MK1000
MicroKiosk

Product Reference Guide

MK1000 MicroKiosk
Product Reference Guide

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symbol®

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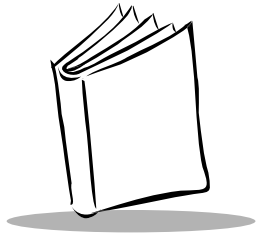

About This Guide

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.
- Appendix H, *DHCP Options* provides a table with DHCP options 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

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

United States

Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300

Tel: 1-800-653-5350

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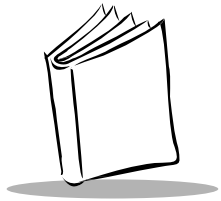
If you purchased your Symbol product from a Symbol Business Partner, contact that Business Partner for service.

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



Chapter 1
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, 3-27, **3-28,** 3-31
- Bar code Scanning Modes — **1-6**, C-1, 5-16

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
  - System Menu — 3-3, **3-25**
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Demo Application — 4-1

PCK Emulation Protocol — **3-2**, 5-1

Troubleshooting — F-1

Parts of the MK1000

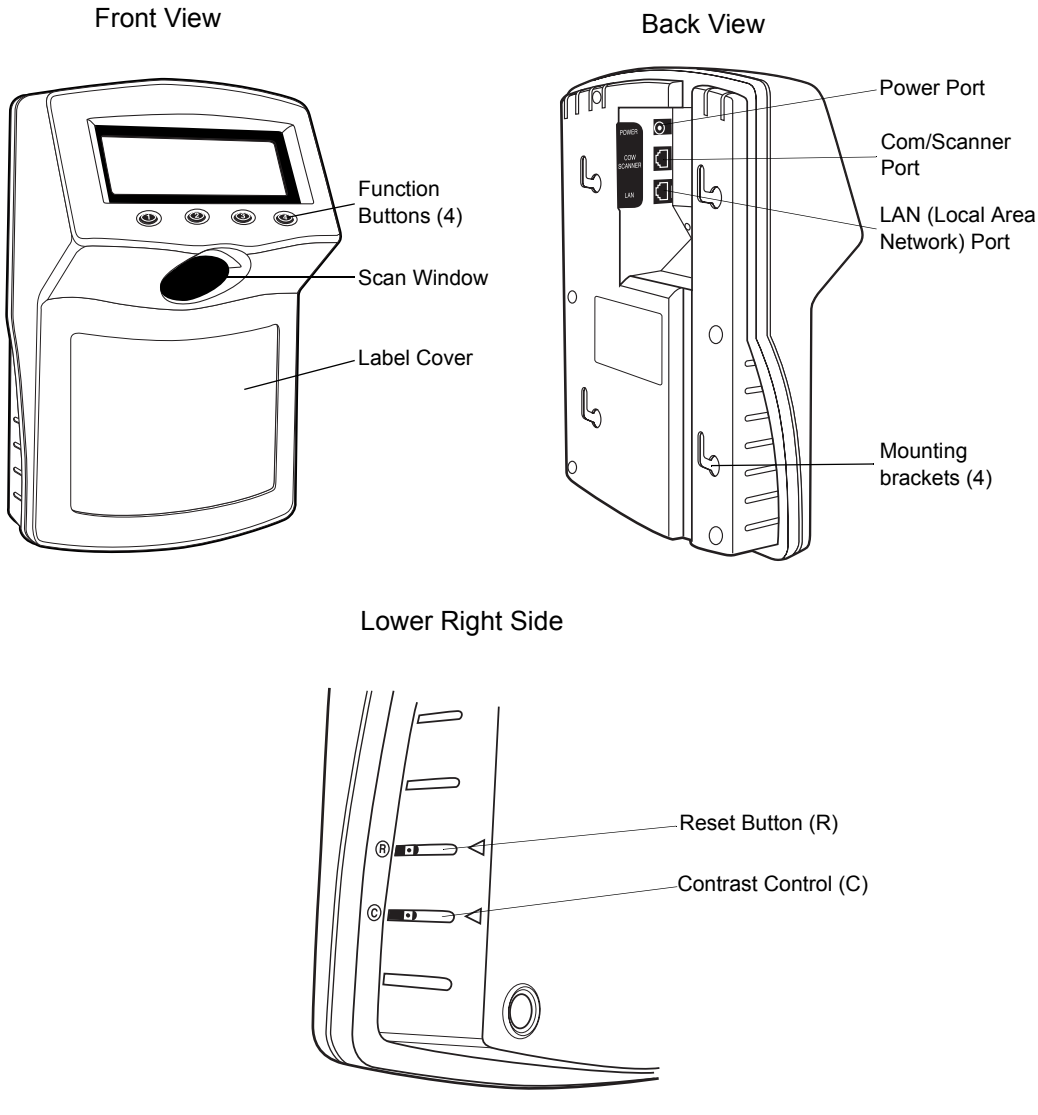


Figure 1-1. Parts of the MK1000

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. The function buttons can also be disabled.

Note: *For details on how to navigate MK1000 screens, see Navigating the System Menu on page 3-28.*

For details on how to enter alphanumeric values while in the System menu, see Entering Alphanumeric Values on page 3-31.

For details on how to disable and enable function buttons, see Disabling & Enabling Function Buttons on page 3-29.

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.

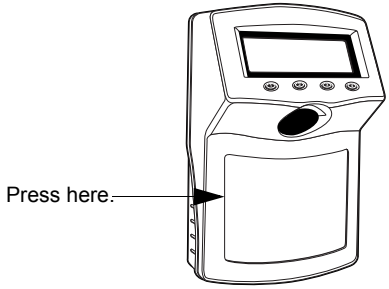


Figure 1-2. Removing the Label Cover

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.

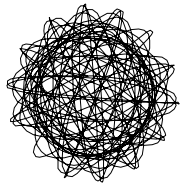
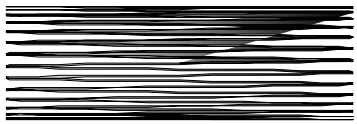
Bar Code Scanning

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 5-16.
- 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.

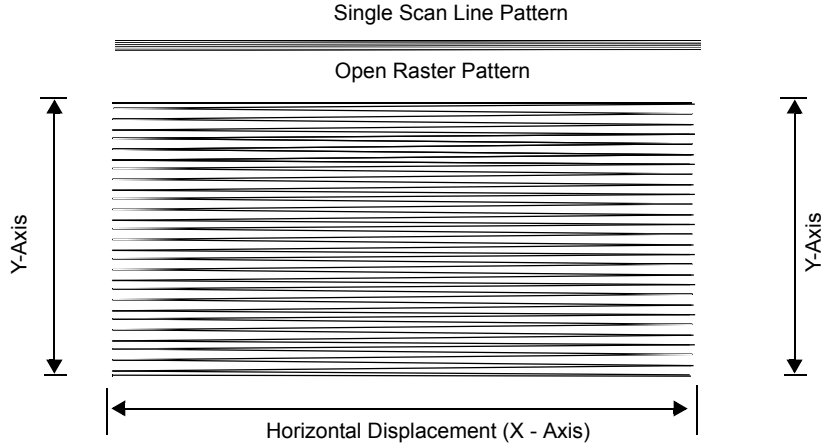


Figure 1-3. Smart Raster Scanning Pattern

- 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.

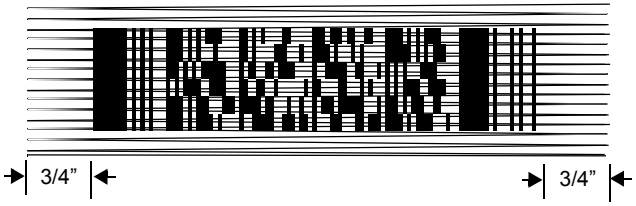


Figure 1-4. Raster Pattern Expanded Over PDF-417 Symbol

- 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.

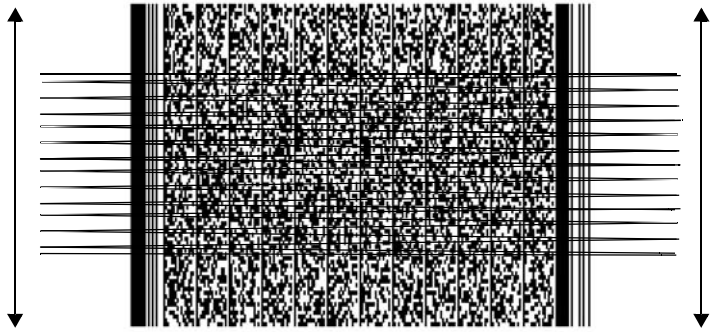


Figure 1-5. Moving Scan Pattern Upward and Downward on "Tall" PDF Symbol

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

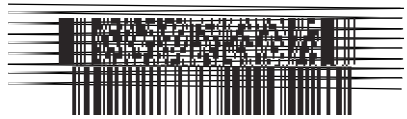
Scanning Composite (2D) Bar Codes

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.

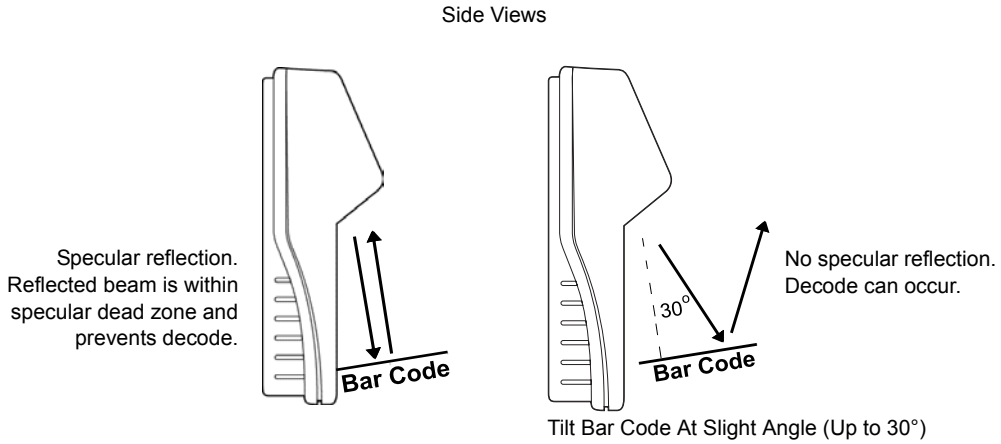


Figure 1-6. Avoiding Specular Reflection

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.

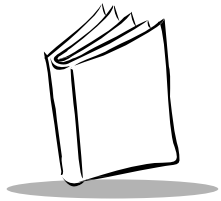
Wired Ethernet: Power via Power-over-Ethernet

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).

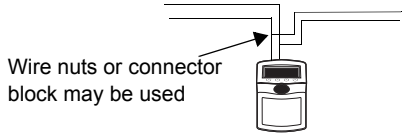


Figure 2-1. Connector Block

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.

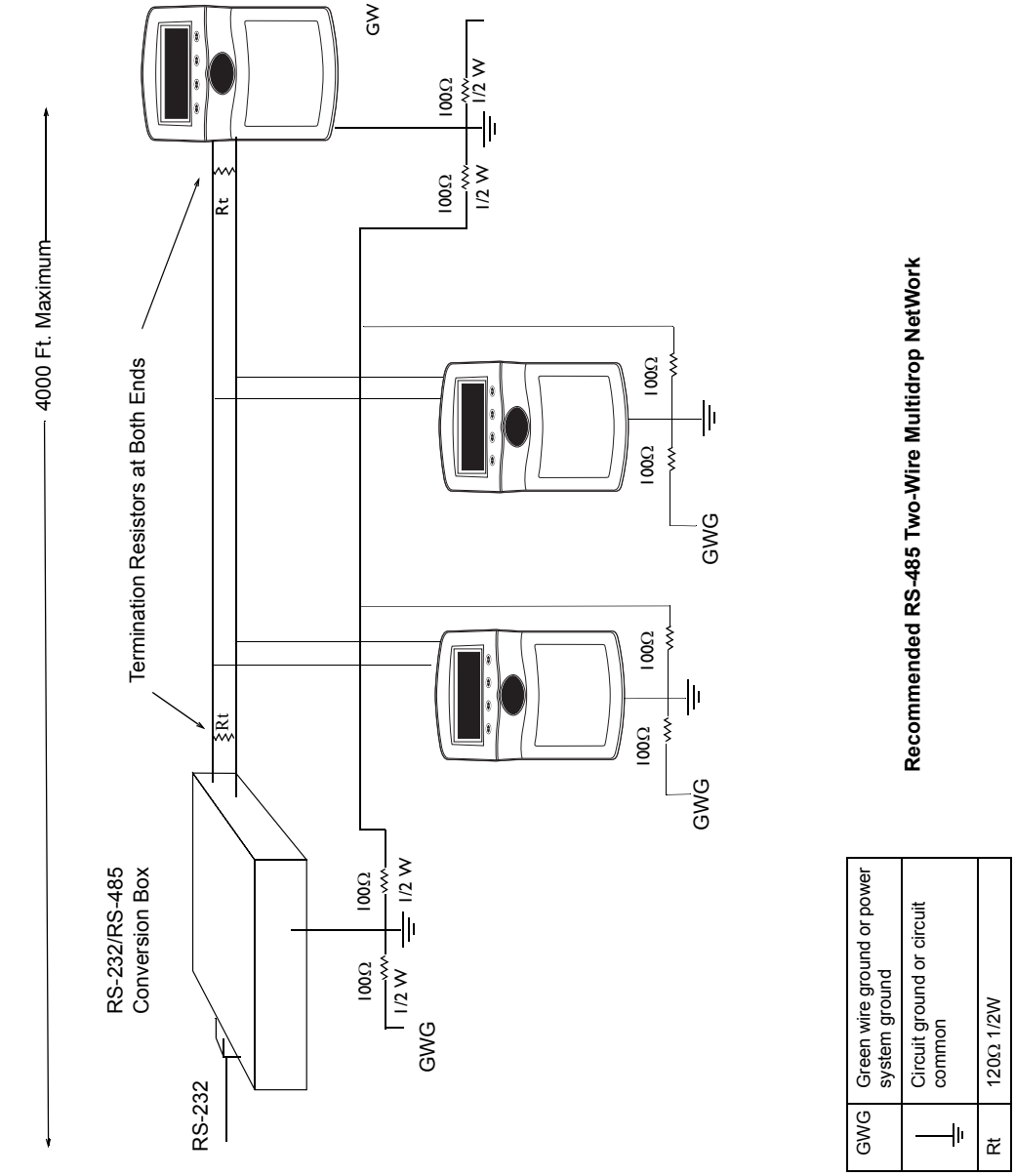


Figure 2-2. RS-485 Two-Wire Serial Network

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.

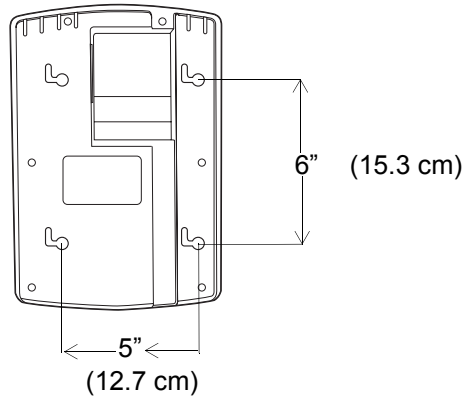


Figure 2-3. Mounting Dimensions

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.

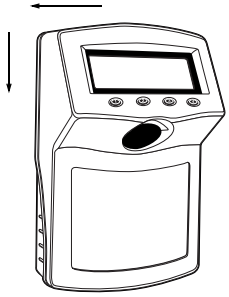


Figure 2-4. Mounting Directions

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

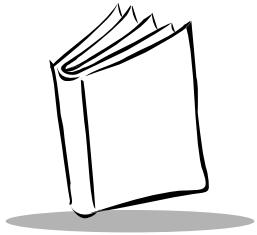
Pin	Description
Pin 1	Power +5V@200mA maximum
Pin 2	Laser On
Pin 4	*DBP
Pin 6	GND
Pin 8	Trigger
* Digital Bar Code Pattern	

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 System 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 3
- System Menu			X	- See Note 4
- Telnet Session	X			- See Note 2

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 System menu and/or a Telnet Session.
2. Telnet sessions require an Ethernet connection between the host and the MK1000.
3. PCK Configuration programming bar codes are located in Appendix B, *PCK Configuration Programming Bar Codes*.
4. System 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 System 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.

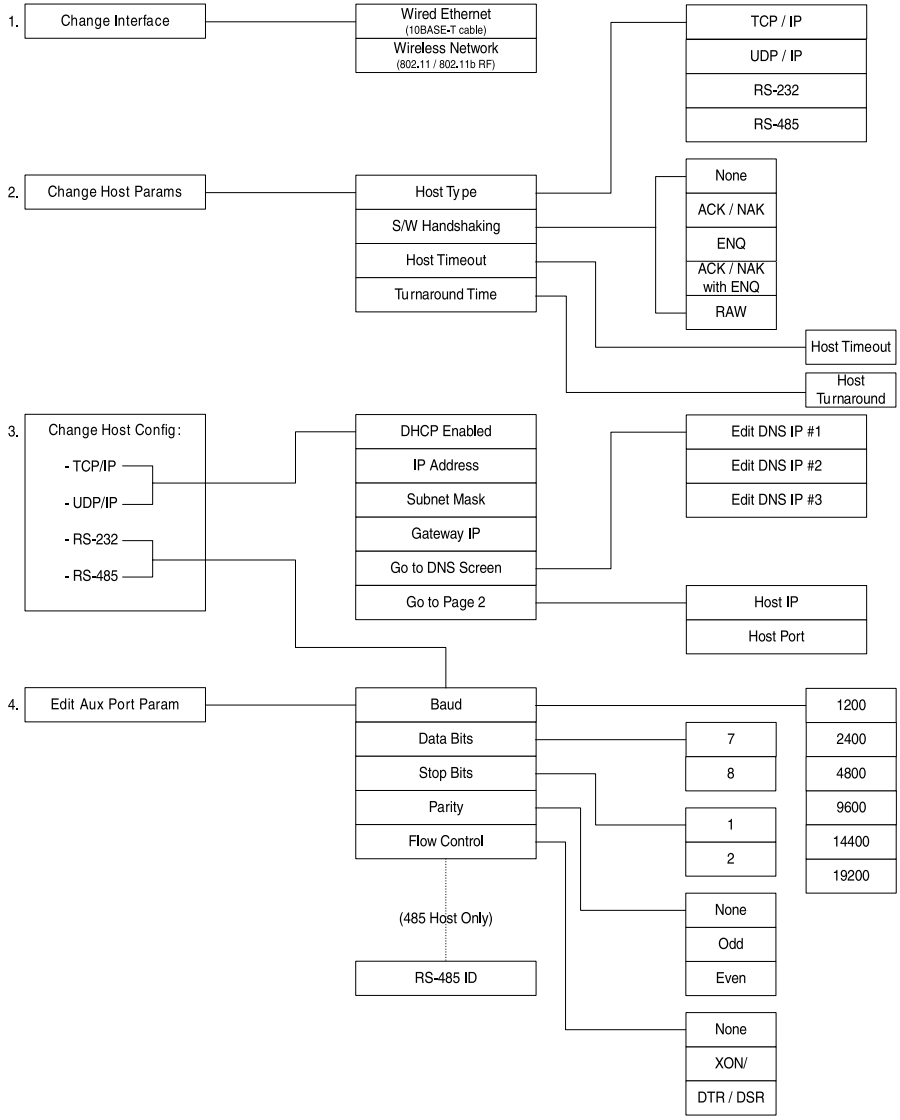


Figure 3-1. Navigating the PCK Configuration Menus/Screens

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*.

Note: *The PCK Configuration and MK1000 System menus cannot be accessed simultaneously. Only one menu can be active at a time.*

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

```
        PCK Configuration
Current Host: TCP/IP, WIRELESS

1. Change Interface
2. Change Host Params
3. Change Host Config
4. Edit Aux Port Params
   Scan 1-4 to Set 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 host parameters, you can access the Select Host Params screen by scanning the “2” bar code at the PCK Configuration menu.

Saving Changes

After making your desired changes on a screen, you can save the changes by scanning the **Save & Exit** bar code on page B-4.

Note: *Changes must be saved on each screen before exiting the screen.*

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.

Note: *Some screens may require scanning the **Cancel** bar code twice, or scanning a numeric bar code selection.*

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 a 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 a 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
2. Wireless Ethernet



   Scan 1 or 2 to Select Item
```

Figure 3-3. Select Interface Type Screen

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

Selecting Host Parameters

Change Host Params - PCK Configuration Menu Option 2

To select or change a host parameter, choose *Change Host Params* 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 Params menu.

```
     Select Host Params

1. Host Type       : TCP/IP
2. Current HS      : ACK/NAK
3. Host Timeout    : 2.0
4. Turnaround Time: 25

   Scan 1-4 to Set a Param
```

Figure 3-4. Select Host Params Menu

Scanning a “1”, “2”, “3”, or “4” bar code displays the appropriate screen to select or change host parameters. Scan the “1’ bar code to select or change the host type. Scan the “2” bar code to edit Software Handshaking. Scan the “3” bar code to change the host time-out period. Scan the “4” bar code to change host Turnaround Time.

Note: *When returned to this menu after making changes on any of the Host Params sub-screens, you must scan the **Save & Exit** bar code to save changes and return to the PCK Configuration menu.*

Selecting a Host Type

When you scan the “1” bar code at the Select Host Params menu, the Select Host Type screen displays.

```
     Select Host Type:

1. TCP/IP
2. UDP/IP
3. RS-232
4. RS-485

   Scan 1-4 for Host Type
```

Figure 3-5. Select Host Type Screen

Scanning a “1”, “2”, “3”, or “4” bar code selects the corresponding host type and returns you to the Select Host Params menu. From the Select Host Params menu, scan the **Save & Exit** bar code to save changes and exit.

Editing Software Handshaking

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

When you scan the “2” bar code at the Select Host Params menu, 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 3-6. 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 Params menu. From the Select Host Params menu, scan the **Save & Exit** bar code to save changes and exit.

Editing Host Time-out

When you scan the “3” bar code at the Select Host Params menu, the Host Timeout Config screen displays.

```
     Host Timeout Config:

Current Timeout (secs): 2.0
New Timeout (secs):


Scan 0,1 to 9,9 for New Value
```

Figure 3-7. Host Timeout Config Screen

Scan two numeric bar codes beginning on page B-6 to set the host time-out period. The time-out period determines the maximum time allowed to elapse before the MK1000 assumes end of transmission. The delay period can range from 0.1 to 9.9 seconds in .1 second increments. After scanning the appropriate host time-out period, scan the **Save & Exit** bar code on page B-4 to save the changes and return to the Select Host Params menu.

Editing Host Turnaround Time

When you scan the “4” bar code at the Select Host Params menu, the Turnaround Time Config screen displays.

```
     Turnaround Time Config:

Curr Turnaround (ms): 25
New Turnaround (ms) :


Scan 5 to 2,5,5 for New Value
```

Figure 3-8. Host Turnaround Time Config Screen

Scan three numeric bar codes beginning on page B-6 to set the turnaround time. The turnaround time is the time period that the host or MK1000 waits before sending a response. The turnaround time can range from 5 to 255 msecs. After scanning the appropriate host turnaround time, scan the **Save & Exit** bar code on page B-4 to save the changes and return to the Select Host Params menu.

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 *Change Host Config* is selected at the PCK Configuration menu, the system automatically displays the current host type. If TCP/IP is the current host type, the following screen displays for TCP/IP configuration.

```
TCP/IP Configuration Page 1
1. DHCP Enabled:   No
2. IP Address:  192.168.0.2
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 3-9. TCP/IP Configuration Page 1

Scan the number "1" bar code to enable or disable DHCP. (For a list of MK1000 supported DHCP options, see Appendix H, *DHCP Options*.) Scan the number "2", “3”, “4”, or “5” bar code to display the appropriate screen to change the IP Address, Subnet Mask, Gateway, or DNS configuration, respectively. 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:      4050

3. Go Back to Page 1

    Scan Item Number to Edit
```

Figure 3-10. TCP/IP Configuration Page 2

To change the Server Host IP or Server Host Port, scan the number “1” or "2" bar code to display the respective screen. Scan the number “3” to return to the previous screen.

Editing IP Address

When *IP Address* is selected at the TCP/IP Configuration Page1 screen, the following screen displays:

```
Curr IP Addr:
       192.168.0.2
New IP Addr:
```

Figure 3-11. IP Address Screen

To enter changes on this screen, scan the required numeric bar code(s) to enter data in the New IP Addr 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.

Note: *You must scan **Cancel** two times to escape WITHOUT completing the entry. The first scan erases the data and the second scan escapes to the previous screen WITHOUT completing the entry.*

Editing Subnet Mask

When *Subnet Mask* is selected at the TCP/IP Configuration Page1 screen, the following screen displays:

```
Curr subnet mask:
       255.255.255.0
New subnet mask:
```

Figure 3-12. Subnet Mask Screen

To enter changes on this screen, scan the required numeric bar code(s) to enter data in the New Subnet Mask field, as necessary. 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.

Note: *You must scan **Cancel** two times to escape WITHOUT completing the entry. The first scan erases the data and the second scan escapes to the previous screen WITHOUT completing the entry.*

Editing Gateway

When *Gateway* is selected at the TCP/IP Configuration Page1 screen, the following screen displays:

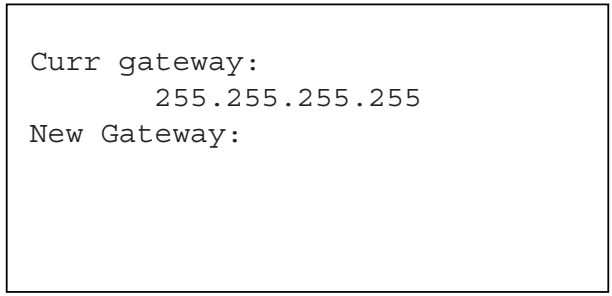


Figure 3-13. Gateway Screen

To enter changes on this screen, scan the required numeric bar code(s) to enter data in the New Gateway field, as necessary.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.

Note: *You must scan **Cancel** two times to escape WITHOUT completing the entry. The first scan erases the data and the second scan escapes to the previous screen WITHOUT completing the entry.*

Editing DNS (Domain Settings) Configuration

When *Go To DNS Screen* is selected at the TCP/IP Configuration Page1 screen, the following screen displays:

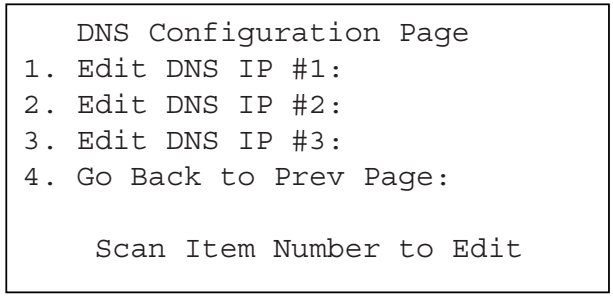


Figure 3-14. DNS Configuration Screen

Scan the “4” bar code to return to the TCP/IP Configuration menu. Scanning a “1”, “2”, or “3” bar code displays the appropriate screen to edit the domain setting for each DNS IP. The following screen displays for each DNS IP Address:

```
Curr DNS IP Addr 1:
       0.0.0.0
New DNS IP Addr 1:
```

Figure 3-15. DNS IP Address Screen

To enter changes on each DNS IP Address screen, scan the required numeric bar code(s) to enter data in the New DNS IP Addr field, as necessary. 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.

Note: *You must scan **Cancel** two times to escape WITHOUT completing the entry. The first scan erases the data and the second scan escapes to the previous screen WITHOUT completing the entry.*

Editing Host IP Address

When *Host IP Address* is selected at the TCP/IP Configuration Page 2 screen, the following screen displays:

```
Curr Srvr IP Addr:
       0.0.0.0
New Srvr IP Addr:
```

Figure 3-16. Host IP Address Screen

To enter changes on this screen, scan the required numeric bar code(s) to enter data in the New Srvr IP Addr 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.

Note: *You must scan **Cancel** two times to escape WITHOUT completing the entry. The first scan erases the data and the second scan escapes to the previous screen WITHOUT completing the entry.*

Editing Host Port

When *Host Port* is selected at the TCP/IP Configuration Page 2 screen, the following screen displays:

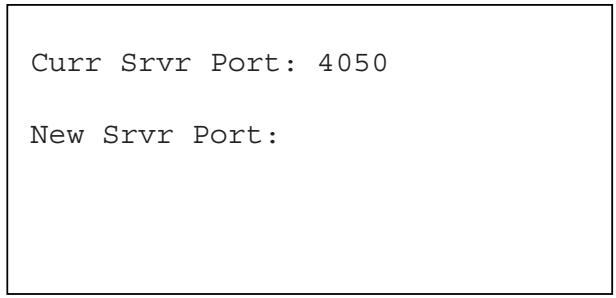


Figure 3-17. Host Port Screen

To enter changes on this screen, scan the required numeric bar code(s) to enter data in the New Srvr Port field, as necessary. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

Note: *You must scan **Cancel** two times to escape WITHOUT completing the entry. The first scan erases the data and the second scan escapes to the previous screen WITHOUT completing the entry.*

UDP/IP Configuration

When *Change Host Config* is selected at the PCK Configuration menu, the system automatically displays the current host type. If UDP/IP is the current host type, the following screen displays for UDP/IP configuration.

```
UDP/IP Configuration Page 1
1. DHCP Enabled:   No
2. IP Address:  192.168.0.2
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 3-18. UDP/IP Configuration Page 1

Scan the number "1" bar code to enable or disable DHCP. (For a list of MK1000 supported DHCP options, see Appendix H, *DHCP Options*.) To change the IP Address, Subnet Mask, Gateway, or DNS configuration, scan the number "2", “3”, “4”, or “5” bar code to display the respective screen. Scan the number "6" bar code to display the second UDP/IP screen.

```
 UDP/IP Configuration Page 2
1. Host IP:       0.0.0.0
2. Host Port:     4050

3. Go Back to Page 1

    Scan Item Number to Edit
```

Figure 3-19. UDP/IP Configuration Page 2

To change the Server Host IP, or Server Host Port, scan the number “1” or "2" bar code to display the respective screen. Scan the number “3” to return to the previous screen.

To enter changes on each screen, scan the required numeric bar code(s) to enter data in any field, as necessary. (Refer to the *TCP/IP Configuration* section for each screen.) 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.

Note: *You must scan **Cancel** two times to escape WITHOUT completing the entry. The first scan erases the data and the second scan escapes to the previous screen WITHOUT completing the entry.*

RS-232/RS-485 Configuration

When *Change Host Config* is selected at the PCK Configuration menu, the system automatically displays the current host type. If RS-232 or RS-485 is the current host type, the appropriate screen displays for configuration. Refer to the section *Auxiliary Port Parameters* for RS-232 and RS-485 configuration information.

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-485 Configuration for an RS-485 host type):

```
     RS-232 Configuration

1. Baud: 19200
2. Data Bits: 8
3. Stop Bits: 1
4. Parity: None
5. Flow Cntrl: DTR/DSR
    Scan Item Number to Edit
```

Figure 3-20. RS-232 Configuration Screen

Scan the number “1”, "2", “3”, “4”, or “5” bar code to display the appropriate screen to change the Baud Rate, Data Bits, Stop Bits, Parity, or Flow Control respectively. (RS-485 Configuration includes an additional option, ‘6. Net ID’.)

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.*

Selecting a Baud

When *Baud* is selected at the RS-232/RS-485 Configuration screen by scanning the “1” bar code located in the section *Numeric Bar Codes* beginning on page B-6, the following screen displays:

```
Current Baud: 19200
Select New Baud:
1. 1200
2. 2400
3. 4800
4. 9600
5. 14400
6. 19200
```

Figure 3-21. Baud Rate Screen

To select or change the baud rate, Scan the required numeric bar code(s) to select the new baud. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

Selecting Data Bits

When *Data Bits* is selected at the RS-232/RS-485 Configuration screen by scanning the “2” bar code located in the section *Numeric Bar Codes* beginning on page B-6, the following screen displays:

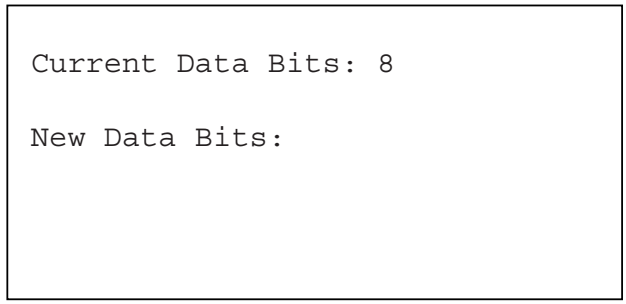


Figure 3-22. Data Bits Screen

Scan the required numeric bar code(s) to enter the new data bits value. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

Selecting Stopbits

When *Stop Bits* is selected at the RS-232/RS-485 Configuration screen by scanning the “3” bar code located in the section *Numeric Bar Codes* beginning on page B-6, the following screen displays:

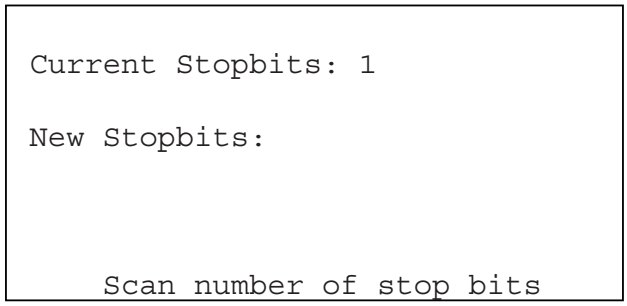


Figure 3-23. Stopbits Screen

Scan the required numeric bar code(s) to enter the new stopbits value. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

Selecting Parity

When *Parity* is selected at the RS-232/RS-485 Configuration screen by scanning the “4” bar code located in the section *Numeric Bar Codes* beginning on page B-6, the following screen displays:

```
Current Parity:   None

Select New Parity:
1. None
2. Odd
3. Even

   Scan 1-3 to select parity
```

Figure 3-24. Parity Screen

Scan the required numeric bar code(s) to select the new parity. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

Selecting Flow Control

When *Flow Cntrl* is selected at the RS-232/RS-485 Configuration screen by scanning the “5” bar code located in the section *Numeric Bar Codes* beginning on page B-6, the following screen displays:

```
Current Flow Control:  DTR/DSR

Select New Flow Control
1. None
2. XON/XOFF
3. DTR/DSR

   Scan 1-3 to select Flow Ctrl
```

Figure 3-25. Flow Control Screen

Scan the required numeric bar code(s) to select the new flow control. Remember to scan the **Save & Exit** bar code when you are finished, or scan **Cancel** to escape WITHOUT completing the entry.

Configuring via the System Menu

Overview

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

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

From the System 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: System Menu

Upon entering the menu system, Figure 3-26 is used for navigation.

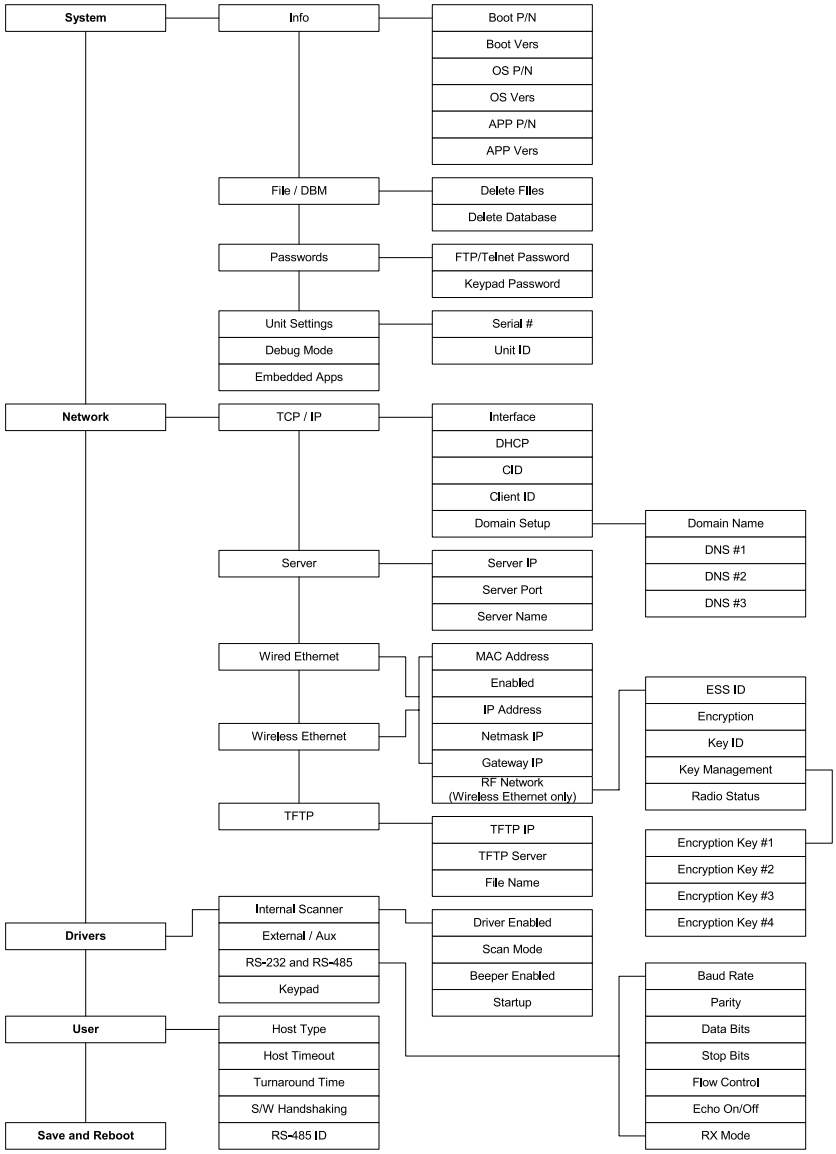


Figure 3-26. System Menus/Screens

Entering, Navigating & Saving Changes

Entering the System Menu

There are three ways to access the System menu:

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

Note: *The PCK Configuration and MK1000 System menus cannot be accessed simultaneously. Only one menu can be active at a time.*

For information about accessing Configuration menus/screens remotely via Telnet, refer to *Configuration via a Telnet Session* *on page 3-63*.

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.

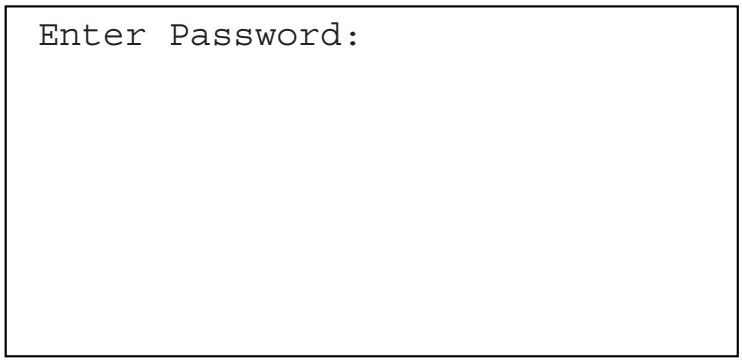


Figure 3-27. Password Screen

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 System menu displays:

```
System Menu
System <
Network
Drivers
User
Save & Reboot

Set System Configuration
```

Figure 3-28. System Menu

When the System menu displays, other system activity related to application programs is suspended. Also, while the menus and screens are active, a time-out 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 System 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*.

Disabling & Enabling Function Buttons

Disabling and enabling function buttons is managed from the Driver Configuration menu (see page 3-53). When the keypad is “Enabled" (default state), the keypad buttons function as noted in Table 3-3. When the keypad is “Disabled”, it can no longer be used to access any of the MK1000 menus.

Once disabled, the keypad can be restored either through a Telnet session and accessing the "Drivers" menu, or by pressing and holding the ‘4’ button while the unit is booting up.

Programming Function Buttons

Function buttons cannot be programmed however, the PCK application sends a message to the host whenever a button is pressed. Button 1 sends "BTN1", Button 2 sends "BTN2", etc.

No provision exists within the PCK application to query what is currently displayed (i.e., to track which screen is displayed) when using multiple screens. To do this, developers must devise their own method for establishing a default screen environment and provide a way to restore the defaults and appropriate screen sequences based on current system events (button press, bar code scan, host connect/disconnect etc.).

The PCK specification currently recognizes four unique events and has default screens (messages) for each of those events. (Also see Table 5-4 on page 5-10 for information about Command Parameters.)

Table 3-4. Events & Screen Messages

Message ID	Event
999	Lost Host Connection message
1000	Power up message
1001	Out of Service message
1002	Ready to Scan message.

All other messages (screens) are host driven, including scanner and button responses. The developer should be able to track what is displayed because the host application drives the screen content.

Saving Changes

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

If the System 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 System 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 System menu (see Figure 3-26 on page 3-26), 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 <
File/DBM
Passwords
Unit Settings
Debug Mode    : DISABLED
Embedded Apps: ENABLED
Display System Info
```

Figure 3-29. System Configuration Menu

Table 3-5. System Configuration Menu Definitions

Field Name	Description
Info	When selected, the Info option displays the *System Information* screen (see Figure 3-30). This screen displays the boot part number, boot version, operating system part number, the operating system version, application part number, and the application version.
File/DBM	When selected, the File/DBM option displays the *File Sys/DBM Management* screen (see Figure 3-31). 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.
Passwords	When selected, the Passwords option displays the *Change Passwords* screen (see Figure 3-32). From this screen you can set and change the FTP/Telnet and keypad passwords.
Unit Settings	When selected, the Unit Setting option displays the *Unit Settings* screen (see Figure 3-33). From this screen you can change the unit's serial number and ID.

Table 3-5. System Configuration Menu Definitions (Continued)

Field Name	Description
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.
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.

System Information Screen

From the System Configuration menu (see Figure 3-29 on page 3-32), 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-14-001-11-03
OS Vers  : V4.09.00
APP P/N  : S-15-016-02-0L
APP Vers : V1.09.00
```

Figure 3-30. System Information Screen

Table 3-6. 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.
APP P/N	This field represents the embedded application part number. The default APP P/N for the MK1000 is S-15-016-02-xx (where xx is the revision level).

Table 3-6. System Information Screen Definitions (Continued)

Field Name	Description
APP Vers	The PCK application version number.

File Sys/DBM Management Screen

From the System Configuration menu (see Figure 3-29 on page 3-32), 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:

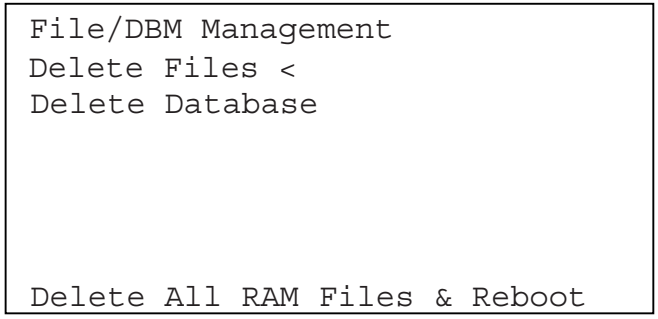


Figure 3-31. File Sys/DBM Management Screen

Table 3-7. 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 of modified MK1000 setup parameters is deleted.

Change Passwords Screen

From the System Configuration menu (see Figure 3-29 on page 3-32), 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:

```
Change Passwords
FTP/Telnet Password:
<
Keypad Password:



Set Telnet/FTP Password
```

Figure 3-32. Change Passwords Screen

Table 3-8. 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.

Change Unit Settings Screen

From the System Configuration menu (see Figure 3-29 on page 3-32), press the Previous or Next buttons to move the "<" cursor to the Unit Settings option and press the Enter button. To return to the System Configuration menu, press the '1' button to escape.

The Unit Settings screen displays:

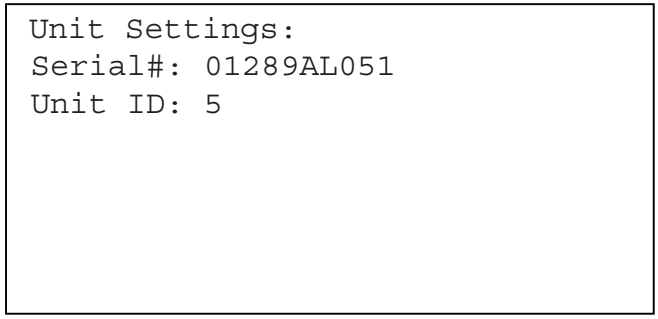


Figure 3-33. Unit Settings Screen

Table 3-9. Unit Settings Screen Definitions

Field Name	Description
Serial#	This is a read only field that includes the unit's serial number.
Unit ID	This is a read only field that includes an identification number for the unit.

The Network Configuration Menu

From the System menu (see Figure 3-26 on page 3-26), press the Previous or Next buttons to move the "<" cursor to the Network option and press the Enter button.

The Network Configuration menu displays:

```
Network Configuration
TCP/IP <
Server
Wired Ethernet
Wireless Ethernet
TFTP

Configure TCP/IP
```

Figure 3-34. Network Configuration Menu

Note: *If DHCP mode is disabled and the IP address for either Wired Ethernet or Wireless Ethernet 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 3-10. Network Configuration Menu Definitions

Field Name	Description
TCP/IP	When selected, the TCP/IP option displays the *TCP/IP Configuration* screen (see Figure 3-35). From this screen it is possible to configure the primary interface (Wired Ethernet or Wireless Ethernet) 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. (For a list of MK1000 supported DHCP options, see Appendix H, *DHCP Options*.)
Server	When selected, the Server option displays the *Server Configuration* screen (see Figure 3-38).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.
Wired Ethernet	When selected, the Wired Ethernet option displays the *Wired Ethernet Configuration* screen (see Figure 3-39). This screen allows configuration of the Wired 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 3-10. Network Configuration Menu Definitions (Continued)

Field Name	Description
Wireless Ethernet	When selected, the Wireless Ethernet option displays the *Wireless Ethernet Configuration* screen for RF Settings (see Figure 3-41). The configuration screen for the Wireless Ethernet is nearly identical in function to that of the Wired 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 3-41) that allows configuration of Wireless Ethernet 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 3-34 on page 3-38), 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
Interface: WIRELESS ETHERNET <
DHCP: DISABLED
DHCP Setup:
Domain Setup


Select Wired or Wireless
```

Figure 3-35. TCP/IP Configuration Screen

Table 3-11. TCP/IP Configuration Screen Definitions

Field Name	Description
Interface	Press the Previous or Next buttons to move the "<" cursor to this field and select the interface type (Wired Ethernet or Wireless Ethernet). To toggle the field setting, press the Enter button. The default Interface for the MK1000 is Wireless Ethernet.
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. (For a list of MK1000 supported DHCP options, see Appendix H, *DHCP Options*.)
DHCP Setup	When selected, the DHCP Setup option displays the *DHCP Settings* screen (see Figure 3-36). From this screen the user can Enable or Disable the Client ID.
Domain Setup	When selected, the Domain Setup option displays the *Domain Settings* screen (see Figure 3-37). From this screen the user can set 3 domain server addresses.

DHCP Setup

From the TCP/IP Configuration screen (see Figure 3-35 on page 3-40), press the Previous or Next buttons to move the "<" cursor to the DHCP Setup option and press the Enter button. To return to the TCP/IP Configuration screen, press the ‘1’ button to escape.

The DHCP Setup screen displays:

```
DHCP Settings
CID: DISABLED <
Client ID:


User Class:

Enable/Disable Client ID
```

Figure 3-36. DHCP Settings Screen

Table 3-12. DHCP Settings Screen Definitions

Field Name	Description
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.
User Class	Press the Previous or Next buttons to move the "<" cursor to this field and enter the User Class.

Domain Settings

From the TCP/IP Configuration screen (see Figure 3-35 on page 3-40), 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:   0.0.0.0
DNS #2:   0.0.0.0
DNS #3:   0.0.0.0

Set Local Domain Name
```

Figure 3-37. Domain Settings Screen

Table 3-13. 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.
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 3-34 on page 3-38), 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   : 0.0.0.0 <
Server Port: 4050
Server Name:



Set Server IP Address
```

Figure 3-38. Server Configuration Screen

Table 3-14. 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.
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.

Wired Ethernet Configuration Screen

From the Network Configuration menu (see Figure 3-34 on page 3-38), press the Previous or Next buttons to move the "<" cursor to the Wired 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:

```
Wired Ethernet Configuration
MAC Address: 00:60:A3:00:00:05
Enabled    : Yes
IP Address : 192.168.0.1
Netmask IP : 255.255.255.0
Gateway IP : 255.255.255.255

Enable/Disable Wired Ethernet
```

Figure 3-39. Wired Ethernet Config Screen

Wireless Ethernet Configuration Screen

From the Network Configuration menu (see Figure 3-34 on page 3-38), press the Previous or Next buttons to move the "<" cursor to the Wireless Ethernet option and press the Enter button. To return to the Network Configuration menu, press the ‘1’ button to escape.

The Wireless Ethernet Config screen displays:

```
Wireless Ethernet Config.
MAC Address: 00:A0:F8:33:5D:C6
Enabled    : No <
IP Address : 192.168.0.2
Netmask IP : 255.255.255.0
Gateway IP : 255.255.255.255
RF Network Settings
Enable/Disable Wireless Ether.
```

Figure 3-40. Wireless Ethernet Config Screen

Note: *If an Ethernet chip is not installed in your MK1000, the fields on the Wired Ethernet Configuration screen are not supported.*

Table 3-15. Wired/Wireless Ethernet Config Screen Definitions

Field Name	Description
MAC Address	Both Wired and Wireless Ethernet MAC addresses are configured at the factory and cannot be altered. Each unit has a unique MAC address.
Enabled	The port can be enabled or disabled, if not being used. The defaults for both wired and wireless configurations for the MK1000 are YES (enabled). 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. 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 both wired and wireless configurations 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 both wired and wireless configurations for the MK1000 is 255.255.255.255.

Table 3-15. Wired/Wireless Ethernet Config Screen Definitions (Continued)

Field Name	Description
RF Settings (Wireless Ethernet only)	When selected at the Wireless Ethernet Config screen, the RF Settings option displays the RF Network Settings screen (see Figure 3-41). From this screen the user can configure radio specific parameters such as ESS ID, Encryption type, Key ID, Key Management and Radio Status.

Wireless Ethernet - RF Settings

From the Network Configuration menu (see Figure 3-34 on page 3-38), press the Previous or Next buttons to move the "<" cursor to the Wireless Ethernet option and press the Enter button to display the Wireless Ethernet Config screen. Press the Previous or Next buttons to move the "<" cursor to the RF Network Settings option and press the Enter button. To return to the Network Configuration menu, press the '1' button to escape.

The RF Network Settings screen displays:

```
RF Network Settings
ESS ID:
101 <
Encryption: Disabled
Key ID    : 1
Key Management
Radio Status
Set ESS ID
```

Figure 3-41. Wireless Ethernet Config - RF Network Settings Screen

Table 3-16. 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. Note: ESS ID is a 32-character field however this screen does not display the full 32 characters. To view all 32 characters, if applicable, it is recommended that you use a Telnet session to configure the ESS ID remotely. For more information about Telnet, see *Configuration via a Telnet Session on page 3-63*.
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 OPEN KEY, 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.
Radio Status	When selected, the Radio Status option displays the *Radio Status* screen (see Figure 3-41). From this screen the user can view the RF Mac address, the AP Mac address, Link, Channel, TxRate, Port, CQ, ASL and ANL. **Note:** This option is only available when an 11 MB radio is installed.

Wireless Ethernet - Radio Status Settings

From the RF Network Settings screen, press the Previous or Next buttons to move the "<" cursor to the Radio Status option and press the Enter button to display the *Radio Status* screen.

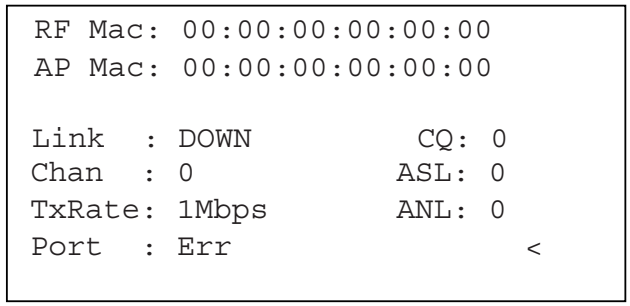


Figure 3-42. Wireless Ethernet Config - Radio Status Screen

The Radio Status screen is only available when an 11MB radio is installed. The contents of the Radio Status screen are valid only when the TCP/IP Interface is set to "Wireless Ethernet," the Wireless Ethernet Configuration is set to "Enabled," and the MK1000 was powered up with these two options already set. If these options were not set, the values displayed are all zeroes. (Figure 3-42 shows the values of inactive Radio Status screen.)

To return to the RF Network Setting screen, press the '1' button to escape.

Table 3-17. Radio Status Screen Definitions

Field Name	Description
Note: All fields on this screen are read only.	
RF Mac	This field includes the MAC address of the installed Symbol LA-41x1 802.11b RF PCCard. If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **0**. This field is read only.

Table 3-17. Radio Status Screen Definitions (Continued)

Field Name	Description
Note: All fields on this screen are read only.	
AP Mac	This field includes the MAC address of the associated 802.11b Access Point (AP). If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **0**. This field is read only.
Link	The value in this field is **Down** when there is no association with an AP and **CONNECTED** when there is an association with an AP. If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **Down**. This field is read only.
Chan	This field includes the radio channel ID selected by the AP for RF communications. This value is usually **11**. If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **0**. This field is read only.
TxRate	This field includes the TxRate selected by the AP for RF communications. This value can be **1**, **2**, **5.5** or **11**. If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **1**. This field is read only.

Table 3-17. Radio Status Screen Definitions (Continued)

Field Name	Description
Note: All fields on this screen are read only.	
Port	This field includes the Port number selected by the AP for RF communications. This value can be **Err** (Wireless Networking not selected or not enabled), **SEARCHING** (AP not associated) or **CONN_ESS** (AP associated). If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **Err**. This field is read only.
CQ	This field includes the Channel Quality of current RF communications. The higher the value, the better the channel quality. If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **0**. This field is read only.
ASL (Average Signal Level)	This field includes the RF signal quality. The higher the value, the better the signal quality. If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **0**. This field is read only.
ANL (Average Noise Level)	This field includes the RF signal noise level. The lower the value, the better the signal quality. If the TCP/IP interface is not set to "Wireless Ethernet" and the Wireless Ethernet Configuration is not set to "Enabled" prior to powering up the MK1000, the value in this field is **0**. This field is read only.

TFTP Configuration Screen

From the Network Configuration menu (see Figure 3-34 on page 3-38), 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
TFTP IP: 0.0.0.0 <
TFTP Server:

File Name:


Set TFTP IP Address
```

Figure 3-43. TFTP Configuration Screen

Table 3-18. 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).
TFTP Server	Press the Previous or Next buttons to move the "<" cursor to this field to enter the TFTP server name.
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 System menu (see Figure 3-26 on page 3-26), press the Previous or Next buttons to move the "<" cursor to the Drivers option and press the Enter button.

The Driver Configuration menu displays:

```
Driver Configuration
Internal Scanner <
External/Aux Barcode Reader
RS-232 Port
RS-485 Port
KEYPAD: ENABLED

Configure Laser Scanner
```

Figure 3-44. Driver Configuration Menu

Table 3-19. Driver Configuration Menu Definitions

Field Name	Description
Internal Scanner	When selected, the Internal Scanner option displays the *Laser Scanner Configuration* screen (see Figure 3-45). 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).

Table 3-19. Driver Configuration Menu Definitions (Continued)

Field Name	Description
External/Aux 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.)
RS-232 Port	When selected, the RS-232 Port option displays the *RS-232 Configuration* screen (see Figure 3-46). 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 Configuration* screen (see Figure 3-47).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.
KEYPAD	When selected, the KEYPAD option allows you to toggle between disabling and enabling MK1000 keypad function buttons. When the keypad is "Enabled" (default state), the keypad buttons function as noted in Table 3-3 on page 3-29. When the keypad is "Disabled", it can no longer be used to access any of the MK1000 menus. Keypad operation can be restored either through a Telnet session and accessing the "Drivers" menu, or by pressing and holding the '2' and '3' buttons simultaneously while the unit is booting up.

Laser Scanner Configuration Screen

From the Driver Configuration menu (see Figure 3-44 on page 3-53), press the Previous or Next buttons to move the "<" cursor to the Internal 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:

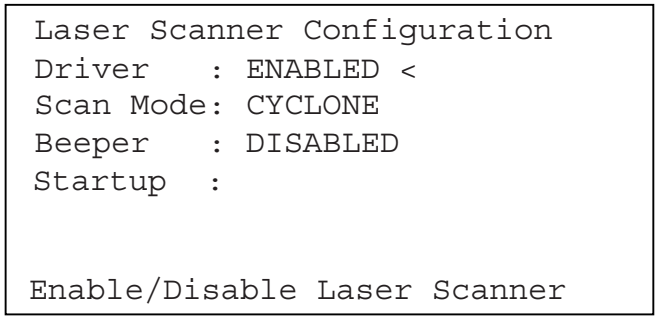


Figure 3-45. Laser Scanner Config Screen

Table 3-20. 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.)

Table 3-20. Laser Scanner Config Screen Definitions (Continued)

Field Name	Description
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.
Startup	Press the Previous or Next buttons to move the "<" cursor to the Startup field to enter custom scanner parameter settings (in hexadecimal format). This field is a 30 character field that is used for custom scanner parameter settings. These parameter settings conform to the option codes and values defined in the SE 2223/3223 Integration Guide (p/n 70-36636-xx). Multiple codes and values may be entered, but all values must be in hexadecimal format. For example, to cause all decoded bar codes to be terminated with a carriage return/line feed character pair, the following startup string would be entered: E203690A6A00 where: E203 = Scan Data Transmission Option 3 <Data><Suffix1><Suffix2> 690A = Suffix1: 0x0D 6A00 = Suffix2: 0x00 The default Startup value for the MK1000 is blank.

RS-232 Configuration Screen

From the Driver Configuration menu (see Figure 3-44 on page 3-53), 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 Port Configuration
Baud   : 19200 <     Echo: OFF
Parity: NONE         Rx   : XPT
Data   : 8 BITS
Stops  : 1 BIT
Flow   : DTR/DSR

Toggles Baud Rate
```

Figure 3-46. RS-232 Config Screen

Table 3-21. 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 3-21. 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.
Stops (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 3-44 on page 3-53), 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-232 Port Configuration
Baud   : 9600 <      Echo: OFF
Parity: NONE         Rx   : XPT
Data   : 8 BITS
Stops  : 1 BIT
Flow   : NONE

Toggles Baud Rate
```

Figure 3-47. 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 3-22. 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 3-22. 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.
Stops (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 3-22. 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 Configuration Menu

The User Configuration menu is used to change PCK application parameters using the MK1000 function buttons, or remotely through Telnet.

From the System menu (see Figure 3-26 on page 3-26), press the Previous or Next buttons to move the "<" cursor to the User option and press the Enter button.

The User Configuration menu displays:

```
User Configuration
Host Type        : RS-232
Host Timeout     : 2000
Turnaround Time  : 25
S/W Handshaking  : ACK/NAK
RS-485 ID        : 48
```

Figure 3-48. User Configuration Menu

Table 3-23. User Configuration Menu Definitions

Field Name	Description
Host Type	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the Host Type. The Host Type setting on this screen defaults to the current host type setting for the MK1000. Available Host Type settings: TCP/IP, UDP/IP, RS-232 and RS-485.
Host Time-out	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Host Time-out period. The time-out period determines the maximum time allowed to elapse before the MK1000 assumes end of transmission. The delay period can range from 100 to 9900 msecs in 100 msec increments. The default Host Time-out period is 2000 msecs.
Turnaround Time	Press the Previous or Next buttons to move the "<" cursor to this field and enter the Turnaround Time. The turnaround time is the time period that the host or MK1000 waits before sending a response. The turnaround time can range from 5 to 255 msecs. The default Turnaround Time for the MK1000 is 25 msecs.
S/W Handshaking	Press the Previous or Next buttons to move the "<" cursor to this field and toggle by pressing the Enter button to select the type of Software Handshaking. Available Software Handshaking types: NONE, ACK/NAK, ENQ, ACK/NAK/ENQ and RAW. The default S/W Handshaking type for the MK1000 is ACK/NAK.
RS-485 ID	Press the Previous or Next buttons to move the "<" cursor to this field and enter the RS-485 ID. The default RS-485 ID for the MK1000 is 48.

Configuration via a Telnet Session

Overview

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

From the System 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, screens appear as they do when navigating the System menu as shown on page 3-25.

Depending on the version of software installed, a Telnet Session menu with Debug and Configuration options may appear. If this menu displays, select the Configuration option (option 2) and press enter.

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 3-24. Telnet Navigation Buttons

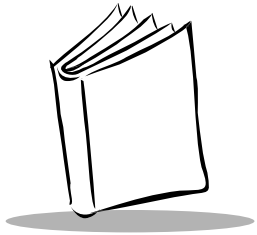
Button	Description
↑	- Moves the cursor up.
↓	- Moves the cursor down.
Enter	- Selects the highlighted item. - Enters a value that has been typed in.
Esc	- Exits the current screen and returns to the previously displayed screen. - Escapes a data entry field.
Ctrl-D	Exits the Telnet session, WITHOUT saving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

To properly navigate the System menu 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 System 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.

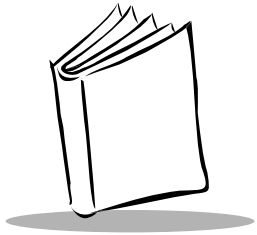
Enter/Exit Demo Mode

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 Host 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 Host 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 Host 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.

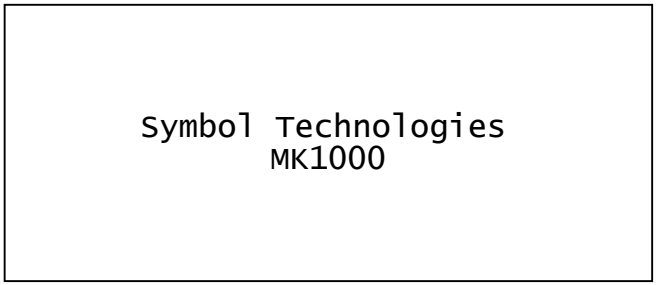


Figure 5-1. Powerup Default Message

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.

MK1000 Command Examples - Host to PCK Software

All commands have the following format:

stx FF <Command Syntax> <Data> etx lrc

where:

stx = 02 (Start of Transmission)

FF = 0C

Command Syntax = Optional text, font, or position command (e.g., xy coordinates to position a message)

<Data> = message

etx = 03

lrc = Exclusive - or of all characters transmitted except for the stx character (calculated longitudinal redundancy check).

Command Syntax Examples

Table 5-8. Clear Screen

02	0C	03	0F
stx	FF	etx	lrc

Table 5-9. Send Text

esc	[	1	;	1	T

Table 5-10. Position Cursor Then Send Text

esc	[	Px	;	Py	T

Table 5-11. Display Stored Message

esc	[	Pi	J

Complete String Examples

Table 5-12. Clear Screen & Send “HI”

02	0C	1B	5B	31	3B	31	54	48	49	03	21
stx	FF	esc	[	1	;	1	T	H	I	etx	lrc

Table 5-13. Clear Screen & Send “HI” at Position 100x32

02	0C	1B	5B	31	30	30	3B	33	32	54	48	49	03	11
stx	FF	esc	[	1	0	0	;	3	2	T	H	I	etx	lrc

Table 5-14. Clear Screen & Send Stored Message #1002

02	0C	1B	5B	31	30	30	32	4A	03	06
stx	FF	esc	[	1	0	0	2	J	etx	lrc

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.*

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.

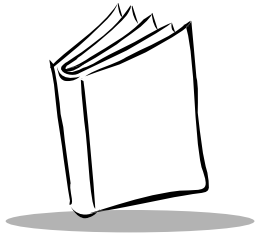
Pb is the beep code parameter that is, the beep code value specified in ASCII digits (see the table below).

Table 5-15. 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
7	3 Short Low Beeps
8	4 Short Low Beeps

Table 5-15. Beep Sequences (Continued)

Decimal Value	Beep Sequence
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 System 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 3-31.

Bar Codes

Setup

Scan the bar code below to enter the System menu.

Enter System Menu

Save and Reboot

Scan the bar code below to save your changes and exit the System menu.

Exit System 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 3-29 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 3-29 for more information about button functions.

Prev

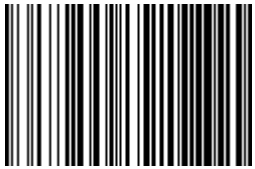
Enter

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 3-29 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 3-29 for more information about button functions.

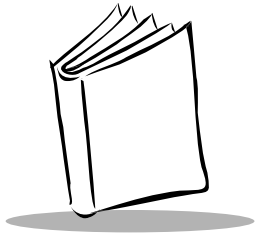


Escape

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

Note: *The PCK Configuration and MK1000 System menus cannot be accessed simultaneously. Only one menu can be active at a time.*

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

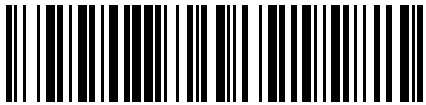
7

8

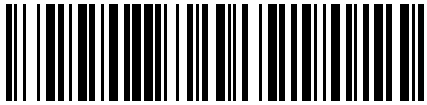
9

Alphabetic Character Bar Codes

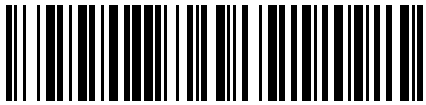
The following pages provide the uppercase alphabetic characters A-Z. They are on separate pages here to make it easier to scan without scanning adjacent bar codes



A

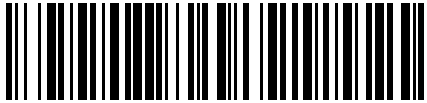


B

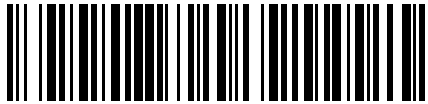


C

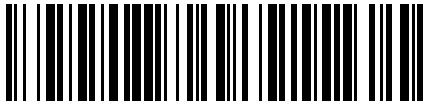
D



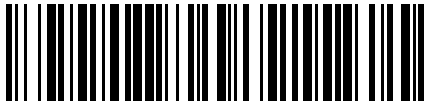
E



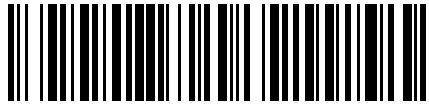
F



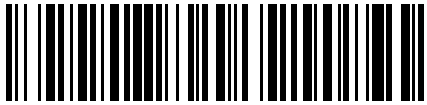
G



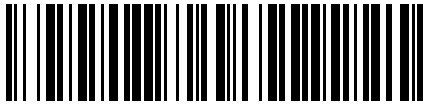
H



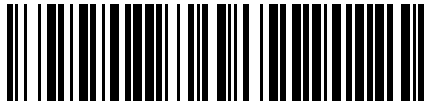
I



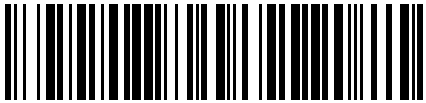
J



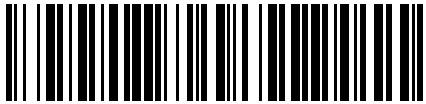
K



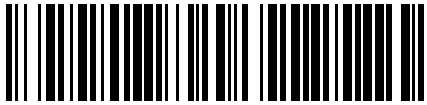
L



M

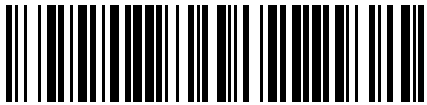


N

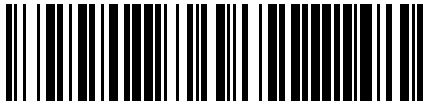


O

P

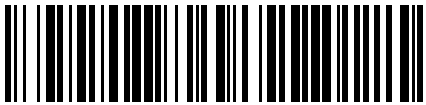


Q

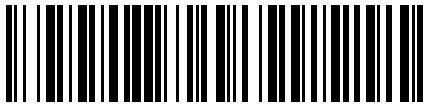


R

S

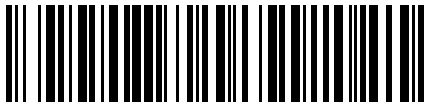


T

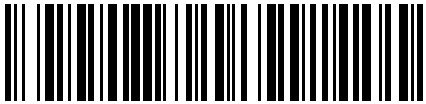


U

V



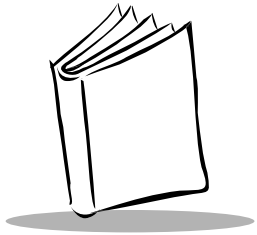
W



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

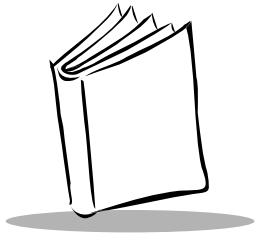
(04h)

Cyclone Pattern

(06h)

Semi-Omni Pattern

(07h)



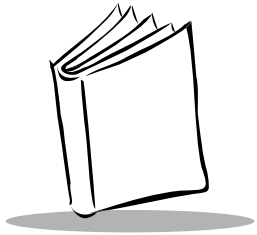
Appendix D
MK1000 Fonts

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.



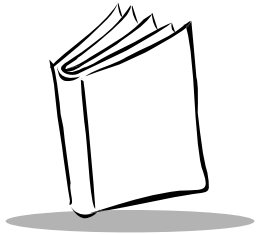
Appendix E
Technical Specifications

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. “Loader Activated...Stand By” message displays.
5. Determining the MK1000's current OS version.
6. Confirming communication with host computer.
7. Restoring factory default settings.
8. Unit does not complete firmware upgrade and keeps rebooting itself.
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.
13. Bar code lookups with the host are timing out.
14. Front panel buttons on the MK1000 are not working (disabled).

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.
4. "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 System menu and set the embedded apps option to enable. or 2) Load a custom application onto the MK1000.

5. How do I determine the MK1000's current OS version?	(Not applicable)	**OS version is displayed on a screen within the System menu screens:**
		- Press the '4' and '1' buttons on the unit simultaneously (an *Enter Password* screen appears).
		- Type in '44213' (the System 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 System menu WITHOUT saving any changes:** - Press '1' (System Configuration screen appears). - Press '1' (System menu appears). - Press '1' (System menu is exited, changes are NOT saved, and the original settings are retained as described in Troubleshooting Note 1).
6. 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. (continued)

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
(continued) How do I confirm my MK1000 is communicating with my host computer?		- 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. - 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
7. 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 System menu.** - Press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears). - Type in '44213' (System menu 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). - 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 System menu, the unit defaults to its factory settings database. See Troubleshooting Note 1. - Press '1' (System Configuration screen re-appears). - Press '1' (System 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 System menu.** - Scroll the cursor down to Save & Reboot by pressing the '3' button four times. - With the cursor on Save & Reboot, press '4'. (System menu is exited, all changes made are saved, and the unit reboots as described in Troubleshooting Note 1.)
8. My MK1000 does not complete the firmware upgrade process. It keeps rebooting itself.	The unit does not have enough free memory available.	**The unit does not have enough free memory available.** - While stuck in the rebooting loop, press the '4' and '1' buttons on the unit simultaneously (an Enter Password screen appears). - Type in '44213' (System menu 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 is now ready for new firmware to be loaded.

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions

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' (System 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 System 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’ (System 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 Wired/ Wireless Ethernet by pressing the ‘3’ button three times.
		- With the cursor on Wired/Wireless Ethernet, press ‘4’ (Wired/Wireless Ethernet 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 System menu WITHOUT saving/making any changes
		  - Press the ‘1’ button three times.

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
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)
		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' (System menu 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.

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions

(continued)
MK1000 will not communicate over a wired-Ethernet connection.
		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)

		4. Confirm the Wireless (RF) Ethernet Setup is DISABLED. - Scroll the cursor down to Wired/ Wireless Ethernet by pressing '3'. - With the cursor on Wired/Wireless Ethernet, press '4' (Wired/WIreless Configuration screen appears). - On the Wired/Wireless 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' (System menu re-appears).

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
(continued) MK1000 will not communicate over a wired-Ethernet connection.		**5. Save ALL changes made and EXIT the System menu.** - Scroll the cursor down to Save & Reboot by pressing the '3' button three times. - With the cursor on Save & Reboot, press '4'. (System menu is exited, all change made are saved, and the unit reboots as described in Troubleshooting Note 1.)
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.

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
(continued) MK1000 will not communicate over a wireless-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' (System 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 Wired/ Wireless Ethernet by pressing the '3' button three times. - With the cursor on Wired/Wireless Ethernet, press '4' (Wired/Wireless Ethernet 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 Wired/Wireless 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).
		4. Confirm the Wired Ethernet Setup is DISABLED.
		- Scroll the cursor up to Wired Ethernet by pressing '2'
		- With the cursor on Wired Ethernet, press '4' (Wired Ethernet Configuration screen appears).
		- On the Wried 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' (System menu screen re-appears).
		(continued)

Table F-1. Troubleshooting (Continued)

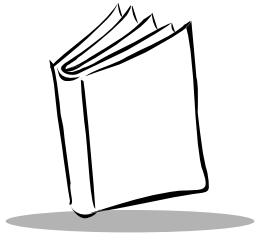
Problem	Possible Causes	Possible Solutions
(continued) MK1000 will not communicate over a wireless-Ethernet connection.		**5. Save ALL changes made and EXIT the System menu.** - Scroll the cursor down to Save & Reboot by pressing the '3' button three times. - With the cursor on Save & Reboot, press '4' (System 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' (System menu 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.

Table F-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
13. Bar code lookups with the host are timing out.	Heavy network traffic or slow database response.	Extend the Host time-out period from the default value of 2000 milliseconds (2 seconds) to a maximum of 9900 milliseconds (9.9 seconds). Host time-out periods longer than 9900 milliseconds would indicate network or host unavailability, or a network or host failure.
14. Front panel buttons on the MK1000 are not working (disabled).	The MK1000 front panel buttons may have been disabled.	If the keypad is disabled, the MK1000 briefly displays "Keypad Disabled!" when the unit is rebooted or powered up. Keypad operation can be restored either through a Telnet session and accessing the "Drivers" menu, or by pressing and holding the ‘2’ and ‘3’ buttons simultaneously while the unit is booting up. Overriding the keypad setting in this manner causes the MK1000 to briefly display “Keypad Enabled.”

Troubleshooting Notes

1. Changes made while navigating the System menu screens are NOT saved or applied UNTIL the System menu is exited through its Save & Reboot option. If the System 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

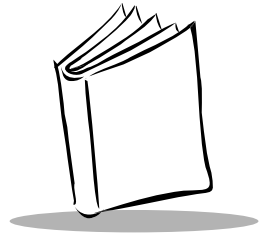
2M5 = Wireless Only: Frequency Hopping 2Mb Radio with 500mW radio power

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



Appendix H
DHCP Options

Table H-1. MK1000 Supported DHCP Options

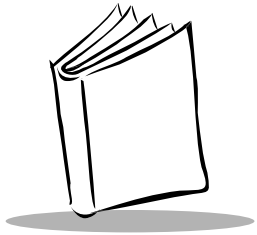
Option	Name	Meaning
0	Pad	None
1	Subnet Mask	Subnet Mask Value
2	Time Offset	Time Offset in Seconds from UTC
3	Router	Router addresses list
4	Time Server	Timeserver addresses list
5	Name Server	IEN-116 Server addresses list
6	Domain Server	DNS Server addresses list
7	Log Server	Logging Server addresses list
8	Quotes Server	Quotes Server addresses list
9	LPR Server	Printer Server addresses list
10	Impress Server	Impress Server addresses list
11	RLP Server	RLP Server addresses list
12	Hostname	Hostname string
13	Boot File Size	Size of boot file in 512 byte chunks
14	Merit Dump File	Client to dump and file name to dump it to
15	Domain Name	The DNS domain name of the client

Table H-1. MK1000 Supported DHCP Options (Continued)

Option	Name	Meaning
16	Swap Server	Swap Server address
17	Root Path	Path name for root disk
18	Extension File	Path name for more BOOTP info
19	Forward On/Off	Enable/Disable IP Forwarding
20	SrcRte On/Off	Enable/Disable Source Routing
21	Policy Filter	Routing Policy Filters
22	Max DG Assembly	Max Datagram Reassembly Size
23	Default IP TTL	Default IP Time to Live
24	MTU Time-out	Path MTU Aging Time-out
25	MTU Plateau	Path MTU Plateau Table
26	MTU Interface	Interface MTU Size
27	MTU Subnet	All Subnets are Local
28	Broadcast	Address Broadcast Address
29	Mask Discovery	Perform Mask Discovery
30	Mask Supplier	Provide Mask to Others
31	Router Discovery	Perform Router Discovery
32	Router Request	Router Solicitation Address
33	Static Route	Static Routing Table
34	Trailers	Trailer Encapsulation
35	ARP Time-out	ARP Cache Time-out
36	Ethernet	Ethernet Encapsulation
37	Default TCP TTL	Default TCP Time to Live
38	Keepalive Time	TCP Keepalive Interval
39	Keepalive Data	TCP Keepalive Garbage
40	NIS Domain	NIS Domain Name
41	NIS Servers	NIS Server Addresses

Table H-1. MK1000 Supported DHCP Options (Continued)

Option	Name	Meaning
42	NTP Servers	NTP Server Addresses
43	Vendor Specific	Vendor Specific Information
44	NETBIOS Name Srv	NETBIOS Name Servers
45	NETBIOS Dist Srv	NETBIOS Datagram Distribution
46	NETBIOS Node Type	NETBIOS Node Type
47	NETBIOS Scope	NETBIOS Scope
48	X Window Font	X Window Font Server
49	X Window Manager	X Window Display Manager
50	Address Request	Requested IP Address
51	Address Time	IP Address Lease Time
52	Overload	Overload "sname" or "file"
53	DHCP Msg Type	DHCP Message Type
54	DHCP Server Id	DHCP Server Identification
55	Parameter List	Parameter Request List
56	DHCP Message	DHCP Error Message
57	DHCP Max Msg Size	DHCP Maximum Message Size
58	Renewal Time	DHCP Renewal (T1) Time
59	Rebinding Time	DHCP Rebinding (T2) Time
60	Class Id	Class Identifier
61	Client Id	Client Identifier
66	Server-Name	TFTP Server Name



Glossary

ACK/NAK	ACK/NAK is the default software handshaking.
AirBEAM Manager	See **WNMS**.
Aperture	The opening in an optical system defined by a lens or baffle that establishes the field of view.
ANSI Terminal	A display terminal that follows commands in the ANSI standard terminal language. For example, it uses escape sequences to control the cursor, clear the screen and set colors. Communications programs support the ANSI terminal mode and often default to this terminal emulation for dial-up connections to online services.
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.
BOOTP	A protocol for remote booting of diskless devices. Assigns an IP address to a machine and may specify a boot file. The client sends a bootp request as a broadcast to the bootp server port (67) and the bootp server responds using the bootp client port (68). The bootp server must have a table of all devices, associated MAC addresses and IP addresses. Broadband Wireless - Wireless transmission at 1 Mbps and higher.
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.

DHCP	(Dynamic Host Configuration Protocol) Software that automatically assigns IP addresses to client stations logging onto a TCP/IP network. Similar to BOOTP, but also permits the leasing of an IP address. It eliminates having to manually assign permanent IP addresses. DHCP software typically runs in servers and is also found inn network devices such as routers that allow multiple users access to the Internet.
DHCP Server	A server in the network or a service within a server that assigns IP addresses.
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.
Encryption	Encryption is the scrambling and coding of data, typically using mathematical formulas called algorithms, before information is transmitted over any communications link or network. A key is the specific code used by the algorithm to encrypt or decrypt the data.
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.

IEEE Address See **MAC Address**.

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.

IP (Internet Protocol) The IP part of the TCP/IP communications protocol. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or subnetwork. IP accepts “packets” from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a “datagram” to the layer 2 data link protocol. It may also break the packet into fragments to support the maximum transmission unit (MTU) of the network.

IP Address (Internet Protocol address) The address of a computer attached to a TCP/IP network. Every client and server station must have a unique IP address. A 32-bit address used by a computer on a TCP/IP network. Client workstations have either a permanent address or one that is dynamically assigned to them each session. IP addresses are written as four sets of numbers separated by periods; for example, 204.171.64.2.

Kerberos Kerberos is a network authentication protocol. It is designed to provide strong authentication for client/server applications by using secret-key cryptography. A free implementation of this protocol is available from the Massachusetts Institute of Technology. Kerberos is available in many commercial products as well.

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.
MAC Address (also called IEEE Address)	Spectrum24® devices, like other Ethernet devices, have unique, hardware-encoded MAC (also called IEEE addresses). MAC addresses determine the device sending or receiving data. The MAC address is a 48-bit number written as six hexadecimal bytes separated by colons.
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.
Null Modem Cable	An RS-232 cable used to connect two personal computers together in close proximity for file transfer. It attaches to the serial ports of both machines and simulates what would occur naturally if modems and the phone system were used. It crosses the sending wire with the receiving wire. A counterpart special cable is also available that uses the parallel port for higher transfer speed.
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%.

PING	(Packet INternet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.
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.
Subnet Mask	A 32-bit number used to separate the network and host sections of an IP address. A custom subnet mask subdivides an IP network into smaller subsections. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets. Default is often 255.255.255.0.
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).

TCP/IP (Transmission Control Protocol/Internet Protocol) A communications protocol used to internetwork dissimilar systems. This standard is the protocol of the Internet and has become the global standard for communications.

TCP provides transport functions, which ensures that the total amount of bytes sent is received correctly at the other end. UDP is an alternate transport that does not guarantee delivery. It is widely used for real-time voice and video transmissions where erroneous packets are not retransmitted.

IP provides the routing mechanism. TCP/IP is a routable protocol, which means that all messages contain not only the address of the destination station, but the address of a destination network. This allows TCP/IP messages to be sent to multiple networks within an organization or around the world, hence its use in the worldwide Internet. Every client and server in a TCP/IP network requires an IP address, which is either permanently assigned or dynamically assigned at startup.

Telnet A terminal emulation protocol commonly used on the Internet and TCP/IP-based networks. It allows a user at a terminal or computer to log onto a remote device and run a program. Telnet is a part of the TCP/IP communications protocol.

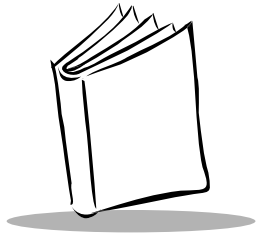
TFTP (Trivial File Transfer Protocol) A version of the TCP/IP FTP (File Transfer Protocol) protocol that has no directory or password capability. It is the protocol used for upgrading frimware, downloading software and remote booting of diskless devices.

Tolerance Allowable deviation from the nominal bar or space width.

UDP (User Datagram Protocol) A protocol within the TCPIP protocol suite that is used in place of TCP when a reliable delivery is not required. For example, UDP is used for real-time audio and video traffic where lost packets are simply ignored, because there is no time to retransmit. If UDP is used and a reliable delivery is required, packet sequence checking and error notification must be written into the applications.

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.
WEP Encryption	(Wired Equivalent Privacy encryption) The conversion of data into a secret code for transmission over a public network. The original text, or plaintext, is converted into a coded equivalent called ciphertext via an encryption algorithm. The ciphertext is decoded (decrypted) at the receiving end and turned back into plaintext. The encryption algorithm uses a key, which is a binary number that is typically from 40 to 128 bits in length. The greater the number of bits in the key (cipher strength), the more possible key combinations and the longer it would take to break the code. The data is encrypted, or "locked," by combining the bits in the key mathematically with the data bits. At the receiving end, the key is used to "unlock" the code and restore the original data.
WNMP	(Wireless Network Management Protocol) This is Symbol's proprietary MAC layer protocol used for inter access point communication and other MAC layer communication.
WNMS (has been renamed to AirBEAM Manager)	SpectrumSoft Wireless Network Management System (WNMS) is a comprehensive wireless network management system that provides essential functions that are required to configure, monitor, upgrade, and troubleshoot your Spectrum24® wireless network and its components. Some features include event notification, access point configuration, diagnostics, statistical reports, auto-discovery, wireless proxy agents and monitoring of access points and mobile units. WNMS has multiple products available including WNMS Open View Solaris, WNMS Open View Windows NT, WNMS Enterprise Windows NT and WNMS Site Windows NT.



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

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What can we do to further improve our manuals?

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Thank you for your input—We value your comments.

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