-FF	Used for error detection, LRC is the Exclusive-OR (XOR) of all characters in <DATA> and the <ETX>.
<ADDR>	30-4F	The address of the MK1000 when used in a 485 network. Each unit is assigned a unique address.
<ENQ>	05	ASCII Enquiry
<ACK>	06	ASCII Acknowledge
<NAK>	15	ASCII Negative Acknowledge

PCK Ethernet & RS-232 Communication Protocol

When communicating to the host terminal via Ethernet or RS-232, MK1000 data is formatted as follows:

<STX> <DATA> <ETX> <LRC>

Host to MK1000 Handshaking

ACK/NAK handshaking is supported for data sent from the host to the MK1000. If enabled, the MK1000 ACKs or NAKs a data packet based on its format and the LRC being correct. Because no error checking is performed on the data in the packet, the MK1000 ignores invalid display commands within the packet and sends an ACK.

This increases the throughput of the system. The MK1000 can store incoming packets in memory while performing commands in packets already received. This frees up the host to do other things after sending a sequence of complex commands to the MK1000. The MK1000 can store up to 25 packets (totaling up to 600 bytes) in memory before the queue is full. When full, incoming packets are NAKed until space is available (if host to MK1000 ACK/NAK handshaking is enabled).

When the MK1000 is responding to a packet from the host, it waits a programmable Turnaround Time after the last character is received before transmitting back to the host.

None

The MK1000 transmits data to the host without software handshaking and assumes an ACK. The EOT character is sent immediately after the LRC. Host handshaking is ignored.

ACK/NAK

ACK/NAK is the default software handshaking. The host verifies the LRC and responds with an ACK or NAK. If no response is received within the Serial Response Time-out period (2.0 seconds), a NAK is assumed and the MK1000 retransmits (see *Example 4 - Host Not Receiving Transmission* on page 5-5.) Retransmission occurs up to three times. If a NAK is received from the host, the MK1000 re-transmits immediately.

If ACK/NAK is disabled, the MK1000 transmits the data and assumes an ACK. The EOT is sent immediately after LRC.

ENQ (RS-232 Only)

ENQ software handshaking is also supported for data sent to the host. The MK1000 waits for an ENQ from the host before sending data. If the ENQ is not received within the Serial Response Time-out period (2.0 seconds), the data is discarded.

ACK/NAK with ENQ

The MK1000 uses ACK/NAK handshaking to communicate with the host but does not respond to the host until an ENQ is received.

RAW

Allows binary data communication, no software handshaking is used. Data packets contain no control characters.

Communications Examples

Example 1 - Correct Communications

MK1000	Host
<STX> <DATA> <ETX> <LRC>	
	<ACK>
<EOT>	

Example 2 -Wrong First Transmission

MK1000	Host
<STX> <DATA> <ETX> <LRC>	
	<NAK>
No Time-out	

Example 3 - No Time-out

MK1000	Host
<STX> <DATA> <ETX> <LRC>	
	<ACK>
<EOT>	

Example 4 - Host Not Receiving Transmission

MK1000	Host
<STX> <DATA> <ETX> <LRC>	
	No response

Example 5 - MK1000 Waiting for Serial Response Time-out Period

MK1000	Host
<STX> <DATA> <ETX> <LRC>	
	<ACK>
<EOT>	

PCK RS-485 Communication Protocol

When communicating via RS-485, the host computer must poll each MK1000 individually. Therefore, each MK1000 has a unique address programmable by bar code menus. The value of the address ranges from hex 30 (48 decimal) to hex 4F (79 decimal).

The poll command format is:

<EOT> <ADDR> <ENQ>

The host and the MK1000 communicate with each other using the following packet format:

<SOH> <ADDR> <STX> <DATA> <ETX> <LRC>

If the MK1000 is polled and has no data, it responds with an EOT character.

The same ACK/NAK protocol used for RS-232 is used for RS-485 communication.

Example 1 - Correct Communications, No Data

Host	MK1000
<EOT> <ADDR> <ENQ>	
	<EOT>

Example 2 - Correct Communications, MK1000 Sends Data

Host	MK1000
<EOT> <ADDR> <ENQ>	
	<SOH><ADDR> <STX>
	<DATA> <ETX> <LRC>
<ACK>	
	<EOT>

Example 3 - Display Message for MK1000

Host	MK1000
<SOH> <ADDR> <STX>	
<DATA> <ETX> <LRC>	
	<ACK>
<EOT>	

Default Display Messages

There are three default display messages that can be overridden by downloading a resource file, or through host commands. Downloaded resource file messages are retained until a new resource file is sent, while messages sent through host commands are lost when the unit is powered down, and must be resent when the unit is powered up again.

Powerup Message

This default message displays when the unit powers up.

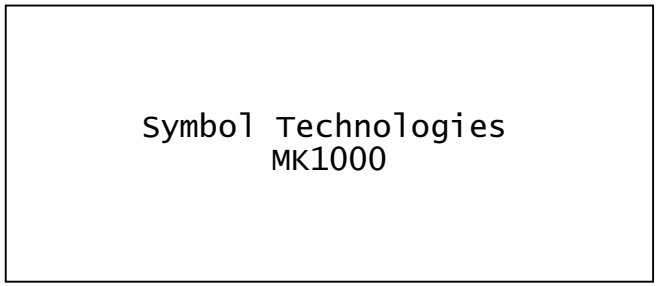


Figure 5-1. Powerup Default Message

Idle Message/Host Connection Failure Message

This default message displays if the MK1000 is not polled by the host for more than one minute, or if a connection fails to the host.

Figure 5-2. Idle/Connection Failure Default Message

Reactivated/Host Connection Established Message

This default message displays once the station has received polls from the host, or if a host connection is established after being out of service.

Figure 5-3. Reactivated/Connection Established Message

Display Control Characters

The following control characters are supported within display messages. Note that the exact position of the cursor after a VT, FF, or CR depends on the size of the currently selected font.

Table 5-3. Display Control Characters

Control Character	Hex Representation	Function
VT	0BH	Clear display & go to top left position
FF	0CH	Clear display & go to top left position
CR	0DH	Go to left-most position of next line
SO	0EH	Shift Out: Set the shift state that causes the most significant bit of all subsequent characters to be flipped. This allows 7-bit systems to access codes 160-255, and 8-bit systems to access codes 0-31. Note: Codes 0-3 are not shifted.
SI	0FH	Shift In: Resets the shift state set by the Shift Out code. The shift state is also reset at the end of every packet sent to the MK1000.

Display Commands

Several commands display text and bit mapped graphics, control data sent to and from the second Serial port, or interface to the scanner. Display commands view the LCD display as an array of points 240 across by 64 high. Point 0,0 is in the top left corner and point 239,63 is in the bottom right.

Command Parameters

Table 5-4 lists the display command parameters.

Table 5-4. Command Parameters

Px	X-axis parameter specified with ASCII digits. Valid range is 0-239.
Py	Y-axis parameter specified with ASCII digits. Valid range is 0-63.
Pf	Fill/No Fill flag parameter used to fill graphic geometric shapes. No Fill: 0 Fill: 1
Pi	ID parameter that specifies a particular bitmap, font, or message. ID numbers are assigned through the Resource Manager program. Any valid ID number may identify a bitmap/font/message. Valid ranges are: Bitmaps: 0-999 Fonts: 0-1000 where 1000 selects the default font. This ID cannot be overridden. Messages: 0-1002 999 = Socket Connection Broken message 1000 = Power-up message 1001 = Out of Service Message 1002 = Ready to Scan Message The default messages are overridden by creating a new message in the Resource Manager and giving it the appropriate ID number.

Draw Commands

Table 5-5. Draw Commands

Command	Description	Syntax	Example
Draw Point	Draws a single point on the display	ESC [Px;PyP	ESC[10;20P sets a point at column 1 row 20 in the current color.
Draw Line	Draws a line between two points	ESC[Px;Py; Px;PyL	ESC[5;10;200;50L draws a line from (5,10) to (200,50) in the current color. Note: If either endpoint is off the screen, the line is not drawn.
Draw Rectangle	Draws a rectangle between two points. If Pf = 1, the rectangle is filled. If Pf = 0, it is not filled.	ESC[Px1;Py1;Px2; Py2;PfR	ESC[10;10;100;40;1R draws a filled rectangle from (10,10) to (100,40) in the current color. Note: If any corner is off the screen, the rectangle is not drawn.
Set Color	Sets the drawing color for subsequent graphics commands.	ESC[30m sets the color to black. ESC[37m sets the color to white.	N/A
Draw Bitmap	Draws the bitmap specified by Pi at location (Px,Py) on the screen, with the upper-left corner at (Px,Py). The pixels are combined with the current screen image according to the Pm parameter.	ESC[Pi;Px;Py;PmD	ESC[42;10;25;1D draws bitmap #42 at (10,25) with its colors XORed with the current screen image.

Text/Font Commands

Table 5-6. Text/Font Commands

Command	Description	Syntax	Example
Select Font	Font number Pi becomes the current font for any subsequent text output.	ESC[PiF	ESC[37F This is a test This sets the current font to #37, then draws the text "This is a test."
Font Height Query (Supported in PCK emulation versions 1.06 or greater)	Returns the height, in pixels, of the currently selected font.	ESC[H	Unit responds with the ASCII representation of the font height.
Set Text Drawing Mode	Sets the drawing mode for subsequent text output commands. When Pm = 0 any text output overlays the current image, when Pm = 1 it is XORed with the current image.	ESC[PmM	
Position Cursor	Positions text cursor to a specified point on the display, characters are drawn with the left side of the character cell at the X cursor position, and the character baseline at the Y cursor position.	ESC[Px; PyT	
Font Screen Position (Supported in PCK emulation versions 1.06 or greater)	Changes the current position at which the unit draws fonts to Px, Py. The positioning is done by the current font's height and average width.	ESC[Px;Pyp	ESC[10;3p Draws fonts to column 10, row 3.

Message Commands

A message is composed of display commands and text to be displayed. Commands are executed in the same manner as host commands. The MK1000 has four default messages (see Table 5-4 on page 5-10) that can be replaced using the Resource Manager to create messages with the same ID numbers.

The following commands display user-defined messages, and send messages to store in RAM.

Table 5-7. Message Commands

Message	Syntax	Description
Display Stored Messages	ESC[PiJ	Message number Pi is displayed after the current packet, and pending packets are processed. Messages stored in RAM override any messages from Resource files with the same ID. Messages in RAM or from Resource files override default messages. Be sure messages do not call each other recursively. A message called from another is not displayed until the first message is done. Approximately 10 messages waiting to be displayed can be stored. Commands from the host are also stored.
Store Message	ESC[PiK <Message Text>	The MK1000 stores everything in the packet following this command as a message with ID number Pi. This message can be displayed using the Display Stored Message command above. Up to 50 messages of up to 20 characters each may be stored. The message may contain any text or commands the MK1000 supports, including commands to display bitmaps, change fonts, etc.
Flush Stored Messages	ESC[I	This command deletes all messages stored in RAM.

Button Press - Event Notification

When one of the MK1000 function buttons is depressed, a string is sent to the host where <Keypad digit, 1 through 4> is the number of the button pressed. For example, "BTN4" is sent to the host when the right most button, ‘4’, is pressed. This event notification must be surrounded by the normal framing characters used by the PCK emulation firmware (which are dependent on communications type described in Table 5-2 on page 5-3).

Button Event Sent to Host RS-232

MK1000	Host
<STX>BTN4<ETX><LRC>	
	<ACK>
<EOT>	

Scan Engine Commands

Changing the Scanning Mode (Scan Pattern)

To change the scanning mode, the host sends the MK1000 the following command sequence:

<Esc> [<scanning mode number> s

The following is a list of scanning mode numbers:

Number	Scan Mode
1	Smart Raster
2	Always Raster
6	Cyclone Omnidirectional (1D scanning only)
7	Semi-Omni Pattern

To change the scanning mode to Smart Raster, the scanning mode number 1 would be used.

To change the scanning mode from Cyclone (factory default) to Smart Raster, use the following syntax:

MK1000	Host
<STX><ESC>[1s<ETX> <LRC>	
	<ACK>
<EOT>	

Pass Through Scanner Commands

A special "ParamSend" escape sequence is available in the PCK emulation application to allow "pass through" scanner programming commands. These scanner commands consist of the "PARAM_SEND" programming group as defined in the *Simple Serial Interface (SSI) Programmer's Guide*, 72-40451-xx, along with the SE3223 scanner parameter values as defined in the SE 2223/3223 *Scan Engine Integration Guide*, 70-36636-xx. The MK1000 "ParamSend" escape sequence, along with the scanner parameter data, allows complete customization of the scanner's operational behavior.

Note: *Parameter changes can be issued singly or in groups. Group changes are recommended.*

The general format of the ParamSend message is:

<ESC>[255s<0xC6><0x04><0x00><0xFF><Parameter><ParamData>

Where:

<ESC> = The Escape control character, 0x1B.

[255s = The MK1000 ParamSend command string.

<0xC6> = The SSI_PARAM_SEND command byte. Required.

<0x04> = Data from the host. Required.

<0x00> = The status byte. The value 0 indicates that this is a temporary parameter change. You MUST have this and it must be set to zero. Parameter changes are only effective until the MK1000 is rebooted.

<0xFF> = The beep code. The scanner's beeper output is not monitored. 0xFF indicates no beep, and it should be set to 0xFF.

<Parameter> = Any valid SSI ParamSend value.

<ParamData> = Any valid SSI ParamSend data value.

Redirecting Data To The Serial Port

ESC[B<Data For Auxiliary Port> redirects data to the Serial port. All data following this command up to the end of the current packet is sent out the auxiliary port. Data is sent "as is" without processing, except for the Shift Out/In control codes, to allow the host to send all 256 possible codes to the auxiliary port.

Note: *When the MK1000 is running in PCK emulation mode, data received on the Auxiliary port is sent to the host. It is sent in packets, up to a maximum of 128 bytes, as the data is received. It is framed according to the current Software Handshaking Type setup in the unit.*

Beep Commands

ESC[PbS sounds the beeper.

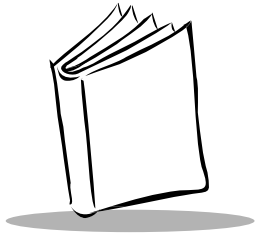
Pb is the beep code parameter that is, the beep code value specified in ASCII digits (see the table below).

Table 5-8. Beep Sequences

Decimal Value	Beep Sequence
0	1 Short High Beep
1	2 Short High Beeps
2	3 Short High Beeps
3	4 Short High Beeps
4	5 Short High Beeps
5	1 Short Low Beep
6	2 Short Low Beeps

Table 5-8. Beep Sequences (Continued)

Decimal Value	Beep Sequence
7	3 Short Low Beeps
8	4 Short Low Beeps
9	5 Short Low Beeps
10	1 Long High Beep
11	2 Long High Beeps
12	3 Long High Beeps
13	5 Long High Beeps
14	2 Long High Beeps
15	1 Long Low Beep
16	2 Long Low Beeps
17	3 Long Low Beeps
18	4 Long Low Beeps
19	5 Long Low Beeps
20	Fast Hi-Lo-Hi-Lo Warble
21	Slow Hi-Lo-Hi-Lo Warble
22	Hi-Low Beep
23	Low-High Beep
24	Hi-Lo-Hi Beep
25	Lo-Hi-Lo Beep



Appendix A
Configuration Menu Programming Bar Codes

Overview

These programming bar codes (**Setup**, **Enter**, **Prev**, **Escape** and **Next**) can be used to navigate the MK1000 Configuration menus. However, you must use the four function buttons on the front panel for data entry on each screen as described in *Entering Alphanumeric Values* on page 3-21.

Bar Codes

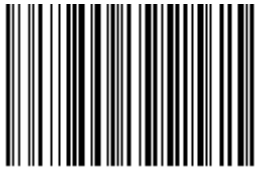
Setup

Scan the bar code below to enter the `MK1000 Configuration` menu.

Enter MK1000 Configuration Menu

Save and Reboot

Scan the bar code below to save your changes and exit the `MK1000 Configuration` menu.



Exit MK1000 Configuration Menu

Next

Scan the **Next** bar code below to move the cursor down to any selectable field. This bar code is equivalent to button ‘3’ on the MK1000 front panel. See Table 3-3 on page 3-20 for more information about button functions.

Next

Prev

Scan the **Prev** bar code below to move the cursor up to any selectable field. This bar code is equivalent to button ‘2’ on the MK1000 front panel. See Table 3-3 on page 3-20 for more information about button functions.

Prev

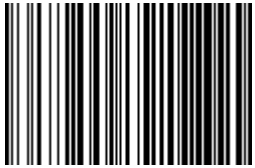
Enter

Scan the **Enter** bar code below to activate the selected field. This bar code is equivalent to button ‘4’ on the MK1000 front panel. See Table 3-3 on page 3-20 for more information about button functions.

Enter

Escape

Scan the **Escape** bar code below to return to the previous screen. This bar code is equivalent to button ‘1’ on the MK1000 front panel. See Table 3-3 on page 3-20 for more information about button functions.

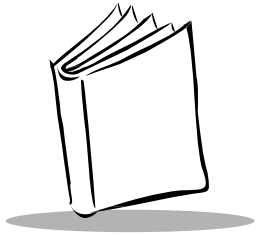


Escape

Save

Scan the **Save** bar code below to save changes.

Save



Appendix B
PCK Configuration Programming Bar Codes

Overview

This appendix provides the programming bar codes used to enter, save changes in, and exit the PCK Configuration Menu.

Also included are alphanumeric programming bar codes used to enter values, such as an IP address, or select an item from a menu list.

Bar Codes

Enter PCK Configuration

Scan the bar code below to enter PCK application's main menu.

Enter PCK Configuration Menu

Exit PCK Configuration

When all desired changes are made, scan the **Exit PCK Configuration Menu** bar code below to exit PCK configuration.

Exit PCK Configuration Menu

Save Changes

To save your changes and exit the current menu screen, scan the **Save & Exit** bar code below. This bar code also allows you to exit the PCK application's main menu.

Save & Exit

Escaping a Screen WITHOUT Saving Changes

If you have accidentally entered a screen and wish to exit it WITHOUT making ANY changes, scan the **Cancel** bar code below.

Cancel

Numeric Bar Codes

The following pages provide the digits 0-9. They are on separate pages here to make it easier to scan without scanning adjacent bar codes.

0

1

2

3

4

5

6

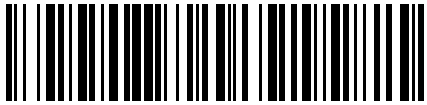
7

8

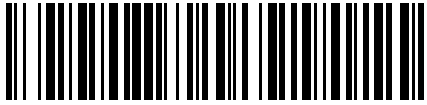
9

Alphabetic Character Bar Codes

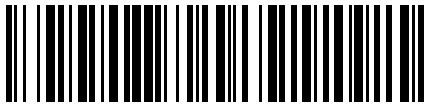
The following pages provide the uppercase alphabetic characters A-Z. They are on separate pages here to make it easier to scan without scanning adjacent bar codes



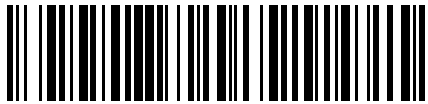
A



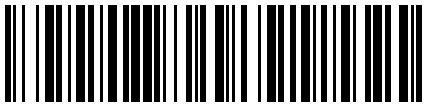
B



C

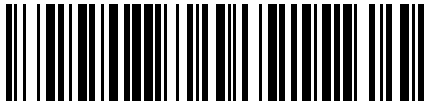


D

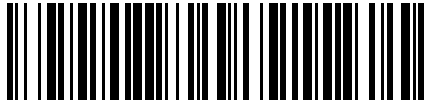


E

F

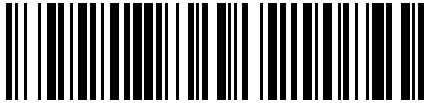


G

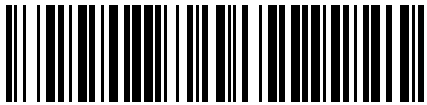


H

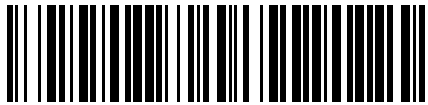
I



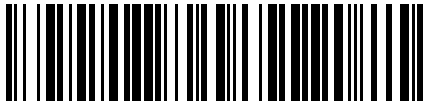
J



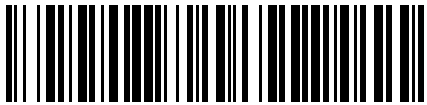
K



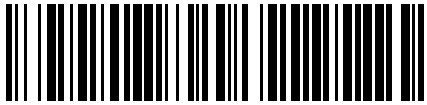
L



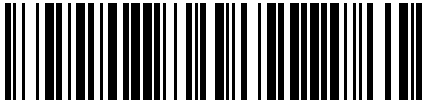
M



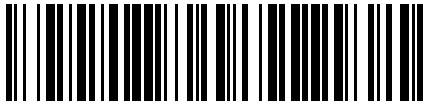
N



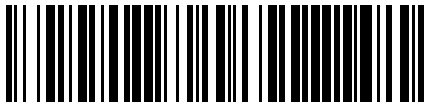
O



P

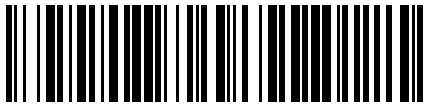


Q

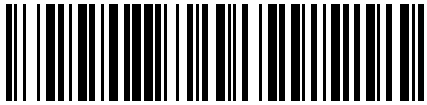


R

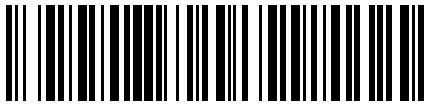
S



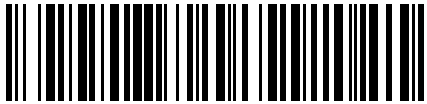
T



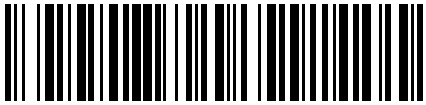
U



V



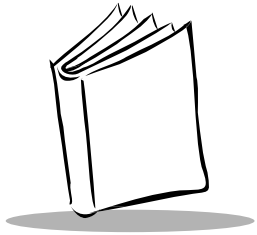
W



X

Y

Z



Appendix C
Scanning Mode Programming Bar Codes

Scanning Mode

Select one of the following scanning modes:

- Smart Raster
- Slab Only Raster
- Omnidirectional (Cyclone)
- Always Raster
- Programmable Raster
- Semi-Omnidirectional

Smart Raster

(01h)

Always Raster

(02h)

Programmable Raster

(03h)

Slab Only Raster

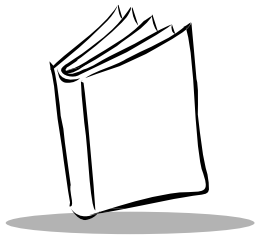
(04h)

Cyclone Pattern

(06h)

Semi-Omni Pattern

(07h)



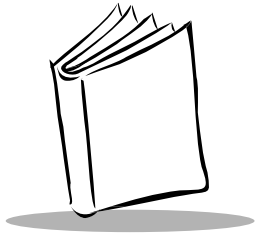
Appendix D
MK1000 Fonts

Three onboard fonts can be used by a PCK application.

- System Default 8 pt
- OEM 8 pt Embedded in the OS, loaded into LCD RAM on demand *****
- Courier New 8 pt Embedded in the OS, loaded into LCD RAM on demand *****

To utilize additional Windows based fonts within a PCK application, a resource file specifying the desired fonts must be downloaded to the MK1000.

***** These fonts display faster than OS based fonts as they are stored in and displayed directly from LCD memory.



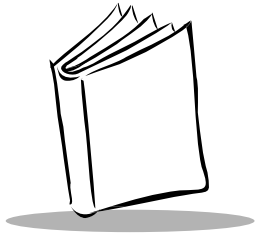
Appendix E
Technical Specifications

Table E-1. Technical Specifications

Item	Description
Power Requirements	Input = 12-24VAC or 12-36VDC, 16VA
Power Source	12-24 VAC; 12-36 VDC Supports Symbol's power over Ethernet (BiasT)
Decode Capability	All standard retail codes including: UPC/EAN, Code 39, Interleaved 2 of 5, Code 128, Codabar, MSI, PDF417, RSS and Composite Codes
Display	64 H x 240 W graphical liquid crystal display (LCD)
Operating Temperature	0° C to 50° C (32° F to 122° F)
Storage Temperature	-40 to +70 C
Humidity	5% to 95% noncondensing
Weight (without cable)	3 lbs./1.4 kg
Dimensions	11.4 in. H x 7.75 in. W x 4.25 in.D (max.) 29 cm H x 19.6 cm W x 10.8 cm D (max.)
Scanner **Light Source:** **Scan Rate:** **Print Contrast:**	 650 ± 10 nm laser diode 590-640 scans per second **2-D**: 35% absolute dare/light reflectance **1-D**: 25% absolute dare/light reflectance
Memory	1 MB flash

Table E-1. Technical Specifications (Continued)

Item	Description
Software Support	Supports existing PCK91XX applications; IBM 4680/4690 Terminal Emulation; AirBEAM wireless configuration management supported. SDK available.
Communications	Serial (RS-232/RS-485) Ethernet (TCP/IP) Wireless LAN: Spectrum24 - 2 Mbps Frequency Hopping (IEEE 802.11); Spectrum24 - 11 Mbps Direct Sequence (IEEE 802.11b)
Configurations	See Appendix F, *Troubleshooting*.
Laser Classifications	IEC Class 2, CDRH Class II
External Ports	RS-232 (RJ45 connector) enables peripheral devices such as handheld scanner or printer to be connected



Appendix F
Troubleshooting

Troubleshooting topics covered in this appendix include:

1. Unit does not turn on.
2. Unit does not respond to polls from the host computer (RS-485 only).
3. Unit does not send data to host computer (RS-232 only).
4. Can’t PING (Packet InterNet Groper) the MK1000.
5. “Loader Activated...Stand By” message displays.
6. Determining the MK1000's current OS version.
7. Confirming communication with host computer.
8. Restoring factory default settings.
9. Determining the MK1000's IP Address.
10. Unit does not communicate over a wired-Ethernet connection.
11. Unit does not communicate over a wireless-Ethernet connection.
12. Parameter changes made to the MK1000 are not saved/retained after exiting the menu screens.

Table F-1. Troubleshooting

Problem	Possible Causes	Possible Solutions
1. MK1000 does not turn on.	No power to the device.	**- Power via AC outlet** - Check AC power to the device. Ensure power supply is plugged into AC power source and the MK1000. **- Power via power-over-Ethernet** - Confirm Ethernet cable is plugged into MK1000 LAN port. - Confirm other end of Ethernet cable is plugged into Bias-T (power-over-Ethernet). - Confirm Bias-T (power-over-Ethernet) module is plugged into an AC outlet. - Perform continuity check on Ethernet cable.
2. MK1000 does not respond to polls from the host computer (RS-485 only).	No communication between the host and MK1000.	Check cabling to the MK1000. Ensure the MK1000 address is the same as the one you are polling. **Note:** When the MK1000 has not been polled for one minute, it displays a default “Out of Service” message (unless the default message was changed). Check polarity of signal at connection to network. Check communication parameters.

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
3. MK1000 does not send data to host computer (RS-232 only).	MK1000 is not programmed to work with the host. MK1000 is not connected to the host.	Check setup communication parameters. Check cables to host computer.
5. "Loader Activated...Stand By" message displays on the MK1000.	Embedded application was disabled and no custom application is loaded/available to run.	Either: 1) Return to the MK1000 Configuration menu and set the embedded apps option to enable. or 2) Load a custom application onto the MK1000.

6. How do I determine the MK1000's current OS version?	(Not applicable)	**OS version is displayed on a screen within the MK1000 Configuration screens:**
		- Press the '4' and '1' buttons on the unit simultaneously (an *Enter Password* screen will appear).
		- Type in '44213' (the MK1000 Configuration menu appears).
		- With the cursor (<) on System, press '4' (System Configuration screen appears).
		- With the cursor on Info, press '4' (System Information screen appears).
		  - The OS Version is displayed on the 5th line of the screen.
		  - If no Info option is available, the unit has OS version 4.06.05 or earlier.
		(continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
(continued) How do I determine the MK1000's current OS version?		**To exit the MK1000 Configuration menu WITHOUT saving any changes:** - Press '1' (System Configuration screen appears). - Press '1' (MK1000 Configuration menu appears). - Press '1' (MK1000 Configuration menu is exited, changes are NOT saved, and the original settings are retained as described in Troubleshooting Note 1).

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions

7. How do I confirm my MK1000 is communicating with my host computer?	(Not applicable)	**A PING command can be used to confirm ethernet communication between the host computer and MK1000.**
		- From the Command / DOS prompt, type Ping followed by the MK1000 IP address, and then press Enter. The command looks like the following: "Ping 192.168.0.1". In this example, 192.168.0.1 is the MK1000's IP address. For instructions on how to determine your MK1000's IP address see the troubleshooting topic # ***9. How do I determine the MK1000's IP Address?***
		  - A successful PING (proving communication exists) results in a message like, "reply from 192.168.0.1 ...". In addition, PING statistics will show packets sent to the MK1000 were RECEIVED.
		  - An unsuccessful PING (proving communication does not exist) results in a message like, "request timed out" or "Destination Host Unreachable". In addition, PING statistics will show packets sent to the MK1000 were LOST.
		(continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions

(continued)
How do I confirm my MK1000 is communicating with my host computer?
		- If communication does not exist between the MK1000 and host computer, examine the following:
		  - Is the MK1000 receiving power?
		  - Does your MK1000 support the type of Ethernet connection you are attempting to use? For example, if trying to communicate via a cabled connection, confirm your unit supports wired Ethernet communication.
		  - Is the MK1000 properly configured for the type of Ethernet communication you are using (wired-cabled vs. wireless-RF)?
		  - For wired Ethernet connections, is the Ethernet cable properly connected?
		  - Are you trying to communicate with the correct MK1000 IP address?

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
8. How do I return the MK1000 to its factory default settings?	(Not applicable)	**The majority of MK1000 setup parameters can be returned to their factory defaults from a screen within the MK1000 Configuration menu.** - Press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears). - Type in '44213' (MK1000 Configuration screen appears). - With the cursor (<) on System, press '4' (System Configuration screen appears). - Scroll the cursor down to File/DBM by pressing the '3' button three times. - With the cursor on File/DBM, press '4' (File Sys/DBM Management screen will appear). - Scroll the cursor down to Delete Database by pressing '3'. - With the cursor on Delete Database, press '4'. The database of modified setup parameters is automatically deleted. Upon exiting the MK1000 Configuration menu, the unit defaults to its factory settings database. See Troubleshooting Note 1. - Press '1' (System Configuration screen re-appears). - Press '1' (MK1000 Configuration menu re-appears). (continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
(continued) How do I return the MK1000 to its factory default settings?		**Save ALL changes made and EXIT the MK1000 Configuration menu** - Scroll the cursor down to Save & Reboot by pressing the '3' button four times. - With the cursor on Save & Reboot, press '4'. (MK1000 Configuration menu is exited, all changes made are saved, and the unit reboots as described in Troubleshooting Note 1.)

9. How do I determine the MK1000's IP Address?	(Not applicable)	**Wired Ethernet Connection**
		- Press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears).
		- Type in '44213' (MK1000 Configuration menu appears).
		- Scroll the cursor (<) down to Network by pressing the '3' button.
		- With the cursor on Network, press '4' (Network Configuration menu appears).
		- Scroll the cursor down to Ethernet by pressing '3' twice.
		- With the cursor on Ethernet, press' 4' (Ethernet Configuration screen appears).
		- The 4th line shows MK1000's wired IP Address - record it on a sheet of paper.
		  - The factory default wired IP Address is 192.168.0.1.
		- To exit the MK1000 Configuration menu WITHOUT saving/making any changes...
		  - Press the 1 button - three times
		(continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions

(continued)
How do I determine the MK1000's IP Address?
		Wireless (RF) Ethernet Connection
		- Press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears).
		- Type in '44213' (MK1000 Configuration menu appears).
		- Scroll the cursor (<) down to Network by pressing the '3' button.
		- With the cursor on Network, press '4' (Network Configuration screen appears).
		- Scroll the cursor down to Radio by pressing the '3' button three times.
		- With the cursor on Radio, press '4' (Radio Configuration screen appears)
		- The 4th line shows the MK1000's wireless IP Address - record it on a sheet of paper.
		  - The factory default wireless IP Address is 192.168.0.2.
		  - To exit the MK1000 Configuration menu WITHOUT saving/making any changes
		  - Press the '1' button three times.

10.MK1000 will not communicate over a wired-Ethernet connection.	Unit does not support a wired Ethernet connection.	**1. Confirm your unit supports a wired Ethernet connection.** - Find the model number (see sticker attached on the back of the unit). The model number structure is MK1000-xxx???xxxxx. To support a wired Ethernet connect, one of the following designations must be present: RSE, RFR, AL1, AL2 or AL3. (continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions

(continued)
MK1000 will not communicate over a wired-Ethernet connection.
		2. Determine the MK1000's IP Address.
		- Press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears).
		- Type in '44213' (MK1000 Configuration screen appears).
		- Scroll the cursor (<) down to Network by pressing the '3' button.
		- With the cursor on Network, press '4' (Network Configuration screen appears).
		- Scroll the cursor down to Ethernet by pressing '3' twice.
		- With the cursor on Ethernet, press '4' (Ethernet Configuration screen appears).
		- The 4th line shows the MK1000's wired IP Address - record it on a sheet of paper.
		  - The factory default wired IP Address is 192.168.0.1.
		3. Confirm the Wired Ethernet Setup is ENABLED.
		- On the Ethernet Configuration screen (3rd line), Enabled must = Yes.
		  - If *Enabled* = No, with the cursor on *Enabled*, press the '4' button. *Enabled* should now = Yes. See Troubleshooting Note 1.
		  - Press 1 (Network Configuration screen re-appears).
		(continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
(continued) MK1000 will not communicate over a wired-Ethernet connection.		**4. Confirm the Wireless (RF) Ethernet Setup is DISABLED.** - Scroll the cursor down to Radio by pressing '3'. - With the cursor on Radio, press '4' (Radio Configuration screen appears). - On the Radio Configuration screen (3rd line), Enabled must = No. - If *Enabled* = Yes, with the cursor on *Enabled*, press the '4' button. *Enabled* should now = No. See Troubleshooting Note 1. - Press '1' (Network Configuration screen re-appears). - Press '1' (MK1000 Configuration menu re-appears). **5. Save ALL changes made and EXIT the MK1000 Configuration menu.** - Scroll the cursor down to Save & Reboot by pressing the '3' button three times. - With the cursor on Save & Reboot, press '4'. (MK1000 Configuration menu is exited, all change made are saved, and the unit reboots as described in Troubleshooting Note 1.)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
11.MK1000 will not communicate over a wireless-Ethernet connection.	Unit does not support a wireless Ethernet connection.	**1. Confirm your unit supports a wireless (RF) Ethernet connection.** - Find the model number (see sticker attached on the back of the unit). The model number structure is MK1000-xxx???xxxxx. To support a wireless Ethernet connect, one of the following designations must be present: 2M1, 2M5, 11M, AL1, AL2 or AL3. **2. Determine the MK1000's IP Address.** - Press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears). - Type in '44213' (MK1000 Configuration menu appears). - Scroll the cursor (<) down to Network by pressing the '3' button. - With the cursor on Network, press '4' (Network Configuration screen appears). - Scroll the cursor down to Radio by pressing the '3' button three times. - With the cursor on Radio, press '4' (Radio Configuration screen appears). - The 4th line shows the MK1000's wireless IP Address - record it on a sheet of paper. - The factory default wireless IP Address is 192.168.0.2. (continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions

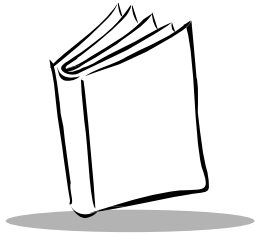
(continued)
MK1000 will not communicate over a wireless-Ethernet connection.
		3. Confirm the Wireless (RF) Ethernet Setup is ENABLED.
		- On the Radio Configuration screen (3rd line), *Enabled* must = Yes.
		  - If *Enabled* = No, with the cursor on *Enabled*, press the '4' button. *Enabled* should now = Yes. See Troubleshooting Note 1.
		- Press '1' (Network Configuration screen will re-appear)
		4. Confirm the Wired Ethernet Setup is DISABLED.
		- Scroll the cursor up to Ethernet by pressing '2'
		- With the cursor on Ethernet, press '4' (Ethernet Configuration screen appears).
		- On the Ethernet Configuration screen (3rd line), *Enabled* must = No.
		  - If *Enabled* = Yes, with the cursor on *Enabled*, press the '4' button. *Enabled* should now = No. See Troubleshooting Note 1.
		- Press '1' (Network Configuration screen re-appears).
		- Press '1' (MK1000 Configuration screen re-appears).
		(continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
(continued) MK1000 will not communicate over a wireless-Ethernet connection.		**5. Save ALL changes made and EXIT the MK1000 Configuration menu.** - Scroll the cursor down to Save & Reboot by pressing the '3' button three times. - With the cursor on Save & Reboot, press '4' (MK1000 Configuration menu is exited, all changes made are saved, and the unit reboots as described in Troubleshooting Note 1.)
12. **Parameter changes made to the MK1000 are not saved/retained after exiting the menu screens.**		**The unit may have an INI type configuration file loaded in RAM. This static file is referenced to set certain parameters when the unit is powered up such as an IP Address.** - Press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears). - Type in '44213' (MK1000 Configuration screen appears). - With the cursor (<) on System, press '4' (System Configuration screen appears). - Scroll the cursor down to File/DBM by pressing the '3' button three times. - With the cursor on File/DBM, press '4' (File Sys/DBM Management screen appears). - With the cursor on Delete Files, press '4' (any files loaded in RAM are deleted) and the unit automatically reboots itself. - The unit now saves and retains parameter changes.

Troubleshooting Notes

1. Changes made while navigating the MK1000 Configuration screens are NOT saved or applied UNTIL the MK1000 Configuration menu is exited through its Save & Reboot option. If the MK1000 Configuration menu is exited by pressing the ‘1’ button, changes are NOT saved and the original settings are retained.



Appendix G
Table of MK1000 Communication Interfaces

The MK1000 supports up to four communication interfaces:

- wireless Ethernet
- wired Ethernet
- RS-485 (wired)
- RS-232 (wired).

The number and type of communication interfaces your unit has is specified by three digits in its model number. The location of the three digits is illustrated with '**???**' (three question marks) in the MK1000 model structure, MK1000-xxx**???**xxxxx. For a key defining the supported onboard communication interfaces, see below.

RSE = Wired Only: All 3 wired interfaces - RS232 / RS485 / Ethernet (10Base-T)

RFR = Wired/Wireless Ready: All wired interfaces + Upgrade to RF with addition of PC Card

2M1 = Wireless Only: Frequency Hopping 2Mb Radio with 100mW radio power

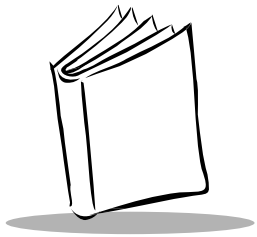
2M5 = Wireless Only: Frequency Hopping 2Mb Radio with 500mW radio power

11M = Wireless Only: Direct Sequence 11Mb Radio with 100mW radio power

AL1 = Multi-Interface: all 3 wired interfaces + 2Mb wireless with 100mW radio power

AL2 = Multi-Interface: all 3 wired interfaces + 2Mb wireless with 500mW radio power

AL3 = Multi-Interface: all 3 wired interfaces + 11Mb wireless with 100mW radio power



Glossary

ACK/NAK	ACK/NAK is the default software handshaking.
Aperture	The opening in an optical system defined by a lens or baffle that establishes the field of view.
ASCII	American Standard Code for Information Interchange. A 7 bit-plus-parity code representing 128 letters, numerals, punctuation marks, and control characters. It is a standard data transmission code in the U.S.
Autodiscrimination	The ability of an interface controller to determine the code type of a scanned bar code. After this determination is made, the information content is decoded.
Bar	The dark element in a printed bar code symbol.
Bar Code Density	The number of characters represented per unit of measurement (e.g., characters per inch).
Bar Height	The dimension of a bar measured perpendicular to the bar width.
Bar Width	Thickness of a bar measured from the edge closest to the symbol start character to the trailing edge of the same bar.
Baud Rate	A measure of the data flow or number of signaling events occurring per second. When one bit is the standard "event," this is a measure of bits per second (bps). For example, a baud rate of 50 means transmission of 50 bits of data per second.
Bit	Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

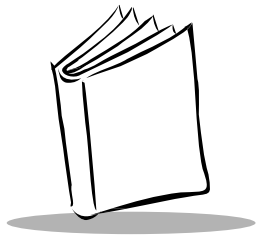
Byte	On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory is used to store one ASCII character.
CDRH	Center for Devices and Radiological Health. A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.
CDRH Class 1	This is the lowest power CDRH laser classification. This class is considered intrinsically safe, even if all laser output were directed into the eye's pupil. There are no special operating procedures for this class.
CDRH Class 2	No additional software mechanisms are needed to conform to this limit. Laser operation in this class poses no danger for unintentional direct human exposure.
Character	A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message.
Character Set	Those characters available for encoding in a particular bar code symbology.
Check Digit	A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.
Codabar	A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (- $: / , +).
Code 128	A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.
Code 3 of 9 (Code 39)	A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9, and 7 special characters (- . / + % $ and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.
Code 93	An industrial symbology compatible with Code 39 but offering a full character ASCII set and a higher coding density than Code 39.

Code Length	Number of data characters in a bar code between the start and stop characters, not including those characters.
Continuous Code	A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.
Dead Zone	An area within a scanner's field of view, in which specular reflection may prevent a successful decode.
Decode	To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.
Decode Algorithm	A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.
Depth of Field	The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.
Discrete Code	A bar code or symbol in which the spaces between characters (intercharacter gaps) are not part of the code.
Discrete 2 of 5	A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and START/STOP characters may be encoded.
EAN	European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.
Element	Generic term for a bar or space.
Encoded Area	Total linear dimension occupied by all characters of a code pattern, including start/stop characters and data.
ENQ (RS-232)	ENQ software handshaking is also supported for the data sent to the host.
Flash Memory	Flash memory is responsible for storing the system firmware and is non-volatile, if the power is interrupted in the system.
Host Computer	A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs, and network control.

IEC	International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.
IEC (825) Class 1	This is the lowest power IEC laser classification. Conformity is ensured through a software restriction of 120 seconds of laser operation within any 1000 second window and an automatic laser shutdown if the scanner's oscillating mirror fails.
Intercharacter Gap	The space between two adjacent bar code characters in a discrete code.
Interleaved Bar Code	A bar code in which characters are paired together, using bars to represent the first character and the intervening spaces to represent the second.
Interleaved 2 of 5	A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar/spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and START/STOP characters may be encoded.
LASER - Light Amplification by Stimulated Emission of Radiation	The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.
Laser Diode	A gallium-arsenide semiconductor type of laser connected to a power source to generate a laser beam. This laser type is a compact source of coherent light.
LED Indicator	A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition.
MIL	1 mil = 1 thousandth of an inch.
Misread (Misdecode)	A condition which occurs when the data output of a reader or interface controller does not agree with the data encoded within a bar code symbol.
Nominal	The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.

Nominal Size	Standard size for a bar code symbol. Most UPC/EAN codes are used over a range of magnifications (e.g., from 0.80 to 2.00 of nominal).
Parameter	A variable that can have different values assigned to it.
Percent Decode	The average probability that a single scan of a bar code would result in a successful decode. In a well-designed bar code scanning system, that probability should approach near 100%.
Print Contrast Signal (PCS)	Measurement of the contrast (brightness difference) between the bars and spaces of a symbol. A minimum PCS value is needed for a bar code symbol to be scannable. PCS = (RL - RD) / RL, where RL is the reflectance factor of the background and RD the reflectance factor of the dark bars.
Programming Mode	The state in which a scanner is configured for parameter values. See SCANNING MODE.
Quiet Zone	A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.
Reflectance	Amount of light returned from an illuminated surface.
Resolution	The narrowest element dimension which is distinguished by a particular reading device or printed with a particular device or method.
Scan Area	Area intended to contain a symbol.
Scanner	An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are: 1. Light source (laser or photoelectric cell) - illuminates a bar code. 2. Photodetector - registers the difference in reflected light (more light reflected from spaces). 3. Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.
Scanning Mode	The scanner is energized, programmed, and ready to read a bar code.
Scanning Sequence	A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.
Self-Checking Code	A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol.
Space	The lighter element of a bar code formed by the background between bars.

Specular Reflection	The mirror-like direct reflection of light from a surface, which can cause difficulty decoding a bar code.
Start/Stop Character	A pattern of bars and spaces that provides the scanner with start and stop reading instructions and scanning direction. The start and stop characters are normally to the left and right margins of a horizontal code.
Substrate	A foundation material on which a substance or image is placed.
Symbol	A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters, and check characters.
Symbol Aspect Ratio	The ratio of symbol height to symbol width.
Symbol Height	The distance between the outside edges of the quiet zones of the first row and the last row.
Symbol Length	Length of symbol measured from the beginning of the quiet zone (margin) adjacent to the start character to the end of the quiet zone (margin) adjacent to a stop character.
Symbology	The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39).
Tolerance	Allowable deviation from the nominal bar or space width.
UPC	Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which is any of four widths. The standard symbology for retail food packages in the United States.
Visible Laser Diode (VLD)	A solid state device which produces visible laser light.



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

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

_____
_____

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

_____
_____

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

_____
_____

What can we do to further improve our manuals?

_____
_____

Thank you for your input—We value your comments.

QUICK STARTUP INSTRUCTIONS

This index of instructions highlights key installation topics. Mandatory steps are noted by an asterisk (*). If multiple pages are referenced, the key reference is bolded

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Symbol Technologies, Inc. One Symbol Plaza, Holtsville N.Y. 11742-1300