



MK2200 MicroKiosk for CE .NET 4.2

Product Reference Guide



***MK2200 MicroKiosk for CE .NET 4.2
Product Reference Guide***

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Revision A

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Warranty

For the complete Motorola hardware product warranty statement, go to: <http://www.symbol.com/warranty>.

Revision History

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev A	8/2006	Initial Release.
-02 Rev A	9/2007	Add 128 MB nonvolatile flash memory configuration, updated RF card information.

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Tell Us What You Think...

Quick Startup Instructions



About This Guide

Introduction

The *MK2200 MicroKiosk for CE .NET 4.2 Product Reference Guide* provides information on installing, operating, and programming the MK2200.

✓ **NOTE** Unless otherwise noted, the term MK2200 refers to all configurations of the device.

Chapter Descriptions

Following are brief descriptions of each chapter in this guide.

- [Chapter 1, MK2200 Introduction](#), provides an overview of the MK2200 that includes parts of the MK2200, features, and scanning modes.
- [Chapter 2, Installation](#), describes the hardware setup and installation of the MK2200.
- [Chapter 3, Configuration](#), describes the configuration parameters of the MK2200.
- [Chapter 4, Remote Device Manager](#), provides information about the Remote Device Manager (RDM).
- [Chapter 5, Transferring Files to the MK2200](#), describes how to use Microsoft® ActiveSync for communication between the MK2200 and a host computer.
- [Chapter 6, Web Kiosk Software Suite](#), describes the free browser-based application available for download.
- [Chapter 7, C# Kiosk Software Suite](#), describes the free C# application available for download.
- [Chapter 8, System Features](#), describes the wide range of capabilities used to support independent application development on the MK2200.
- [Chapter 9, Software Development Environments](#), describes the software development environments.
- [Appendix A, Technical Specifications](#), provides technical information about the MK2200.
- [Appendix B, RF Network Configuration](#), describes how to configure the Spectrum24 wireless connection.
- [Appendix C, Rapid Deployment Client](#), describes the Rapid Deployment Client and how it facilitates software downloads to the MK2200 from a Mobility Services Platform (MSP) Console's FTP server.

- [Appendix D, Web Kiosk Software Suite Bar Codes](#), provides sample bar codes used with the Web Kiosk Software Suite.
- [Appendix E, C# Kiosk Software Suite Bar Codes](#), provides sample bar codes used with the C# Kiosk Software Suite.
- [Appendix F, Terminal Configuration Manager](#), provides an overview of the Terminal Configuration Manager (TCM), used to specify and load files into the MK2200 flash memory using the MK2200 Initial Program Loader (IPL).
- [Appendix G, OS Upgrade Procedures](#), provides instructions on using IPL mode to upgrade flash partitions.
- [Appendix H, Troubleshooting](#), provides troubleshooting procedures for correcting problems encountered with the MK2200.
- [Appendix I, Setting Scanner Parameters](#), lists the defaults for all scanning parameters.

Notational Conventions

This document uses these conventions:

- “User” refers to anyone using an application on the terminal.
- “Device” refers to the MK2200.
- *Italics* are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents. It also identifies names of windows, menus, menu items, and fields within windows.
- **Bold** identifies buttons to be tapped or clicked.
- Bullets (•) indicate:
 - lists of alternatives or action items.
 - lists of required steps that are not necessarily sequential.
- Numbered lists indicate a set of sequential steps, i.e., those that describe step-by-step procedures.

Related Publications

Following is a list of documents that provide additional information about configuring the MK2200:

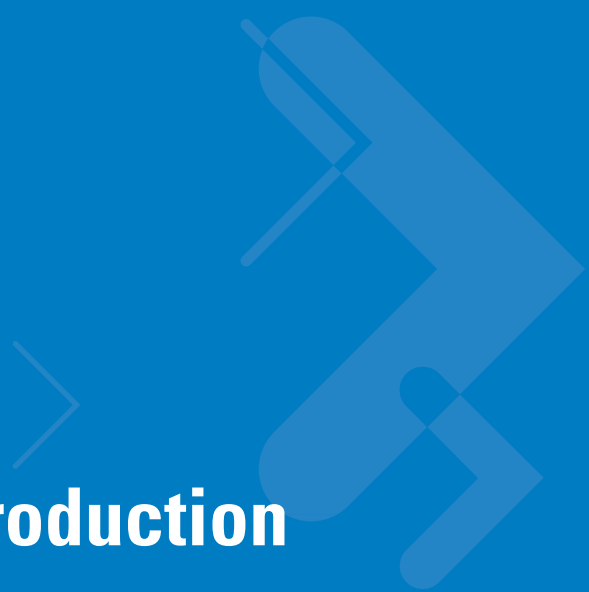
- *MK1200/MK2200 Quick Reference Guide*, p/n 72-88687-xx
- MK2000 PSDK (Platform Software Development Kit)
- MK2000 SMDK (Symbol Mobility Developer Kit) for C
- MK2000 SMDK (Symbol Mobility Developer Kit) for .NET
- MK2000 SMDK (Symbol Mobility Developer Kit) for .WEB
- *MSR Magnetic Stripe Reader Quick Reference Guide*, p/n 72-54435-xx
- *AirBeam Package Builder Product Reference Guide*, p/n 72-55769-xx.
- Aegis documentation, available at <http://www.mtghouse.com/>
 - Aegis Client for Windows CE .NET Registry Definitions Version 2.1
 - Aegis Client for Windows CE .NET & PPC User Guide Version 2.1

Service Information

If you have a problem with your equipment, contact Motorola Enterprise Mobility Support for your region. Go to <http://www.symbol.com/contactsupport>. If you purchased your Motorola product from a Motorola Business Partner, contact that Business Partner for service.

Before contacting, have the model number and serial number at hand. If your problem cannot be solved by the Motorola Enterprise Mobility Support, you may need to return your equipment for servicing and you will be given specific directions.

Motorola 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.

A large, light blue, stylized graphic of a person standing at a kiosk, positioned in the upper right background of the page.

Chapter 1 MK2200 Introduction

Overview

The MK2200 MicroKiosk provides retail consumers access to data critical to making an informed purchasing decision. The MK2200 verifies prices on bar coded merchandise and obtains up-to-the-minute information on in-store promotions. Its large, easy-to-read display can be used as an electronic billboard for instant in-store merchandising and multimedia presentations to promote seasonal sales and upcoming events. The touch screen and programmable function buttons enhance in-store applications and allow customer interaction.

MK2200 Configurations

The MK2200 MicroKiosk is available in two configurations:

- **MK2200-0N0SFKBWT0R:** Wired Ethernet, touch screen, 32 MB / 64 MB
- **MK2250-0N0SFKBWTWR:** 802.11b, touch screen, 32 MB / 64 MB; no Ethernet support/chip is present

MK2200 Parts

MK2200 parts include:

- Touch screen
- Speakers and microphone
- Scanner window
- Function buttons
- Access covers
- External ports.

See [Figure 1-1 on page 1-3](#), [Figure 1-2 on page 1-4](#), and [Figure 1-3 on page 1-5](#) for illustrations.

Touch Screen LCD

The full color 6.4 inch (16.26 cm) diagonal full VGA active matrix LCD (640 X 480 pixels) is ideal for presenting text, graphics, and video. The touch screen accommodates greater user interaction and enhances custom designed applications.

Speakers and Microphone

The MK2200 speakers are ideal for multimedia applications, and its built-in front-mounted microphone can be used for voice recording.

Scanner Window

The scanner window protects the scan engine.

Function Buttons

The MK2200 has four programmable function buttons (see [Figure 1-1 on page 1-3](#)) identified **A**, **B**, **C**, and **D** (from left to right) for reference purposes in this document, and are not labeled on the MK2200. Program these buttons for various tasks such as navigating through an application and making decisions when prompted. See [Remapping Buttons on page 8-8](#) for instructions on setting the button values.

Access Covers

The three access covers on the back of the MK2200 cover expansion card slots. Expansion card slot access is intended for development or maintenance purposes only.

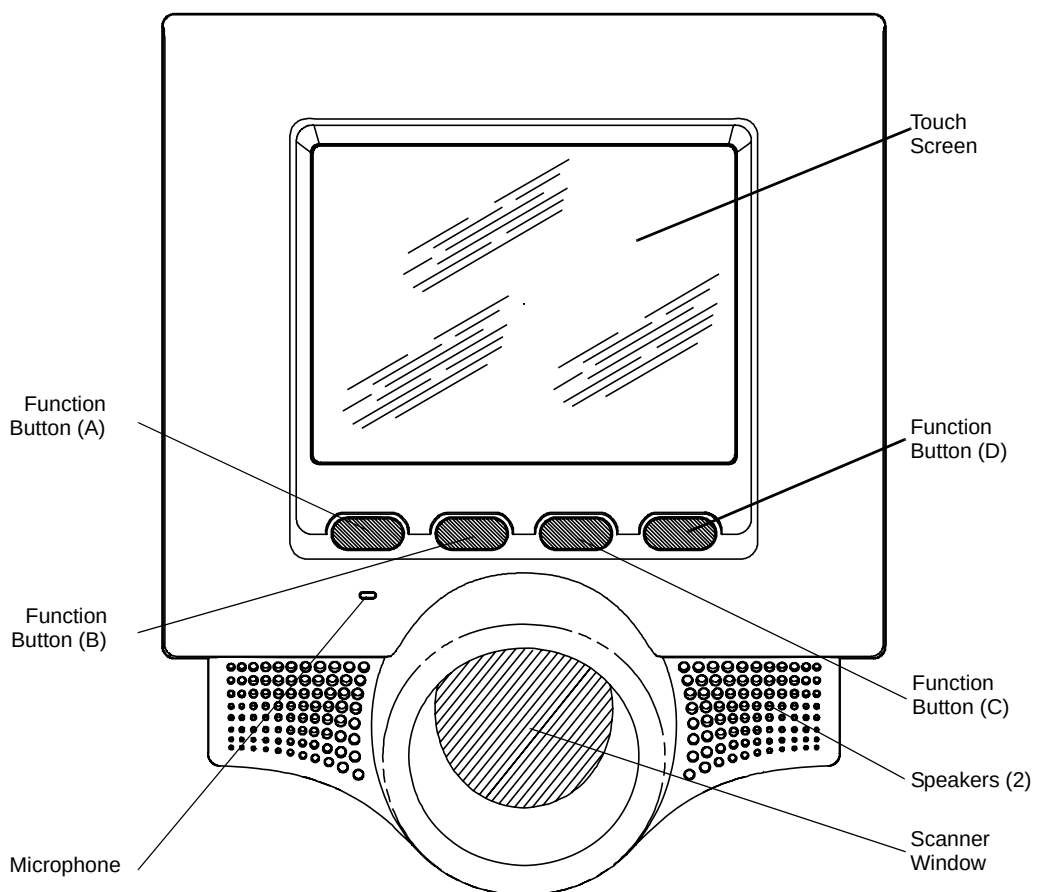


Figure 1-1 *MK2200 Front View*

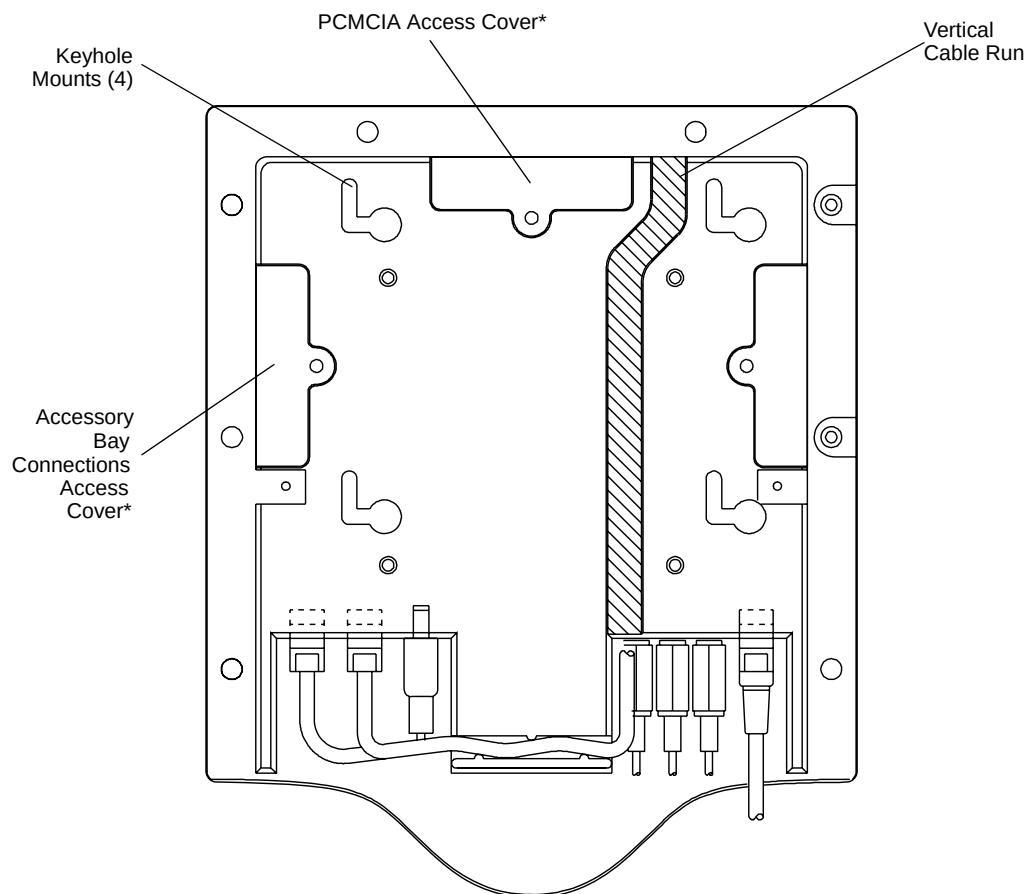


Figure 1-2 MK2200 Rear View



CAUTION When removing an access cover, follow proper (Electro-Static Discharge) ESD precautions to avoid damaging sensitive components. These precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions can damage the MK2200 and void the warranty.

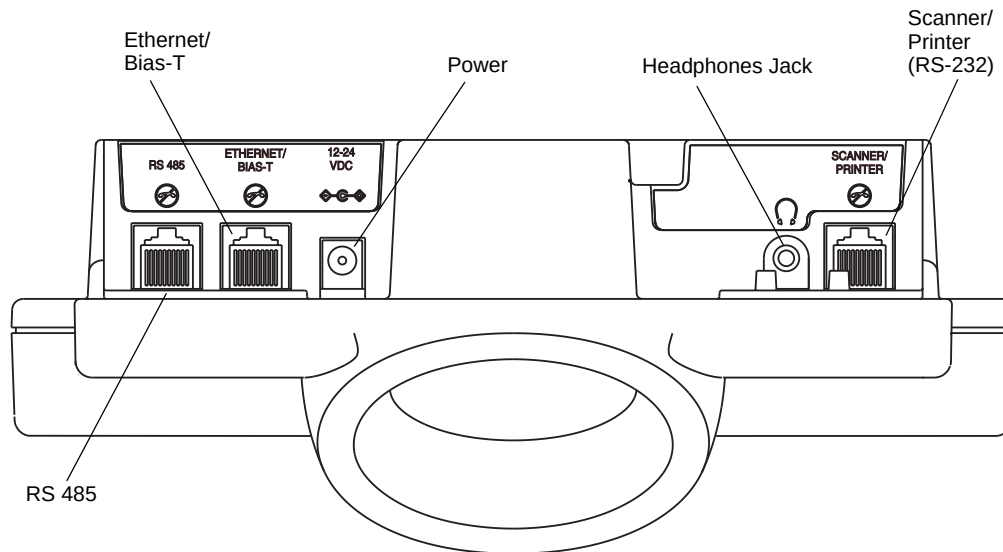


Figure 1-3 MK2200 Bottom (Connectors) View

External Ports

The MK2200 has the following external ports:

- RS485
- Ethernet / Bias-T (Power-over-Ethernet)
- Power
- Headphones
- Scanner/printer (RS-232, powered).

RS-485

The RS-485 (10-conductor RJ-45 connection) half-duplex interface is also called the Multidrop LAN since it can connect several MK2200s in a LAN network environment. See [Figure 2-9 on page 2-13](#). These devices are all connected to a single pair wire (i.e., transmit and receive share the same two wires).

Ethernet/Bias-T

Wired Ethernet: Power through AC Outlet

The Ethernet / Bias-T (10-conductor RJ-45) port accommodates Ethernet data connection. The MK2200 receives power through the Symbol approved power supply.

Wired Ethernet: Power through Power-over-Ethernet

The MK2200 supports Power-over-Ethernet (POE), Symbol Technologies' proprietary Bias-T functionality. An Ethernet (10/100Base-T) cable connected to the Ethernet/Bias-T port provides both data communication and power to the MK2200.

Power Port

A Symbol power supply connects to the power port (2.0 mm barrel jack connector) on the MK2200. For more information, see [Connecting the MK2200 on page 2-7](#) and [Technical Specifications on page A-1](#).

Headphones Jack

This standard 3.5 mm headphone connection is compatible with headphones used on many portable audio products (MP3 players). Headphones that do not protrude into the ear are recommended. Connecting headphones disables the speakers.

Scanner/Printer (RS-232)

Use the powered (5V/500mA) Scanner/Printer (RS-232) port (RJ-45 jack, 10 conductor) for serial communication with a host or to connect an external device such as a decoded scanner or portable printer. Confirm the cable pin-outs before attaching the cable. See [Scanner/Printer \(RS-232\) Port Connections on page 2-16](#) for cable pin-outs.

MK2200 Features

Programmable Function Buttons

The MK2200 has four function buttons you can program to perform various tasks such as navigation through an application or choosing between various options. See [Figure 1-1 on page 1-3](#).

Bar Code Scanner

The omni-directional scan pattern decodes all traditional 1D bar codes (including RSS bar code type), and Smart Raster mode decodes 2D symbologies such as PDF417. See [Bar Code Scanning on page 1-8](#).

Software

Standard well-supported operating system and development tools ease application development for the Microsoft® Windows® CE .NET operating system: Embedded Visual C/C++ 4.0, Visual Studio.NET, Internet Explorer 6.0, C#, VisualBasic.NET, and Windows CE Media Player.

Touch Screen

The touch screen provides user interaction and enhances the capabilities of custom applications.

Magnetic Stripe Reader (Optional)

An optional three-track Magnetic Stripe Reader (MSR) module attaches to the MK2200 and adds the ability to read and process loyalty card and credit card transactions.

Memory

The MK2200 standard system configuration contains 64 MB flash/32 MB DRAM. The flash memory is non-volatile and stores the system firmware, user applications, and data.

Connectivity Options

MK2200 connectivity options include wired 10/100 Mbps Ethernet or wireless 802.11 Mbps. Common ports to both the wired and RF configuration include Printer/Scanner (RS-232) and RS-485.

Expansion Card Slot

The MK2200 contains one Personal Computer Memory Card International Association (PCMCIA/PC Card) expansion slot.

Power Options

To supply power, use the standard Symbol approved power supply or the Symbol proprietary Power-Over-Ethernet (POE).

Mounting Options

You can mount the MK2200 on a wall or pole. See [MK2200 Mounting on page 2-2](#). Alternatively, use a commercially-available bracket or stand that conforms to the 100 mm Video Electronics Standards Association (VESA) Flat Panel Monitor Physical Mounting Interface (FPMPMI™) mounting standards.

Symbol Mobility Developer Kits (SMDKs)

The following developer kits are available for the MK2200:

- SMDK for C (see [Symbol Mobility Developer Kit \(SMDK\) for C on page 9-2](#)) for developing native C/C++ applications
- SMDK for the Web (see [Symbol Mobility Developer Kit \(SMDK\) for the Web on page 9-2](#)) for developing browser-based applications
- PocketBrowser v2.01 support (see [PocketBrowser v2.01 for the Web on page 9-3](#)) for web development
- SMDK for .NET (see [Symbol Mobility Developer Kit \(SMDK\) for .NET on page 9-3](#)) for developing managed .NET applications in C# or VB.NET.

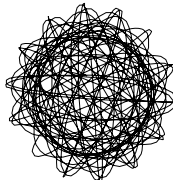
Bar Code Scanning

The MK2200 decodes any traditional retail or PDF417 bar code presented in its field of view.

Scanning Modes

[Table 1-1](#) describes the MK2200 scan modes.

Table 1-1 Common Scan Modes

Scan Mode	Description	Scan Pattern
Cyclone Omnidirectional 1D Scan Pattern (recommended)	A highly efficient scan pattern which decodes 1D and EAN/UCC reduced space symbologies in any orientation. Note: In this mode, the MK2200 does not decode 2D bar codes like PDF417.	
Always Raster Scan Pattern	Directly opens the laser to a full sized Raster pattern. Decodes 1D and PDF417.	
Smart Raster Scan Pattern	Creates a single scan line which opens vertically for PDF417 symbols using the Smart Raster feature. This feature autodetects the type of bar code presented and adjusts its pattern accordingly. This provides optimal performance on 1D, PDF417, and EAN/UCC.	

Scanning Guidelines

When scanning a bar code:

- Hold the bar code below the scan window at an approximately 45° angle.
- Hold the bar code at an angle which does not cause specular reflection (see [Specular Reflection on page 1-12](#)).
- Hold the bar code close for small bar codes and farther away for large bar codes.

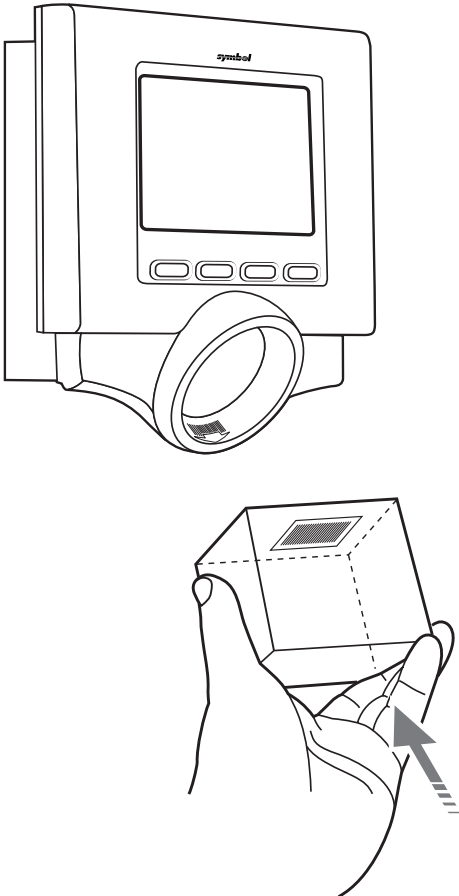


Figure 1-4 Scanning with the MK2200

Cyclone Omnidirectional

In Cyclone Omnidirectional mode the scan pattern decodes standard 1-dimensional symbologies in any orientation. This mode cannot be used to decode 2D bar codes like PDF417.

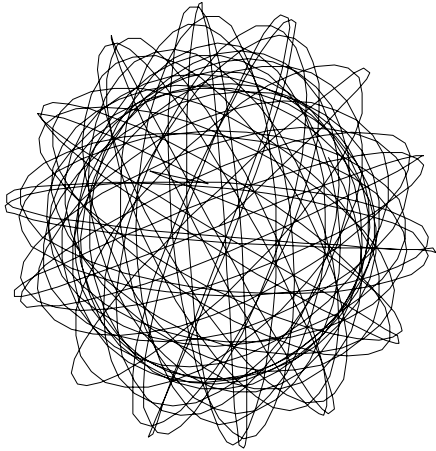


Figure 1-5 *Cyclone Omnidirectional Pattern*

Smart Raster

In Smart Raster mode, a single scan line pattern appears that decodes a standard bar code. If a 2D bar code is presented, the scanning pattern opens up to a full, optimized raster pattern.

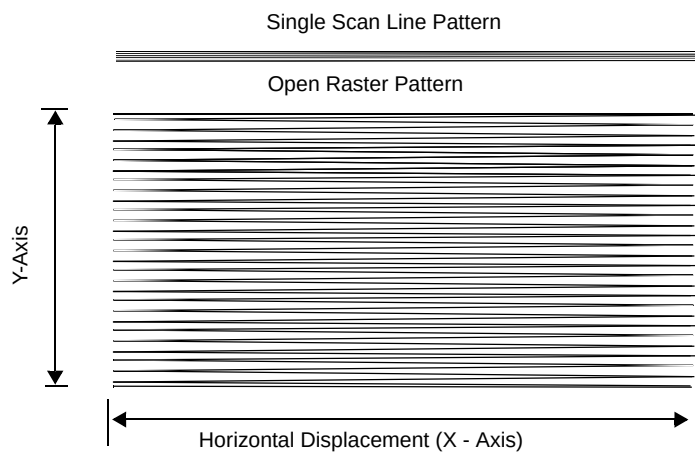


Figure 1-6 *Smart Raster Scanning Pattern*

The raster pattern must cover the top and bottom of a 2D symbol. If not, pull the bar code further away until the pattern completely covers the bar code. Make sure the scan pattern extends *at least three quarters of an inch* beyond the edges of the bar code.

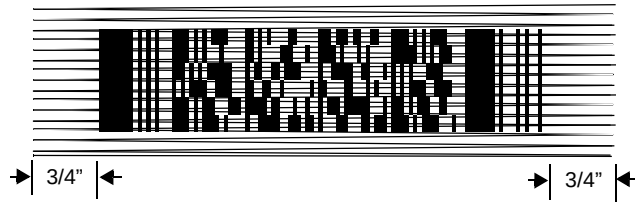


Figure 1-7 *Raster Pattern Expanded Over PDF417 Bar Code*

If the vertical scan pattern is not high enough to cover a “tall” PDF417 symbol, move the bar code slowly down toward the bottom of the scan beam, keeping the beam horizontal to the rows, then slowly back up 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.

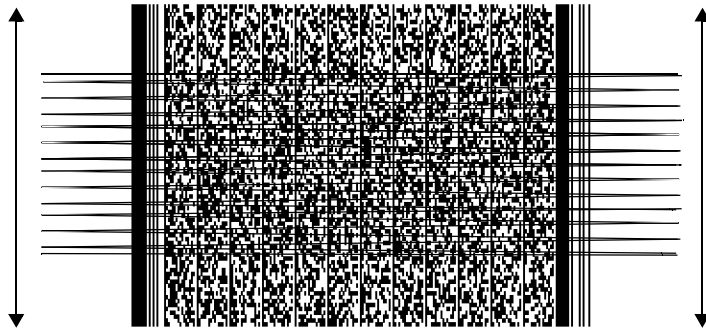


Figure 1-8 *Moving Scan Pattern Up and Down on “Tall” PDF417 Bar Code*

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).

Ensure the symbol is in good condition.

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 do not 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.

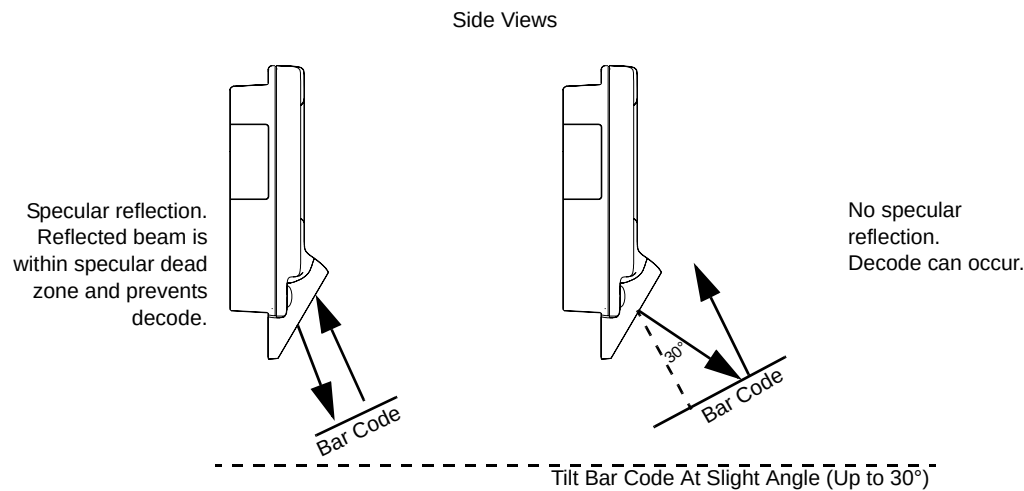


Figure 1-9 Avoiding Specular Reflection

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



Chapter 2 Installation

Overview

This chapter describes MK2200 installation, including:

- Unpacking
- Installation
 - Mounting
 - Providing power
 - Communication interfaces
 - Installing accessories
 - Peripherals
- Connector pin-outs
- Optional accessories.

Unpacking the MK2200

Remove the MK2200 from its packing and inspect it for damage. Keep the packing, it is the approved shipping container and should be used if the MK2200 needs to be returned for servicing.

Installation Overview

To install the MK2200:

1. Select the mounting method (see [MK2200 Mounting on page 2-2](#)):
 - Wall Mount
 - Pole Mount
 - Desk Mount.
2. Select the method of supplying power (see [Connecting the MK2200 on page 2-7](#)):
 - Symbol AC power supply
 - Power-over-Ethernet (Symbol Byas T).
3. Select the data communications method (see [Connecting the MK2200 on page 2-7](#)):
 - Wired Ethernet (10/100 Base-T cable)
 - Wireless Ethernet (11Mb RF)
 - Wired RS-485 (serial cable)
 - Wired Scanner/Printer (RS-232, serial cable).
4. Select optional peripherals (see [Peripherals on page 2-14](#)):
 - Printer
 - External hand held scanner.
5. Configure the MK2200:
 - For configuration see [Chapter 4, Remote Device Manager, System Menu on page 3-5](#), or [Control Panel Configuration Parameters on page 3-23](#).
 - To access the Windows® CE Desktop, see [Accessing the Windows® CE Desktop on page 6-3](#).

MK2200 Mounting

If desired, mount the MK2200 on a wall, pole, or counter top using one of the following optional mounting accessories:

- Wall Mounts
- Pole Mount Kit, see [page 2-6](#)

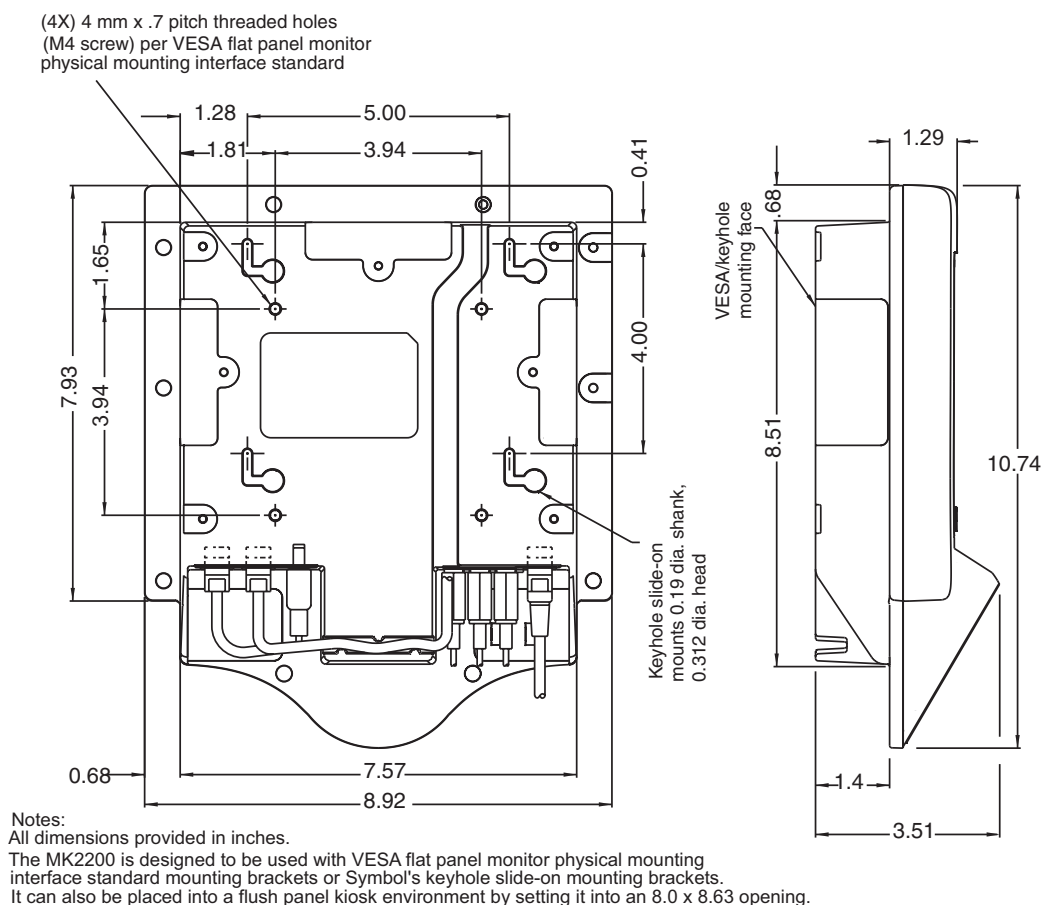


Figure 2-1 Mounting Dimensions

MK2200 Wall Mounting Options

Wall mounting options include:

- Free wall-mounting template (shipped with the unit)
- Wall Mount Kit (optional)
- Recessing the MK2200 into a MicroKiosk or wall (see [page 2-5](#)) (optional).

Using the Wall Mount Kit

1. Determine the MK2200 mounting location.
2. Follow the instructions and use the template provided with the MK2200. Secure the Connector/Port Cover to the wall using four screws (not provided) appropriate for the wall material.
3. Connect the cables to the MK2200 (see [Figure 1-3 on page 1-5](#)) and ensure the cables are routed and secured correctly (see [Figure 1-4 on page 1-9](#)). Cables incorrectly mounted or secured can become pinched when the MK2200 is attached to the Connector/Port Cover.

4. To install the Connector/Port Cover, place the keyholes on the back housing over the shoulder head bolts protruding from the plate and slide the MK2200 to the left and down to secure in place. See [Wall Mounting Kit on page 2-4](#) and [Mounting Directions on page 2-4](#).
5. Screw one 8-32 pan head screw (lock screw) into the Connector/Port Cover tab (located at the top left corner). Hand tighten the screw or for additional security use a nylon locknut (not included) to prevent removal of the MK2200.
6. Proceed to [Connecting the MK2200 on page 2-7](#).

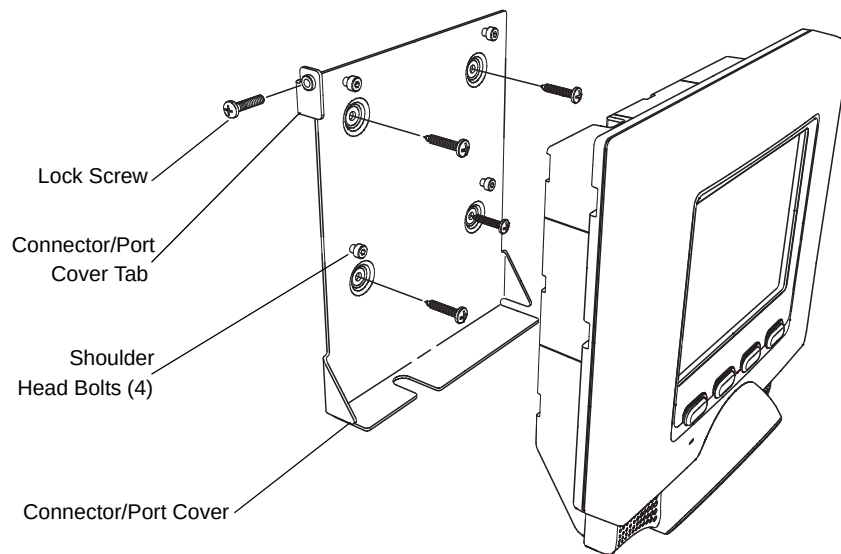


Figure 2-2 Wall Mounting Kit

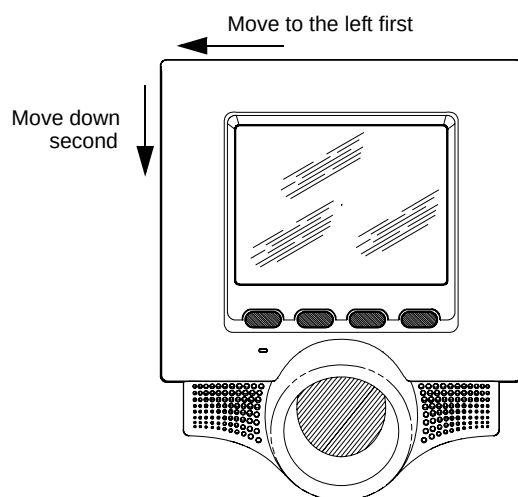


Figure 2-3 Mounting Directions

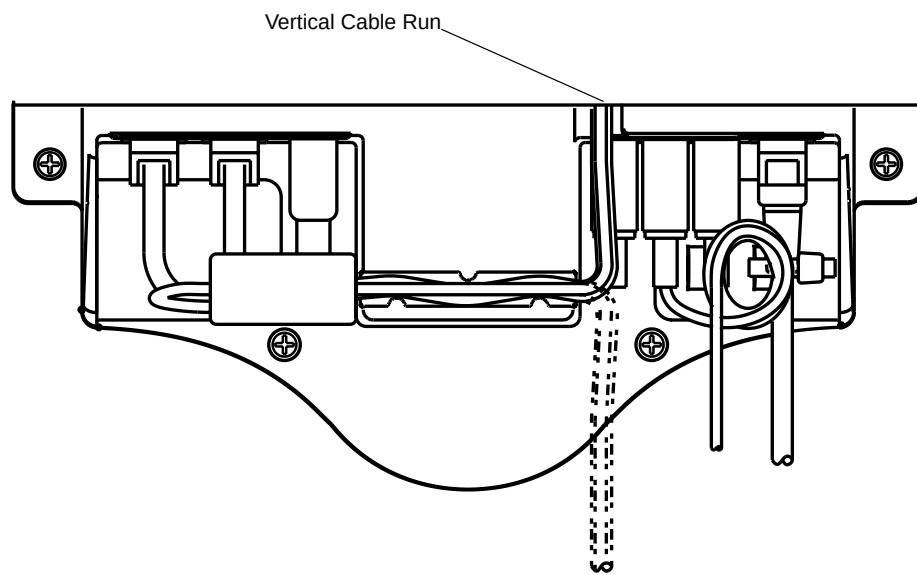


Figure 2-4 Cable Routing

Recessed Wall/Kiosk Mounting

To recess the MK2200:

1. Cut an opening in the wall or MicroKiosk, 8.63" minimum height x 8.0" minimum width.
2. Place the back housing into the opening, following the instructions in [Using the Wall Mount Kit on page 2-3](#). See [Figure 2-2](#) and [Figure 2-3 on page 2-4](#). Symbol does not provide hardware to support this installation.

✓ **NOTE** Recessed mounting may degrade wireless network performance.

Pole Mounting

The Pole Mounting Kit accommodates poles up to 11.5 inches in diameter. To install the MK2200 using the Pole Mounting Kit:

1. Wrap the pole mount straps around the pole and tighten.
2. Secure the connector port cover to the pole mount bracket using the four shoulder screws.
3. Connect the cables to the MK2200 (see [Figure 1-3 on page 1-5](#)) and ensure the cables are routed and secured correctly (see [Figure 2-4 on page 2-5](#)). Cables incorrectly mounted or secured can become pinched when the MK2200 is attached to the Connector/Port Cover.
4. Position the MK2200 keyholes located on the back housing (see [Figure 1-2 on page 1-4](#)) over the shoulder head bolts and slide the MK2200 to the left and down to secure in place. See [Wall Mounting Kit on page 2-4](#) and [Mounting Directions on page 2-4](#).
5. Screw one 8-32 pan head locking screw into the pole mount bracket bottom left tab. See [Figure 2-5 on page 2-6](#). Hand tighten the locking screw, or for additional security use a nylon locknut (not included), to prevent removal of the device.
6. Proceed to [Connecting the MK2200 on page 2-7](#).

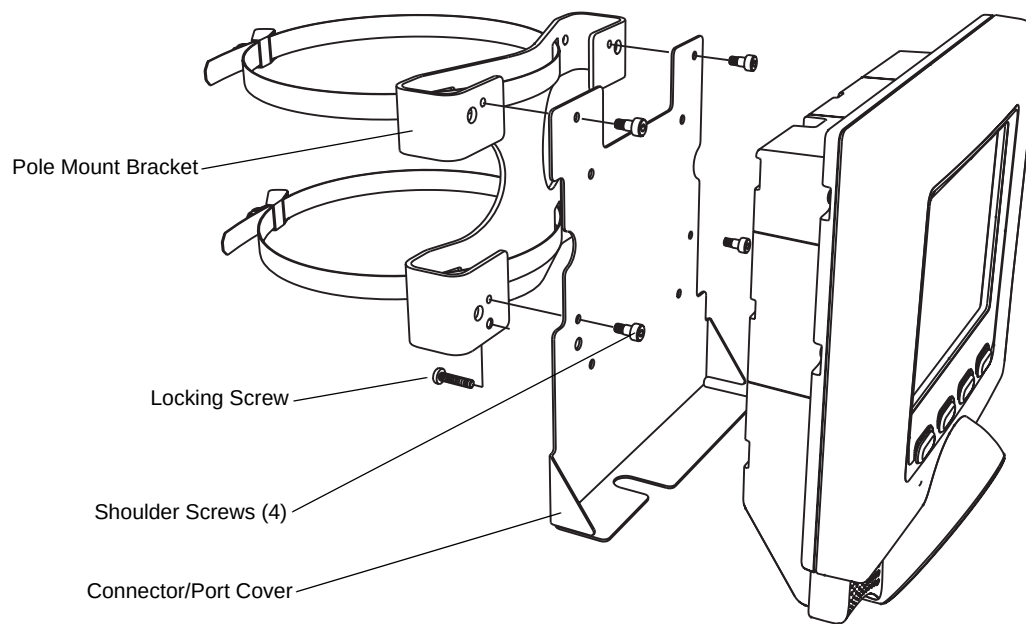


Figure 2-5 Pole Mount Kit

Connecting the MK2200

The MK2200 communication interfaces include both wired or wireless solutions:

- Wired Ethernet (10/100Base-T cable)
 - Power through AC outlet (see [page 2-7](#))
 - Power through Power-over-Ethernet (see [page 2-8](#))
- Wireless Ethernet (11Mb RF)
 - Power through AC outlet (see [page 2-7](#))
- Wired RS-485 (serial cable) (see [page 2-11](#))
- Wired RS-232 (serial cable) (see [page 2-12](#)).

To configure communication interfaces, see [Remote Device Manager on page 4-1](#). To access the Windows® CE Desktop, see [Accessing the Windows® CE Desktop on page 8-7](#).

✓ **NOTE** Wireless MK22XX devices do not have an Ethernet chip, and so do not support wired Ethernet communication.

AC Power Supply

The Symbol universal AC power supply connects to the power port on the MK2200 using a 2.0 mm barrel jack. The power supply has a positive center pin and the outer tab is ground. It is compatible with:

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

Wired Ethernet Connection

With a wired Ethernet connection (10/100Base-T cable), the MK2200 is powered either using the MK2200 Symbol AC power supply, or by Power-over-Ethernet through the Ethernet cable.

Wired Ethernet: Power through AC Outlet

The MK2200 communicates to the host through a 10/100Base-T Ethernet cable and receives power through a Symbol AC power supply.

1. Insert the power supply barrel connector into the MK2200 power port. See [Figure 1-3 on page 1-5](#).
2. Route the power cable.
3. Plug the Symbol AC power supply into a wall outlet.
4. Connect the Ethernet cable to the LAN port on the MK2200. See [Figure 1-3 on page 1-5](#).
5. Ensure the Ethernet cable is terminated according to [Table 2-2 on page 2-15](#).
6. Plug the other end of the Ethernet cable into the host system LAN port.

Wired Ethernet: Power through POE

The POE installation option allows the MK2200 to communicate and receive power on the same 10/100Base-T Ethernet cable. See [Figure 2-6 on page 2-9](#) and [Figure 2-7 on page 2-10](#).



CAUTION Do not use POE in conjunction with an external power supply connected to the power port on the MK2200. Using two power sources can damage the MK2200 and/or the network.

1. Connect the Ethernet cable to the MK2200 Ethernet / Bias-T port. See [Figure 1-3 on page 1-5](#).
2. Ensure the Ethernet cable is terminated according to [Table 2-2 on page 2-15](#).
3. Plug the other end of the Ethernet cable into the Bias-T (POE) module.
4. Connect a patch cable from the Bias-T (POE) module to the host system LAN port.
5. Connect the DC power supply to the Bias-T module.

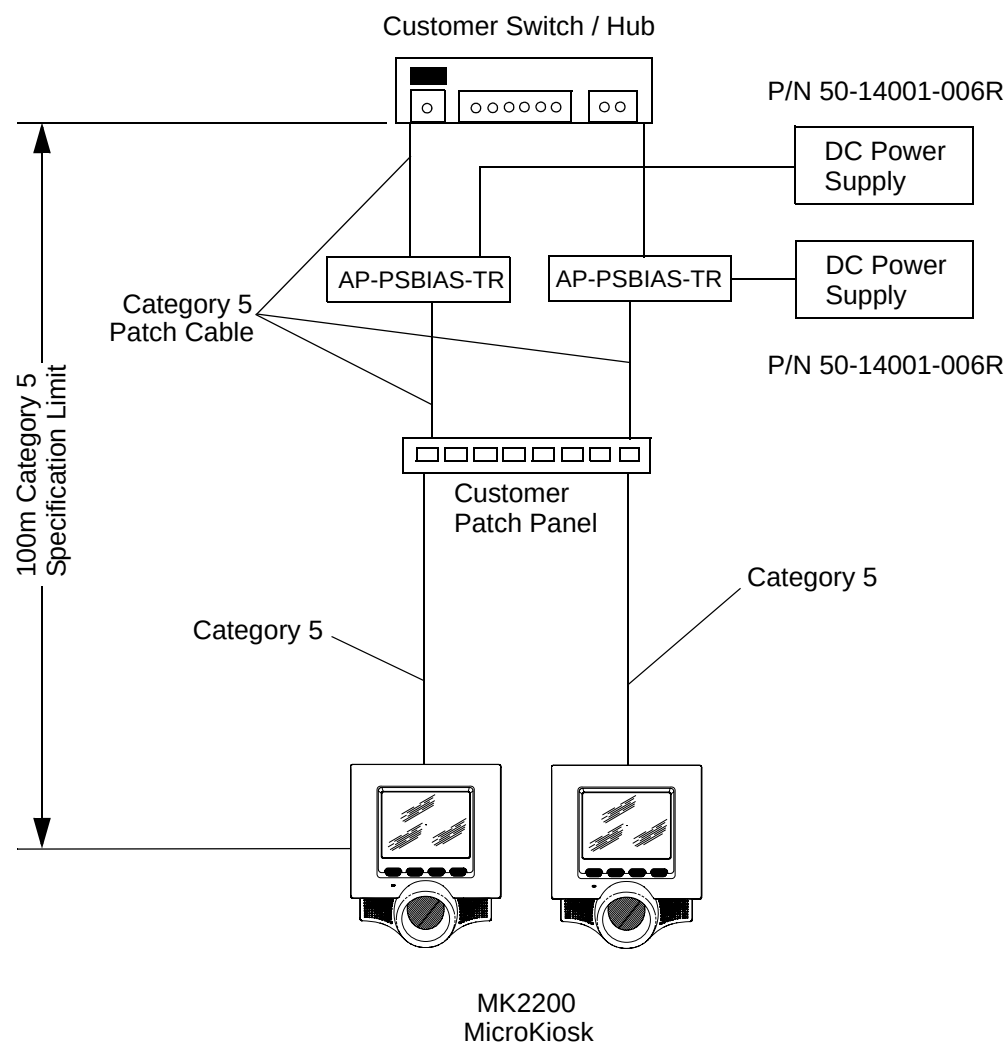


Figure 2-6 MK2200 Power-Over-Ethernet, Network Connectivity

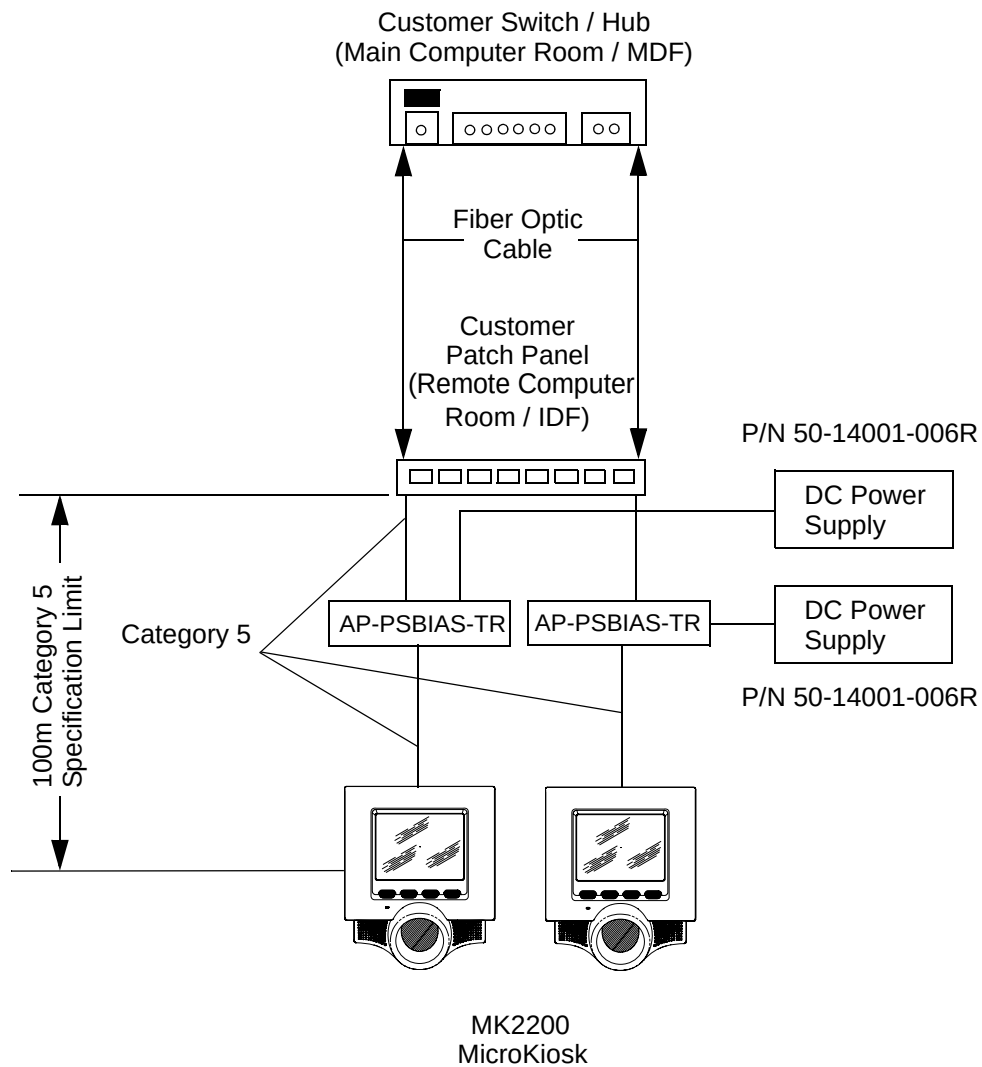


Figure 2-7 Alternate MK2200 Power-Over-Ethernet, Network Connectivity

Wired RS-485 Setup

The MK2200 can communicate with a host using a wired RS-485 serial connection, typically using the MK2200 Symbol AC power supply. When installing MK2200s where PCK 9100, PCK 9140, or MK1000 wiring exists, connect that wiring directly to the MK2200.

RS-485 is a two-wire multidrop network: RS-485 signal and RS-485 inverted signal. See [Figure 2-9 on page 2-13](#) for an illustration of a two-wire network.

Ensure each MK2200 is connected directly to the RS-485 bus with correct polarity (see [Figure 2-8](#)).

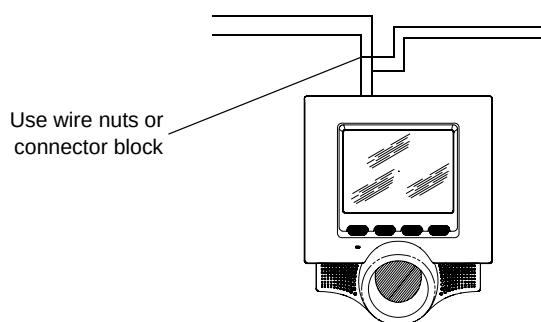


Figure 2-8 Connector Block

In an RS-485 installation, use a cable that meets or exceeds 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 the host does not support RS-485, use an RS-232 to RS-485 conversion box, sourced locally and configured per manufacturer instructions. To install the MK2200 with a host that does not support RS-485:

1. Insert the power supply barrel connector into the MK2200 power port. See [Figure 1-3 on page 1-5](#).
2. Route the power cable.
3. Plug the Symbol AC power supply into a wall outlet.
4. Connect the conversion box to the host using an RS-232 cable.
5. Connect the RS-485 cable to the LAN port on the MK2200. See [Figure 1-3 on page 1-5](#) for port locations. Terminate the cable according to the [RS-485 Port Connections](#) described in [Table 2-3](#).
6. Plug the other end of the RS-485 cable into the converter box.

Wired RS-232 Setup

The MK2200 can communicate with a host using a serial cable connected to the Scanner/Printer (RS-232) port.

1. Insert the power supply barrel connector into the MK2200 power port. See [Figure 1-3 on page 1-5](#).
2. Route the power cable.
3. Plug the Symbol AC power supply into a wall outlet.
4. Connect the RS-232 serial cable to the Scanner/Printer (RS-232) port on the MK2200. See [Figure 1-3 on page 1-5](#) for port locations. Ensure the cable is terminated according to the [Scanner/Printer \(RS-232\) Port Connections](#) pin-outs described in [Table 2-4 on page 2-16](#).
5. Plug the other end of the serial cable into the host.

✓ **NOTE** Because there is no service running on the MK2200's RS-232 port, harmful data cannot be pushed to the MK2200 from another computer regardless of how the serial port is used.

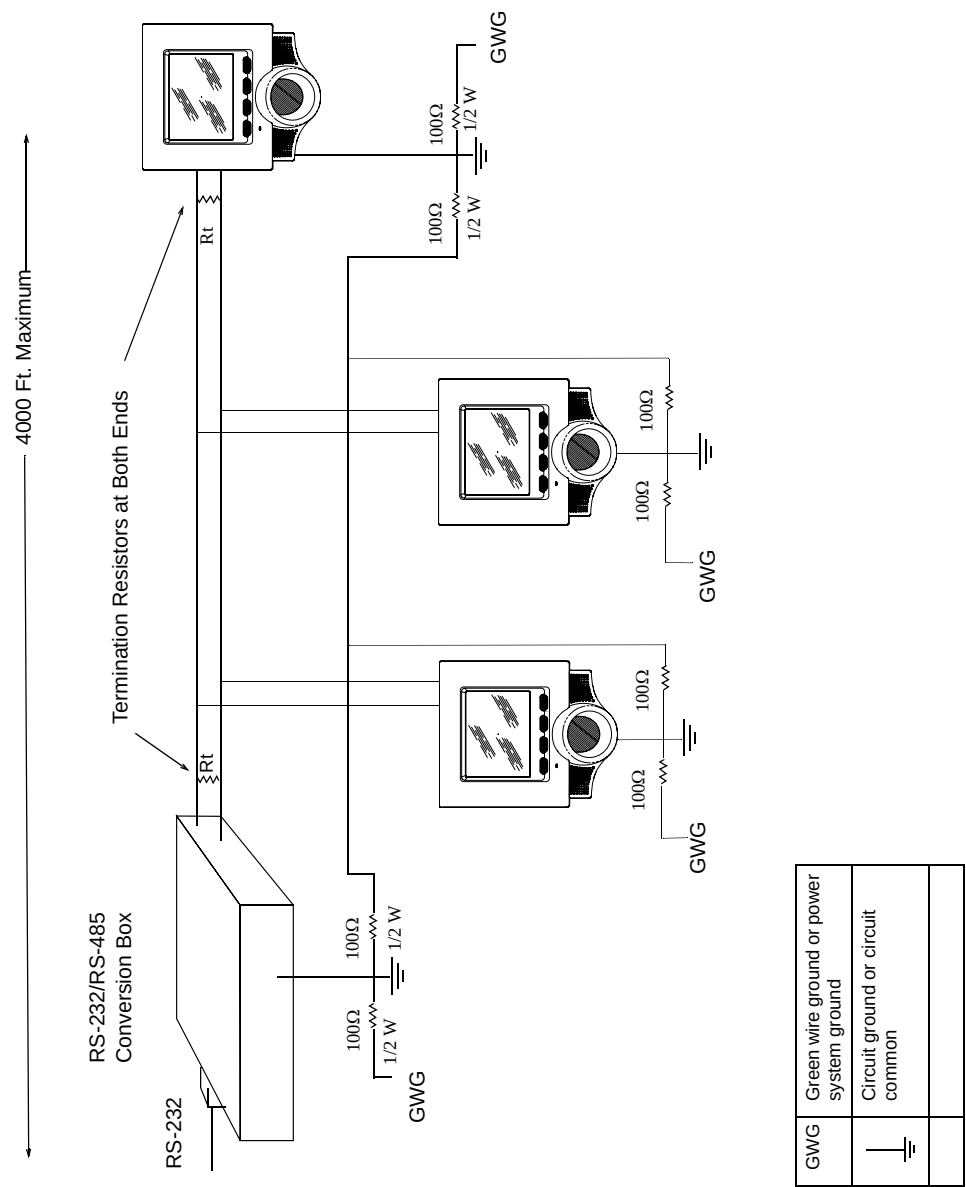


Figure 2-9 RS-485 Two-Wire Multidrop Network Example

Peripherals

You can use the RS-232 port to connect to a peripheral device such as a printer or a decoded scanner. For port locations, see [Figure 1-3 on page 1-5](#). The Scanner/Printer (RS-232) port can also supply power (5 Vdc up to 500mA) to peripheral devices using a “virtual” COM port that enables power to the connector.

Confirm the connector pin-out before attaching the cable. See [Scanner/Printer \(RS-232\) Port Connections on page 2-16](#). For tethered scanner connection, see [Connecting a Tethered Scanner on page 3-20](#).

1. Attach the peripheral device cable to the Scanner/Printer (RS-232) port on the MK2200. See [Figure 1-3 on page 1-5](#) for port locations. Ensure the cable is terminated according to [Table 2-4 on page 2-16](#).
2. Connect the other end of the cable to the peripheral device.

COM Port

Table 2-1 COM Port

COM	Port	Connector
COM1	RS-485	RS-485
COM4	RS-232 (no power)	Scanner/Printer
COM6	RS-232 (with 5 VDC)	Scanner/Printer

Connector Pin-Outs

[Table 2-2](#) through [Table 2-4](#) identify the MK2200 connector pin-outs. See [Figure 1-3 on page 1-5](#) for port locations.

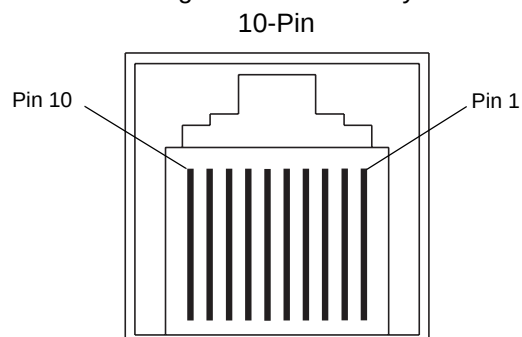


Figure 2-10 10-Pin Connector Port

Ethernet / Bias-T Port Connections

The Ethernet connector provides both Ethernet signals and power supply voltage to the MK2200 through a single Ethernet cable. If providing power to the MK2200 through POE, do not use the Symbol AC power supply.

Table 2-2 Power-over-Ethernet Connections

Pin	Description
Pin 1	Reserved/Do not Use
Pin 2	TXD (+)
Pin 3	TXD (-)
Pin 4	RXD (+)
Pin 5*	Bias-T VCC
Pin 6*	Bias-T VCC
Pin 7	RXD (-)
Pin 8*	Bias-T GND
Pin 9*	Bias-T GND
Pin 10	Reserved/Do not Use
* Used only with Power-over-Ethernet	

RS-485 Port Connections

Table 2-3 RS-485 Connector: 10-Pin

Pin	Description
Pin 1	RS-485 (+)
Pin 2	RS-485 (+)
Pin 3	Reserved
Pin 4	Reserved
Pin 5	USB PWR
Pin 6	USB -
Pin 7	USB +
Pin 8	RS-485 (-)
Pin 9	GND
Pin 10	RS-485 (-)

Scanner/Printer (RS-232) Port Connections

Use this connector pin-out for serial communication with the host or communication with an external decoded scanner. The powered Scanner/Printer (RS-232) port specifications are RJ-45 jack, 10 conductor, 5V/500mA.

Table 2-4 Scanner/Printer (RS-232) Connector: 10-Pin

Pin	Description
Pin 1	+5V
Pin 2	Not Used
Pin 3	RXD (input)
Pin 4	Not Used
Pin 5	RTS (output)
Pin 6	GND
Pin 7	CTS (input)
Pin 8	Not Used
Pin 9	TXD (output)
Pin 10	Not Used

Magnetic Stripe Reader (MSR) Mounting

- ✓ **NOTE** The MSR increases the width of the MK2200 from 8.92 inches to 11.5 inches. The height and depth do not change.

To mount the optional Magnetic Stripe Reader (MSR) onto the MK2200:

1. Gently place the MK2200 face down on a flat surface, using care not to damage the touch panel display.

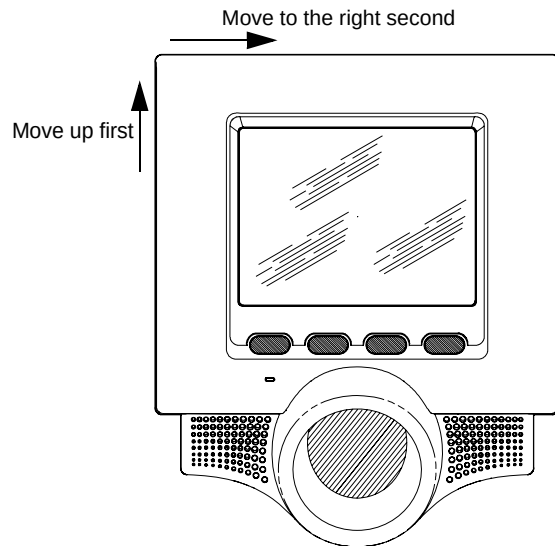


Figure 2-11 Removal Directions

2. Remove the three screws shown in [Figure 2-12](#) from the back of the MK2200 and remove the protective cover. Retain only the screw from the protective cover. Two new (longer) screws are provided with the MSR.

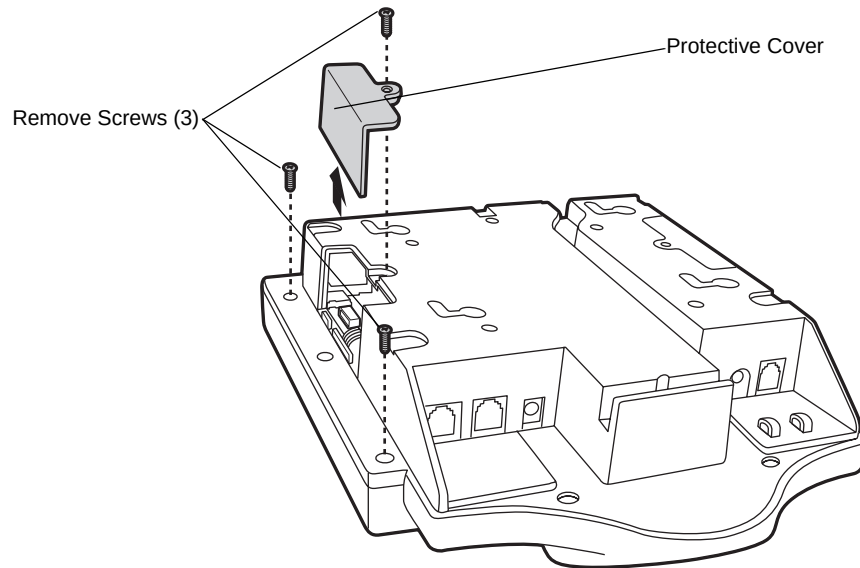


Figure 2-12 Removing the Cover and Screws



CAUTION When removing an access cover, follow proper ESD precautions to avoid damaging sensitive components. These precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions can damage the MK2200 and void the warranty.

3. Connect the MSR cable to the MK2200.

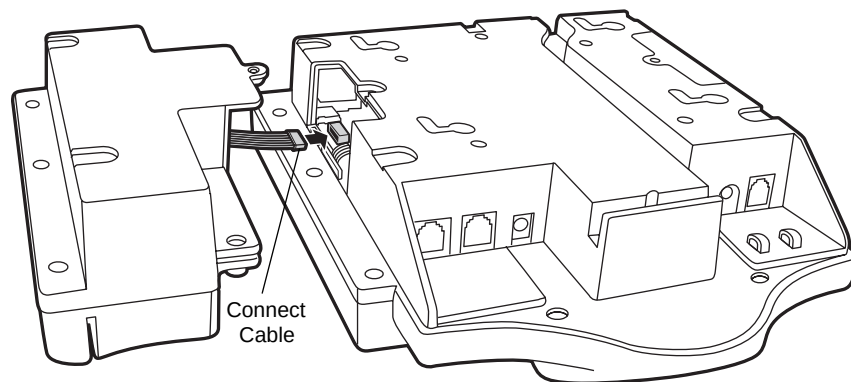


Figure 2-13 Connecting the MSR Cable to the MK2200

4. Align the mounting holes on the MSR with the MSR mounting holes on the MK2200 as shown in [Figure 2-14](#).

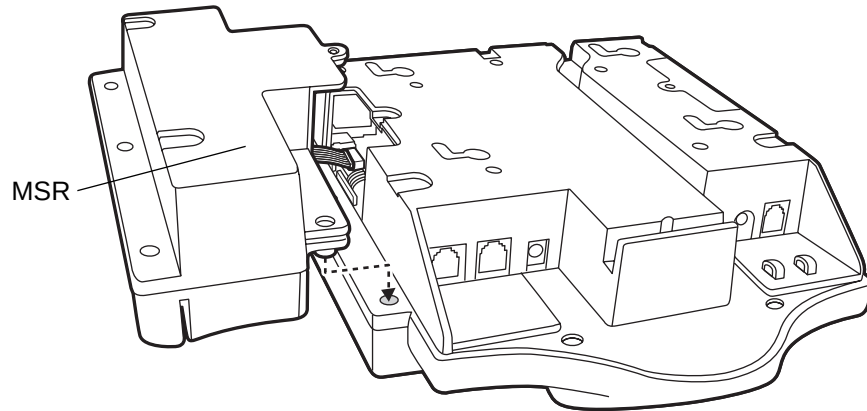


Figure 2-14 Positioning the MSR on the MK2200

5. Secure the MSR to the MK2200 as shown in [Figure 2-15](#). Use the shorter screw from the protective cover, and two new (longer) screws provided with the MSR.

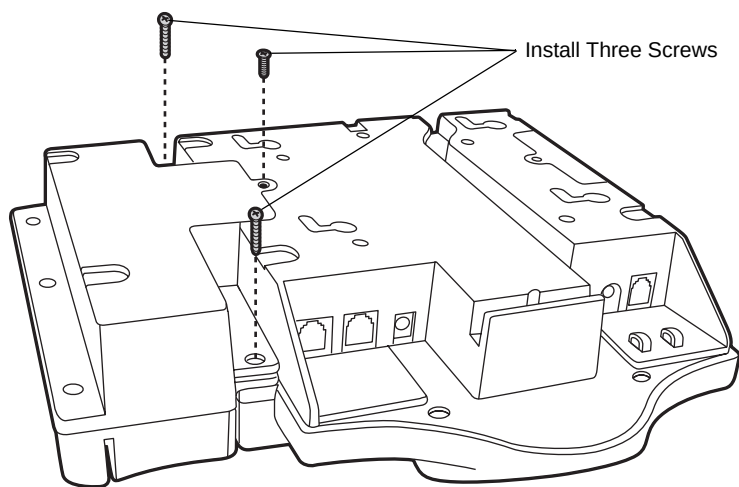


Figure 2-15 Securing the MSR to the MK2200

Figure 2-16 shows the MSR mounted to the MK2200 for card reading.

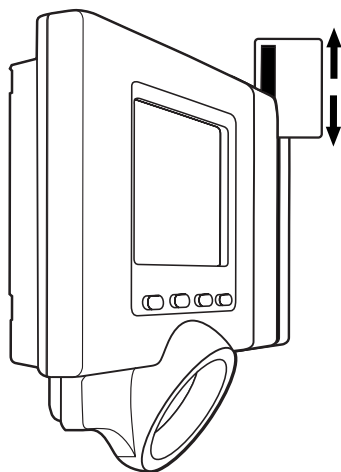


Figure 2-16 *View of MSR Mounted to the MK2200*

Installing/Removing the RF Card

✓ **NOTE** This section applies to factory-shipped RF models only.

To remove and re-install the RF card:

1. Disconnect power from the MK2200.
2. Gently place the MK2200 face down on a flat surface, using care not to damage the touch panel display.
3. Remove the PCMCIA access cover.

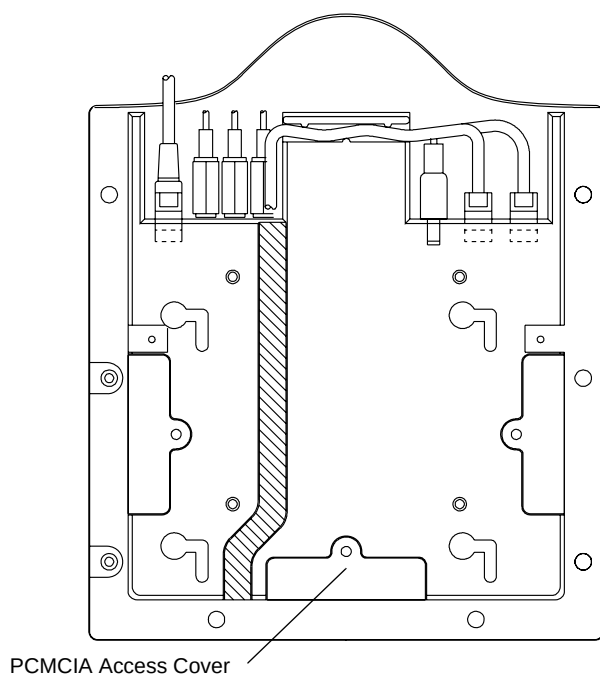


Figure 2-17 MK2200 Rear View



CAUTION When removing an access cover, follow proper ESD precautions to avoid damaging sensitive components. These precautions include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions can damage the MK2200 and void the warranty.

4. Press the ejector button and remove the RF card.

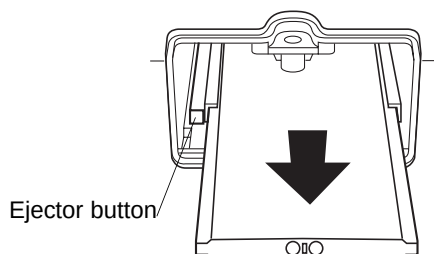


Figure 2-18 Removing the RF Card from the MK2200

5. Insert the RF card.
6. Re-install the PCMCIA access cover.

Chapter 3 Configuration

Overview

This chapter describes how to set up and configure the MK2200 applications, communications, and network settings which include parameters such as the device name, internet browser settings, date and time, and several other key settings.

Configure these settings remotely using the Symbol Remote Device Manager (RDM), or locally on the MK2200 using the System Menu. These settings are saved in the configuration registry file (mkconfig.reg) in the MK2200 Application folder to maintain them across cold boot cycles.

Table 3-1 *Methods of Configuring the MK2200*

Configuration Method	Remote	Local
Remote Device Manager (RDM)	X	
System Menu		X
Control Panel		X

Remote Configuration using Symbol Remote Device Manager

Use the Symbol Remote Device Manager (RDM) to configure parameters remotely. RDM is a Windows®-based utility that runs on a host computer and generates/edits an MK2200 configuration file (mkconfig.reg). Load this file onto the MK2200 and reboot the MK2200 to configure the device.

See [Chapter 4, Remote Device Manager](#) for more details.

Local Configuration

Using the System Menu

The System Menu function sets configuration parameters locally on the MK2200. The System Menu is similar to the MK2200 Configuration Utility window of the RDM, except the virtual keyboard is used to enter information. From within the System menu, use the **File > Save** option to save the changes and update the configuration registry file (mkconfig.reg). The new settings are invoked upon the next cold boot. See [System Menu on page 3-5](#).

Using the Microsoft Windows Control Panel

The Control Panel on the MK2200 Start menu changes a limited number of parameters. If desired, use the Control Panel to change the functions listed in [Control Panel Configuration Parameters on page 3-23](#); however Symbol recommends only changing the Stylus Settings/Touch Screen Calibration using the Control Panel. To save changes to the mkconfig.reg configuration file, select **Start > Programs > Save Configuration** to maintain the settings across cold boot cycles.

Updating the Device Configuration File

Use one of the following methods to update the device configuration file (mkconfig.reg) locally on the MK2200.

- **Start > Programs > Save Configuration**

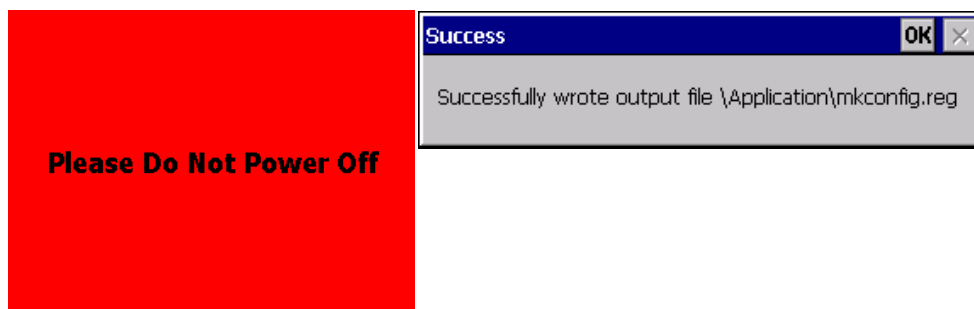


Figure 3-1 Save Configuration Screens

The Save Configuration option uses the current registry parameter values and writes them to the mkconfig.reg file. The windows shown in [Figure 3-1](#) appear while the file is saved and written. Not all registry values are saved with this option; only the registry parameter values that can be configured using the RDM or the System Menu (and some system parameters) are written and saved to the mkconfig.reg file.

- **Start > Programs > System Menu > File > Save.**

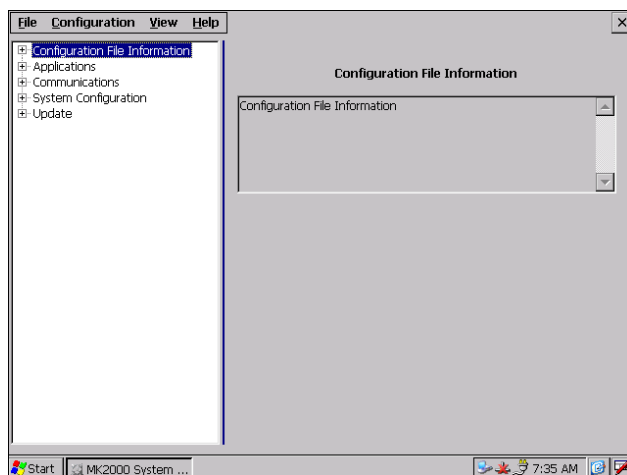


Figure 3-2 System Menu Main Screen

This option reads the current content of the mkconfig.reg file, allows user changes, then writes them back to the mkconfig.reg file. The window shown in [Figure 3-2](#) reads and displays the current contents of the mkconfig.reg file. Tap an item listed in the left window pane to display current mkconfig.reg file information.

Edits are permitted to the current file information in the text boxes that appear in the right pane. Tap **File > Save** to save changes and write them to the mkconfig.reg file.

- ✓ **NOTE** If upgrading the MK2200 OS and a configuration (.reg) file was created using an older OS version, you must create a new .reg file (see [Creating a Configuration File on page 4-11](#)). For more information about upgrades, see [Appendix G, OS Upgrade Procedures](#).

Downloading the Configuration File to the MK2200

Before downloading the configuration file (.reg file) to the MK2200 **Application** folder, rename it **mkconfig.reg**. In MK2200 Configuration Utility window, select **File > Open** and select the file, then select **File > Save As**, rename the file **mkconfig.reg**, and click **Save**.

Use one of the following methods to download the file to the MK2200:

- Use the RDM to “push” the file to the MK2200(s) (see [Downloading the Configuration File to the MK2200 Using the RDM on page 4-13](#)).
- Copy the mkconfig.reg file to the MK2200 **Application** folder using a USB ActiveSync connection (see [Downloading the Configuration File Using ActiveSync on page 3-3](#)).
- Send the file to the MK2200 **Application** folder using FTP (see the instructions provided with the FTP software) or AirBeam.
- Copy the mkconfig.reg file to a PCMCIA card, then transfer the file into the MK2200 **Application** folder.

Downloading the Configuration File Using ActiveSync

To copy the mkconfig.reg from the host computer to the MK2200 **Application** folder (**My Computer/Application**) using ActiveSync:

1. Connect the MK2200 to the host computer by connecting the USB cable (Symbol p/n 25-64626-01) to the RS-485 port on the MK2200, and the other end to a USB port on the host computer.
2. In ActiveSync on the host computer, click **Explore**. Windows® Explorer opens the Mobile Device window for the MK2200.
3. Open a new Windows® Explorer and browse the host computer to locate the file.
4. Right-click on the file and select **Copy**.
5. Right-click in the MK2200 **Application** folder and select **Paste**. A prompt requests to overwrite the existing file (if present).

- ✓ **NOTE** Use the RDM or System Menu to enable ActiveSync support in the MK2200 if support is disabled.

Rebooting the MK2200

After downloading the mkconfig.reg file, perform a remote or local cold boot to apply the new settings.

Remote Boot

After loading the configuration file onto the MK2200 using the wired or wireless Ethernet connection, use the RDM to send a command over the network to initiate a remote cold boot of the MK2200.

1. Select the MK2200 to cold boot from the list box in the **Remote Device Manager** screen.
2. From the RDM main toolbar, select **Actions > Cold Boot**. Allow approximately one minute for the MK2200 to reboot and reconnect, then select **View > Refresh** to verify the device rebooted successfully.

Local Boot

To manually cold boot the MK2200, which enables the settings within the mkconfig.reg file to load, press and hold buttons **B** and **C** on the MK2200 (see [Figure 1-1 on page 1-3](#)) until the display goes blank (typically 15 seconds), then release the buttons.

System Menu

Setting Defaults Using the System Menu

Use the System Menu to set parameter values locally on the MK2200. See [Default Parameters on page 3-6](#) for these options. The System Menu is identical to the MK2200 Configuration Utility window, and provides local instead of remote access to the same parameters. The System Menu modifies parameters in the configuration file (mkconfig.reg) on the MK2200.

✓ **NOTE** Saving the System Menu configuration overwrites mkconfig.reg. Reboot the MK2200 to apply the values.

To launch the System Menu, even while an application is running, press the physical buttons A, B, and C simultaneously. Use the virtual keyboard to enter data. To launch the virtual keyboard, press buttons B and C simultaneously.

As with the MK2200 Configuration Utility window, the parameters in the System Menu fall into five categories:

- Configuration file Information
- Applications
- Communications
- System configuration
- Update.

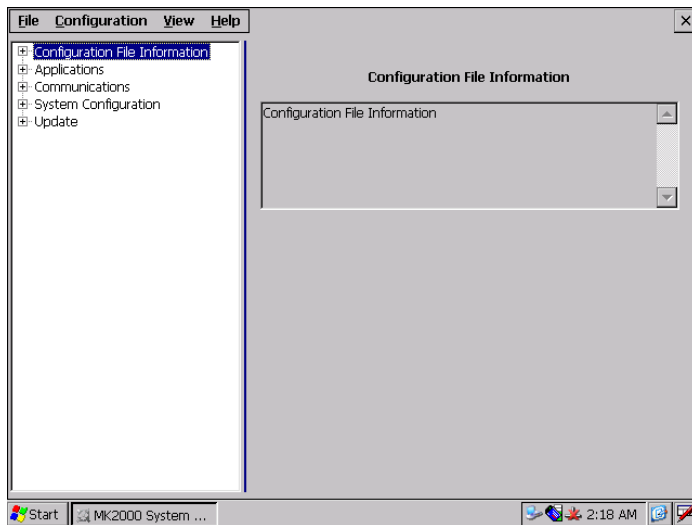


Figure 3-3 System Menu Main Screen

Default Parameters

The default settings that follow apply to both the Remote Device Manager on a host computer and System Menu on the MK2200.

Configuration File Information

The first branch of the MK2200 Configuration Utility window and System Menu is Configuration File Information. Use this to track mkconfig.reg version information. [Table 3-2](#) provides descriptions for these parameters.

Table 3-2 Configuration File Version Information Parameters

Configuration File Information Parameters	Description	Default
Configuration File Version	Configuration File Version Information	
Version	Use the Version parameter to track the version number of the mkconfig.reg file.	
Description	Use the Description parameter to write a detailed description of the location, use, and the changes made on the deployed mkconfig.reg file.	

Applications

The second branch of the MK2200 Configuration Utility window and System Menu is **Applications**. [Table 3-3](#) provides descriptions and defaults for these parameters.

Table 3-3 Application Default Parameters

Application Parameters	Description	Default
Internet Explorer	Internet Explorer Configuration	
Anchor Underline	Specifies whether an anchor or link is underlined or not.	no
Cache Limit	Specifies the cache size for Internet Explorer, in kilobytes.	512 kB (0x200 hex)
Search Page	Specifies the default search page for Internet Explorer.	http://search.msn.com
Secure Protocols	Specifies the security settings configuration for Internet Explorer.	TLS 1.0 disabled, SSL 2.0, SSL3.0 enabled
Smooth Scroll	Check to enable smooth scrolling in Internet Explorer.	Disabled
Start Page	The default home page for Internet Explorer.	file:///windows/mk2200.htm
Play Background Sounds	Check to enable playing of sound files in an html page.	Enabled

Table 3-3 Application Default Parameters (Continued)

Application Parameters	Description	Default
Kiosk IE	Kiosk IE Configuration	
ErrorRecoveryPage	Specifies an error recovery page for Internet Explorer. When an error is detected, the browser is redirected to this page.	\\Windows\\RetryPage.html
NeedProgressBar	Check to display a progress bar on the left top corner of the Kiosk IE which indicates the progress of downloading a page to the Kiosk IE. Enable this feature when deploying MK2200 devices in a slow network.	Disabled
Media Player	Media Player Configuration parameters	
Windows Media Buffer	Specifies the Windows Media Player buffer time in seconds.	3 seconds
Playback	Enables/disables playback feature on Windows Media Player. Checking the Playback option enables playback of media files indefinitely.	Disabled
Scanner Wedge	Scanner Wedge Configuration	
Append Enter To Barcode?	Check to add an ENTER to the end of each bar code.	Disabled
Append Tab to Barcode?	Check to add a TAB character to the end of each bar code (and after ENTER, if enabled).	Disabled
Trigger Mode	Specifies whether to constantly trigger the scanner laser or trigger it manually.	Manual Trigger
Scanning Mode	Specifies scanner raster mode.	Omnidirectional - 1D only
Prefix	Specifies text to add to the beginning of a bar code.	None
Suffix	Specifies text to add to the end of bar code, before TAB/ENTER (if enabled).	None
Transmit Code ID	Transmit bar code type identifier.	None
No Shell Present	Flag indicating the wedge should not put an item on the system tray.	Disabled

Table 3-3 Application Default Parameters (Continued)

Application Parameters	Description	Default
Slide Show	Slide Show Inactivity Application parameters	
Background Color	Default screen background color if image is smaller than screen. Format is 0BGR, where the first byte is zero, and the rest are byte values for each color.	7340032 (0x700000 hex)
Display Duration	The duration, in seconds, to display each image before loading the next image. The minimum delay allowed is 2s. If this value is less than 2s SlideShow takes delay as system default of 5s.	5 (0x5 hex)
Image Directory	The directory that contains the images to display.	\\Application\\Slides

Communications

The third branch of the MK2200 Configuration Utility window and System Menu is **Communications**. [Table 3-4](#) describes these wired Ethernet parameters. To configure DHCP options, see [DHCP Configuration on page 4-24](#), and to specify RF settings for wireless networks see [Specifying RF Settings for Wireless Network Connections on page 3-9](#).

Table 3-4 Communication Default Parameters

Communication Parameters	Description	Default
Onboard Wired Ethernet	Onboard Wired Ethernet Configuration	
Enable DHCP	Check to turn on DHCP Address resolution. When checked, do not set IP Address, Subnet Mask, Gateway, DNS Server(s), or WINS Server(s).	Enabled
IP Address	Sets the IP Address for the Onboard Wired Ethernet adapter.	None
Subnet Mask	Sets the subnet mask for the Onboard Wired Ethernet adapter.	None
Default Gateway	Sets the Default Gateway for the Onboard Wired Ethernet adapter.	None
DHCP Options	Opens DHCP Options dialog (see DHCP Configuration on page 4-24).	None
DHCP Server	Specifies DHCP server. The device contacts the specified server for retrieving IP address and other network parameters. If the DHCP is not specified, device automatically broadcasts for the server for retrieving IP address.	None
DNS Domain	The domain name for the Onboard Wired Ethernet adapter.	None
DNS Server(s)	A list of DNS servers, in the order to query.	None
WINS Server(s)	A list of WINS servers, in the order to query.	None

Specifying RF Settings for Wireless Network Connections

To enable a wireless MK2200 to work on an RF network, configure RF settings as defined in [Appendix B, RF Network Configuration](#).

Two utilities are available for specifying wireless security:

- Aegis Client ([page B-2](#))
- Mobile Companion ([page B-3](#)).

RF devices shipped with a wireless card include both the Aegis Client and Mobile Companion pre-installed. The default client is Aegis.

✓ **NOTE** RF settings are not stored within the mkconfig.reg file or entered via the RDM. For details on configuring RF settings, see [page B-1](#).

System Configuration

The fourth branch of the MK2200 Configuration Utility window and System Menu is **System Configuration**. [Table 3-5](#) lists these parameters and their descriptions. Also see:

- [Device Activity Management \(Sleep/Wake-up Functionality\) on page 3-19](#)
- [Printing on page 3-19](#)
- [Configuring User Application\(s\) on page 3-21.](#)

Table 3-5 System Configuration Default Parameters

System Configuration Parameters	Description	Default
ActiveSync	ActiveSync Configuration	
EnableActiveSync	ActiveSync is enabled at all times, even when an application is running.	Enabled
Backlight	Backlight Configuration	
Brightness	Default display backlight brightness.	Bright (maximum)
Buttons	Configuration of MK2200 four buttons. See Table 8-6 on page 8-9.	
Button A	Button A default	38 (0x26 hex) Up
Button B	Button B default	40 (0x28 hex) Down
Button C	Button C default	37 (0x25 hex) Left
Button D	Button D default	39 (0x27 hex) Right
Button A and B	Button A and B default	13 (0xd hex) Enter
Button A and C	Button A and C default	194 (0xc2 hex) Shift-Tab
Button B and C	Button B and C default	199 (0xc7 hex) Input Panel
Button A, B, and C	Button A, B, and C default	197 (0xc5 hex) System Menu
Button A and D	Button A and D default	18 (0x12 hex) Alt
Button B and D	Button B and D default	9 (0x9 hex) Tab
Button A, B, and D	Button A, B, and D default	195 (0xc3 hex) Alt-Down
Button C and D	Button C and D default	27 (0x1b hex) Cancel/ESC
Button A, C, and D	Button A, C, and D default	196 (0xc4 hex) Calibration
Button B, C, and D	Button B, C, and D default	8 (0x8 hex) Backspace
Button A, B, C, and D	Button A, B, C, and D default	198 (0xc6 hex) Signal Strength
Trigger Time	Button combination trigger time, in milliseconds. Specifies the maximum time between button presses for them to be considered a button combination.	500 (0x1f4hex)

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Button Security	Enables/disables the button security functionality on the MK2200 device. Check to lock the buttons. These can only be unlocked by entering the button security password.	Enabled
Date and Time Settings	Date and Time Configuration	
Time Zone	Standard time zone. Drop-down list of time zone names, such as Pacific Standard Time or South Africa Standard Time . Select the appropriate time zone.	Pacific Standard Time
Daylight Saving	Daylight Saving Configuration	
AutoDST	Check to enable daylight saving time for the current time zone. When enabled, the Windows Explorer shell uses this setting to set the system time for daylight saving. Use this setting if the application runs with the Windows Explorer shell.	Enabled
HomeDST	Check to enable daylight saving time for the current time zone. Use this setting if application does not run with Windows Explorer shell, for example when developing a browser (Kiosk IE) based application.	Enabled
Device Activity Management	There are three slots with identical parameters: First Activity Configuration Second Activity Configuration Third Activity Configuration See Device Activity Management (Sleep/Wake-up Functionality) on page 3-19.	
Items	Devices to apply activity scheme to.	All
Days	Set of days on which to apply this activity scheme (Monday through Sunday).	None
On Time	Time when device is activated, using 24 hour clock representation. Set this value for correct functioning of the Device Activity Manager.	None

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Off Time	Time when device is deactivated, using 24 hour clock representation. Set this value for correct functioning of the Device Activity Manager.	None
Identification	General Configuration	
Name	Specifies device name.	MK2200
Description	Specifies device description.	MK2200 MicroKiosk
Contact	Contact details of the system administrator.	Your System Contact Here
Location	Specifies the location of the device.	Your Location Here
Configuration Group 1	First user-definable string. Intended for use when grouping devices to aid configuration. Can be used as part of device filter in the Configuration Utility.	None
Configuration Group 2	Second user-definable string. Intended for use when grouping devices to aid configuration. Can be used as part of device filter in the Configuration Utility.	None
Inactivity Manager	Inactivity Manager Configuration (see Inactivity Application (Screen Saver) on page 8-12)	
Inactivity Application Name	Inactivity application.	\\Windows\\SimpleSaver.exe
Idle Time Before Launch	Idle time before inactivity application launches, in seconds.	0 (0x0 hex)
Memory Allocation	Memory Partition of Storage Memory and System Memory	
SystemStorePercent	Percentage of memory used for storage. The remaining memory is allocated to program memory (memory used to run programs). Half the unused RAM is used, when the value assigned to SystemStorePercent does not provide enough memory for the device to operate normally. This parameter only configures unused RAM.	50 (0x32 hex)

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Network Time Update	Configuration of Simple Network Time Protocol client (see Network Time Update: SNTP Client on page 8-10 for details)	
Time Server	Specifies the domain name of the time server to contact for updates. If no time server is set in the field, the time service is disabled. Do not set an IP address for this parameter. If the MK2200 is unable to obtain a time value from the time server, it uses the default setting (June 1, 1999 12:00:00 PM), and does not re-attempt to acquire a time value unless a regular update is also configured (the next attempt occurs at the configured time).	tock.usno.navy.mil
Refresh	Specifies the time period, in milliseconds, between synchronizations with the SNTP server.	1209600000 (0x48190800 hex)
Recovery Refresh	Specifies the time period, in milliseconds, until next synchronization, if the previous synchronization attempt failed.	86400000 (0x5265c00 hex)
Threshold	Specifies the interval between the time on the SNTP server and the current time in milliseconds. If the difference between the SNTP server time and the local system time is larger than the specified value in Threshold parameter, the update is ignored.	86400000 (0x5265c00 hex)
Printer Configuration	Printer Configuration (see Printing on page 3-19)	
Active Printer	Use this parameter to set the active printer. Select the printer from the list.	Zebra (QL320, Cameo, Encore)
Zebra QL Series	Specifies the baud rate for the Zebra QL Series printer if it is the selected active printer.	19200
Zebra QL Series Flow Control	Specifies the flow control of the Zebra QL Series printer if it is the selected active printer.	No flow control

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Zebra EPL Series Transport	Specifies the transport mode for the Zebra EPL Series printer if it is the selected active printer. For a list of supported EPL printers, see Printing on page 3-19 .	Serial
Zebra EPL Series	Specifies the baud rate of the Zebra EPL Series printer if it is the selected active printer. For a list of supported EPL printers, see Printing on page 3-19 .	9600
Zebra EPL Series Flow Control	Specifies the flow control of the Zebra EPL Series printer if it is the selected active printer. For a list of supported EPL printers, see Printing on page 3-19 .	No flow control
Zebra ZPL Series Transport	Specifies the transport mode for the Zebra ZPL Series printer if it is the selected active printer. For a list of supported ZPL printers, see Printing on page 3-19 .	Serial
Zebra ZPL Series	Specifies the baud rate of the Zebra ZPL Series printer if it is the selected active printer. For a list of supported ZPL printers, see Printing on page 3-19 .	9600
Zebra ZPL Series Flow Control	Specifies the flow control of the Zebra ZPL Series printer if it is the selected active printer. For a list of supported ZPL printers, see Printing on page 3-19 .	No flow control
Epson TML90 Transport	Specifies the transport mode for the Epson TML90 printer if it is the selected active printer.	Serial
Epson TML90	Specifies the baud rate of the TML90 printer if it is the selected active printer.	9600
Epson TML90 Flow Control	Specifies the flow control of the Epson TML90 printer if it is the selected active printer.	No flow control
Epson TMT88III Transport	Specifies the transport mode for the Epson TMT88III printer if it is the selected active printer.	Serial

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Epson TMT88III	Specifies the baud rate of the Epson TMT88III printer if it is the selected active printer.	9600
Epson TMT88III Flow Control	Specifies the flow control of the Epson TMT88III printer if it is the selected active printer.	No flow control
Protected Mode	Gate Keeper Configuration (see Password Protection (Gate Keeper) on page 8-7)	
Password	Required for Protected Mode access. Buttons are assigned numeric values from left to right (A=1, D=4).	44213 (denoted with *****)
Application	Application to run in Protected Mode.	\\windows\\explorer.exe
Regional Settings - General	HTML in web pages does not use regional settings without programmatic support. To use regional settings, script in web pages must format dates, times, currency, and numbers using built-in functions that take the regional settings into account. This is the only method of using the regional settings in a browser. C/C++/C# apps can use regional settings through the standard Windows CE API.	
Regional Settings - Date	Configuration of Date Regional Settings	
Long Date	Long date format.	dddd, MMMM dd, yyyy
Short Date	Short date format.	M/d/yyyy
Short Date Separator	Character uses as the short date separator.	/
Regional Settings - Time	Configuration of Time Regional Settings	
PM indicator	PM indicator.	None
AM indicator	AM indicator.	None
Time Separator	Time separator (generally 1 character).	None
Leading Zero	Display leading zero for hours/minutes/seconds.	Disabled
Time Format	Time format.	None
Regional Settings - Currency	Configuration of Currency Regional Settings	
Digits In Group	Number of digits allowed in a group.	0
Grouping Symbol	Digit grouping symbol (generally zero or one character).	None
Digits After Decimal	The number of digits allowed after a decimal point.	0

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Decimal Symbol	Decimal symbol (one character).	None
Negative Format	Format for negative currency values. The asterisk ("*") denotes the universal currency symbol. The period (".") indicates the chosen decimal separator.	(*1.1)
Currency Symbol Position	Position of currency symbol. The asterisk ("*") denotes the universal currency symbol. The period (".") indicates the chosen decimal separator.	*1.1
Currency Symbol	Currency symbol.	\$
Regional Settings - Numbers	Configuration of Number Regional Settings	
List Separators	List separators (character).	None
Measurement System	Measurement system.	Metric
Display Leading Zero	Display leading zero.	Enabled
Negative Number Format	Negative number format. The period (".") indicates the chosen decimal separator.	(1.1)
Negative Sign	Negative sign (generally one character).	None
Digits In Group	Number of digits in group.	0
Grouping Symbol	Digit grouping symbol (generally zero or one character).	None
Digits After Decimal	The number of digits allowed after a decimal point.	0
Decimal Symbol	Decimal symbol (one character).	None
Screen Taps	Screen Tap Configuration	
Double-Click Distance	Specifies the maximum number of pixels between two screen taps to qualify the screen taps as a double-click. Use this parameter to differentiate double-clicks from screen taps.	6 (0x6 hex)

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Double-Click Speed	Specifies the maximum number of milliseconds between two screen taps to qualify the screen taps as a double-click. Use this parameter to differentiate double-clicks from screen taps.	500 (0x1f4 hex)
Tethered Scanner	Tethered Scanner Configuration	
Enabled	Enables or disables tethered scanner support. Disable if no tethered scanner is connected.	Disabled
Scanner Model	Specifies the scanner model to support.	LS1902T
Serial Port	Specifies the serial port to which the scanner is connected.	COM6
Baud Rate	Specifies the baud rate for communication with tethered scanner. Configure tethered scanner separately.	9600
Stop Bits	Specifies the number of stop bits in serial frame.	1
Data Bits	Specifies the number of data bits (generally 8).	8
Parity	Specifies the parity bit configuration.	None
Intercharacter Timeout	Timeout (in milliseconds) between characters before bar code is considered complete.	64 (0x40 hex)
User Apps	There are seven user application slots, with identical parameters. Each slot is under a group called "X Application Launched", where "X" is First, Second, etc. See Configuring User Application(s) on page 3-21 for details.	
Application Path	Full path to application.	First application: \\windows\\explorer.exe Remaining applications: None
Arguments	Command line arguments for the program (UNICODE string).	None
Delay Before Launch	Number of seconds to delay before launching program.	0
Waiting For Completion	Specifies whether to wait for program to complete before proceeding.	Continue List Immediately

Table 3-5 System Configuration Default Parameters (Continued)

System Configuration Parameters	Description	Default
Volume and Sounds	Volume and Sound Configuration	
Default System Volume	Sets the overall default volume.	Maximum
Default Beeper Volume	Specifies volume of beeper.	High
Sounds Generated By	Controls whether system events, etc. generate sounds.	Events, Applications and Notifications enabled
Screen Tap Sounds	Specifies whether screen touches generate a sound, and, if so, at what volume.	Enabled, Loud
Key Press Sounds	Specifies whether key presses generate a sound, and, if so, at what volume.	Enabled, Loud
Sound Scheme	Scheme for sounds.	DefaultSounds
USB Host	USB Host Configuration	
Enable USB Host	Enables/disables the USB host in the device.	Disable
Web Server	Web Server in MK2200 Configuration	
Enable WebServer	Enables/disables the Web Server in the device.	Enable

Device Activity Management (Sleep/Wake-up Functionality)

Use the Device Activity Manager to manage the device usage profile and lifecycle by turning on/off the scan engine laser and the display backlight. Set the sleep and wake-up times by day, weekday, weekend, etc.

✓ **NOTE** It is strongly advised to use the Device Activity Management functionality.

If the Device Activity Manager (DAM) puts the scan engine and/or backlight into sleep mode, these subsystems repower (wake up) upon the following events:

- a button press
- a display touch.

The DAM only checks whether to turn devices on or off when the Inactivity Application Timeout expires. If a device wakes up due to user input (a “wake-up”), it remains awake regardless of user input until another timeout expires, then goes back to sleep.

To use the DAM without the Inactivity Application Manager, configure the Inactivity Application Timeout to the default wakeup time and set the Inactivity Application parameter to nothing.

✓ **NOTE** Use the RDM or System Menu to set up the Device Activity Manager. Enter valid values to all DAM parameters (see [page 3-11](#)). Otherwise the system rejects the input values and the DAM does not invoke the Inactivity Application.

Printing

The MK2200 supports printing text, bar codes, and bitmaps in the following environments:

- Browser applications
- C/C++ applications
- C# applications
- Visual Basic.NET applications.

The MK2200 transmits data to a printer using an RS-232 serial or USB connection. RS-232 serial port settings (port, stop bits, data bits, parity) are shared with the tethered scanner. [Table 3-5](#) contains the default baud rate settings for the following printers:

- Zebra QL (QL320, Cameo, Encore)
- Zebra EPL Series (LP/TLP 2824, LP/TLP 2844, TLP 3842)*
- Zebra ZPL (LP/TLP 2844-Z, TLP 3844-Z)
- Epson TML90
- Epson TMT88III.

* Zebra LP printers ship in Gap mode. If using a printer in Continuous Paper mode, the autosense does not work and you must manually set the gap to zero. To avoid this, send a command to the printer to change the mode. Refer to the Zebra printer documentation.

Advanced Printer Monitoring Functionality

For some printers, such as the Zebra QL Series, the MK2200 supports advanced printer monitoring functionality, such as:

- Detecting if the printer cable is connected
- Detecting if the printer power is on
- Detecting if the printer is out of paper
- Detecting if the printer door is open.

Connecting a Tethered Scanner

The MK2200 supports attachment of the Symbol LS1902T or LS2208 external tethered hand-held scanner. The tethered scanner data integrates into the data stream generated by the internal scanner driver. The data originating from the tethered scanner uses the same format as the data from the internal scanner.

This feature supports the following programming environments:

- C/C++
- Browser
- .NET.

To configure the MK2200 for tethered scanner support:

1. Configure the MK2200 serial port. In the MK2200 Configuration Utility window, enable support for a tethered external scanner and set the serial parameters (baud, parity, data bits, stop bits). Note that flow control is not supported. See [Tethered Scanner on page 3-17](#).
2. Attach the external scanner using cable p/n 25-56221-20.
3. Use the tethered scanner *Product Reference Guide* to set the following parameters in order to operate with the MK2200:
 - Set **Transmit Code ID Character** to: **Symbol Code ID Character**
 - Set **RS-232 Host Type** to: **Standard RS-232**
 - Confirm the tethered scanner baud rate matches the setting in the MK2200 Configuration Utility window (tethered scanner settings).
4. Launch the application that accepts data from the MK2200's internal scan engine. The tethered scanner data enters the application as though it came from the internal scan engine.

Configuring User Application(s)

The MK2200 Configuration Utility window configures the launching of user application(s). The seven definable application "slots" are processed upon power up. Programs launch in sequence with no delay, unless you set the **Delay Before Launch or Waiting For Completion** parameter.

The Startup program supports four parameters for each slot, detailed in [Table 3-6](#): executable path, command line arguments, delay before running, and a special flag.

Table 3-6 *User Applications, Parameter Descriptions*

Parameter	Description
Application Path	The full "run" path to the executable. Define this in order to process the entry (i.e., do not just specify a delay). File type associations are not supported. For example if the Argument contains a word document, specify the full path to wordpad.exe in the Application Path .
Arguments	Optional. Command line arguments for the program above. Escape double quotation marks using a back slash character, as in \". Also escape back slashes, i.e., \\..
Delay Before Launch	Optional. Specifies the number of seconds to delay before launching the User Application, if a previous program needs to complete or to ensure system resources are available. This is a simple way to handle sequencing; see Reliable Sequencing of Application Programs on page 3-21 for more complex situations (requires "wait for completion").
Waiting For Completion	Specifies whether the startup sequence waits for this program to complete before launching the next one, typically set to Disabled. See Reliable Sequencing of Application Programs on page 3-21 .

Reliable Sequencing of Application Programs

Use the **Delay Before Launch** and **Wait for Completion** parameters to set the startup process parameters:

- If an application requires a definitive order of execution
- To provide a signal between components to detect failures
- To verify that local or networked resources are available before the main application launches.

Use the **Delay Before Launch** parameter to achieve a delay in the launch sequence. However, this is not a robust way to ensure correct system operation. The recommended method is to write a separate program, with or without a user interface, that performs required checks then terminates, possibly setting a registry value or filesystem flag to indicate success. Set the **Wait For Completion** flag and run this program before running the main application(s).

Update

The fifth branch of the MK2200 Configuration Utility window and System Menu is **Update**. The default parameters are listed in [Table 3-7](#).

Table 3-7 Update Default Parameters

Update Parameters	Description	Default
FTP Server	FTP Configuration	
Allow Anonymous	Determines whether the server allows anonymous access.	Enabled
Allow Anonymous Upload	Determines whether authorization is required for uploading files to server.	Enabled
FTP Enable Part I	Determines whether the FTP server is loaded/accessible when the kiosk is powered on. Note that disabling this parameter has no impact on the ability to load or retrieve mkconfig.reg files via the Remote Device Manager's Push Configuration File and Retrieve Remote Configuration File functionality.	Enabled
FTP Enable Part II	Enabling this parameter allows the RDM to load/retrieve a mkconfig.reg file even if the kiosk's FTP server is disabled (FTP Enable Part I = disabled). If this parameter and FTP Enable Part I are both disabled, you cannot load an mkconfig.reg file remotely via the Configuration Utility or FTP. You can still load an mkconfig.reg file locally via an ActiveSync connection or a PC card.	Enabled
Root Directory	Directory and subdirectories of this key are accessible remotely. If this value is not set in the registry, the default is \Temp.	\
Use Authentication	Determines whether authorization is required to connect to the server.	Disabled
User Authentication Domain	Domain that holds information on authentic users that are allowed to access FTP service from the server.	None
User List	List of users able to access the FTP server.	None

Control Panel Configuration Parameters

When using the Windows® desktop Control Panel to modify certain MK2200 configuration settings, select **Start > Programs > Save Configuration** on the MK2200. This saves the changes to the mkconfig.reg file and retains them across cold boot cycles.

The Control Panel can set the following options:

- [Backlight Settings on page 3-23](#)
- [Button Definitions on page 3-24](#)
- [Date and Time on page 3-24](#)
- [Inactivity Manager on page 3-25](#)
- [Gate Keeper \(Password Protection\) on page 3-26](#)
- [Volume and Sounds on page 3-26](#)
- [Stylus Settings/Touch Screen Calibration on page 3-27](#)
- [Regional Settings on page 3-29](#)
- [Memory Allocation on page 3-30](#).

For best results, use the system menu for all permanent changes (except recalibrating the touch screen).

Backlight Settings

To change the backlight intensity on the MK2200:

1. Tap **Start > Settings > Control Panel**.
2. Double-tap the **Backlight & Contrast** icon from the **Control Panel** window.

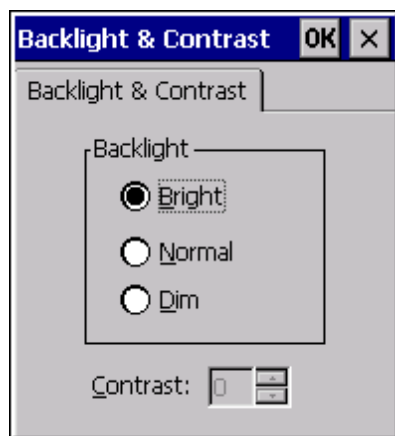


Figure 3-4 Backlight & Contrast Screen

3. Select the desired intensity by tapping the radio button.
4. Tap **OK** or **X** to close the screen and apply the selection.
5. Tap **Start > Programs > Save Configuration** to save the new settings in the MK2200 configuration (mkconfig.reg) file.

Button Definitions

To change the button mapping on the MK2200:

1. Tap **Start > Settings > Control Panel**.
2. Double-tap the **Button Definitions** icon from the Control Panel window.

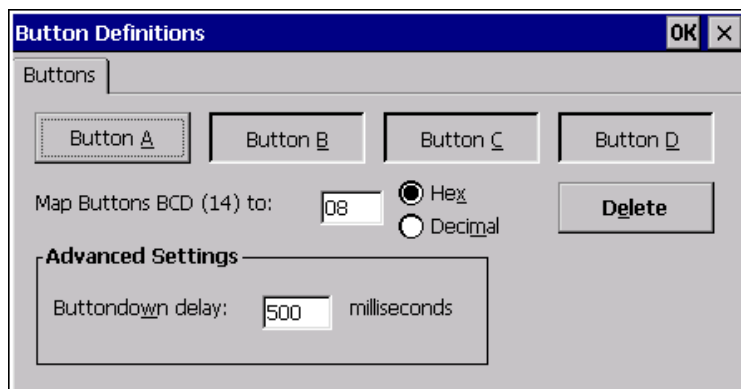


Figure 3-5 Button Definitions Screen

3. Tap on the button to remap. The button's current hex code appears in the text box.
4. Using the input panel, enter the new value of the hex code in the text box to remap the button. Also use this option to remap button combinations. See [Keycode Values on page 8-9](#) for correct key codes.
5. To change the buttndown delay, enter the new value using the input panel.
6. Tap **OK** or **X** to close the screen and apply the selection.
7. Tap **Start > Programs > Save Configuration** to save the new settings in the MK2200 configuration (mkconfig.reg) file.

Date and Time

To set the date/time on the MK2200:

1. Tap **Start > Settings > Control Panel > Date/Time** icon.

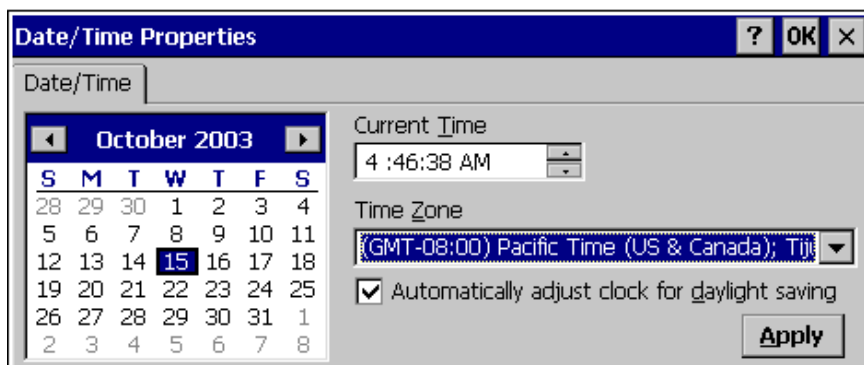


Figure 3-6 Date/Time Properties Screen

2. To set the month, tap the arrows on either side of the month shown, or select the month label to choose from a list of months.

3. To select a date, tap the date in the calendar.
4. To set the current time, highlight the hours, minutes, seconds or AM/PM field in the **Current Time** field. Tap the up/down scroll arrows to change the highlighted selection.
5. To change the time zone, select it from the list labeled **Time Zone**.
6. Tap on the check box for the system to automatically adjust the clock for daylight saving.
7. Tap **Apply** to apply the new date/time settings.

✓ **NOTE** The date resets to June 1, 1999, 12:00 PM upon a cold boot. Use the Control Panel or the SNTP Client to update this (see [Network Time Update: SNTP Client on page 8-10](#)).

To permanently set the time zone and daylight saving settings, use the RDM or System Menu on the MK2200.

Inactivity Manager

To set up the inactivity manager:

1. Tap **Start > Settings > Control Panel**.
2. Double-tap the **Inactivity Manager** icon.

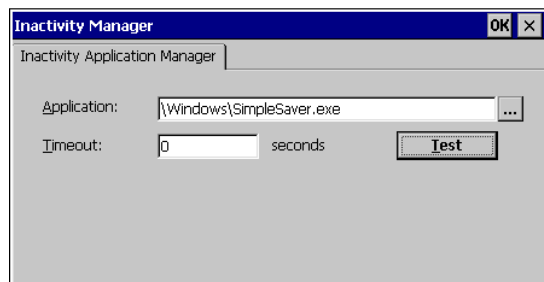


Figure 3-7 Inactivity Manager Screen

3. Select the application to run during inactivity by tapping the  button. (The default application is SimpleSaver.exe.)
4. Enter the timeout (in seconds). The default is 0, which allows the system to run continuously without going into inactivity mode.
5. Tap **OK**.
6. Tap **Start > Programs > Save Configuration** to save the new settings in the MK2200 configuration (mkconfig.reg) file.

Gate Keeper (Password Protection)

To run an application in protected mode:

1. Tap **Start > Settings > Control Panel**.
2. Double-tap the **Gate Keeper** icon from the **Control Panel** window. The **Gate Keeper** screen displays.

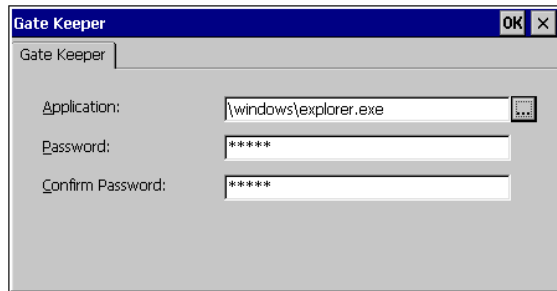


Figure 3-8 Gate Keeper Screen

3. Select the application to run in protected mode by tapping the  button.
Note: Changing this application is not recommended. Errors in this configuration parameter or the program that is run can prevent troubleshooting or interaction with the MK2200 in protected mode.
4. Specify the password to access protected mode, and enter it a second time to confirm it.
5. Tap **OK**.
6. Tap **Start > Programs > Save Configuration** to save the new settings in the MK2200 configuration (mkconfig.reg) file.

✓ **NOTE** When Button Security is enabled and the First User Application is not explorer.exe, a password is required to access functionality launched by the physical buttons.

Volume and Sounds

✓ **NOTE** Also set Volume and Sounds using the RDM. See [Volume and Sounds on page 3-18](#).

To change the volume on the MK2200:

1. Tap **Start > Settings > Control Panel > Volume & Sounds** icon.

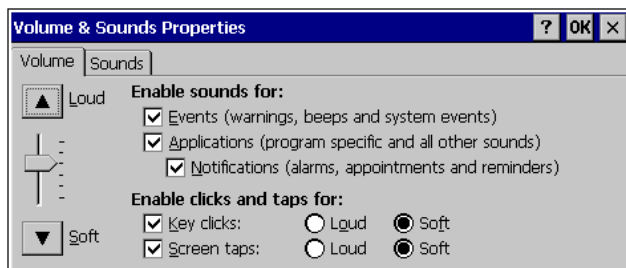


Figure 3-9 Volume & Sound Properties Screen - Volume Tab

2. Select volume options using the slide bar.

3. Tap the **Sounds** tab to change event sounds.

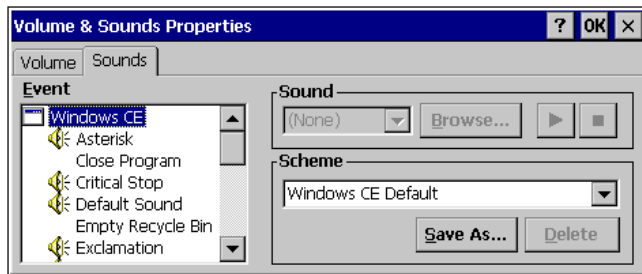


Figure 3-10 Volume & Sound Properties Screen - Sounds Tab

4. From the **Event** name list, select an event.
5. From the **Sound** list, select a sound. To remove a sound from the selected event, select **(None)**.
6. To save the changes to a different scheme, tap **Save As**, then name the sound scheme. To delete a sound scheme, select it in the **Scheme** list and tap **Delete**. To quickly turn off all event sounds, select **No sounds** from the **Scheme** list.
7. Tap **OK**.
8. Select **Start > Programs > Save Configuration** to save the new settings in the MK2200 configuration (mkconfig.reg) file.

Stylus Settings/Touch Screen Calibration

The double-tap speed and calibration setting are factory-set. To recalibrate the Stylus settings:

1. Tap **Start > Settings > Control Panel > Stylus** icon.

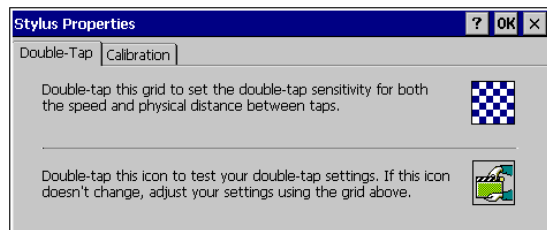


Figure 3-11 Stylus Properties Screen - Double-Tap Tab

2. Double-tap the checkerboard grid at a comfortable speed.
3. Double-tap the clapperboard to test the settings. If the icon does not change, adjust the settings on the checkerboard and test the settings again.

4. If the MK2200 is not responding properly to taps, tap the **Calibration** tab to calibrate the screen.

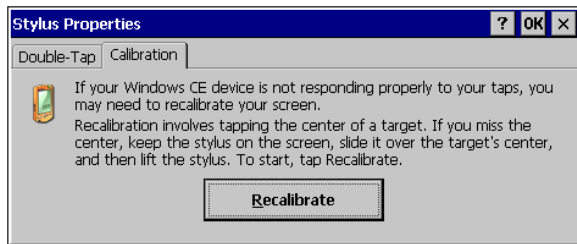


Figure 3-12 Stylus Properties Screen - Calibrate Tab

✓ **NOTE** Alternatively, to access the **Calibrate** screen simultaneously press the buttons A, C, and D (see [Figure 1-1 on page 1-3](#)).

5. Tap the **Recalibrate** button and follow the directions on the screen.

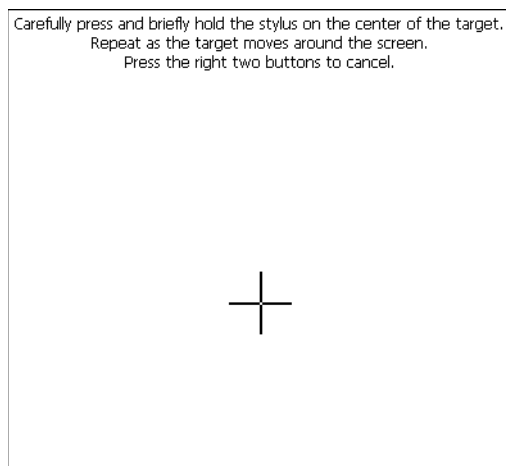


Figure 3-13 Calibrate Screen

6. The system returns to the **Stylus Properties** screen when calibration completes. To cancel calibration, press the **C** and **D** buttons simultaneously.
7. Tap **OK** on the **Stylus Properties** screen.
Note that calibration values are stored separately from other configuration settings in non-volatile storage and cannot be accessed by the user.

Regional Settings

To set up or change regional settings:

1. Tap **Start > Settings > Control Panel > Regional Settings** icon.

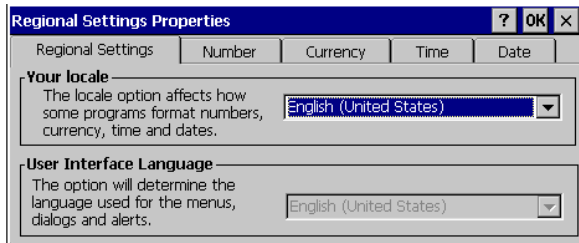


Figure 3-14 Regional Settings Properties Screen - Regional Settings Tab

2. On the **Regional Settings** tab, in **Your locale** (location), select the region to use for date, time, number, and currency formatting from the drop-down list.
3. To change the way numbers appear, tap the **Number** tab and make the changes.

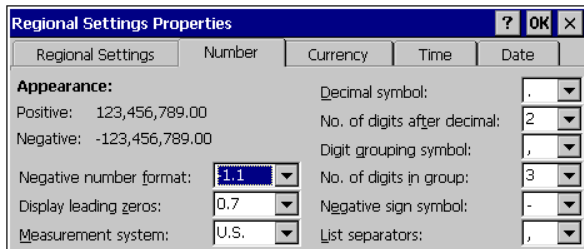


Figure 3-15 Regional Settings Properties Screen - Number Tab

4. To change the way currency values appear, tap the **Currency** tab and make the changes.

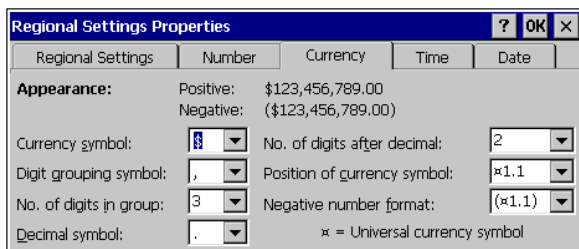


Figure 3-16 Regional Settings Properties Screen - Currency Tab

5. To change the way the time appears, tap the **Time** tab and make the changes.

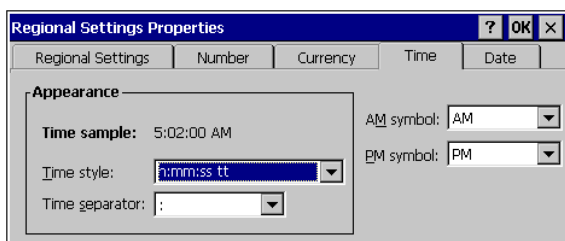


Figure 3-17 Regional Settings Properties Screen - Time Tab

6. To change the way the date appears, tap the **Date** tab and make the changes.

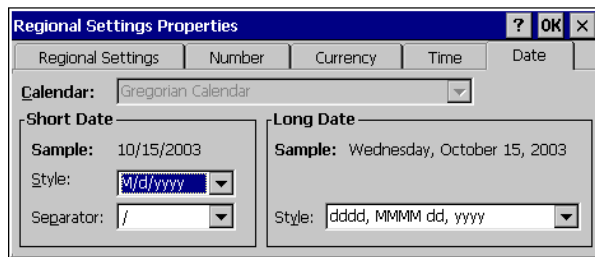


Figure 3-18 Regional Settings Properties Screen - Date Tab

7. Tap **Start > Programs > Save Configuration** to save the new settings in the MK2200 configuration (mkconfig.reg) file.

Memory Allocation

To change memory allocation settings:

1. Tap **Start > Settings > Control Panel > System > Memory**.

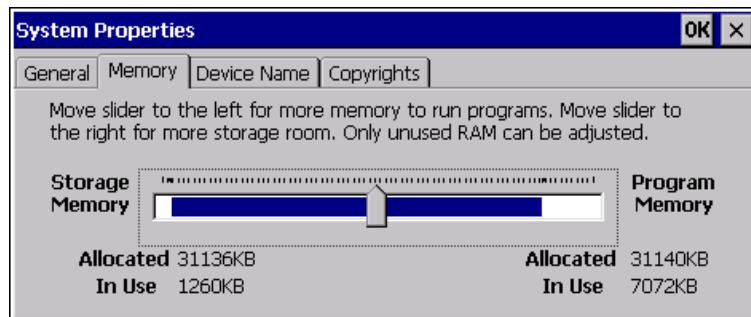


Figure 3-19 System Properties Screen - Memory Tab

2. On the **Memory** tab, adjust the memory allocation as desired using the slider.
3. Tap **OK**.

✓ **NOTE** Changing these settings using the Control Panel does not persist them through cold boot cycles. To set allocation to persist through cold boot cycles, or for more information on this topic, see [Memory Management on page 8-10](#).

Chapter 4 Remote Device Manager

Overview

The Symbol Remote Device Manager (RDM) v 2.4.X is a simple, menu-based Windows® utility for streamlining large and small site deployments. This utility allows a user to remotely stage (discover and configure) and monitor networked MK2200s.

The RDM functionality falls into five categories:

- Generating a device configuration file
- Performing discovery (detection) of devices on a network
- Enabling automated staging/configuring/provisioning of networked devices
- Remote monitoring
- Remotely initiating device functionality.

Generating Configuration Files

Use the **Create Local Configuration File** feature of RDM to create an MK2200 configuration file (**mkconfig.reg**). When loaded onto the device, this file customizes the MK2200 communication settings, application settings, date and time setup, and much more.

After generating the mkconfig.reg file, load it into the MK2200 **Application** folder (**Desktop/My Computer/Application**) and reboot the device. The MK2200 reads the mkconfig.reg file upon power-up and configures its parameters according to the settings defined in the mkconfig.reg file. If the MK2200 loses power, the parameters set within the configuration file persist and are re-established at the next power up.

See [Creating a Configuration File on page 4-11](#) for more information.

Performing Discovery (Detection) of Devices on a Network

The RDM discovers and displays the IP addresses of MK2200s on different subnets to which the host computer is connected, provided that the broadcast IP address is set correctly. See [Setting RDM Options on page 4-13](#) for more details.

The RDM utility broadcasts a request for discovery, and each MK2200 responds with its IP address. The RDM utility displays all responding MK2200 IP addresses on the main **RDM** screen.

The RDM can remotely initiate actions, such as playing a sound file, on the discovered device to help locate it in a store environment.

✓ **NOTE** RDM performance and consistency when performing discovery on a network are directly related to network reliability.

Automated Staging/Configuring/Provisioning of Networked Devices

The RDM can load a device configuration file (mkconfig.reg) onto an MK2200 remotely. This process is automated and does not require user intervention.

For details, see [Creating a Configuration File on page 4-11](#) and [Downloading the Configuration File to the MK2200 Using the RDM on page 4-13](#).

Remote Monitoring

Use the RDM to determine device-specific information. After performing discovery, select an MK2200 from the discovery list box to retrieve information to view:

- Device general information
- Operating System versions
- Storage information
- Partition information
- Application versions
- RF Signal Strength.

See [Monitoring MK2200s on a Network on page 4-15](#) for more information.

Remotely Initiating Select Device Functionality

Use the RDM to remotely initiate select functionality on MK2200s. After performing discovery, highlight desired devices from the discovery list box to initiate remote functionality on these devices, such as launching AirBeam Smart or rebooting the device.

Installing the Symbol Remote Device Manager

The RDM is available for download from the Symbol Developer Zone web site (<http://devzone.symbol.com/>).

1. Download the **Symbol Remote Device Manager** install file and save it on the host computer hard drive.
2. Select **Start > Run** from the Windows® task bar.
3. Using the **Browse** button, locate the **Symbol Remote Device Manager** install file and select **OK**.
4. The [Symbol Remote Device Manager First Install Screen](#) provides copyright information. Select **Next** to continue.

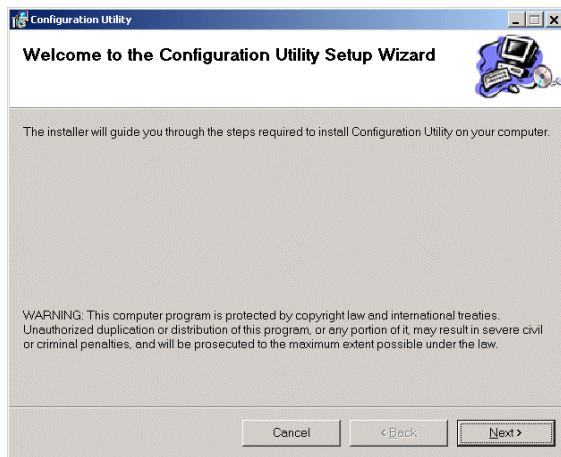


Figure 4-1 *Symbol Remote Device Manager First Install Screen*

5. The [Symbol Remote Device Manager Select Installation Folder](#) screen provides the directory information for the installation. Enter a new install path or accept the default path, and select users. Click **Next** to continue.

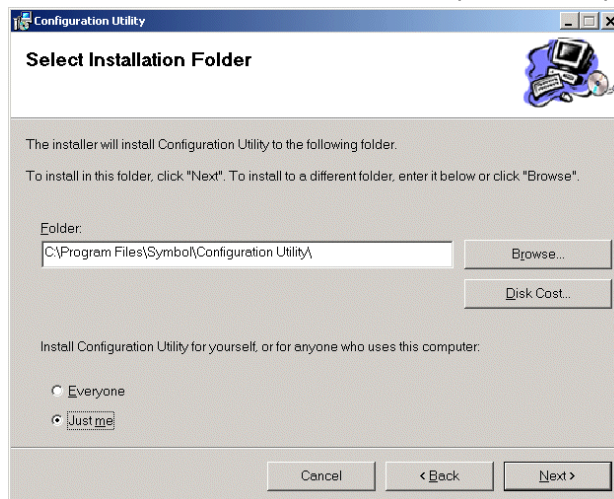


Figure 4-2 *Symbol Remote Device Manager Select Installation Folder*

6. The *Symbol Remote Device Manager Confirm Installation* screen requests to confirm installation. Click **Next** to continue.

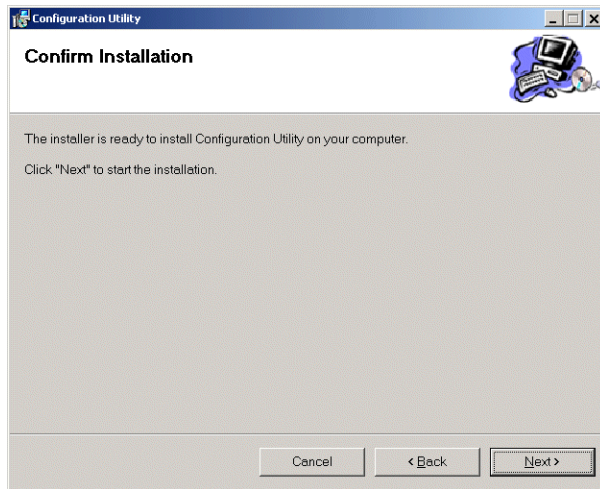


Figure 4-3 *Symbol Remote Device Manager Confirm Installation*

7. The *Symbol Remote Device Manager Installation Complete* screen confirms the installation was completed successfully. Click **Close** to exit.

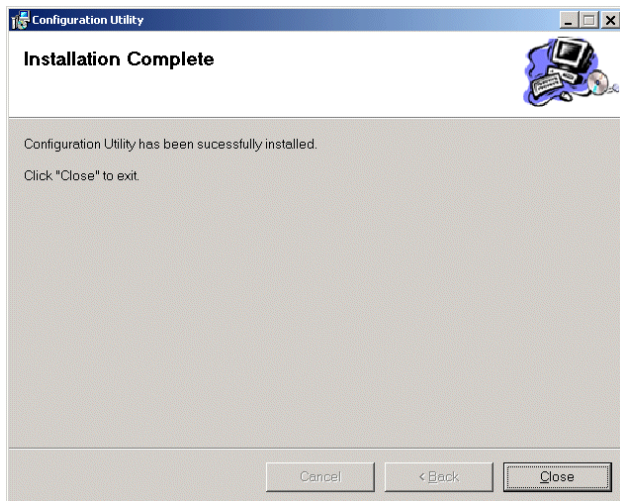


Figure 4-4 *Symbol Remote Device Manager Installation Complete*

Symbol Remote Device Manager Main Screen

To open the Symbol Remote Device Manager on the host computer, select **Start > Programs > Symbol Remote Device Manager > Symbol Remote Device Manager**.

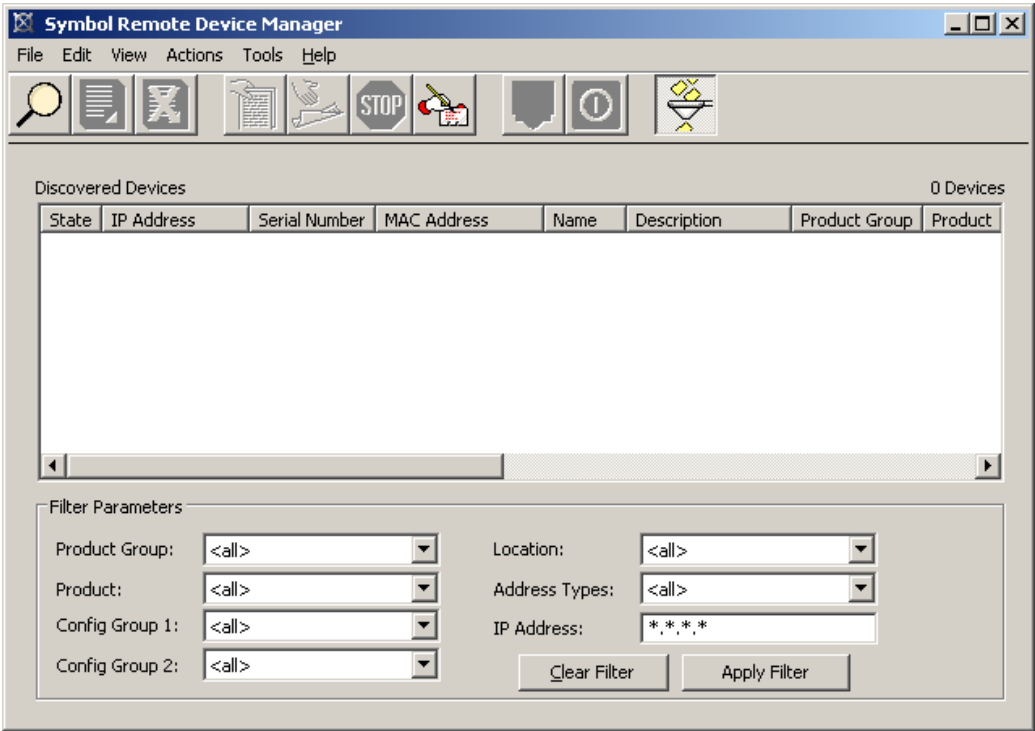


Figure 4-5 MK2200 Symbol Remote Device Manager

Symbol Remote Device Manager Menus

Use the menus on the **Symbol Remote Device Manager** (RDM) main screen to perform the functions in [Table 4-1](#).

Table 4-1 Symbol Remote Device Manager Menu Items

Menu Item	Function
File Menu	
Exit	Exits the Symbol Remote Device Manager.
Edit Menu	
Select All	Selects all MK2200s in the list.
Select None	Deselects all MK2200s in the list.
View Menu	
Refresh (Discover Remote Devices)	Locates all MK2200s on the network and displays them in the list box.
Device Information	Displays information on the selected MK2200. See Monitoring MK2200s on a Network on page 4-15 .

Table 4-1 Symbol Remote Device Manager Menu Items (Continued)

Menu Item	Function
RF Signal Strength	Launches the RF Signal Analyzer which displays RF signal strength. Only RF MK2200s running Mobile Companion support this feature. RF MK2200s running Aegis Client do not support this.
View Filter Parameters	Toggles on/off the Filter Parameters panel of the RDM.
Set Default Column Width	Sets the default column width for fields displayed in main RDM screen.
Actions Menu	
Locate Device	Initiates the device locating mechanism. Select an option for locating the device from the sub menu: • Select Display Color Screen to display a color screen on the target device. • Select Emit Sound to play a high-pitched sound clip from the target device. • Select Display Color and Emit Sound to invoke both the previous two mechanisms in the target device. • Select Terminate Locator mode to terminate the locating mechanism. This terminates the current locator mode before initiating another locator mode.
Ping Device	Ping the selected device. If the device cannot be reached, an error message displays.
Delete Device	Removes the selected device from the list of discovered devices. This only deletes the devices highlighted in gray.
Cold Boot	Cold boots the selected/highlighted MK2200(s). Allow approximately one minute for the device(s) to reboot and reconnect, then select View > Refresh to verify the devices rebooted successfully.
Warm Boot	Warm boots the selected/highlighted MK2200(s). Allow approximately one minute for the device(s) to reboot and reconnect, then select View > Refresh to verify the devices rebooted successfully.
Launch AirBeam	Launches the AirBeam version 2.16 application on the selected/highlighted MK2200(s). See Setting RDM Options on page 4-13 .
Tools Menu	
Create Local Configuration File	Creates a new configuration file and allows saving it to the PC hard drive. See Creating a Configuration File on page 4-11 .
Open Local Configuration File	Opens an existing configuration file that resides on the host computer.
Retrieve Remote Configuration File	Opens a configuration file that resides on the selected/highlighted MK2200.
Push Configuration File	Downloads a selected configuration file to the selected/highlighted MK2200(s). See Downloading the Configuration File to the MK2200 Using the RDM on page 4-13 .

Table 4-1 Symbol Remote Device Manager Menu Items (Continued)

Menu Item	Function
Manage Static IP Address	Opens the Manage Static IP Address window. See Managing Static IP Addresses on page 4-20 .
Custom DHCP Options	Displays the Customer DHCP Options window. Use this window to add/edit/remove DHCP options available within the Symbol RDM.
Options	Customizes Remote Device Manager options such as FTP security and broadcast IP address. See Setting RDM Options on page 4-13 .

Symbol Remote Device Manager Toolbar

Use the toolbar on the *RDM* main screen to perform the functions listed under the menu items in [Table 4-2](#).

Table 4-2 Symbol RDM Toolbar Components

Component	Description			
Tool Bar	Contains buttons that invoke most common functions of RDM.			
		Discover all devices on the network and display the Discovered Devices list. To stop discovery, click the Cancel Discovery button.		Select all devices listed in the Discovered Devices list.
		Deselect all devices.		Retrieve the configuration file from the selected device.
		Push the configuration file to the selected device(s).		Abort pushing the configuration file to device(s).
		Create an MK2200 device configuration file using the RDM.		Retrieve device specific information.
		Cold boot the selected device.		Turns on and off the Filter Parameters panel.

Row Colors

The Symbol RDM uses a color scheme to indicate the state of the MK2200 devices.

Color	Status
Green	Successfully retrieved/pushed configuration file.
Yellow	Selected for downloading a configuration file.
Gray	Device is inactive. The device may be booting up or is no longer in the same subnet.
Red	The retrieval/pushing of the configuration file is unsuccessful.

State Icons

The Symbol RDM uses a color scheme on the State Icons (the left most column) to indicate the state of the MK2200 devices.

Color of Icon	Status
	Successfully discovered device.
	Successfully retrieved/pushed configuration file.
	Device is selected for downloading a configuration file.
	Device is inactive. The device may be booting up or is no longer in the same subnet.
	The retrieval/pushing of the configuration file is unsuccessful.

Filtering Parameters

Use the **Filter Parameters** fields on the **RDM** main screen to display only certain devices on the network. [Table 4-3](#) describes these fields.

Table 4-3 *Filter Parameters Fields*

Menu Item	Function
Product Group	Select a product group to display.
Product	Select product model to display. See Identification on page 3-12 .
Config Group 1	Select an assigned configuration group to display. To set configuration groups, use the System Configuration feature of RDM or System Menu. See Identification on page 3-12 .
Config Group 2	Select a second assigned configuration group to display. To set configuration groups, use the System Configuration feature of RDM or System Menu. See Identification on page 3-12 .
Location	Select a device location to display. To set locations, use the System Configuration feature of RDM or System Menu. See Identification on page 3-12 .
Address Types	Select Static to display devices found in Manage Static IP Address list (see Managing Static IP Addresses on page 4-20), or <i>Discovered</i> to display all devices not in the Manage Static IP Address list (see Enabling DHCP on page 4-24).
IP Address	Enter IP address range to filter devices within the range.

Set the filtering parameters and click **Apply Filter** to apply the filters in RDM.

Click **Clear Filter** to remove the filtering parameters.

Filtering Example

In [Figure 4-6](#), the filter parameter is set to a configuration group called **Technical** to isolate a device used in the Technical department. When you click **Apply Filter**, the RDM scans the discovered devices list and filters out only the devices that fall into that configuration group. Use filters to quickly locate the devices.

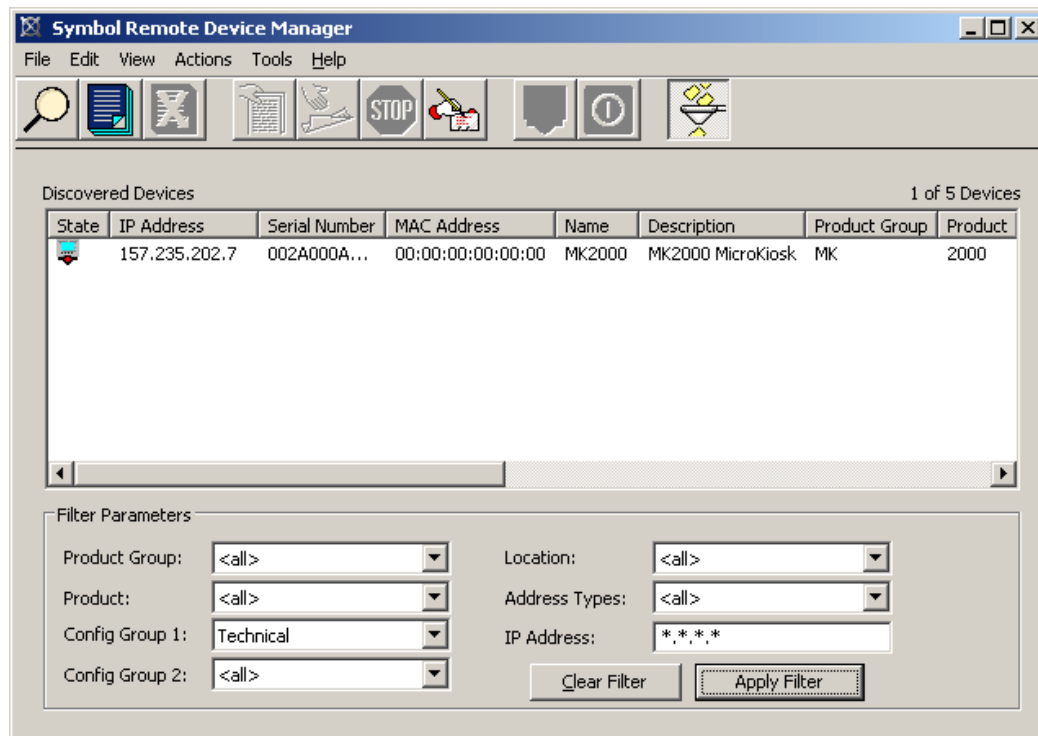


Figure 4-6 Symbol Remote Device Manager Filtering

Electronic Serial Number

The MK22XX has an electronic serial number accessible via network query. This information appears in RDM's **Serial Number** column. A sample serial number is M1J37B90R. Note that only devices manufactured with Windows CE .NET 4.2 support this.

Creating a Configuration File

To create a new configuration file:

1. From the Remote Device Manager, select **Tools > Create Local Configuration File** from the menu bar.
2. In the **Domains** window, select the applicable domain/product (MK2200) and click **OK**. This opens the **MK2200 Configuration Utility** window.
3. Make the necessary changes to the default values in the configuration file. See [Default Parameters on page 3-6](#) for all configuration options, which fall into the following configuration categories:
 - **Configuration File Information** - includes parameters related to version tracking of the mkconfig.reg file.
 - **Applications** - includes parameters related to Internet Explorer.
 - **Communications** - includes parameters for wired MK2200s related to Onboard Wired Ethernet.
 - **System Configuration** - includes parameters related to MK2200 system settings such as backlight intensity, volume and sounds, date/time, button configurations, regional settings, and user applications.
 - **Update** - includes parameters related to the onboard FTP Client.

See [Figure 4-7](#) for a sample screen, and [Data Entry Formats on page 4-27](#) for **MK2200 Configuration Utility** window data entry field types used when changing configuration options.

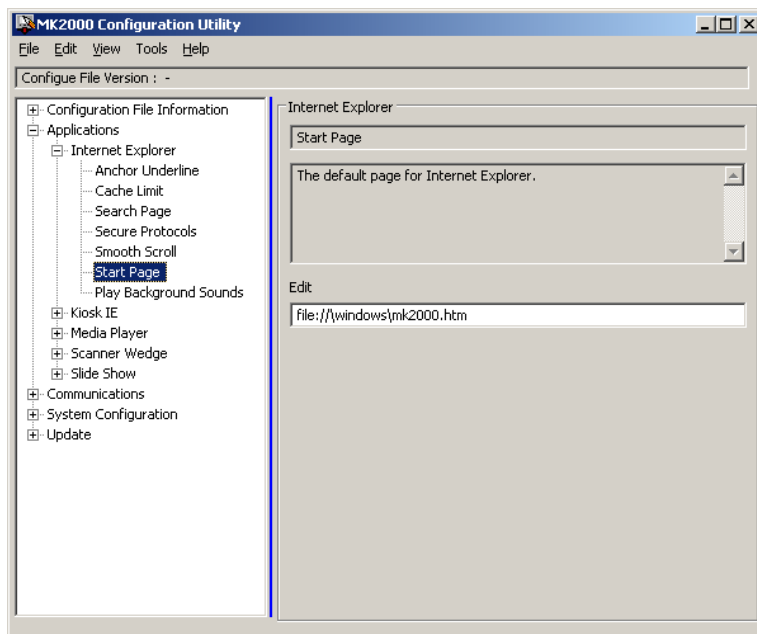


Figure 4-7 Changing Configuration Parameters Example: Internet Explorer Start Page

4. Select **File > Save As**.
5. In the **Save** window, specify the file name and location, then click **OK**.



NOTE The default folder is C:\Program Files\Symbol\Configuration Utility\MK2200 Configuration Files. The default file name is mkconfig.reg. Assign the file any name, but rename the file mkconfig.reg before transferring it to the MK2200.

Modifying an Existing Configuration File

To edit an existing configuration file:

1. From the RDM on the host computer, choose **Tools > Open Local Configuration File** to open the **MK2200 Configuration Utility** window.
 2. Select a configuration file (with a .reg extension) to edit and click **OK**.
- ✓ **NOTE** Only open files created by the RDM, System Menu, or Save Configuration. Loading other registry files can cause file corruption.
3. Make the necessary changes to the default values in the configuration file. See [Default Parameters on page 3-6](#) for these options. Also see [Figure 4-7](#) for a sample screen, and [Data Entry Formats on page 4-27](#) for **MK2200 Configuration Utility** window data entry field types used when changing configuration options.
 4. To save the changes, choose **File > Save** to overwrite the old file, or select **Save As** to specify a new name for the file. Note that you cannot change the Domain (product) of an existing configuration file.

Retrieving and Modifying a Configuration File from an MK2200

1. From the **RDM** screen, select the device from which to retrieve the configuration file.
2. Select **Tools > Retrieve Remote Configuration File** to retrieve the MK2200 configuration file from the MK2200 to the host computer. This launches the **MK2200 Configuration Utility** window of the RDM. If a configuration file is unavailable in the device, RDM opens the **MK2200 Configuration Utility** window with the default factory settings.
3. Make the necessary changes to the default values in the configuration file. See [Default Parameters on page 3-6](#) for these options. Also see [Figure 4-7](#) for a sample screen, and [Data Entry Formats on page 4-27](#) for **MK2200 Configuration Utility** window data entry field types used when changing configuration options.
4. In the **MK2200 Configuration Utility** window, select **File > Save to Remote Device** to save the changes and transfer the updated configuration file back to the original MK2200.
5. Alternatively, configure the RDM to automatically cold boot the MK2200 device after a download completes. Select **Tools > Options** to open the **RDM Options** screen, and check **Auto reboot after download**.

✓ **NOTE** To reboot manually instead, in the RDM, select the MK2200 device, then select **Actions > Cold Boot**. Allow approximately one minute for the MK2200 to reboot and reconnect, then select **View > Refresh** to verify the device rebooted successfully.

Cloning an MK2200 Configuration File to Multiple MK2200s

To use one MK2200 configuration file to configure other MK2200s:

1. In the RDM, select the MK2200 with the configuration file to use.
2. Select **Tools > Retrieve Remote Configuration File** to transfer the configuration file to the host computer and open the **MK2200 Configuration Utility** window.
3. In the **MK2200 Configuration Utility** window, select **File > Save As**.
4. Specify the location for the configuration file to be saved on the host PC, and click **OK**.
5. Select the MK2200 devices to be updated from the **Discovered Devices** list.

6. Select **Tools > Push Configuration File** option to upload the configuration file to the selected MK2200s (see [Downloading the Configuration File to the MK2200 Using the RDM](#)).

Downloading the Configuration File to the MK2200 Using the RDM

To “push” the file to the MK2200(s):

1. In the Symbol Remote Device Manager (RDM) window, select/highlight the MK2200(s) to receive the configuration file.
2. Select **Tools > Push Configuration File**.

3. Select the configuration file to send, then click **Open**.

The row color of the selected device changes to yellow to indicate that the MK2200 device is ready to receive a configuration file through the RDM. When the download completes, the row color changes to green. See [Row Colors on page 4-8](#) and [State Icons on page 4-8](#).

4. If the **Auto reboot after download** option is disabled, manually cold boot the MK2200(s). In the **RDM** main screen, select the MK2200(s) to reboot, then select **Actions > Cold Boot**. Allow approximately one minute for the MK2200 to reboot and reconnect, then select **View > Refresh** to verify the device rebooted successfully.

✓ **NOTE** Setting the device FTP options to Enable Anonymous Login and Disable User Authentication allows anonymous login and retrieval of files through FTP connection. However, modifying/adding files is not allowed for non-anonymous users. Therefore, do not enter a user name and password in RDM's options panel to download a file to the device through RDM if these FTP settings are in place.

Setting RDM Options

If desired, set the following Symbol Remote Device Manager (RDM) options from the **Options** window. These settings apply for the RDM:

- AirBeam parameters
- FTP security
- Timeouts
- Auto-refresh
- 3rd party application data
- Other options (e.g., auto-reboot, device discovery).

To set options:

1. In the **RDM** main screen, select **Tools > Options** to open the **Options** window.

Figure 4-8 *Symbol Remote Device Manager Options Window*

2. Set desired options:

- Set **AirBeam Parameters** for launching AirBeam. For more information on AirBeam command line parameters, refer to the *AirBeam Package Builder Product Reference Guide*.
- Set the FTP user ID in the **User ID** field and password in the **Password** field for accessing an FTP server. Leave this blank to enable anonymous FTP login. See [Downloading the Configuration File to the MK2200 Using the RDM on page 4-13](#) and [FTP Server on page 3-22](#).
- Enter a value for **Device discovery** (the duration for sending network queries for detecting MK2200 devices) and **Query timeout** (the timeout period before the next query).
- Check the **Enable auto-refresh every** option to enable automatic refresh/discovery of devices and specify the time period in its text box. This automatically refreshes the **Discovered Devices** list after a cold/warm boot or after a configuration file push.
- In the **Application 1** and **Application 2** fields, enter the names of applications loaded on the device that the RDM must monitor. For example, to track the Web Kiosk Software Suite version, enter **Web_Kiosk SoftwareSuite** into **Application 1**.
- Check **Auto reboot after download** to reboot the device after a successful configuration file push.
- Check **Device discovery on open** to perform device discovery automatically when the RDM launches.
- Check **Enable RDM Password** to prompt for a User Name and Password for using the RDM. Enter the user name and password in the **RDM Login** screen. RDM prompts for the user name and password when launched.
- Specify the **Broadcast IP Address**, used in discovering devices on the network. The default value is 255.255.255.255. This causes discovery of all device in all network interfaces attached to a single computer (multi-homed computer).

3. Click **OK** to save the changes and close the **Options** window.
4. Click **Defaults** to load the default settings for the RDM.
5. Click **Cancel** to exit the **RDM Options** screen without saving the settings.

Monitoring MK2200s on a Network

Use the RDM to remotely monitor MK2200s connected through a network connection. After performing discovery, double-click on an MK2200 from the discovery list, or click on the MK2200 in the list and select **View > Device Information** from the RDM menu:

- View device general information. See [Device Information - Info Tab: Detected Device Information on page 4-16](#).
- View software version information, such as applications, drivers, OS, and platform. See [Device Information - Software Tab: Version Information on page 4-17](#).
- View RAM and flash memory usage for the selected device. See [Device Information - Storage Tab: Memory Availability and Usage on page 4-18](#).
- View partition information for the selected MK2200. See [Managing Static IP Addresses on page 4-20](#).

Use the up and down arrow keys to navigate through the discovered devices to view information.

Click **Refresh** to refresh the device properties list.

Click **Generate Report** to place the information displayed in the tabs into a printable file.

Device Information - Info Tab: Detected Device Information

The **Info** tab displays identification information about the selected MK2200. Also see [Performing Discovery \(Detection\) of Devices on a Network on page 4-2](#)

The screenshot shows a window titled "Device Properties - 157.235.202.7". It has four tabs: "Info", "Software", "Storage", and "Partitions". The "Info" tab is selected and displays the following information in a list of labels and text boxes:

Contact:	
Location:	
GUID:	000A002A-400D-A179-E800-0050BF7A60E2
Date:	05/31/2005 1:38:38
MIB:	2.1
Flash:	64 MB
RAM:	32 MB
CPU:	Intel ARM PXA255 A0 - 400MHz

At the bottom of the window, there are three buttons: "Refresh", "Generate Report", and "Close". Below these buttons is a note: "Use UP and DOWN Arrow keys to navigate between devices".

Figure 4-9 MK2200 Remote Device Monitor - Info Tab

Device Information - Software Tab: Version Information

The **Software** tab displays the applications, operating system, monitor driver, and platform, and their version information for the selected MK2200.

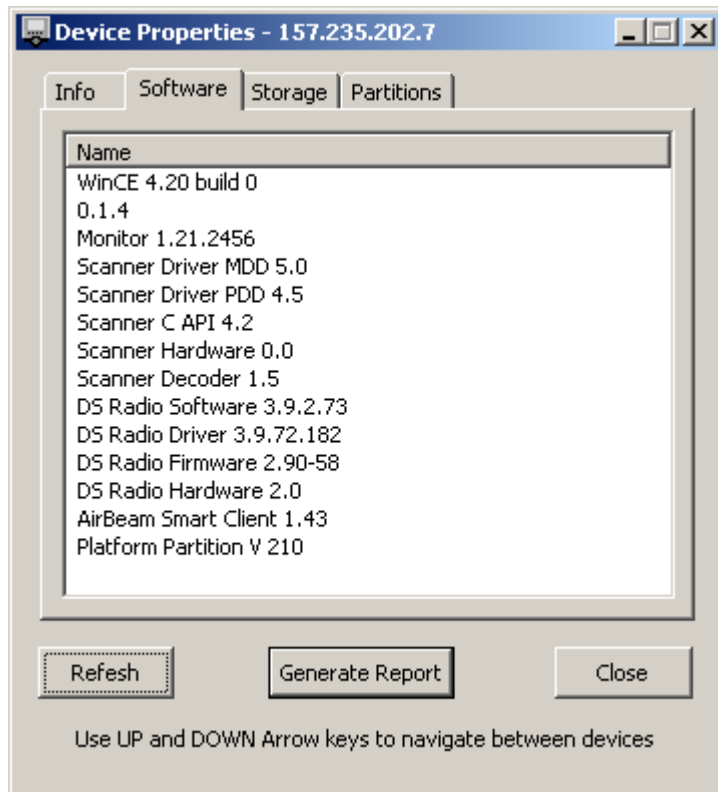


Figure 4-10 MK2200 Remote Device Monitor - Software Tab

Device Information - Storage Tab: Memory Availability and Usage

The **Storage** tab displays storage areas on the selected MK2200, their physical size, and available free memory.

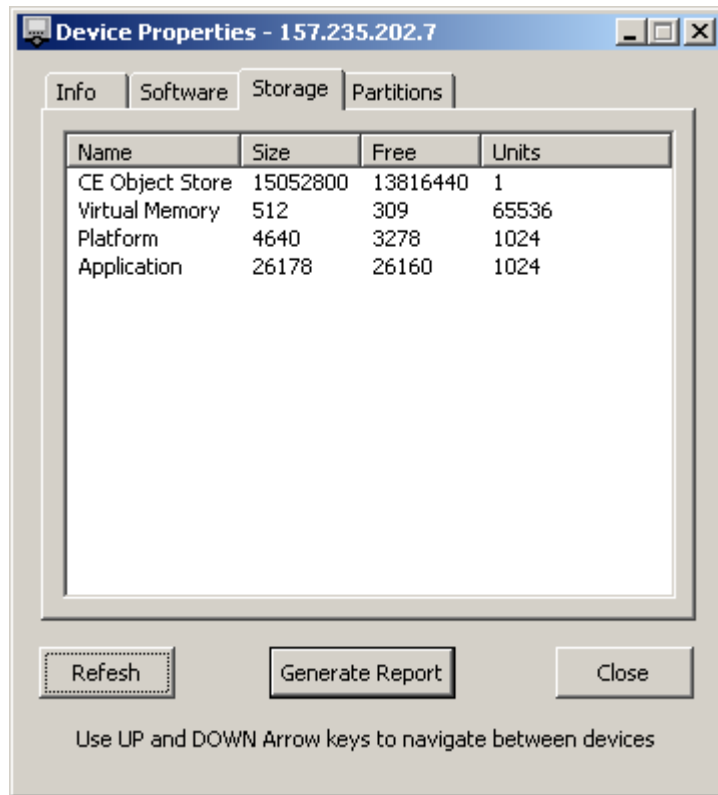


Figure 4-11 MK2200 Remote Device Monitor - Storage Tab

Device Information - Partitions Tab

The **Partitions** tab displays the number and size of the storage areas on the selected MK2200.

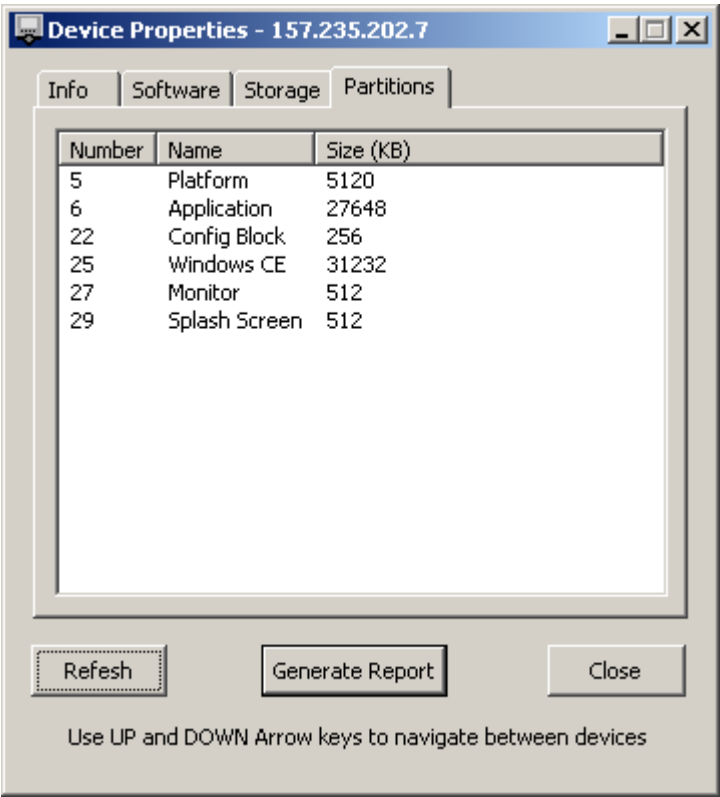


Figure 4-12 MK2200 Remote Device Monitor - Partitions Tab

Setting a Static IP Address

To set a static IP address for a wired device:

1. In the **MK2200 Configuration Utility** window, select **IP Address** under the appropriate adapter: Onboard Wired Ethernet.

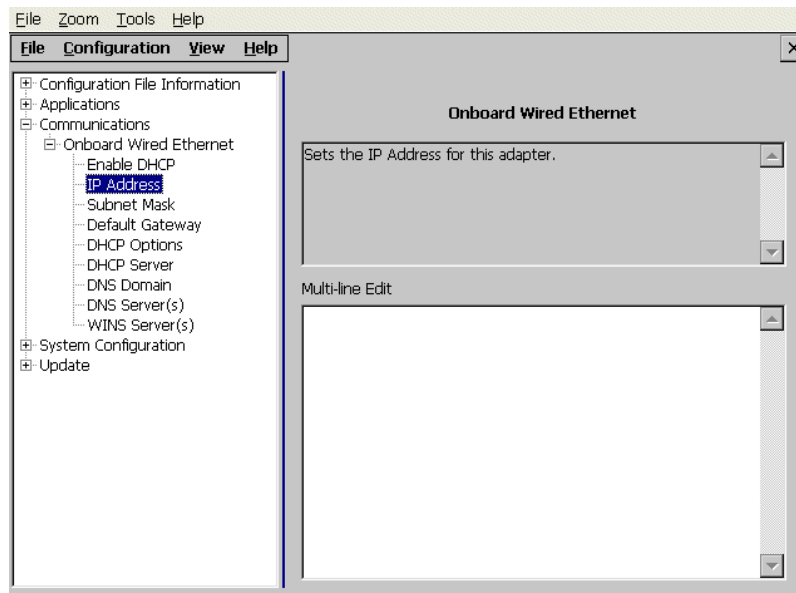


Figure 4-13 *Setting a Static IP Address*

2. In the text box, enter the IP address.
3. Also select and define the adapter's **Default Gateway** and **Subnet Mask**.
4. Optionally, select and define the **DNS Server(s)** and **DNS Domain**.
5. Ensure that **Enable DHCP** is disabled (de-select its check box).
6. Save the changes.

Managing Static IP Addresses

Specify the static IP address of an MK2200, which is on a different subnet than the Symbol Remote Device Manager PC, to establish a connection and still be managed by the RDM. This causes the RDM to list the devices and their IP addresses, without performing discovery, in the **RDM** main screen.

For this to occur, the MK2200 that is on a different subnet than the RDM must have a static (unchanging) IP address during the remote management session.

This is useful when MK2200s are on more than one subnet, when bandwidth is a consideration, or when MK2200s are connected over a WAN. For example, if the MK2200 RF and wired Ethernet devices are on different subnets, the Remote Device Manager can still manage all devices.

Adding Static IP Addresses

1. In the Symbol Remote Device Manager, select **Tools > Manage Static Addresses**.

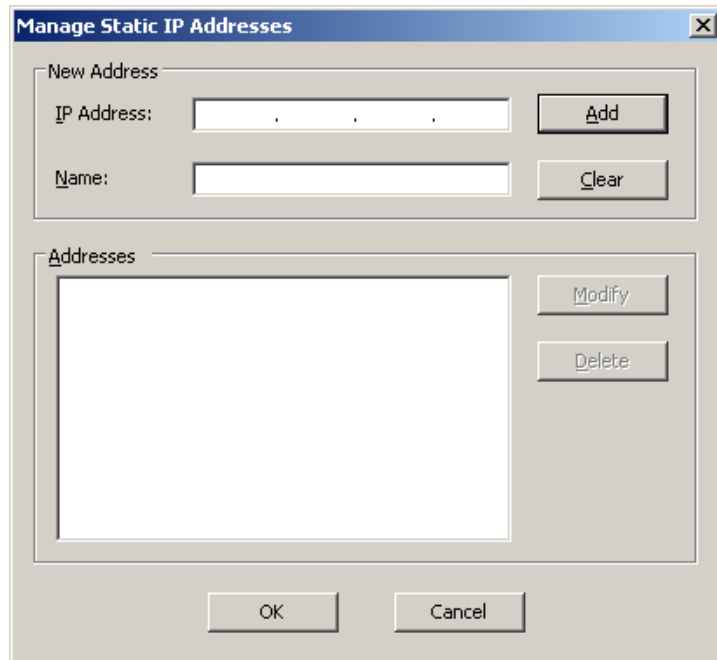


Figure 4-14 *Manage Static Addresses Window*

2. Enter the IP address and the name, and click **Add**. Repeat this to enter other static IP addresses.
3. Click **OK** to save the changes.

Modifying Static IP Addresses

1. In the Symbol Remote Device Manager, select **Tools > Manage Static IP Addresses**.

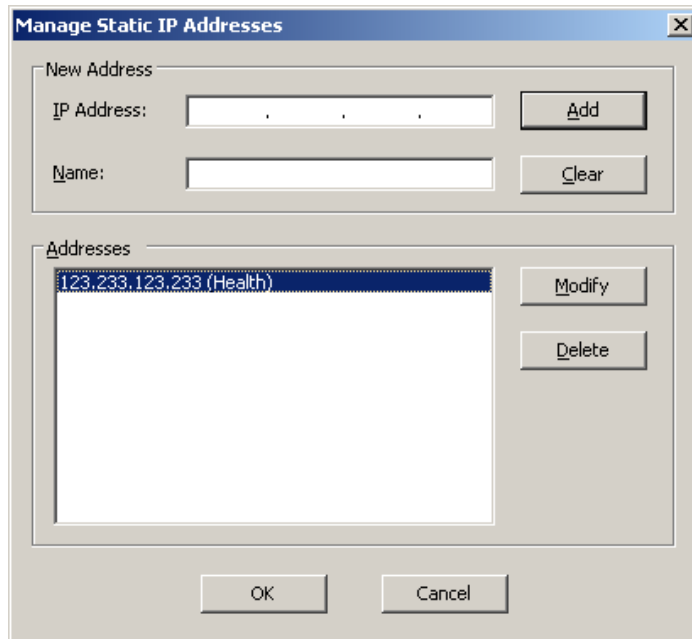


Figure 4-15 *Modifying Static Addresses*

2. Select the IP address and click **Modify**.
3. Change the appropriate settings and click **Update** to update the static IP addresses list. Click **Discard** to discard the modifications.
4. Click **OK** to save the changes.

Deleting Static IP Addresses

1. In the Symbol Remote Device Manager, select **Tools > Manage Static IP Addresses**.

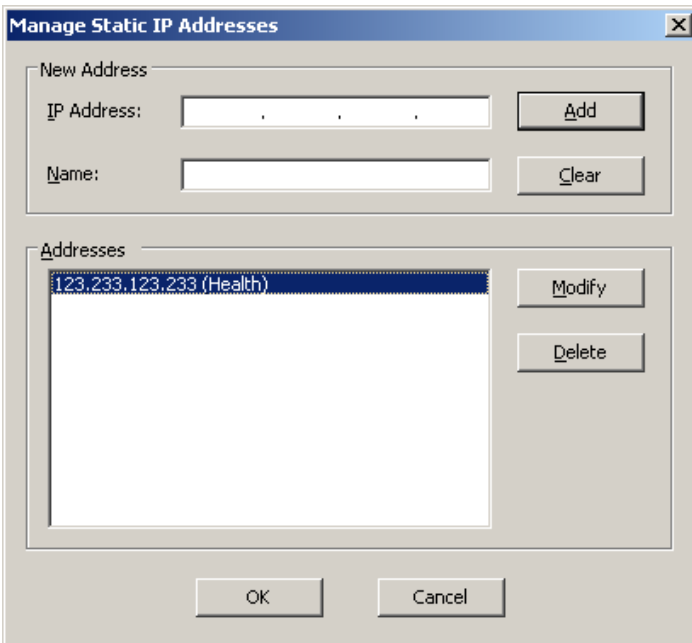


Figure 4-16 *Deleting Static Addresses*

2. Select the IP address to delete, and click **Delete**. Repeat this to delete other static IP addresses.
3. Click **OK** to save the changes.

DHCP Configuration

Familiarity with Dynamic Host Configuration Protocol (DHCP) options is required to edit options and save them to the configuration file.

- ✓ **NOTE** Do not use the System Menu or RDM to enable DHCP receive options 1, 3, 6, 15, 44, 46, 47, 66 and 67. They are already enabled in `dhcptions.reg` as a part of the AirBeam package. Refer to AirBeam documentation for this configuration.

Enabling DHCP

Enabling DHCP configures a specific network adapter to acquire its IP address and other network parameters through DHCP. DHCP options determine what additional data is sent to and received from the DHCP server.

To enable DHCP:

1. In the **MK2200 Configuration Utility** window, select **Enable DHCP** under the appropriate adapter: Onboard Wired Ethernet.

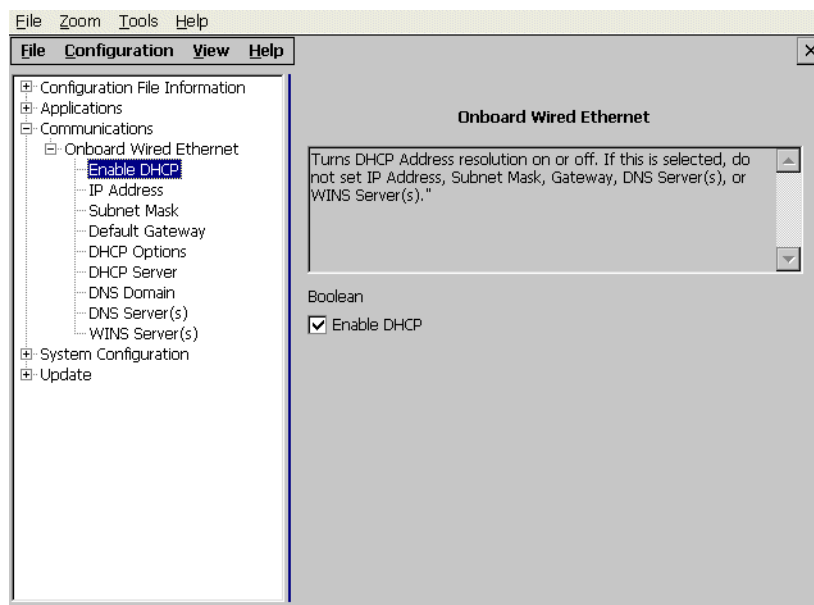


Figure 4-17 Enable DHCP Window

2. Check **Enable DHCP**.

- ✓ **NOTE** If enabling DHCP, you can set DHCP Server; however, this is usually not required. Do not set any other parameters under Communications.

If enabling DHCP to resolve addresses for a network adapter, optionally specify which data fields are sent from or received by the MK2200 (DHCP options) during DHCP transactions using that network adapter.

Some of the 256 available DHCP options are defined by the IETF in RFC-2132, and appear in the **MK2200 Configuration Utility** window when specifying DHCP options. If desired, add custom DHCP options to this list. These custom option definitions are stored in the file `<install_dir>\dhcptions.reg`, which the RDM reads upon launch. If using another computer to edit a configuration file that contains custom DHCP options, transfer the file `<install_dir>\dhcptions.reg` to this computer to view these custom options.

To change Send DHCP options:

1. In the **MK2200 Configuration Utility** window, select **DHCP Options** under the appropriate adapter: Onboard Wired Ethernet.
2. Click **Edit Send Options** to view the **Send** window.

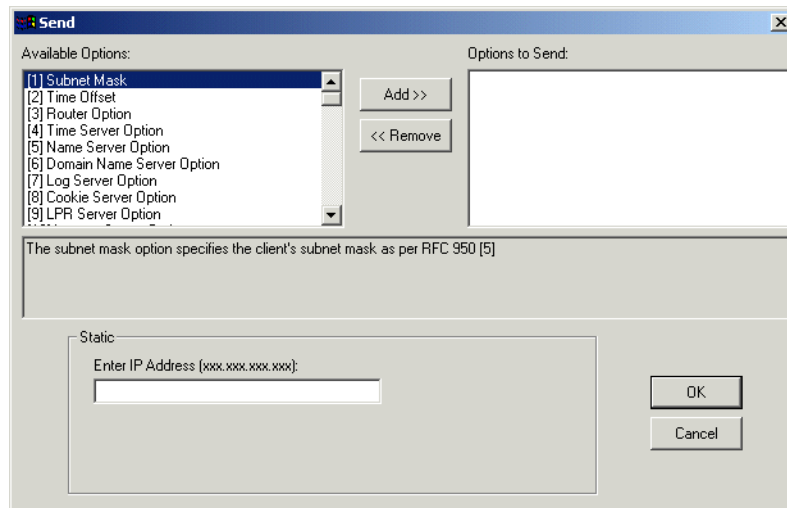


Figure 4-18 *Send DHCP Window*

3. To add options to the configuration, select an option for the network adapter to receive from the **Available Options** list.
4. In the data field(s) in the **Static** area of the window, enter the data to send for this option. Click to add these options to the **Options to Receive** list.
5. To add other Send DHCP options, repeat steps 3 and 4.
6. To remove options from the configuration, select an option to remove from the **Options to Send** list. Click to move the option back to the **Available Options** list. Repeat this for each option to remove.
7. Click **OK** to save the changes and close the **Send** window.

Custom DHCP Options

Use the RDM to add/edit/remove custom DHCP options available within the RDM. Select **Tools > Custom DHCP Options**.

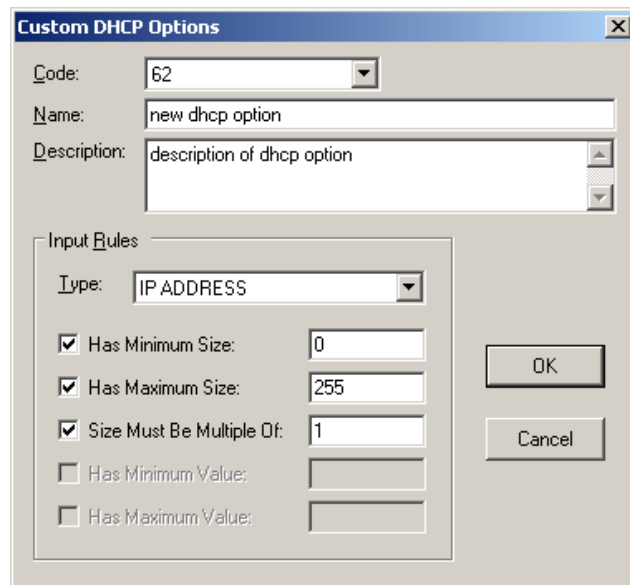


Figure 4-19 Custom DHCP Options Screen

Adding Custom DHCP Options

Use the **Custom DHCP Options** window to add a new DHCP option.

1. Select a code that is not currently used from the **Code** drop-down list.
2. Enter the **Name** and **Description** for the custom DHCP option.
3. Set the **Input Rules**.
4. Click **OK** to submit the entered settings in the RDM.

Editing Custom DHCP Options

1. From the **Code** drop-down list, select the custom DHCP option to edit.
2. Make the appropriate changes.
3. Click **OK** to submit the entered settings in the RDM.

Removing Custom DHCP Options

1. From the **Code** drop-down list, select the custom DHCP option to remove.
2. Delete the **Name** and **Description**.
3. Click **OK** to save in the RDM.

Updating the RDM on the Host Computer

To update the RDM:

1. Use the Windows® **Add/Remove a Program** utility to remove the RDM from the host computer.
2. Install an updated RDM. See [Installing the Symbol Remote Device Manager on page 4-3](#).

Restoring Configuration Parameter Defaults

Some fields have a default value. To restore default values, choose one of the following items from the **MK2200 Configuration Utility** window:

- Select a parameter, then select **Edit > Restore Default** to restore the current field to its default.
- Select **Edit > Restore All Defaults** to restore all parameter default settings.

Save the changes.

Data Entry Formats

The RDM uses standard data entry formats, depending on the data type:

- **Check Box:** Used for true or false values. An "X" in the check box selects the function. Tap the box to check or uncheck.
- **Text Data Entry Box:** Requires text entry. Examples are IP address, domain name, or server name.
- **Numeric Data Entry Box:** Requires numeric entries, in hexadecimal (base 16) or decimal (base 10) notation. Hex values must be preceded by "0x".
- **Drop-down List:** Select a single option. The stored parameter value may be different than the text displayed.
- **Bit Fields:** Multiple items with check boxes. If desired, select multiple items (from none to all). Each selected item affects the value stored, which is a single number, so the selections will not match the mkconfig.reg file.
- **Multiple Text:** Enter multiple free-form strings. Click **Enter** on the keyboard to create a new string. Multiple text values are not represented in the mkconfig.reg file as text, so the value entered is not recognizable in the mkconfig.reg file.
- **External-type:** For each different external type, an associated DLL manipulates what is stored in the Registry (mkconfig.reg) and how it is displayed in the Configuration Utility/System Menu.

The Configuration Utility/System Menu loads the relevant DLL when an External-type is found in the metadata file for the particular Registry type. The DLL should have two standard methods: input and output.

When a registry entry of External- type is stored, the text in the text box is passed to the output method of the DLL which translates the data accordingly and writes it to the Registry file. When retrieving a Registry entry, the DLL invokes the input method and translates the data back to a valid form. It is displayed in the Configuration Utility /System Menu.

All validation for the value entered is done through the DLL. No validation is done through the Configuration Utility/System Menu. This method is used in encrypting and decrypting WEP keys.

Chapter 5 Transferring Files to the MK2200

Overview

Use the following tools to copy files to the MK2200:

- ActiveSync
- FTP Server (see [FTP Server on page 8-11](#))
- AirBEAM version 2.16 (see *AirBeam Package Builder Product Reference Guide*).

ActiveSync

The MK2200 communicates with a host computer using Microsoft® ActiveSync (version 3.7.1 or higher). Use USB ActiveSync to transfer data between a host computer and the MK2200.

When installed on the MK2200, ActiveSync software allows copying and pasting (rather than synchronizing) files between the MK2200 and host computer.

✓ **NOTE** While an application is running, access to ActiveSync can be enabled or disabled using either RDM or the System Menu under **System Configuration - ActiveSync - EnableActiveSync**.

Installing ActiveSync

To install ActiveSync on the host computer, download the latest version of the software from <http://www.microsoft.com>. Refer to the installation instructions included with the ActiveSync software.

Use ActiveSync (version 3.7.1 or higher) to synchronize the information on the MK2200 with the information on the host computer. Changes made on the MK2200 or host computer appear in both places after synchronization.

✓ **NOTE** The MK2200 implementation of ActiveSync 3.7.1 does not support ActiveSync Backup and Restore functionality and automatic information synchronization.

Connecting the MK2200 to the Host Computer

To configure ActiveSync for Guest access (suitable for copying files between the host computer and the MK2200):

1. Connect the RJ-45 connector of the ActiveSync Developer Cable, p/n 25-64626-01R, to the RS-485 port on the MK2200 (see [Figure 1-3 on page 1-5](#)). Connect the other end of the cable to a USB port on the host computer.
2. If the **Get Connected** window does not appear, on the host computer, select **Start > Programs > Microsoft ActiveSync**.



Figure 5-1 *Get Connected Window*

3. Select **Next**. The host computer and the MK2200 attempt to synchronize. The **New Partnership** window displays.



Figure 5-2 *New Partnership Window*

4. Click **No** and then **Next**. The **New Partnership/Name Your Device** window displays.

5. Click **Next**. The **Microsoft ActiveSync Guest Connected** window displays.

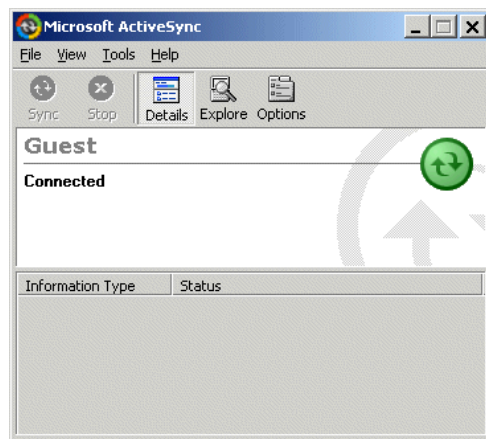


Figure 5-3 *Microsoft ActiveSync Guest Connected Window*

To download files (such as the `mkconfig.reg` file) from the host computer to the MK2200, use Windows Explorer to copy the files. Then, select **File > Explore** on the ActiveSync window, locate the folder to upload the files to, and paste the files.

For more information about ActiveSync, start ActiveSync on the host computer, then refer to ActiveSync **Help**.

Chapter 6 Web Kiosk Software Suite

Overview

The Web Kiosk Software Suite (Web KSS) is a comprehensive browser solution that demonstrates the many capabilities of the MK2200 MicroKiosk. For software developers, production quality HTML source code is included as a reference implementation for creating custom solutions.

Web Kiosk Software Suite Features

The Web Kiosk Software Suite provides a sample retail application that demonstrates the functionality of the MK2200 in a retail environment, and includes Customer and Store Operations applications.

The **Customer Application** screens provide:

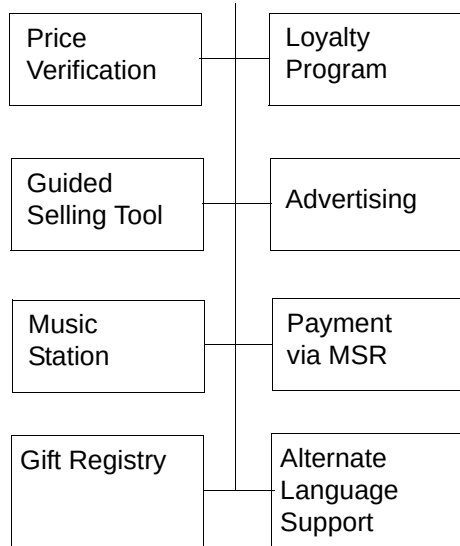
- Advertising (Attract Mode)
- Price verification
- Music listen station
- Alternate language information
- Printing capability
- Magstripe reading (MSR)
- Loyalty program
- Guided selling tool with audio prompts
- Gift registry registration.

The **Store Operations** screens provide:

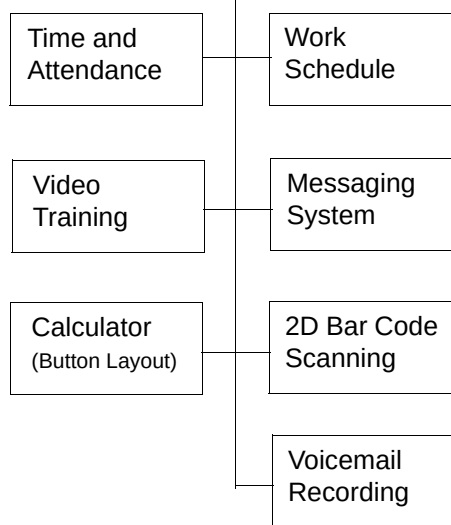
- Time and attendance (clocking in)
- Full screen video
- In-store messaging (text, voice, and video)
- Recording a voicemail response

- Voicemail playback
- 2D bar code scanning and display data
- Scan engine deactivation / reactivation
- Weekly employee work schedule
- Calculator.

Customer Facing



Employee Facing



Web Kiosk Software Suite

The Web Kiosk Software Suite MK2000WEBKSS_X.XX.zip and source code are available at <http://devzone.symbol.com>. The Web Kiosk Software Suite does not require external connectivity to run.

Web Kiosk Software Suite Bar Codes

The Web Kiosk Software Suite uses the bar codes in [Appendix D, Web Kiosk Software Suite Bar Codes](#) to demonstrate MK2200 capabilities.

Installing the Web Kiosk Software Suite

To install the Web Kiosk Software Suite when the MK2200 is set to launch another application on power-up, see [Accessing the Windows® CE Desktop](#).

Accessing the Windows® CE Desktop

To prevent launching an application on power-up:

1. Perform a cold boot: press and hold buttons **B** and **C** on the MK2200 (see [Figure 1-1 on page 1-3](#)) until the display changes and goes blank (typically 15 seconds), then release the buttons. If the virtual keyboard appears when pressing the buttons, ignore it.
2. To prevent the MK2200 from entering an application, simultaneously press and hold buttons **A** and **D** just after the blue **Performing System Initialization (Phase 1)** screen displays, and before the message changes to **Phase 2**. Release the buttons.
3. When the **Enter Password** prompt appears, enter **DDBAC**, then touch **OK** or simultaneously press the **A** and **B** buttons for Enter.

The MK2200 enters Protected Mode and the Windows® CE desktop displays.

Deleting the Current Web Kiosk Software Suite Version

1. Double-tap the **My Computer** icon on the CE desktop.
2. Double-tap the **Application** folder.
3. Select and delete the **MK2000WebKioskSoftwareSuite** folder.
4. Select and delete the **mkconfig.reg** file.
5. Select and delete the **Web_KioskSoftwareSuite.reg** file.

✓ **NOTE** Use Delete in the Files menu to remove the files.

Installing a New Web Kiosk Software Suite Version

1. Create a folder on the host computer called **SoftwareSuite**.
2. Download the MK2000 Web Kiosk Software Suite MK2000WEBKSS_X.XX.zip from <http://devzone.symbol.com>, saving it to the desktop. The downloaded files are compressed in a .zip file.
3. Extract all files to the **SoftwareSuite** folder to create the following files and folders:
 - **MK2000WebKioskSoftwareSuite** folder
 - MK2000_WebKSS_Install+SourceCode.doc
 - mkconfig.reg
 - retry.html
 - Web_KioskSoftwareSuite.reg.
4. Copy the following files and folders onto a PC card:
 - **MK2000WebKioskSoftwareSuite** folder
 - mkconfig.reg
 - retry.html
 - Web_KioskSoftwareSuite.reg.
5. Insert the PC card into the PC card slot in the MK2200. See [Figure 1-2 on page 1-4](#). To access PC card contents, use the **Storage Card** folder located in **My Computer**.
6. Double-tap the **My Computer** icon.
7. Double-tap the **Application** folder.
8. Use the copy function to copy the folder and files from the **My Computer\Storage Card** folder into the **My Computer\Application** folder.
9. Reboot the MK2200 to launch the new version of the Web Kiosk Software Suite.

✓ **NOTE** Alternatively, use an ActiveSync connection to transfer files from the host computer to the MK2200.

Disabling and Restoring the Web Kiosk Software Suite

1. To prevent the MK2200 from entering an application, simultaneously hold down buttons **A** and **D** just after the blue **Performing System Initialization (Phase 1)** screen displays, and before the message changes to **Phase 2**. Release the buttons.
2. When the **Enter Password** prompt appears, enter **DDBAC**, then touch **OK** on the MK2200 screen or simultaneously press the **A** and **B** buttons for Enter.
The MK2200 enters Protected Mode and the Windows® CE desktop displays.
3. Double tap the **My Computer** icon.
4. Double tap the **Application** folder.
5. Use the cut function to cut **mkconfig.reg** from the **My Computer\Application** folder.
6. Double tap the **MK2000WebKioskSoftwareSuite** folder and paste the **mkconfig.reg** file into this folder.
7. Reboot the MK2200. The Windows® CE desktop displays.

8. To restore the Web Kiosk Software Suite, move the **mkconfig.reg** file back to the **My Computer\Application** folder.

Starting and Exiting the Web Kiosk Software Suite

Before launching the Web Kiosk Software Suite, print out the [Web Kiosk Software Suite Bar Codes on page D-1](#) used to demonstrate MK2200 features. For sample source code that demonstrates automatic MK2200 startup from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of MK2000WEBKSS_X.XX.zip.

To launch the Web Kiosk Software Suite automatically, apply power to the MK2200 and allow the boot sequence to proceed uninterrupted. To exit the Web Kiosk Software Suite and access the Windows® CE Desktop, see [Accessing the Windows® CE Desktop on page 6-3](#).

Web Kiosk Software Suite Structure

The Web Kiosk Software Suite **Customer Application** screens are for customer use, and the **Store Operations** screens are for store employee access only. Use the [Employee Badge on page D-7](#) to access the **Store Operations** screens. These screens use the four programmable buttons and/or virtual touch screen buttons (displayed over the four function buttons).

The **Customer Application** screens demonstrate the customer support features.

- [Main Menu Bar on page 6-6](#)
- [Scanning Bar Codes on page 6-6](#)
- [Attract Mode on page 6-6](#)
- [Price Verification on page 6-7](#)
[Price Verification Menu Bar on page 6-8](#)
- [Printing on page 6-9](#)
- [Loyalty Program on page 6-10](#)
- [Guided Selling Tool \(Select Ink Cartridge\) on page 6-11](#)
- [Gift Registry on page 6-14](#).

The [Store Operations Screen on page 6-16](#) demonstrates sample store operations that the MK2200 supports, including:

- [Work Schedule Screen on page 6-17](#)
- [Calculator on page 6-17](#)
- [Scan a 2D Bar Code Screen on page 6-18](#)
- [In-Store Messaging on page 6-18](#)
 - [Voicemail Options Screen on page 6-19](#)
 - [Voicemail Playback Screen on page 6-20](#)
 - [Voicemail Recording Screen on page 6-20](#)
 - [Text Messaging Screen on page 6-21](#)
 - [Video Message Screen on page 6-22](#).

Customer Application Screens

Main Menu Bar

In Attract Mode (Idle Mode) the MK2200 displays the **Main Menu** bar titles above the programmable buttons.



Figure 6-1 Main Menu Bar

Scanning Bar Codes

Scan a bar code (on an item's SKU, employee badge, or loyalty card) from any point within the application where the scanner is active. However, 2D bar codes can only be scanned from the [Scan a 2D Bar Code Screen on page 6-18](#). For example, after a store employee scans an item's SKU for price lookup, the employee can scan an employee badge on the **Price Verification** screen to directly access the store operations menu.

For sample source code that demonstrates how to control the scan engine from a browser application, refer to the MK2000_WebKSS_Install+SourceCode.doc file, which is part of the Web Kiosk Software Suite.

Attract Mode

The MK2200 Web Kiosk Software Suite enters Attract Mode after a period of inactivity, and displays a slide show. The **Main Menu** bar is visible during the slide show.

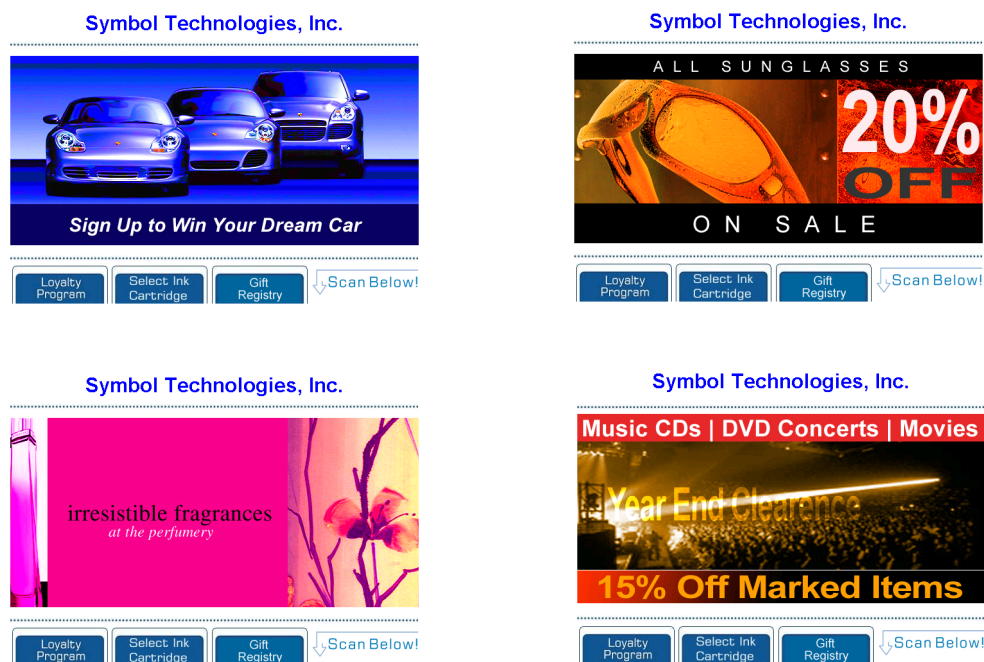


Figure 6-2 Slide Show Screens

Price Verification

The Web Kiosk Software Suite has three price verification screen formats:

- **Price Verification** screen (Loyalty Program enabled) - requires the Loyalty Program bar code to access special Loyalty Program product information.
- **Price Verification** screen (non-Loyalty Program) - displays standard non-Loyalty Program product information.
- **Price Verification** screen (Audio Enabled).

Scan the bar code *White Correction Fluid on page D-2*.



Figure 6-3 Loyalty Program Enabled, Price Verification Screen

Scan the bar code *White Correction Fluid on page D-2*.



Figure 6-4 Non-Loyalty Program, Price Verification Screen

CD Listening Station

The **Audio Enabled Price Verification** screen provides an audio listening station for the price verification screen. Options include:

- Two volume control buttons (louder/quieter)
- Pause (two bar) button
- **Home**, returns to [Attract Mode on page 6-6](#).

Scan the bar code [CD on page D-5](#).



Figure 6-5 Audio Enabled Price Verification Screen

For sample source code that demonstrates volume control from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of the Web Kiosk Software Suite.

Price Verification Menu Bar

The **Price Verification Menu** bar appears directly over the function buttons and identifies the button functions (when in the **Price Verification** screen).

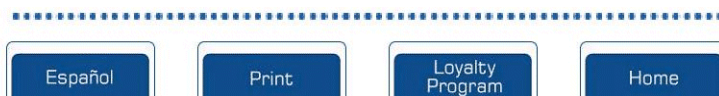


Figure 6-6 Price Verification Menu Bar

The menu bar enables the following functionality:

- **Español** (alternate language) - The title above the first button labels the alternate language (Spanish is the default). Once selected, screen text appears in the alternate language, including all screen titles, buttons titles, and price verification field titles. This language remains in effect until you exit the screen or select another button.
For sample source code that demonstrates alternative language support from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of the Web Kiosk Software Suite.
- **Print** - prints information shown on the screen. See [Printing on page 6-9](#).
- **Loyalty Program** - see [Loyalty Program on page 6-10](#).
- **Home** - returns the MK2200 to [Attract Mode on page 6-6](#).

Printing

Select the **Print** button to view the **Select Printer** screen, which offers the following options:

- **Print** - prints bar codes, bitmaps, and/or text on the selected printer.
- **Down arrow** - scrolls down the printer list.
- **Troubleshoot** - sets the printer in a mode to print on receipt paper. The default setting is label stock.
- **Home** - returns the MK2200 to [Attract Mode on page 6-6](#).



Figure 6-7 Select Printer Screen

The Web Kiosk Software Suite supports printing using the Zebra QL220/320/420 or Zebra LP2834/2844 series printers, and demonstrates how to print on receipt stock (continuous printing) or label stock. The QL series printers support advanced printer monitoring functionality (see [Advanced Printer Monitoring Functionality on page 3-20](#)).

For sample source code that demonstrates printing from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file.

Printer Errors

If an error occurs during printing to a Zebra QL printer, the error is highlighted in red as shown in [Figure 6-8](#).

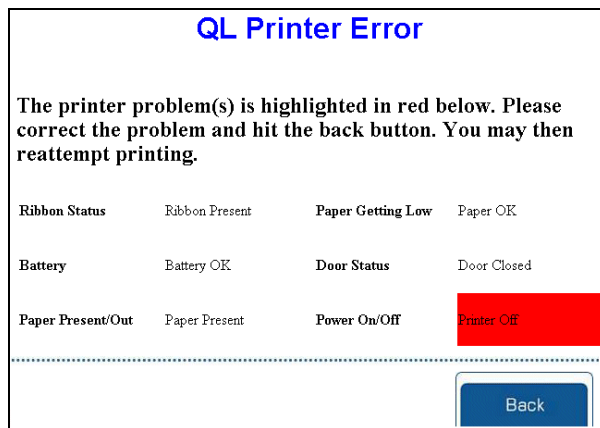


Figure 6-8 Printer Errors

Loyalty Program

Select the **Loyalty Program** button from the **Main Menu** bar (see [page 6-6](#)) or from the **Price Verification** screen (see [page 6-7](#)) to view the **Loyalty Program** screen.



Figure 6-9 Loyalty Program Screen

Scan the [Loyalty Card on page D-7](#) for details about the customer's Loyalty Program account status.



Figure 6-10 Loyalty Program Account Status

Guided Selling Tool (Select Ink Cartridge)

Select the **Select Ink Cartridge** button from the **Main Menu** bar (see [page 6-6](#)) to view the **Print Cartridge** screen.

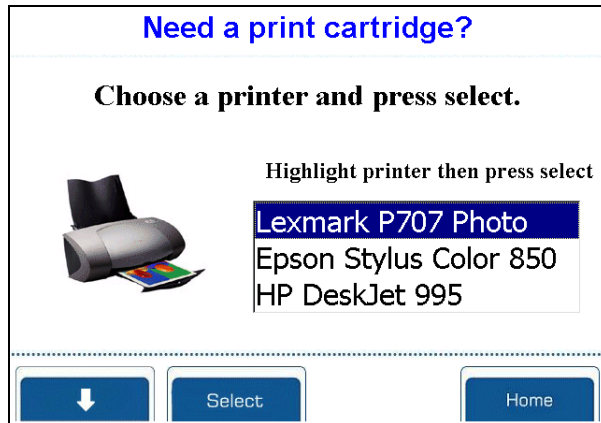


Figure 6-11 *Print Cartridge Screen*

The Web Kiosk Software Suite plays audio clips, on every screen of the guided selling screen flow, to explain instructions and available choices for the consumer.

Highlight one of the printers and select the **Select** button. The **Cartridge Type Selection** screen displays for the selected printer.



Figure 6-12 *Cartridge Type Selection Screen*

Select either Black Cartridges or Color Cartridges to view information for that cartridge.

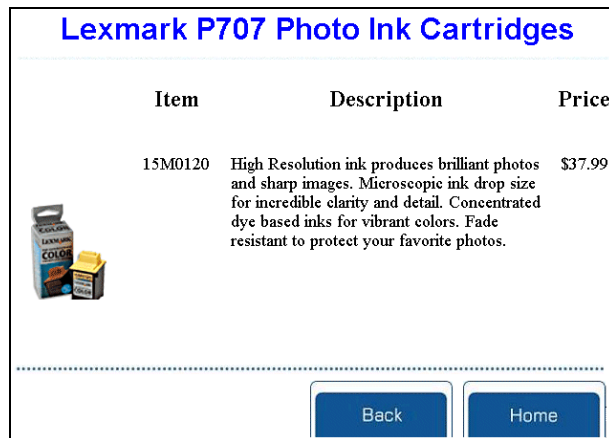


Figure 6-13 Cartridge Information Screen

For an MSR demonstration on MK2200s with an attached MSR, tap **Buy**.

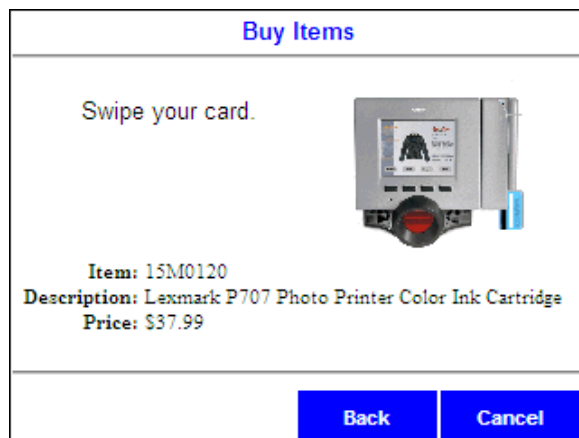


Figure 6-14 MSR Payment Screen

Slide a credit card through the MK2200 MSR for sample payment authorization. No payment information from the credit card is sent or retained.

For sample source code that demonstrates MSR operation from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of the Web Kiosk Software Suite.

✓ **NOTE** If the MK2200 does not have an MSR attached, tap Back or Cancel to exit this screen, as no credit cards can be swiped.

KichenAid Mixer

The screen flow for KichenAid Mixer demonstrates the Web Kiosk Software Suite capability to handle sales of complex items.

Scan the bar code for *KichenAid Mixer on page D-6*, to move to the **KichenAid Mixer** screens.



Figure 6-15 *KichenAid Mixer Screen*

- **Color Options** - displays all available colors for KitchenAid Mixer. See [KitchenAid Mixer Color Selection Screen on page 6-13](#)
- **Print** - prints information shown on the screen. See [Printing on page 6-9](#).
- **Accessories** - displays the KitchenAid Mixer accessories. See [KitchenAid Mixer Accessories Screen on page 6-14](#).
- **Home** - returns the MK2200 to [Attract Mode on page 6-6](#).



Figure 6-16 *KitchenAid Mixer Color Selection Screen*

Select the color from the list. The color of the KitchenAid Mixer on the main screen changes accordingly.

Select **Back** to move to the **KitchenAid Mixer** screen.

KitchenAid® Artisan Mixer Accessories



Figure 6-17 KitchenAid Mixer Accessories Screen

Select **Back** to move to the *KitchenAid Mixer* screen.

Gift Registry

Use the voice guided **Gift Registry** screen flow to create/register user accounts. Select the **Gift Registry** button in the main menu of the Web Kiosk Software Suite to access the **Gift Registry** screen flow.

Enter First Name Screen

Figure 6-18 Enter First Name Screen

Enter the first name using the virtual keyboard. Select **Next** to move to the **Enter Last Name** screen.

Enter Last Name Screen

Figure 6-19 Enter Last Name Screen

Enter the last name using the virtual keyboard. Select **Next** to move to the **Enter Phone Number** screen.

Enter Phone Number

Figure 6-20 Enter Phone Number

Enter the phone number using the virtual keyboard. Select **Next** to move to the **Customer Information** screen.

Customer Information Screen

Use the **Customer Information** screen to confirm the entered information is correct.

Figure 6-21 Customer Information Screen

If there are any errors, select **Back** to return to the data entry screens. Otherwise select **Next** to complete the registration process. The following screen displays.

Figure 6-22 Registered Screen

The **Registered** screen message indicates the user data entered is in the system. Select **Next** or **Quit** to exit the gift registry process and return to Attract Mode.

Store Operations Screen

Scan the [Employee Badge on page D-7](#) (5 digit code 128) to enter **Store Operations** mode. On this screen, the internal scan engine is disabled.

The **Store Operations** menu bar offers the following buttons:

- **Messages** (see [page 6-18](#))
- **Work Schedule** (see [page 6-18](#))
- **Calculator** (see [page 6-17](#))
- **Home** - returns the MK2200 to [Attract Mode on page 6-6](#)
- **Video Player** (see [page 6-22](#)).

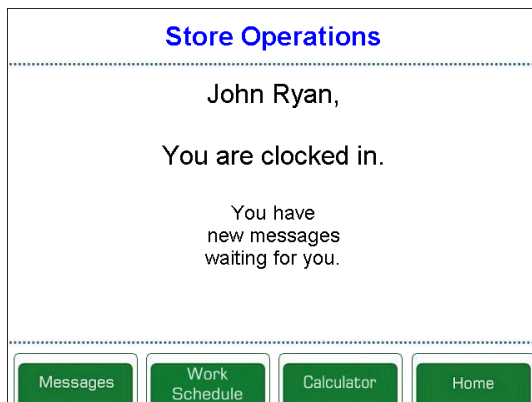


Figure 6-23 *Store Operations Screen*

Work Schedule Screen

Select **Work Schedule** from the **Store Operations** screen to view the **Work Schedule** screen, which displays an employee's schedule.

Select **Back** to return to the [Store Operations Screen on page 6-16](#).

Work Schedule							
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8:00AM	Off					Off	
10:00AM		Checkout	Checkout	Checkout	Checkout		Checkout
Noon		Checkout	Checkout	Checkout	Checkout		Checkout
2:00PM		Lunch	Lunch	Lunch	Lunch		Lunch
4:00PM		Unload	Checkout	Unload	Checkout		Checkout
6:00PM		Unload	Checkout	Unload	Checkout		Checkout
8:00PM							
Back							

Figure 6-24 Work Schedule Screen

Calculator

Select **Calculator** for an on-screen calculator.

7	8	9	+	-
4	5	6	X	÷
1	2	3	Clear	
0	.		=	
Scan 2D Home				

Figure 6-25 Calculator

This screen and associated source code demonstrate an ideal button layout, based on an average user's finger width. If using a stylus, the 6.4" VGA screen accommodates an alphanumeric keypad layout.

For sample source code that demonstrates numeric keypad operation from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of the Web Kiosk Software Suite.

Scan a 2D Bar Code Screen

Select **Scan 2D** from the **Calculator** to view the **Scan a 2D Bar Code** screen, where store associates can scan a 2D bar code such as a PDF417 code. See [2D Bar Code \(PDF417\) on page D-8](#).

Selecting the **Scan 2D** button changes the scanning mode (laser scan pattern) from omni-directional (cyclone) 1D scanning to 2D scanning. When the MK2200 decodes a 2D bar code, it beeps and displays the bar code data.

Select **Home** to return to the **Store Operations** screen.

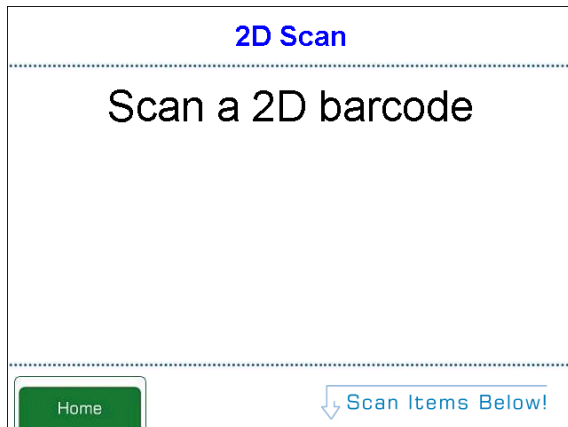


Figure 6-26 Scan a 2D Bar Code Screen

In-Store Messaging

Select **Messages** from the [Store Operations Screen on page 6-16](#) to view in-store messages. When the screen displays, the first (most recent) item is highlighted. The **In-Store Messaging** view menu bar indicates current button functions.

Button options are:

- **Up arrow** - scrolls up the Item list.
- **Down arrow** - scrolls down the Item list.
- **Open** - selects an item on the list:
 - Select a **Voicemail** message to view the [Voicemail Options Screen on page 6-19](#).
 - Select a text message (in this demo “**Employee Bulletin**”) to view the [Text Messaging Screen on page 6-21](#).
 - Select a full screen video message (in this demo “**Training Video**”) to view the [Video Message Screen on page 6-22](#).
- **Home** - returns to the [Store Operations Screen on page 6-16](#).

In-Store Messaging				
Item	Type	From	Sent	New
1.	Vicemail	Rob Johnson	6/20/02 3:24PM	X
2.	Employee Bulletin	Human Resources	6/15/02 1:15PM	X
3.	Training Video	Human Resources	6/15/02 10:10AM	X

Figure 6-27 In-Store Messaging Screen

Voicemail Options Screen

Select a voicemail item from the **In-Store Messaging** screen to use the **Voicemail Options** screen to listen or respond to a voice message. Options include:

- **Right pointer** - plays the message.
- **Reply** - records a message and plays it back by entering the [Voicemail Recording Screen on page 6-20](#).
- **Delete** - deletes the message.
- **Back** - returns to the previous messaging screen.

Voicemail Options				
Item	Type	From	Sent	New
1.	Vicemail	Rob Johnson	6/20/02 3:24PM	X

Figure 6-28 Voicemail Options Screen

Voicemail Playback Screen

Select an item from the **Voicemail Options** screen to use the **Voicemail Playback** screen to listen to and/or reply to a message. Options include:

- **First speaker** - increases volume.
- **Second speaker** - decreases volume.
- **Double bar** - pauses the recorded message.
- **Square** - returns to the [Voicemail Options Screen on page 6-19](#).

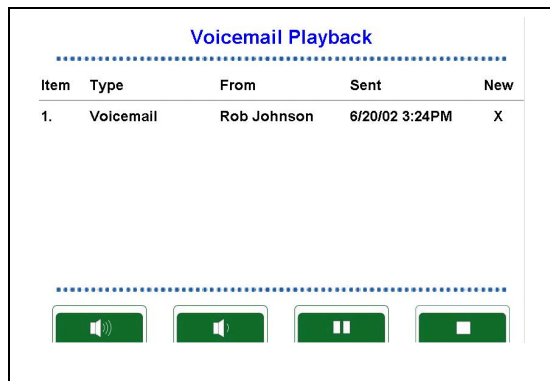


Figure 6-29 Voicemail Playback Screen

Voicemail Recording Screen

Select **Reply** from the **Voicemail Options** screen to use the **Voicemail Response** screen to record a voice mail reply using the MK2200 built in microphone (see [Figure 1-1 on page 1-3](#)), and play the message back. Options include:

- **Press to Record** - select and speak into the microphone to record a reply message. This records a .wav file using the MK2200 ActiveX object. The text on the button changes to **Stop**; select this to end recording. The text on the button changes back to **Press to Record**.
- **Right pointer** - plays the recorded .wav file message.
- **Send** - sends the message.
- **Back** - returns to the [Voicemail Options Screen on page 6-19](#).

Voicemail Response				
Item	Type	From	Sent	New
1.	Voicemail	Rob Johnson	6/20/02 3:24PM	X
Press to Record ▶ Send Back				

Figure 6-30 Voicemail Response Screen

For sample source code that demonstrates audio recording using the microphone from a browser application, refer to the MK2000_WebKSS_Install+SourceCode.doc file, which is part of the Web Kiosk Software Suite.

Text Messaging Screen

Select a text-based message item from the **In-Store Messaging** screen to use the **Text Messaging** screen to view a text-based message. Options include:

- **Delete** - returns to the [In-Store Messaging on page 6-18](#).
- **Back** - returns to the [In-Store Messaging on page 6-18](#).

Text Messaging	
Topic:	Employee Bulletin
From:	Human Resources
Sent:	6/15/02 1:15PM
All associates are invited to attend our "How to Plan for Retirement" seminar Thursday, July 18 at 12:00 in Lecture Hall B.	
Delete Back	

Figure 6-31 Text Messaging Screen

Video Message Screen

Select a video item from the **In-Store Messaging** screen to use the **Video Message** screen to view a training or informative full screen video. Options include:

- **First speaker** - increases volume.
- **Second speaker** - decreases volume.
- **Double bar** - pauses the video message.
- **Square** - terminates the video message and returns to the [In-Store Messaging on page 6-18](#).

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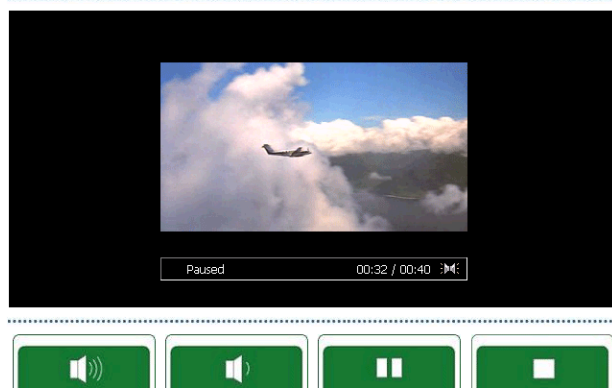


Figure 6-32 Video Message Screen

For sample source code that demonstrates playing video files from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of the Web Kiosk Software Suite.

Web KSS Source Code Index

Refer to the **MK2000_WebKSS_Install+SourceCode.doc** file for sample source code for the following functionality.

Screen Layout

- Touch screen "click" sound control:
 - Deactivating the click sound on the screen except where a button is located
 - Enabling a click sound for a virtual button.
- Alternate language support:
 - Displaying screen text in Spanish.
- Numeric keypad operation:
 - Setting up a numeric keypad.
- Hiding the browser toolbars:
 - Internet Explorer toolbar
 - Windows® CE Start bar.
- Setting up a **Price Verification** screen:
 - Routing UPC data
 - Laying out item pricing information on a screen.
- Setting up an **Audio Guided** screen:
 - Adding an audio file for background audio instructions.
- Setting up **Product Color Selection** screen:
 - Designing a color selection for products and items listed on the **Price Verification** screen (e.g., Kitchen Aid Mixer).
- Gathering customer information:
 - Using a two-frame solution to gather customer information (e.g., gift registry).
- Dynamically relabeling buttons:
 - Selecting a button on the screen for a new screen and new buttons with new titles.
- Virtual Keyboard.

Printing

- Printing:
 - Bitmap
 - Bar code
 - Text.
- QL printer error handling.

Scan Engine

- Scan engine control:
 - Turning the engine on and configuring
 - Turning the engine off.
- Switching between omnidirectional and 2D
- Embedding the Active X object in a hidden frame
- Routing bar code data through symbology type to different locations.

Magstripe Reader

- MSR control:
 - Turning on the MSR in unbuffered mode
 - Error handling
 - Setting time out values.
- Reading and processing a credit card.

Four Physical Buttons

- Enabling a button press sound
- Disabling a button press sound.

Multi-Media Content

- Microphone control:
 - Recording using microphone
 - Playing back recorded message.
- Playing audio files:
 - Playing an audio file with media player
 - Controlling the volume while the file plays
 - Pausing playback
 - Closing an audio object.
- Full screen video:
 - Playing a video file with media player
 - Controlling the volume while the file plays
 - Pausing playback.
- Audio:
 - Played upon entering Web page.

Advertising

- Attract loop:
 - How the loop works
 - Changing the amount of time each image displays
 - Locating images.
- Running a slide show.

Device Startup

- Enabling automatic device setup (refer to the Web Kiosk Software Suite mkconfig.reg file)
- How to enable device self-configuration/setup at power up.

Application Version Tracking

- Tracking the Web Kiosk Software Suite version information (refer to the Web_KioskSoftwareSuite.reg file)
- How to track application versions using a .reg file.

Network Down - Redirect to an Internal Error Page

- Verifying a custom Kiosk IE error page
- Setting a custom Kiosk IE error page
- Activating a custom Kiosk IE error page.

Chapter 7 C# Kiosk Software Suite

Overview

The Symbol C# Kiosk Software Suite is a sample application for the C# environment available for the MK2200. The MK2200 C# Kiosk Software Suite (MK2000C#KSS_X.XX.zip) is a comprehensive solution that demonstrates the many capabilities of the MK2200 Micro Kiosk.

For developers, C# production quality source code is provided in **MK2000_C#KSS_Install+SourceCode.doc** to serve as a reference implementation to speed custom application development.

✓ **NOTE** When demonstrating the MK2200 to customers, use the Web Kiosk Software Suite, discussed on [page 6-1](#), which demonstrates more functionality than the C# KSS.

C# Kiosk Software Suite Features

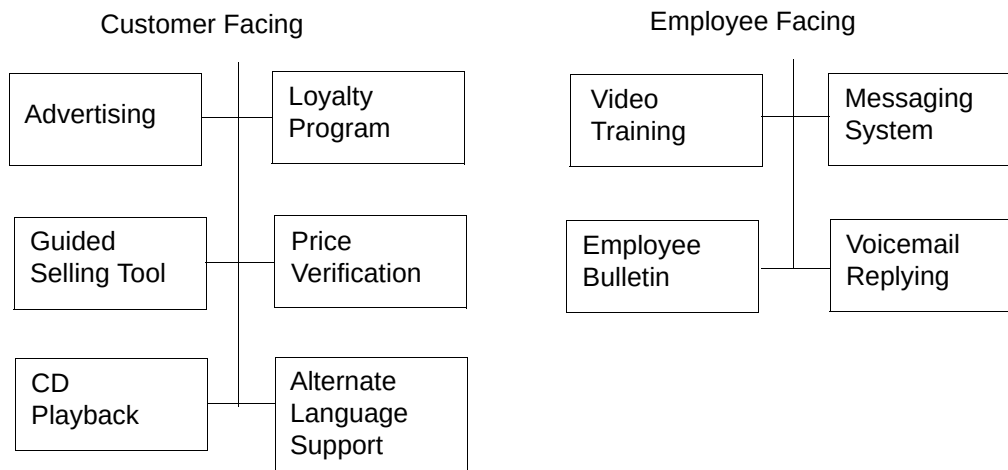
The C# Kiosk Software Suite supports the following features.

The customer facing screens demonstrate the following functionality:

- Price verification
- Loyalty program
- Guided selling tool
- Alternate language text
- Advertising (attract loop).

Additional functions of the Store Operations application are:

- Removal of the Internet Explorer toolbar
- Removal of the CE Start bar
- Scan engine control
- Enabling / disabling symbologies
- Automatic device setup using an mkconfig.reg file.



Installing the C# Kiosk Software Suite

To install and run the C# KSS, first install the .NET Compact Framework and the Symbol Mobility Developer Kit v1.1 (SMDK) for .NET in the target device.

Loading .NET Compact Framework onto an MK Device

The SMDK includes Microsoft .NET Compact Framework installation files.

The mass deployment files for the MK Series are located in the **Program Files\Symbol Mobility Developer Kit for .NET\vX.X\Windows CE\MassDeployment\MKSeries** folder. These files (.cab, .cpy, and .reg) are used to copy the .NET Compact Framework and SMDK CAB files from the **Application** partition into the **Windows** directory and install upon a cold boot. The CAB files are installed using Startup.exe, which initiates wceload.exe (standard CAB installation method) or wceldcmd.exe (UI-less install) with the command line that contains the name of the CAB file.

✓ **NOTE** The .NET CF CAB files are not provided in the Mass Deployment directory. Manually copy them from the Visual Studio .NET 2003 directory to the Application folder on the Symbol device. For Windows CE .NET devices the .NET CF CAB files (netcf.all.wce4.armv4.cab) are located in the **Program Files\Microsoft Visual Studio .NET 2003\CompactFrameworkSDK\v1.0.5000\Windows CE\wce400\armv4** folder.

Downloading SMDK Installation Files

The SMDK is available in the Symbol Developer Zone, <http://devzone.symbol.com/>. Register at this site to access Symbol Developer resources.

Installing SMDK onto a Desktop PC

To install the SMDK to a host computer, run the setup program. This copies all SMDK samples, Visual Studio .NET Smart Application Projects, and Mass Deployment content to subfolders in the selected SMDK installation folder. For additional information, refer to the Read Me file or the SMDK help.

Installing .NET Compact Framework onto the MK2200

Create a temporary folder with Symbol-specific CAB files and generic .NET framework CAB files described in [Loading .NET Compact Framework onto an MK Device on page 7-2](#). Include the .CPY files as well as the .REG

together with the `wceldcmd.exe` available in the MK Series mass deployment directory. Once all files are copied to the temporary folder, copy the content to the root of the application partition of the target device and reboot. The device should be ready with the .NET CF and SMDK APIs.

For details on copy file (.CPY), see [page 8-6](#).

Install the C# KSS onto the MK2200

Download the MK2000C#KSS_X.XX.zip deployment files from the Symbol Developer Zone (<http://devzone.symbol.com>) and extract the content to the application partition of the target MK device. Reboot the device to load the application full-screen.

C# Kiosk Software Suite Bar Codes

The C# Kiosk Software Suite uses the bar codes in [Appendix E, C# Kiosk Software Suite Bar Codes](#) to demonstrate MK2200 capabilities.

Automated Launching of the C# KSS

You can configure the MK2200 to automatically load the .NET Compact Framework and launch the C# KSS upon power-up. See the following set of registry entries.

For a detailed list of other C# source code, see [page 7-12](#).

Auto-loading the .NET Compact Framework at Boot-up Sequence

Boot-up redeploys the .NET CF files to the Windows folder from the application partition using registry (*.REG) files and copy (*.CPY) files stored in the **Application** folder. For additional information on RegMerge and CopyFiles, see [page 8-6](#) and [page 8-6](#).

Framework deployment is done before running any .NET executable to avoid dependencies.

The following set of registry entries show how the framework deployment is given priority over loading C# KSS (C# Kiosk Software Suite.exe) at a boot-up.

```
[HKEY_CURRENT_USER\Software\Symbol\Startup\Programs\Prog11]
"Name"="\windows\wceldcmd.exe"
"Command"="\Windows\netcf.all.wce4.armv4.cab"
"Continue"=dword:0
"ColdBootOnly"=dword:1
```

```
[HKEY_CURRENT_USER\Software\Symbol\Startup\Programs\Prog12]
"Name"="\windows\wceldcmd.exe"
"Command"="\Windows\symbol.all.arm.cab"
"Continue"=dword:0
"ColdBootOnly"=dword:1
```

```
[HKEY_CURRENT_USER\Software\Symbol\Startup\Programs\Prog13]
"Name"="\windows\wceldcmd.exe"
"Command"="\Windows\symbol.mkseries.all.arm.cab"
"Continue"=dword:0
"ColdBootOnly"=dword:1
```

```
[HKEY_CURRENT_USER\Software\Symbol\StartUp\Programs\Prog14]
"Name"="\Application\MK2000 C# Kiosk Software Suite
\MK2000 C# Kiosk Software Suite.exe"
"Continue"=dword:1
```

✓ **NOTE** Prog11- Prog17 indicates the sequence of the startup applications. Prog13, Prog14, Prog15 is used for installing SMDK CAB files as well as the .NET CF CAB files using wceldcmd.exe. For additional programming information, refer to the MK2000_C#KSS_Install+SourceCode.doc.

Auto Launching the C# KSS at Power Up

C# Kiosk Software Suite.exe is loaded after the .NET framework. This user application occupies the sixth slot of the start sequence.

```
[HKEY_CURRENT_USER\Software\Symbol\StartUp\Programs\Prog14]
"Name"="\Application\MK2000 C# Kiosk Software Suite
\MK2000 C# Kiosk Software Suite.exe"
"Continue"=dword:1
```

C# Kiosk Software Suite Structure

The C# Kiosk Software Suite **Customer Application** screens demonstrate customer-facing functionality, and the **Store Operations** screens demonstrate employee-facing functionality.

These screens use the four programmable buttons and/or virtual touch screen buttons (displayed over the four function buttons).

The **Customer Application** screens demonstrate the customer support features:

- [Main Menu Bar on page 7-5](#)
- [Scanning Bar Codes on page 7-5](#)
- [Attract Mode on page 7-6](#)
- [Price Verification on page 7-7](#)
- [Loyalty Program on page 7-7](#)

- [Guided Selling Tool \(Fitting Guide\) on page 7-8.](#)

The [Store Operations Screen on page 7-9](#) demonstrates sample store operations that the MK2200 supports, including:

- [In-Store Messaging on page 7-9](#)
 - [Voicemail Options Screen on page 6-19](#)
 - [Voicemail Messages Screen on page 7-10](#)
 - [Voicemail Recording Screen on page 7-10](#)
 - [Text Messaging Screen on page 7-11](#)
 - [Voicemail Messages Screen on page 7-10.](#)

Customer Application Screens

Main Menu Bar

In Attract Mode (Idle Mode) the MK2200 displays the **Main Menu** bar titles above the programmable buttons.



Figure 7-1 Main Menu Bar

Pressing one of the associated buttons on the main menu bar displays the following C# KSS screens:

- **Fitting Guide** - displays the **Fitting Guide** screen
- **Loyalty Program** - displays the **Loyalty Program** screen.

Scanning Bar Codes

Scan a bar code (on an item SKU, employee badge, or loyalty card) from any point within an application where the scanner is active. For example, after a store employee scans an item's SKU for price lookup, the employee can scan an employee badge on the **Price Verification** screen to directly access the store operations menu.

For sample source code that demonstrates how to control the scan engine from a C# application, refer to the **MK2000_C#KSS_Install+SourceCode.doc** file, which is part of the C# Kiosk Software Suite (see [page 7-12](#)).

Attract Mode

Attract Mode Ads

C# Kiosk Software Suite enters Attract Mode after a period of inactivity, and displays a series of advertisements. The **Main Menu** bar is visible during the slide show. The C# Kiosk Software Suite Attract Mode rotates five sample promotional messages in the main dialog. The attract loop images are stored in the **\\Application\\C# Kiosk Software Suite\\SlideShow_Images** folder.

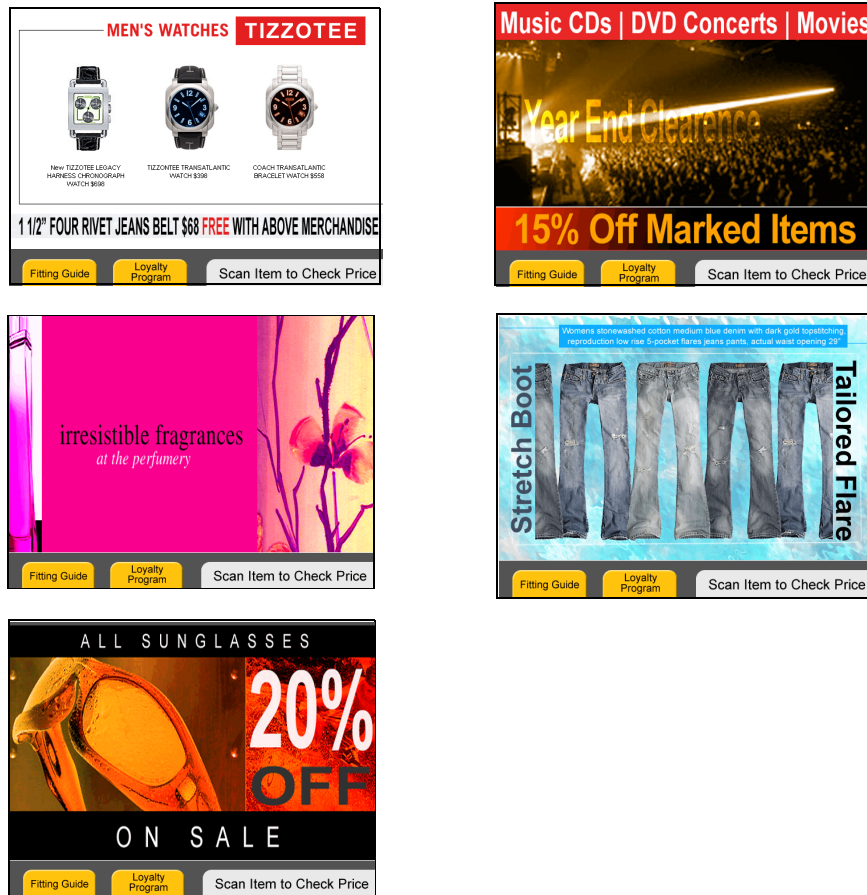


Figure 7-2 Slide Show Screens

Inserting Different Attract Mode Ads

There are five attract images loaded in the C# KSS for demo purpose. You can overwrite these images, which are stored in **\\Application\\C# Kiosk Software Suite\\SlideShow_Images**, with customized GIF files that duplicate the names of the existing images. Attract Mode loads these new images to the attract loop when the application starts.

Ad Size / Shape Requirements

Attract images occupy the entire 640x480 screen. Images are rendered from point (0,0). Therefore ensure all attract images are exactly 640 pixels wide and 480 pixels high. Smaller images occupy a limited screen area.

Price Verification

The C# Kiosk Software Suite has three **Price Verification** screen formats:

- **Price Verification** screen (Loyalty Program enabled) - requires the Loyalty Program bar code to access special Loyalty Program product information.
- **Price Verification** screen (non-Loyalty Program) - displays standard non-Loyalty Program product information.
- **Price Verification** screen (Audio Enabled).

Loyalty Program

Select **Loyalty Program** on Attract Mode advertisements to open the **Loyalty Program** screen.



Figure 7-3 Loyalty Program Enabled, Price Verification Screen

Scan the bar code [Loyalty Card on page E-3](#) to move to the **Loyalty Program** screen.



Figure 7-4 Loyalty Program Screen

Guided Selling Tool (Fitting Guide)

Scan the bar code [Pants UPC-A on page E-1](#).

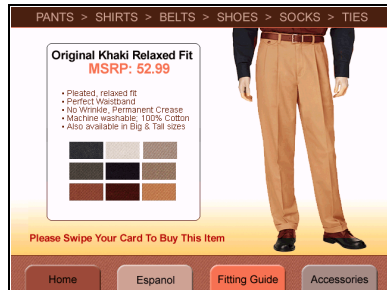


Figure 7-5 Non-Loyalty Program, Price Verification Screen

The Pants UPC-A screen flow demonstrates the guided-selling capability of the C# KSS.

Navigate through the screen flow by pressing the buttons on the screen.

- **Home** - returns the C# KSS to Attract Mode.
- **Español** (alternate language) - changes screen text to the alternate language (Spanish is the default), including all screen titles, buttons titles, and price verification field titles. This language remains in effect until you exit the screen or select another button.
- **Fitting Guide** - displays the **Fitting Guide** screen that displays different styles for a particular item.
- **Accessories** - displays the **Accessories** screen.

CD Listening Station

The **Audio Enabled Price Verification** screen provides an audio listening station for the **Price Verification** screen. A default WAV file is played when the page is loaded. If no interaction is detected, the application returns to Attract Mode after the timeout period. Options include:

- Two volume control buttons (louder/quieter)
- Pause (two bar) button
- **Home**, returns to [Attract Mode on page 7-6](#).

Scan the bar code [CD on page E-2](#).

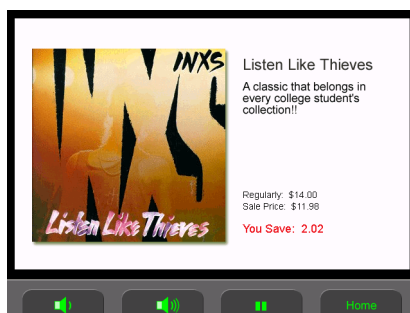


Figure 7-6 Audio Enabled Price Verification Screen

Store Operations Screen

Scan the [Employee Badge on page E-3](#) (5 digit code 128) to enter **Store Operations** mode.

The **Store Operations** menu bar offers the following buttons:

- **Messages** (see [In-Store Messaging on page 7-9](#))
- **Home** - returns to Attract Mode.

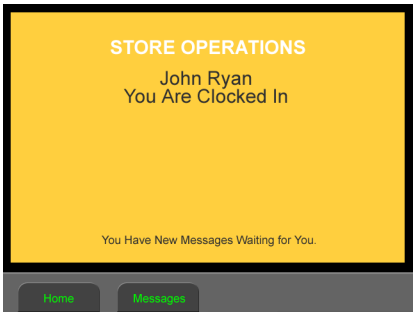


Figure 7-7 Store Operations Screen

In-Store Messaging

Select **Messages** to open the in-store messages screen. The first (most recent) item is highlighted. The In-Store Messaging menu bar indicates current button functions.

Button options are:

- **Up** - scrolls up the message list.
- **Down** - scrolls down the message list.
- **Open** - opens the selected message on the list:
 - Select a **Voicemail** message to view the [Voicemail Messages Screen on page 7-10](#).
 - Select a text message (in this demo “**Employee Bulletin**”) to view the [Text Messaging Screen on page 7-11](#).
 - Select a video message (in this demo “**Training Video**”) to view the [Video Message Screen on page 7-11](#).
- **Home** - returns to the [Store Operations Screen on page 7-9](#).

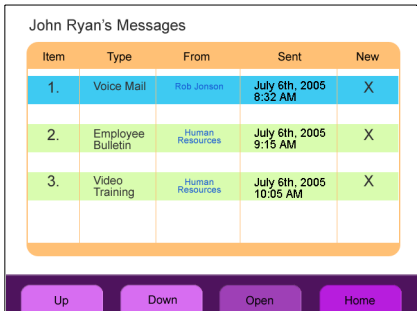


Figure 7-8 In-Store Messaging Screen

Voicemail Messages Screen

Select a voicemail item from the **In-Store Messaging** screen to view a **Voicemail Messages** screen, used to listen or respond to a voice message.

- **Right pointer** - plays the message.
- **Reply** - displays the [Voicemail Recording Screen on page 7-10](#).
- **Delete** - deletes the message. (This button has no functionality. It is used as an example screen layout only.)
- **Home** - returns to the previous messaging screen.

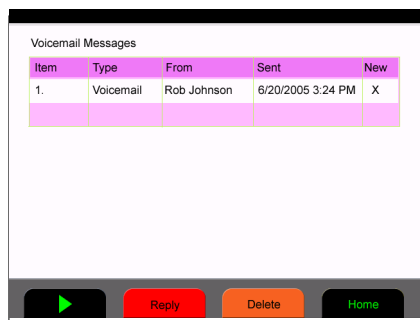


Figure 7-9 Voicemail Screen

Select the **Right pointer** button to play the voice mail.

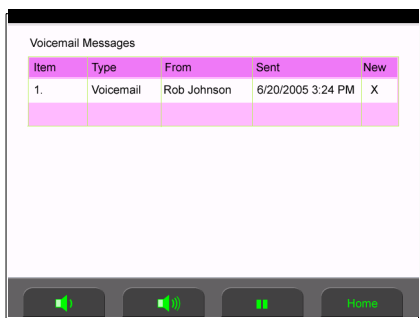


Figure 7-10 Voicemail Playback Screen

- **First speaker** - decreases volume.
- **Second speaker** - increases volume.
- **Double bar** - pauses the recorded message.
- **Home** - returns to the [Voicemail Screen on page 7-10](#).

Voicemail Recording Screen

Select **Reply** from the *Voicemail* screen to record a voice mail reply using the MK2200 built-in microphone (see [Figure 1-1 on page 1-3](#)), and play the message back.

- **Press to Record** - hold down and speak into the microphone to record a reply message.
- **Right pointer** - plays the recorded message file.
- **Send** - sends the message. (This button has no functionality. It is used as an example screen layout only.)

- **Back** - returns to the [Voicemail Messages Screen on page 7-10](#).

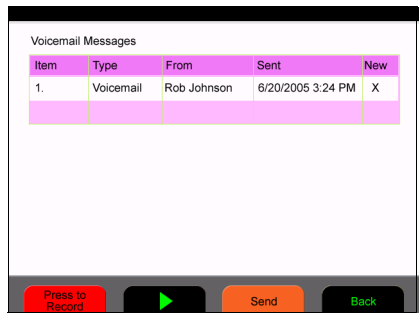


Figure 7-11 Voicemail Response Screen

Text Messaging Screen

Select a text-based message item from the main messages screen to use the **Text Messaging** screen to view a text-based message.

- **Delete** - deletes the message and returns to the [In-Store Messaging on page 7-9](#).
- **Back** - returns to the [In-Store Messaging on page 7-9](#).

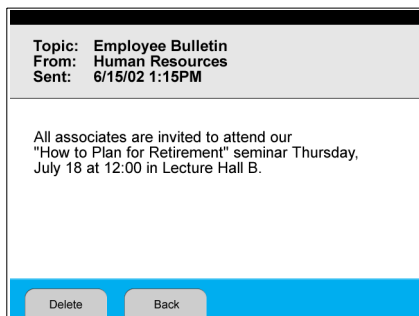


Figure 7-12 Text Messaging Screen

Video Message Screen

Select a video training message from the main message screen to view a full screen video.

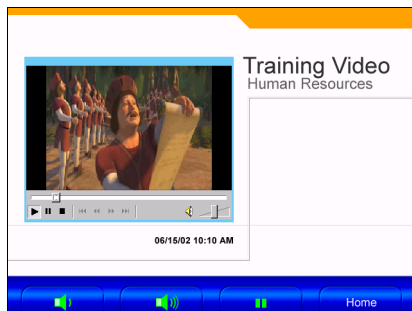


Figure 7-13 Video Message Screen

Use the controls in the Windows Media Player for viewing the video message.

✓ **NOTE** A CFCOM evaluation license key is provided by Odyssey Software. Contact Odyssey Software for CFCOM licensing information at www.odysseysoftware.com, or 585-214-2409, extension 201.

C# KSS Source Code Index

Refer to the **MK2000_C#KSS_Install+SourceCode.doc** file for sample source code for the following functionality.

Scan Engine Control

- Initializing the scan engine
- Start read
- Stop read
- Reader notification and event delegation
- Close scan engine
- Symbol .NET scanner assemblies
- Scanner related members
- Appending a carriage return to scanner data.

Screen Layout

- Hiding Windows CE Taskbar and Windows CE Start menu
- Touch screen click sound
- Click sound inside virtual buttons (no sound outside buttons)
- Deactivate sound outside virtual buttons
 - Buttons
 - Screen timeouts.

Button Control

- Physical button control
- External button events
- Virtual buttons
 - Click sound inside virtual buttons
 - Deactivate sound outside virtual buttons.

Version Tracking

- Remote tracking of version number
- Application revision history - local (version.txt).

Video Playback

- Odyssey software component
- Initializing video control
- License information and ProgID
- Video files
- Automatic invoke.

Automating Launch of the C# KSS

Printing on a Zebra QL320 Printer

- Text
- Bar codes
- Bitmaps.



Chapter 8 System Features

Overview

This chapter discusses the following operating system features:

- [*Network Security on page 8-2*](#)
- [*SNMP-Based Remote Monitoring on page 8-3*](#)
- [*RegMerge and CopyFiles on page 8-6*](#)
- [*Accessing the Windows® CE Desktop on page 8-7*](#)
- [*Password Protection \(Gate Keeper\) on page 8-7*](#)
- [*Remapping Buttons on page 8-8*](#)
- [*Network Time Update: SNTP Client on page 8-10*](#)
- [*Memory Management on page 8-10*](#)
- [*FTP Server on page 8-11*](#)
- [*Inactivity Application \(Screen Saver\) on page 8-12*](#)
- [*Browser Applications - Hiding Toolbars on page 8-13*](#)
- [*Browser Applications - Handling Network Disconnects on page 8-13*](#)
- [*Loading Additional Fonts on the MK2200 on page 8-15*](#)
- [*Input Panel \(Virtual Keyboard\) on page 8-17*](#)
- [*Microsoft WordPad on page 8-18*](#)
- [*Windows Media Player on page 8-19*](#)
- [*Internet Explorer on page 8-20*](#)
- [*Printer Object Test on page 8-21*](#)
- [*MSR Object Test on page 8-22*](#)
- [*Scanner Object Test on page 8-23*](#)
- [*Audio Object Test on page 8-24*](#)

- [MicroKiosk Object Test on page 8-25.](#)

Also see [Electronic Serial Number on page 4-10.](#)

Security Overview

The following items and features help secure the device from external intrusion:

- ActiveSync - deactivation when an application is running: pages [3-10](#) and [5-1](#).
- FTP Server - partial or complete deactivation: pages [3-22](#) and [8-11](#).
- Web Server deactivation: page [3-18](#).
- Password protecting access to CE Desktop: pages [8-7](#), [3-15](#) and [6-3](#).
- RS-232 Port - page [2-12](#).
- Browser error page redirection: page [8-13](#).
- RF Security: pages [B-2](#), [B-3](#), [B-7](#) and [B-12](#).
- Open TCP ports: page [8-2](#).

Network Security

The MK220 has the following open TCP ports:

- Port 23: FTP server
- Port 80: Default HTTPD listen port
- Port 443: Default SSL listen port.

By default the FTP server runs on the MK2200 allowing anonymous login, which makes the entire folder structure accessible to any user.

Using the System Menu or RDM, disable the feature that allows anonymous login to secure the system. Use the Windows Domain control to authenticate the allowed users to login to the FTP server running on the device. Then, using the RDM, enter user information (User Name and Password) required to access the device FTP server.

The web server in the MK2200 is enabled by default. Use the System Menu or RDM to disable and enable the web server.

SNMP-Based Remote Monitoring

The MK2200 supports Simple Network Management Protocol (SNMP) Version 2c. The MK2200 includes an SNMP agent. The MK2200 supports two Host Resource Management Information Bases (HR MIBs):

- The MK2200 extends Microsoft implementation of the MIB-II defined Host Resource MIB to report software versions, file system values, partition table values, and a few miscellaneous items.
- A custom HR MIB performs actions such as rebooting the MK2200. The previous MIBs support Microsoft default implementation.

This guide does not provide details of supported MIB-II and Host Resource MIB (HRMIB) functionality, except for specific changes to the HR MIB made for MicroKiosk products.

✓ **NOTE** Download a detailed specification of the MK2200 MicroKiosk SNMP agent/MIB at <http://devzone.symbol.com>.

The software versions are published using tables within the hrSWInstalledTable table, which is part of the Host Resource MIB. hrStorageTable presents the filesystem information. See [List of Reported Software Component Versions on page 8-3](#) for more information on what is reported using the Host Resource MIB.

The MicroKiosk line of products use the SysOID (System Object Identifier) listed in [Table 8-1](#). This OID is the prefix for all OIDs in the MicroKiosk Custom MIB.

Table 8-1 SysOID

Product	SysOID
MK2200	.1.3.6.1.4.1.388.10.3

These SysOIDs come from the tree officially assigned to Symbol Technologies (.1.3.6.1.4.1.388) and are registered with the body within Symbol that manages our SNMP OIDs.

List of Reported Software Component Versions

The Host Resource MIB reports the items in [Table 8-2](#), which indicates where to find this information in the Host Resource MIB. Use the RDM to view this information. See [Monitoring MK2200s on a Network on page 4-15](#).

Table 8-2 Reported Software Component Versions

Item	Host Resource MIB Location
Symbol OS	hrInstalledSoftware
Windows CE OS	hrInstalledSoftware
Monitor/IPL	hrInstalledSoftware
Scanner C API	hrInstalledSoftware
Scanner Driver MDD	hrInstalledSoftware
Scanner Driver PDD	hrInstalledSoftware
Scanner Decoder Firmware	hrInstalledSoftware
Scanner Hardware	hrInstalledSoftware

Table 8-2 *Reported Software Component Versions (Continued)*

Item	Host Resource MIB Location
Radio Driver	hrInstalledSoftware
Radio Firmware	hrInstalledSoftware
Radio Hardware	hrInstalledSoftware
N User Application names/versions	hrInstalledSoftware
Processor Name/Type	hrDeviceTable
RAM Size	hrDeviceTable
Flash Size	hrDeviceTable
Other devices	hrDeviceTable
Partitions - name/size (Platform, Application, Data, Object Store)	hrPartitionTable
Filesystem Information	hrStorageTable

User Application Version Reporting

SNMP reports user application names and version information as follows:

Upon boot up, the MK2200 reads a .reg file (e.g., application_name.reg) created and loaded into the Application partition (folder), and loads its contents into the system registry.

Values under the registry key HKEY_LOCAL_MACHINE\Software\AppVersions represent software components. Each value/data pair specifies the name of the component and its version, respectively. These values must be string values.

The Symbol RDM and a number of off-the-shelf SNMP-based network management packages can read application version information (see Software Version Information under [Monitoring MK2200s on a Network on page 4-15](#)).

For a sample .reg file see the Web Kiosk Software Suite Web_KioskSoftwareSuite.reg file which contains the following text on two lines:

```
[HKEY_LOCAL_MACHINE\Software\AppVersions]
```

```
"Web_KioskSoftwareSuite"="x.x"
```

When an MK2200 that contains the Web_KioskSoftwareSuite.reg file in its Application folder (file is present at bootup) is queried by the RDM for application version information, it returns the application name and version: **web_kiosksoftwaresuite** and **x.x**.



NOTE For tracking purpose, it is recommended that the name of the registry setting is the same as the registry file name.

Actions - Custom MIB

When running OS version 1.1.1 and platform MK20XXPlat_2.00.17.hex or later, the MicroKiosk Custom HR MIB supports the actions and commands in [Table 8-3](#).

Table 8-3 Custom MIB Actions/Commands

Action/Value	Var Name	OID	Access	Data Type
Cold Boot	Cold boots the MK2200.			
	stiColdBoot	SysOID.10.1	WO	
Warm Boot	Warm boots the MK2200.			
	stiWarmBoot	SysOID.10.2	WO	
Launch AirBeam	Launches AirBeam with no command-line parameters, causing it to perform the function stored in its registry settings. There is no mechanism to provide command-line arguments to AirBeam using SNMP.			
	stiLaunchAirBeam	SysOID.10.3	WO	
GUID	Returns the globally unique system identifier (GUID/UUID). Use this for reliable product tracking as this number does not change if the operating system or other portion of system software changes.			
	stiSystemGUID	SysOID.10.4	RO	String (DisplayString)
Product Group	Alpha prefix for product (e.g., MK, MC, PDT, PPT, VRC). Allows filtering a class of devices in the Remote Terminal Manager.			
	stiProductGroup	SysOID.10.7	RO	String (DisplayString)
Product	Numeric portion of product (e.g., 2200, 1100, 9000, 8100, 2800, 6900). Allows filtering a specific device in the Remote Terminal Manager.			
	stiProduct	SysOID.10.8	RO	String (DisplayString)
Generation	Generation of device. For products with multiple hardware implementations (e.g., PDT 8100, PPT 2800). Allows filtering specific generations in the Remote Terminal Manager and refines product model reporting.			
	stiGeneration	SysOID.10.9	RO	String (DisplayString)
Domain	A unique string used by the RDM to identify the product.			
	stiDomain	SysOID.10.10	RO	String (DisplayString)
Configuration Group 1	A user-defined string that can be filtered in the Remote Terminal Manager (e.g., hardware, housewares, East Coast).			
	stiConfGroup1	SysOID.10.11	RO	String (DisplayString)
Configuration Group 2	A user-defined string that can be filtered in the Remote Terminal Manager (e.g., hardware, housewares, East Coast).			
	stiConfGroup2	SysOID.10.12	RO	String
MIB Version	The version of the terminal MIB.			
	stiCustomMibVersion	SysOID.10.13	RO	String (DisplayString)

RegMerge and CopyFiles

RegMerge and CopyFiles are two device drivers included in the Windows CE OS to assist developers in configuring the MK2200 following a cold boot.

RegMerge.dll

RegMerge.dll is a built-in driver that allows making registry edits to the Windows CE Registry. Regmerge.dll runs very early in the boot process and looks for registry files (.reg files) in certain Flash File System folders during a cold boot. It then merges the registry changes into the system registry located in RAM.

Since the registry is re-created on every cold boot from the default ROM image, the RegMerge driver is necessary to make registry modifications persist between cold boots.

RegMerge looks in the root of two specific folders for .reg files in the following order:

1. \Platform
2. \Application

Regmerge continues to look for .reg files in these folders until all folders are checked. This allows folders later in the list to override folders earlier in the list. This way, it is possible to override Registry changes made by the Platform partition folders. Take care when using Regmerge to make Registry changes. The Device Configuration Package (DCP) for the MK2200 contains real examples of .reg files.

✓ **NOTE** RegMerge only merges the .reg files during a cold boot. A warm boot skips the merge process.

Modifying registry values for drivers loaded before RegMerge is not recommended. However, these values may require modification during software development. Since these early loading drivers read these keys before RegMerge can change them, you must warm boot the MK2200. The warm boot does not re-initialize the registry and the early loading driver reads the new registry values. Note that loading a registry key that corresponds to a built-in driver sets a flag in the regmerge.dll to execute an automatic warm boot.

Do not use RegMerge to merge the same registry value to two files in the same folder, as the results are not predictable.

CopyFiles

Windows CE expects certain files to be in the Windows folder, residing in volatile storage. Windows CE maintains the System Registry in volatile storage. CopyFiles copies files from one folder to another on a cold boot. Files can be copied from a non-volatile partition (Application or Platform) to the Windows or other volatile partition during a cold boot. During a cold boot CopyFiles looks for files with a .CPY extension in the root of the Platform, then Application FFS partition. These files are text files containing the source and destination for the desired files to be copied separated by ">". Following is the content of a sample .cpy file that copies ScanSamp2.exe from the **Applications\Samples** folder to the **\Windows** folder.

Example:

Content of ScanSamp2.cpy

\Application\ Samples\ScanSamp2.exe > \Windows\ScanSamp2.exe

Files are copied to the Windows folder from the flash file system using copy files (*.cpy) in the following order:

\Platform
\Application

Accessing the Windows® CE Desktop

If an MK2200 is configured to launch an application on power-up, you can bypass the application at boot-up to access to the Windows® CE desktop. See [Accessing the Windows® CE Desktop on page 6-3](#).

Password Protection (Gate Keeper)

The Gate Keeper application provides password protection preventing unauthorized access to the Windows® CE desktop.

- **At startup:** After Windows® CE boots (just after the blue **Performing System Initialization (Phase 1)** screen displays), but before an application launches, the Gate Keeper application checks (for two seconds) to see if the user selected the appropriate combination of buttons (currently **A** and **D**) to request password entry. See [Accessing the Windows® CE Desktop on page 6-3](#) for the procedure.
- **While an application is running:** Gate Keeper also password protects access to button functionality such as viewing the System menu while an application is running. See [Setting Defaults Using the System Menu on page 3-5](#) and [Table 8-5 on page 8-8](#) for a list of button functionality.

The buttons are mapped to produce the characters 1, 2, 3, 4, Enter, and Escape, as listed in [Table 8-4](#). On the password screen, enter the desired character sequence and press **Enter** to submit the password and gain access to the Windows® desktop. If the password is incorrect, the MK2200 runs the specified user applications.

✓ **NOTE** When specifying the protected mode password in the RDM or System Menu, enter the password in terms of the characters mapped by Gate Keeper (1-4), not the alphabetic labels (A-D) used in this document. The default password is 4,4,2,1,3.

Use the RDM Protected Mode feature (System Configuration/Protected Mode) to set up password protection. See [Protected Mode on page 3-15](#).

Table 8-4 Button Mappings for Protected Mode

Button Combo	Character / Action	Note
A and D	Request Protected Mode	Only for 2 seconds after boot
A	'1'	During password entry
B	'2'	During password entry
C	'3'	During password entry
D	'4'	During password entry
A and B	'Enter' (Return)	During password entry
C and D	'Escape' (Cancel)	During password entry

Remapping Buttons

Use the four buttons on the front of the MK2200 individually or in combinations. All 15 combinations can remap to a virtual keycode that represents a given character or key sequence, as defined in [Table 8-5](#). Holding any combination that includes buttons **B** and **C** for more than 15 seconds causes a cold boot. Use the Control Panel - Button Definitions, the System Menu, or RDM to remap the buttons (see [Table 8-6 on page 8-9](#)).

Table 8-5 Default Button Mapping

Button Combo	Mapping	Hex Code
A	Up	0x26
B	Down	0x28
C	Left	0x25
D	Right	0x27
AB	Enter/Return	0x0D
AC	Shift-Tab	0xC2
AD	Alt	0x12
BC	Show/Hide Virtual Keyboard	0xc7
ABC	System Menu	0xC5
ABD	Alt-Down	0xC3
ACD	Touchscreen Calibration	0xC4
BCD	Backspace	0x08
BD	Tab	0x09
CD	Cancel/Escape	0x1B
ABCD	Signal Strength (Mobile Companion Information tab)	0xC6



NOTE To disable a button combination, set its mapping to 0.

To perform a cold boot press and hold buttons B and C until the display goes blank (typically 15 seconds) then release the buttons.

Button Remapping - Keycode Values

Use the keycode values in [Table 8-6](#) to remap buttons.

Table 8-6 *Keycode Values*

Button Values			
Function	Value	Function	Value
BACK	0x08	COMMA	0xBC
TAB	0x09	HYPHEN	0xBD
CLEAR	0x0C	PERIOD	0xBE
RETURN	0x0D	SLASH	0xBF
SHIFT	0x10	BACKQUOTE	0xC0
CONTROL	0x11	F1	0x70
ALT	0x12	F2	0x71
CAPITAL	0x14	F3	0x72
ESCAPE	0x1B	F4	0x73
SPACE	0x20	F5	0x74
PRIOR	0x21	F6	0x75
NEXT	0x22	F7	0x76
END	0x23	F8	0x77
HOME	0x24	F9	0x78
LEFT	0x25	F10	0x79
UP	0x26	F11	0x7A
RIGHT	0x27	F12	0x7B
DOWN	0x28	0 thru 9 are the same as ASCII '0' thru '9'	0x30 – 0x39
MULTIPLY	0x6A	A thru Z are the same as ASCII 'A' thru 'Z'	0x41 - 0x5A
ADD	0x6B	SHIFT-TAB	0xC2
SEPARATOR	0x6C	ALT-DOWN	0xC3
SUBTRACT	0x6D	CALIBRATION	0xC4
DECIMAL	0x6E	SYSTEM MENU	0xC5
DIVIDE	0x6F	Mobile Companion Signal Strength / Aegis Client Configuration Dialog	0xC6
SEMICOLON	0xBA	TOGGLE SOFTWARE INPUT PANEL (SIP)	0xC7
EQUAL	0xBB		

Network Time Update: SNTP Client

The MK2200 Simple Network Time Protocol (SNTP) client can automatically set and update the MK2200 time and date through the network. Use this feature to set the system time and date after reboots or power outages. This feature also ensures consistent time and date stamping across a fleet of MK2200s. The SNTP Client program queries the specified SNTP server over the network to set the time and date.

The SNTP client shipped with MK2200 WinCE 4.20 is the Microsoft default SNTP Client program. (This is a change from the WinCE 4.1 operating system, which had a custom SNTP client).

MK2200 allows changing four parameters of the SNTP Client. See [Network Time Update on page 3-13](#).

Memory Management

Flash: Nonvolatile (Persistent) Memory

- The MK2200 64 MB configuration has 64 MB of available nonvolatile flash memory. 5 MB is committed for platform partition use to install external driver packs such as RF drivers, and 27 MB is available for developer's applications within the application partition (folder). The data partition (folder) has no available memory. The data stored in flash memory persists through cold boot cycles.
- The MK2200 128 MB configuration has 128 MB of available nonvolatile flash memory. 5 MB is committed for platform partition use to install external driver packs such as RF drivers, and 59 MB is available for developer's applications within the application partition (folder). The data partition (folder) has no available memory. The data stored in flash memory persists through cold boot cycles.

To increase usable persistent (flash) memory, use the Terminal Configuration Manager (TCM) to adjust the allocation of memory between the application and data partitions. See [Appendix F, Terminal Configuration Manager](#).

Add a PC card to the MK2200 to increase the non-volatile memory available for file storage.

RAM: Volatile (Non-Persistent) Memory

The MK2200 has 32 MB of DRAM volatile memory. Developers can automate control of the device's RAM (volatile) memory allocation (storage vs. memory used to run programs) to persist memory allocation settings through cold boot cycles.

Use the Symbol RDM or the System Menu to permanently configure RAM memory allocations (memory used to run programs). (**System Configuration > Memory Allocation > SystemStorePercent**).

✓ **NOTE** The RDM/System Menu can only configure unused RAM.

FTP Server

The MK2200 supports the minimum implementation of the FTP server defined in RFC 959, which includes configuration values, transfer parameters, and supports only ASCII and image data types.

✓ **NOTE** You cannot use FTP to update partitions.



CAUTION Never enable the server in anonymous mode if the MK2200 is accessible from the internet.

The FTP server is enabled by default. Use the RDM utility FTP Server feature (**Update/FTP Server**) to set up the FTP server. See [page 3-22](#).

FTP Server Registry Parameters

- **Allow Anonymous** - This parameter determines whether to provide anonymous access to users for copying data from MK2200. When enabled, users do not need an account on the local machine.
- **Allow Anonymous Upload** - Use this parameter to enable/disable anonymous users to copy data to the MK2200.
- **FTP Enable Part I** - This parameter determines whether the FTP server is loaded/accessible when the MicroKiosk is powered on. Disabling this does not affect the RDM's ability to load or retrieve mkconfig.reg files using the **Push Configuration File** and **Retrieve Remote Configuration File** options respectively.
- **FTP Enable Part II** - Enabling this parameter allows the RDM to load/retrieve a mkconfig.reg file even if the MicroKiosk FTP server is disabled (FTP Enable Part I = disabled). If both FTP Enable Part I and FTP Enable Part II parameters are disabled, you cannot load the mkconfig.reg file remotely using the RDM or FTP. However, you can load the mkconfig.reg file locally using an ActiveSync connection or a PC card.
- **Root Directory** - Use this parameter to set the root directory, which could be accessed remotely. If you do not specify the root directory, the default **\\Temp** is set.
- **Use Authentication** - Use this parameter to enable/disable authorization to connect to the server. If enabled, a valid user account on the local machine is required and the correct ID and password for the account must be specified to the server.
- **User Authentication Domain** - Valid Windows domain to look for users that are allowed to access FTP service. The FTP server authenticates user password from this Domain Controller.
- **User List** - Use this parameter when the Use Authentication parameter is enabled to set the list of users that are able to access the FTP server.

Inactivity Application (Screen Saver)

The Inactivity Application Manager (IAM) is the screen saver engine for the MK2200. It launches and terminates the screen saver at appropriate times but does not provide the screen saver images.

Use one of the provided applications, or create an application. Use the RDM utility Inactivity Manager feature to configure the IAM (**System Configuration > Inactivity Manager**). See [Inactivity Manager on page 3-25](#).

The screen saver exits if any of the following events occur:

- bar code scan
- pen tap
- button press
- MSR swipe.

Note that using a bar code scan or an MSR swipe to exit the screen saver also passes this data to the application using an ActiveX object, while using a pen tap or button press to wake the device does not pass any additional information to other applications.

SimpleSaver

The SimpleSaver program is the default IAM application, and clears the screen to white and repeatedly displays the following message at different locations on the screen:

Perform some action to wake me up!

This provides a simple example of how to implement a custom application, and is not intended as a final presentation tool. The SMDKs provide source code.

SlideShow

The **SlideShow** screen saver program endlessly displays a group of graphics files (slides) one at a time. The program supports the following file extensions:

- JPG
- GIF
- BMP
- 2BP.

The program uses the following registry entries under the [HKEY_LOCAL_MACHINE\Software\Symbol\SlideShow] key:

- **Directory** - A string value specifying the directory containing the graphic files. Only one directory is supported.
- **Delay** - A DWORD value indicating the number of seconds to display each graphic. If not specified, the default is 5 seconds. The minimum duration is 2 seconds.
- **Background** - A DWORD value specifying the background color to use around graphics that are smaller than the screen size. If not specified, the default background is black.

Set these values using the RDM. The program does not accept command line parameters.

Once the program has read the registry entries, it reads a file named **SlideShow.txt** from the graphics directory. This file should contain one file name per line. These file names should not include a path and must exist within the graphics directory. The files appear in the order specified.

If the **SlideShow.txt** file is not present, the program scans the graphics directory for all files with the appropriate file name extensions and displays these files in a sequence determined by the file system.

If a slide is smaller than the screen size, it is centered on the screen and the background color appears around the slide. If a slide is larger than the screen size, it is scaled to fit on the screen. This can result in an undesirable effect if the slide is not proportional to the screen size. For best results, use slides that are the same size as the screen. Source code is provided in the SMDKs.

Browser Applications - Hiding Toolbars

The MK2200 ships running the standard browser (iesample.exe), which leaves the Windows® CE start bar and the Internet Explorer toolbar accessible. To run a browser application with no toolbars (Windows CE® start bar and Internet Explorer toolbar), use KioskIE.exe. To start the browser application using KioskIE.exe without toolbars, use the RDM.

First, within the RDM, configure the “first application launched” for KioskIE.exe, using the path:

system configuration/user app(s)/First application launched/application path

Enter \windows\KioskIE.exe in the **application path** field.

Second, set the **start page** for the browser. The path to the **start page** is:

applications/Internet Explorer/[start page]

Then enter the start page URL.

✓ **NOTE** If using wireless connectivity and the start page is stored within the network, set a delay of about 10 seconds before KioskIE.exe launches to allow time for the MK2200 to establish the wireless connection. See [Configuring User Application\(s\) on page 3-21](#).

For sample source code that demonstrates hiding browser toolbars and the Windows® CE start bar from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of the Web Kiosk Software Suite (see [page 6-3](#)).

Browser Applications - Handling Network Disconnects

The KioskIE.exe browser can redirect to a custom Error Recovery Page if it detects an Internet Explorer error page (like a error 404). Since the errors are likely to occur during network outages, Symbol recommends using locally stored files to drive the custom error recovery page. Once directed to a local URL, a customer friendly message appears while script code retries to connect.

✓ **NOTE** The Internet Explorer error recovery mechanism can only handle errors occurring when loading the main frame of the loading web page.

- Specify the on-board error recovery page to appear in **Applications > Kiosk IE > ErrorRecoveryPage**. See [ErrorRecoveryPage on page 3-7](#).
- The device includes a sample page in **Windows\RetryPage.html**.

Configuring Error Page Redirection

KioskIE includes an Error Page Redirection feature that defines specific HTML code as errors and allows the KioskIE to navigate to an on-board error recovery page. For this purpose the .reg file KioskIE_ErrorPageList.reg is added to either the Platform or Application folder. The .reg file includes the following entries:

```
[HKEY_CURRENT_USER\Software\Symbol\IEBrowser]
"PageErrorList"=hex(7):\ 54,68,65,20,70,61,67,65,20,63,61,6e,6e,6f,74,20,62,65,20,66,6f,75,6e,64,00,\
43,61,6e,6e,6f,74,20,66,69,6e,64,20,73,65,72,76,65,72,00,\
46,6f,72,63,65,20,45,72,72,6f,72,00,00,00,00
```

These entries correspond to the following common errors reported by most Web servers:

- Line 1: The page cannot be found.
- Line 2: Cannot find server.
- Line 3: Force error.

To add a new error page, append the title of the error page to the registry entry above. The entry is stated in the hex value of the corresponding ASCII characters in the title of the error page.

For example, to add an error page titled "AAA BBBB CCCCC" to the error pages shown above, append the registry entry for the new error page as 'line 4', shown below.

```
[HKEY_CURRENT_USER\Software\Symbol\IEBrowser]
"PageErrorList"=hex(7):\
54,68,65,20,70,61,67,65,20,63,61,6e,6e,6f,74,20,62,65,20,66,6f,75,6e,64,00,\
43,61,6e,6e,6f,74,20,66,69,6e,64,20,73,65,72,76,65,72,00,\
46,6f,72,63,65,20,45,72,72,6f,72,00,\
41,41,41,20,42,42,42,42,20,43,43,43,43,43,00,00,00,00
```

Loading Additional Fonts on the MK2200

You can program the MK2200 to support additional fonts such as Unicode and double-byte character font.

The MK2200 supports the following system fonts as shipped from the factory. The font files corresponding to these formats are located in the **\windows** folder with .ttf extension.

- Arial
- Comic Sans MS
- Courier New
- Georgia
- Symbol
- Tahoma
- Times New Roman
- Verdana
- Wingding.

The default system font path for these fonts is **\windows**.

Use one of the following options to load fonts not supplied with the MK2200:

- Change the system font path where the system looks for fonts. For example, to change default system font path from **\windows** to **\application\fonts** add the following registry to the system along with new fonts in **\application\fonts**:

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\FontPath]
"FontPath"="\application\fonts"
```

Adding this registry changes the entire system fonts directory, so fonts supplied with the OS are no longer available. To use both the provided system fonts and new fonts, copy the system default fonts to the new font directory.
- Copy new/alternate fonts to the default **\windows** directory.
- Copy alternate fonts to the **\windows\fonts** directory.

Copying new fonts to the **\windows** or **\windows\fonts** preserves existing fonts. However the new fonts consume system RAM as they are part of the ObjectStore.

Using the third option, i.e., copying fonts to the **\windows\fonts** directory, makes it easier to manage the system. Note that fonts copied to **\windows** or **\windows\fonts** do not persist over power cycles or cold boots. Use the copy file feature to persist them over power cycles or cold boots.

Using Additional Fonts in Native Applications

Any application written in EVC can use the additional fonts using either MFC or Win32 APIs. If a specified font is missing, the system uses an available font for display.

Using Additional Fonts in Managed Applications

All fonts installed in the system are available to the .Net Compact Framework during runtime.

Using Additional Fonts in Browser Applications

Regardless of how you installed the font in the system, to reference it using a browser page, specify the font as a STYLE, or use FONT tags. Use intuitive names for the fonts (use FontViewer on a Windows desktop and locate the **Typeface Name** line), and use quotes to enclose names with spaces. If the specified font is missing, Internet Explorer uses its default font to display the text.

Things to Consider when Using Additional Fonts

- Different font styles (e.g., bold and italic) often require separate TTF files; be sure to provide all required styles. Do not reference styles by name (e.g., Arial Bold); set the style separately from the font (e.g., using a “b” or “strong” tag, or a style).
- For best results, do not direct the system font path to a storage card (PCMCIA), as this can negatively impact system performance. If this method is necessary, test the use of a storage card thoroughly for fonts to ensure proper operation.
- Most Web pages contain information that tells the browser what language encoding (the language and character set) to use. If the page does not include that information, and the Language Encoding Auto-Select feature is on, Internet Explorer can usually determine the appropriate language encoding. If not, manually select it using **View** menu > **Encoding** > **More**, then select the appropriate language.

✓ **NOTE** If the Auto-Select feature or a specific language pack is not installed, Internet Explorer prompts you to download the files. Adding languages does not guarantee Web pages display in the preferred language.

Input Panel (Virtual Keyboard)

Use the input panel (virtual keyboard) on the touchscreen of the MK2200 to enter information.

To access the **Input Panel**, tap the  icon in the icon tray. To enter information, use a stylus to select the keys on the input panel. To close the **Input Panel**, double-tap the icon.

✓ **NOTE** To access the virtual keyboard, press the physical buttons B and C simultaneously.



Figure 8-1 Input Panel (Virtual Keyboard)

✓ **NOTE** Use Ctrl-C to copy text, and Ctrl-V to paste text.

Microsoft WordPad

Microsoft **WordPad** is an application that allows creating, editing, and viewing documents on the MK2200. Password-protect a document if desired.

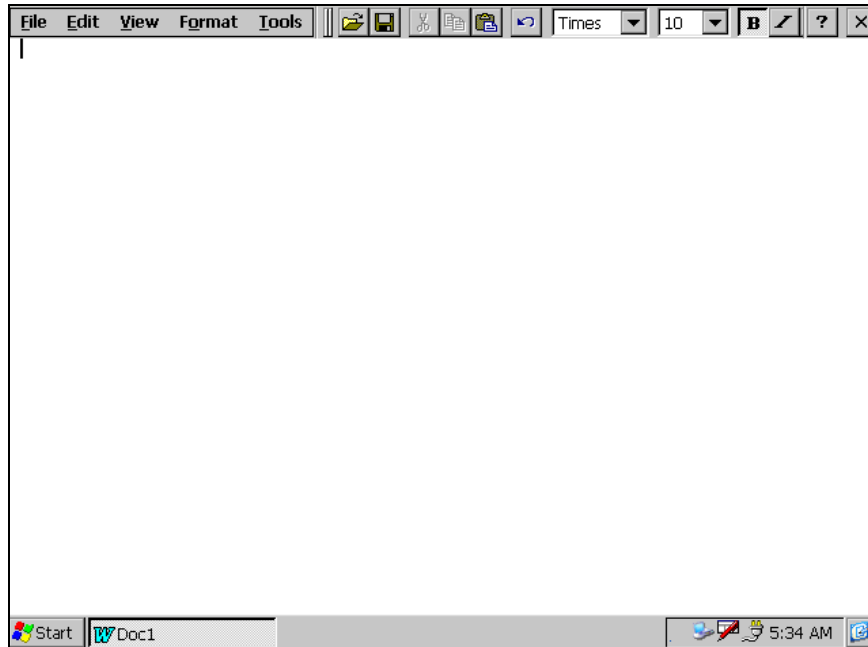


Figure 8-2 Using WordPad

To open a file on the MK2200, tap **File > Open**. The file must be in a format that **WordPad** can read (or convert). **WordPad** can explore the MK2200 to find files stored on the device. Select a file in the list and tap **OK** to open it.

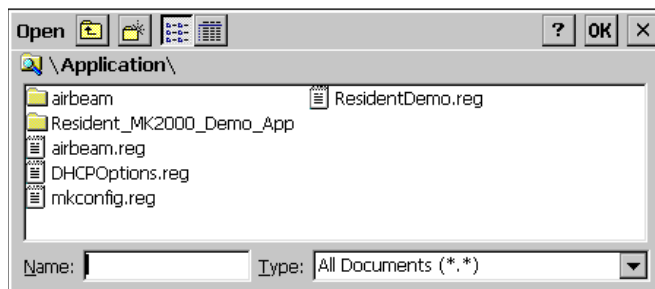


Figure 8-3 Open File Dialog Box

Enter information in **WordPad** as with any text editing program. Select font type, style, color, and size. Use the input panel to enter typed text into a document. See [Input Panel \(Virtual Keyboard\) on page 8-17](#).

To format or edit text, select the text by dragging the stylus across the text. To search a document for specific text, tap **Edit > Find**.

To change the zoom magnification, tap **View > Zoom**. Select the percentage. Select a higher percentage to enter text and a lower one to see more of the document.

If opening a document created on a host computer, tap **View > Wrap to Window** to see the entire document.

Windows Media Player

The MK2200 plays digital audio and video files using Windows® **Media Player**. To launch Windows Media Player, tap **Start > Windows Media**, or double-tap the **Media Player** icon on the MK2200 desktop.

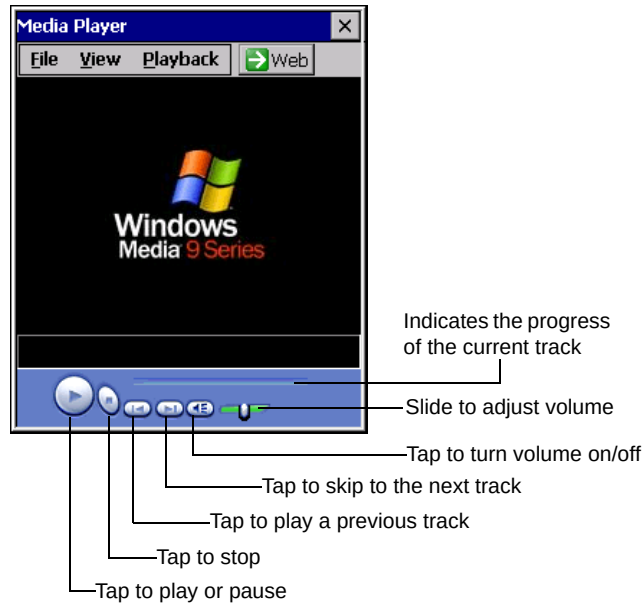


Figure 8-4 *Using Windows Media Player*

Use the host computer to copy digital audio and video files to the MK2200. The MK2200 can play WMA, MP3, WMV, MPEG4, and some WAV file formats.

Use the MK2200 SMDKs to customize the appearance of the **Media Player**.

For more information on using Media Player, tap the Web button to open the Windows Media web site. For sample source code that demonstrates using Media Player from a browser application, refer to the **MK2000_WebKSS_Install+SourceCode.doc** file, which is part of the Web Kiosk Software Suite (see [page 6-3](#)).

Internet Explorer

Use Microsoft Internet Explorer (6.0 compliant) to view Web pages on the MK2200. Use the MK2200 SMDKs to customize the appearance of Internet Explorer.

Use the RDM to configure some parameters of Internet Explorer. See [Internet Explorer on page 3-6](#).

To access Internet Explorer, tap **Start > Programs > Internet Explorer** or double-tap the **Internet Explorer** icon on the MK2200 desktop. The internet browser window opens (see [Figure 8-5](#)).

The MK2200 OS also includes kioskie.exe, which hides the toolbar and the Windows Start bar, menus, title bar, and status bar. Symbol recommends using kioskie.exe as the default browser when running web applications. See [Browser Applications - Hiding Toolbars on page 8-13](#).

For information on loading alternate fonts, see [Loading Additional Fonts on the MK2200 on page 8-15](#).

For information on handling network disconnects and their associated error recovery pages such as error 404, see [Browser Applications - Handling Network Disconnects on page 8-13](#).

Browsing the Web

Go to a specific Web page in one of the following ways:

- Tap **Favorites**, then tap the favorite to view. Note that new favorites added are not persisted as part of Internet Explorer settings.
- In the address bar at the top of the screen, enter the Web address using the input panel and tap the **Enter** button, or tap the arrow to choose from previously entered addresses..

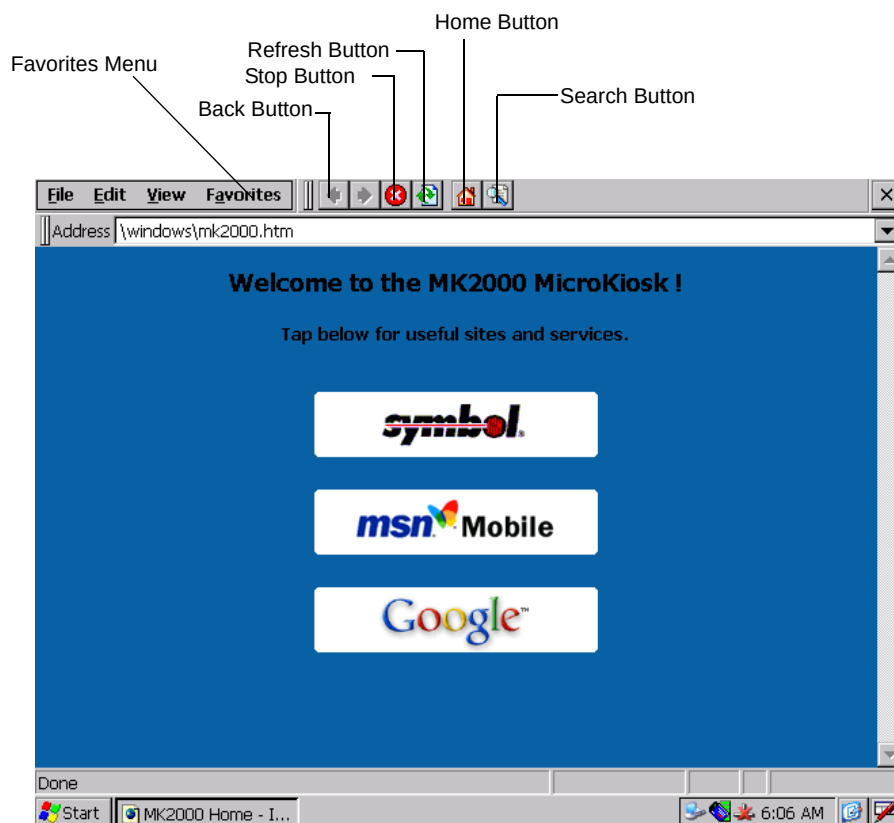


Figure 8-5 Internet Explorer

Printer Object Test

Use the **Printer Object Test Page** to debug serial printer connections and to print test bar codes, bitmaps, and text. Within Internet Explorer, select **Favorites > Printer Object Test Page**. The **Printer Language** drop-down menu lists supported printers, and includes the following information for each printer:

- Programming language acronym (for example, CPL)
- Printer company (for example, Zebra)
- Supported printers (for example, Epson, Zebra. See [Printing on page 3-19](#) for models).

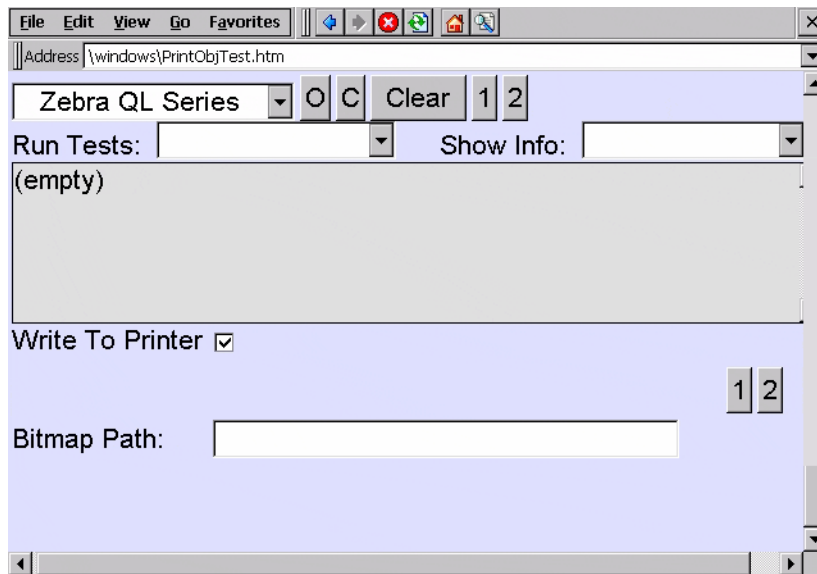


Figure 8-6 *Printer Object Test Page*

MSR Object Test

Use the **MSR Object Test Page** to test the MSR from the browser application. Select **Favorites > MSR Object Test Page** to load the MSR Object Test Page.

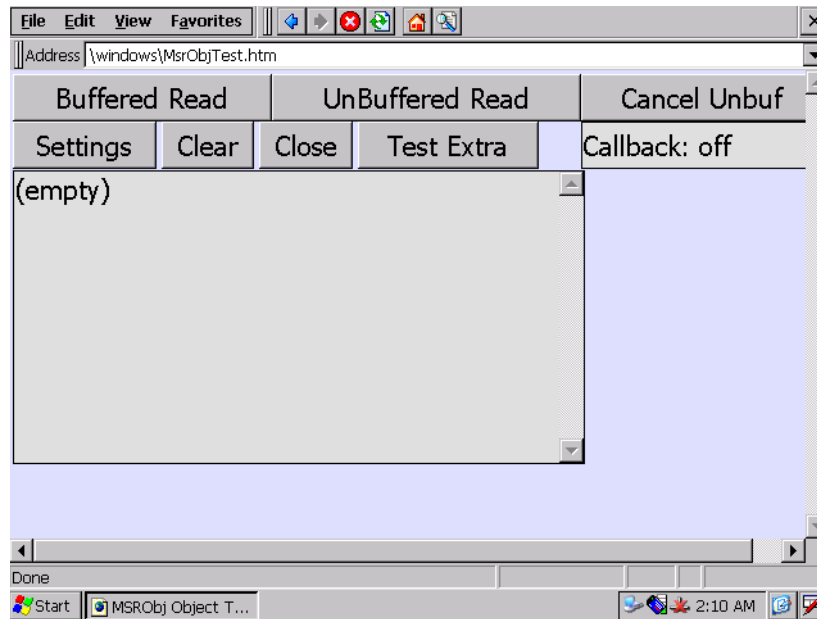


Figure 8-7 MSR Object Test Page

Scanner Object Test

Use the **Scanner Object Test Page** for debugging scanner setup from the browser application. Select **Favorites > Scanner Object Test Page** to load the Scanner Object Test Page.

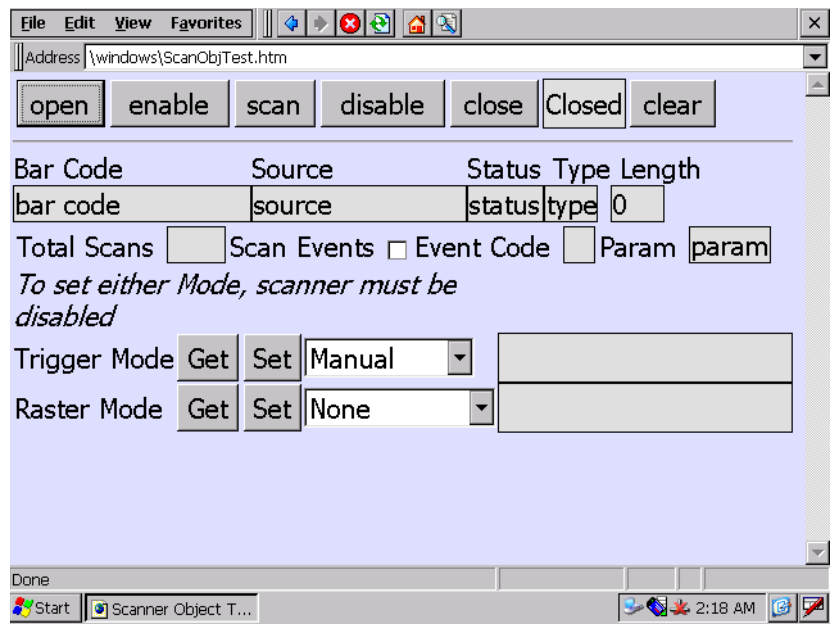


Figure 8-8 Scanner Object Test Page

Audio Object Test

Use the **Audio Object Test Page** for debugging Audio Object setup from the browser application. Select **Favorites > Audio Object Test Page** to load the Audio Object Test Page.

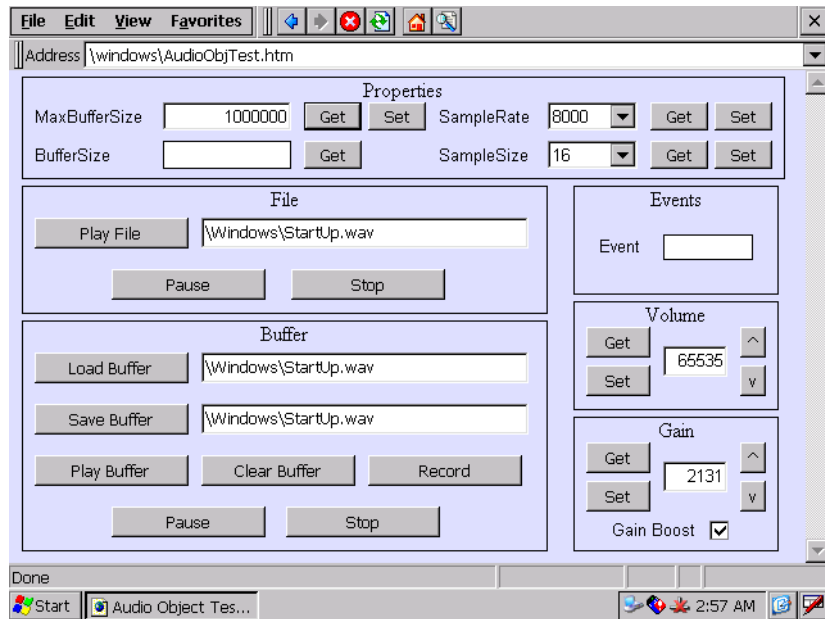


Figure 8-9 Audio Object Test Page

MicroKiosk Object Test

Use the **MK Object Test Page** for debugging MicroKiosk Object setup from the browser application. Select **Favorites** > **MK Object Test Page** to load the MicroKiosk Object Test Page.

File Edit View Favorites |||

Address: \\windows\MK2KObjTest.htm

Reboot Warm Cold Save Config ☒ P: 1 2 3

Inactivity App

App Path Get Set

Timeout Get Set Reset Timer ☐

Running ☐ Enabled ☐ Launch ☐

Prot Mode Pwd: Get Set P: 1 2 3

Prot Mode App: Get Set

Button Map: ID: Get Set Value:

Button Combo Timeout: Get Set

SIP Visible: Get Set ☐ P: 1 2 3

SIP Position: Get Set X: Y:

Clear All Get Last Result

Done

Start | MK Utility Object ... | 1:00 AM

Figure 8-10 MicroKiosk Object Test Page

Chapter 9 Software Development Environments

Overview

The MK2200 operating system is Windows CE.NET 4.2, which supports the major technologies and functions needed to develop applications in any of the following environments:

- Native Windows® CE applications in C and C++
- Managed .NET applications in C# or VB.NET *
- Browser-based applications in VBScript or JScript

* C# and VB.NET require a separate installation of the .NET Compact Framework (.NETCF).

Symbol Mobility Developer Kits (SMDKs)

The following software developer kits are available for the MK2200:

- SMDK for C - for developing native C/C++ applications
- SMDK for the Web - for developing browser-based applications
- PocketBrowser v2.01 support for web development
- SMDK for .NET - for developing managed .NET applications in C# or VB.NET.

All Symbol Mobility Developer Kits are available as free downloads from the Symbol DevZone:
<http://devzone.symbol.com/>.

Symbol Mobility Developer Kit (SMDK) for C

The Symbol Mobility Developer Kit for C is based on industry-standard Microsoft® Windows® CE development tools and enables development of native C and C++ applications. Use this developer kit in conjunction with Microsoft® Embedded Visual C++ 4.0 Service Pack 3 and Symbol's Platform SDK (PSDK) for MK2000c42.

SMDK for C includes the following components:

- Standard Symbol C API Libraries
- MK2200-specific C API Libraries
- Help file containing a C API Reference Guide
- Sample applications with full source code.

Sample Applications

The sample applications are included as a learning tool, to show developers how to interface with the Symbol C API functions. Some of the sample applications contained in the kit include:

Hello: A simple Hello World application.

DisplayTest: Displays various colors on the LCD screen.

KeyCheck: A keyboard checking utility that displays the keys pressed on the device and their associated WM_MESSAGE.

ScanSamp2: Demonstrates the bar code scan engine (and external scanner).

MSRSamp2: Displays the MSR track data when a card is swiped.

KioskWedge: Provides non-scanning aware applications the ability to receive scanned bar code data. KioskWedge interfaces with the scanner driver, captures selected types of bar code data, and sends the bar code data as keystrokes to the window with the keyboard focus (if any).

MemTest: Displays the amount of available memory. Allocate and free blocks of memory to see how available memory changes.

Win32PrintSamp: Prints a sample page to a connected printer.

✓ **NOTE** The MK2200 supports the Signature Capture API via the SMDK for C only. Refer to the Symbol Mobility Developer Kit version 1.4 or later, under MK Series C APIs - Signature Capture.

Symbol Mobility Developer Kit (SMDK) for the Web

The Symbol Mobility Developer Kit for the Web enables development of browser-based applications written in VBScript or Jscript. Use this developer kit in conjunction with any web page editor such as Microsoft Front Page or Notepad. It contains the following components:

- Documentation for the Symbol ActiveX Object library *
- Sample HTML/Jscript applications
- Outside the SMDK for the Web, see [Chapter 6, Web Kiosk Software Suite](#) and [Web KSS Source Code Index on page 6-23](#).

* The ActiveX objects are built into the MK2200 operating system and do not need to be loaded.

The MK2200 ships with Internet Explorer CE version 6.0 browser, which supports VBScript and Jscript. See <http://www.microsoft.com> for information on Internet Explorer CE version 6.0 features and limitations.

The MK2200 operating system also includes the KioskIE.exe browser, which runs in full screen mode without the browser toolbar. See [Browser Applications - Hiding Toolbars on page 8-13](#).

ActiveX objects provide control over the scan engine (and external scanner), four programmable buttons, microphone, MSR, and printers. For information on loading alternate fonts onto the MK2200, see [Loading Additional Fonts on the MK2200 on page 8-15](#).



NOTE MK2200 supports only the following Active X Objects/Controls: Printer, BarcodeReader, AudioManager, MKUtility, and MSR.

PocketBrowser v2.01 for the Web

The Symbol PocketBrowser is a web development kit that provides access to the functionalities of a Symbol device. The PocketBrowser is used across all vertical markets and in a wide variety of applications, enabling developers and integrators to provide advanced Web-based solutions for Symbol devices. Transfer a PocketBrowser application from one Symbol device to another seamlessly without recompiling or rewriting it.

PocketBrowser features include:

- Blocking users from the Microsoft operating system
- Exposing the full screen area to the Web application designer
- Seamless integration with bar code scanning
- Wireless connectivity
- Magnetic stripe readers.

Symbol Mobility Developer Kit (SMDK) for .NET

The Symbol Mobility Developer Kit for .NET allows Microsoft® .NET Compact Framework developers to create managed (C# and VisualBasic.NET) applications that harness Symbol value-add features on the MK2200. Use this developer kit in conjunction with Microsoft® Visual Studio.NET 2003.

The SMDK for .NET includes the following components:

- Class libraries
- Sample applications
- Documentation describing how to use the methods for each class library
- Outside the SMDK for .NET, see [Chapter 7, C# Kiosk Software Suite](#) and [C# KSS Source Code Index on page 7-12](#).



Appendix A Technical Specifications

Technical Specifications

For the latest technical specification information for the MK2200, visit: <http://www.symbol.com/MK2200>

Appendix B RF Network Configuration

Overview

There are two alternative platform partitions available for the MK2250 that enable different RF clients to configure the 11 Mbps wireless connection.

- To implement WPA enterprise-level wireless security in the wireless connection, use the Aegis Client version 2.1.4 to configure the wireless connection.
- Alternatively, use Symbol Mobile Companion version 3.9.3.76.

✓ **NOTE** Mobile Companion supports WPA Home, but not WPA Enterprise.

Automated Launch of Aegis Client

By default, the Aegis Client launches at startup and runs in the background on MK2200s using platform partition 2250c42Plat64Mxxx.hex.

The AegisEnable.reg file included in this partition enables this. **Deleting this file or renaming its .reg extension causes Mobile Companion to launch upon boot up.** In this case, to access Aegis Client double-tap its desktop icon or press all four of the MK2200's buttons simultaneously. The Aegis Client icon then appears in the task bar; select this to display its configuration window.

✓ **NOTE** To use Mobile Companion on an RF unit, you must first disable Aegis Client or conflicts can occur.

To close the Aegis Client window but continue to run the application in the background, select **Client** tab > **Close**. To exit the application completely, select **Client** tab > **Exit**.

Aegis Client

Install the Aegis Client included in the platform partition 2250c42Plat64Mxxx.hex for the MK2250 onto the device to implement WPA enterprise wireless security. Wireless MK2200s ship from the factory with this client installed.

Use the Aegis Client to configure the MK2200's Spectrum24 wireless network settings. See Aegis Client documentation for more information.

Persisting Aegis Settings

To permanently save the settings configured by the Aegis Client, run **Start > Programs > Tools > Save Aegis Configuration**. This creates the \Applications\Aegis.reg file containing the configured parameters.



NOTE To deploy the same Aegis settings on multiple MK2200 devices, copy the Aegis.reg file to other MK2200 devices.

To save certificates installed on the MK2200 for use by Aegis Client, run **Start > Programs > Tools > Save Certificates**. This preserves the certificate across cold boot cycles.

Using Certificates with Aegis Client

When the MK2200 is operating with the default system time after a cold boot (1st of June 1999 12:00:00 AM) and cannot update its time over SNTP because it is not connected to the network, perform the following to use certificates with Aegis:

1. Manually set the date and time.
2. Install the certificate.
3. Create a bat file, e.g., **SetDate.bat**, as follows:
date mm-dd-yyyy
time hh:mm:ss
4. Create a folder named **StartUp** in the **Application** folder, and copy this bat file to it.
5. Use Aegis to connect to the required network with the installed certificate.
6. Select **Start > Programs > Tools > Save Certificates** and **Start > Programs > Tools > Save Aegis Configuration** to save them over power cycles.

IP Configuration of Aegis Client

The Aegis Client does not provide an interface to configure IP settings applicable for NETWLAN adapter. To configure IP settings, on the MK2200, select **Start > Settings > Network & Dial-up Connections > NETWLAN** and set the configurations. Then select **Start > Programs > Tools > Save Aegis Configuration** to preserve the settings over cold boot cycles.

Mobile Companion (11 Mbps Radio)

The MK2200 supports wireless communication using Spectrum24 wireless LAN connection. This requires properly configured Access Points (APs) within the facility. Refer to the AP documentation to set up the wireless LAN hardware.

Use the **Mobile Companion** utility to configure the MK2200 wireless network settings. The **Mobile Companion** icon appears in the task tray (see [Figure B-1 on page B-3](#)), and indicates MK2200 signal strength as follows:

Icon	Status
	Excellent signal strength
	Very good signal strength
	Good signal strength
	Fair signal strength
	Poor signal strength
	Out-of-network range (not associated)

The **Mobile Companion** utility starts automatically if the MK2200 is equipped with a Spectrum24 11 Mbps card. The status icon appears in the task tray and changes in real-time to reflect the signal strength and availability of the adapter and the wireless network. Tap the icon to open the **Mobile Companion** menu.

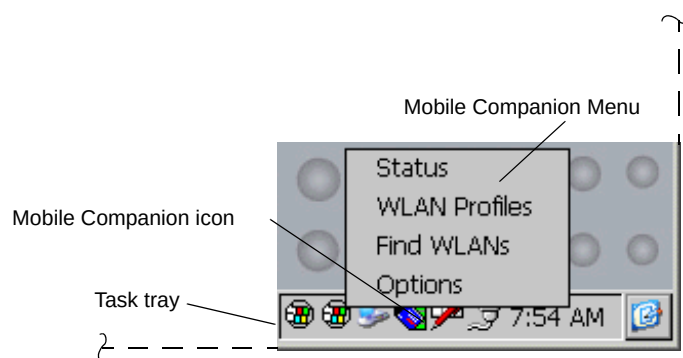


Figure B-1 Mobile Companion Menu

✓ **NOTE** Some options set using Mobile Companion are not persisted after a cold boot.

When the menu opens, select **Status**, **WLAN Profiles**, **Find WLANs**, or **Options**.

Table B-1 *Mobile Companion Menu Descriptions*

Menu Item	Description
Status	Displays the current status and information for the wireless connection. Signal tab - displays radio signal transmission strength from the adapter (using its current profile) to the associated AP. Info tab - displays software, driver, firmware, hardware, and country information for the current profile. IP Status tab - displays network address information. Ping tab - displays signal strength data and data rate, and performs data transmission tests between the MK2200 and associated AP or client. APs tab - displays APs with the same ESSID as the current MK2200 profile. Set the MK2200 roaming capabilities.
WLAN Profiles	Lists the current profiles and allows adding, editing, and deleting profiles. Under Edit, the Mode, Encryption, IP Config, and Power tabs show the ESSID, security settings, network address information, and power consumption level for that profile. See Editing Profiles on page B-6.
Find WLANs	Displays a list of Spectrum24 networks (APs and networked peers) available to the MK2200 for association. The networks are listed by ESSID. Tap a network and tap Connect to interoperate with the AP representing that network. See Find WLANs on page B-16 for more information.
Options	Displays settings for configuring system sounds, AP and MK2200 association capabilities, profile roaming options, and the password protecting the Mobile Companion utility.

Configuring Mobile Companion

Mobile Companion is launched at power-up if an 11 Mbps Spectrum24 radio and driver are installed in the MK2200. The Mobile Companion icon appears in the task tray. If it does not launch, manually launch Mobile Companion on the MK2200 by double clicking **\\Windows\\EVMON.EXE**.

Select **WLAN Profiles** from the **Mobile Companion** menu to view, connect to, create, and edit a profile. A completed profile contains adapter configuration settings for use in different locations to connect to a wireless network.

Options available in the WLAN Profile window are:

- Select any relevant profile from the list and tap **Connect** to set that profile as the active profile. The active profile displays the transmit and receive icon to the left. Once selected, the MK2200 uses the ESSID, encryption, and power consumption settings configured for that profile.
- Select a profile from the list and tap **Edit** to make changes to the profile. See [Editing Profiles on page B-6](#).
- Tap **New** to set the profile name and ESSID on the **Mode** tab. Use the **Encryption**, **IP Config**, and **Power** tabs to set security, network address information, and power consumption level for the new profile.
- Select a profile to delete from the list and tap **Delete** to remove that profile.
- Select a profile from the list and tap **Move Up** or **Move Down** to order the profile. If the current profile association is lost, Mobile Companion attempts to associate with the first profile in the list, then the next, until a new association is achieved.

Configuring the Default Profile

1. Tap on the task tray icon and select **WLAN Profiles** from the **Mobile Companion** menu. The *WLAN Profiles* window displays existing profiles.

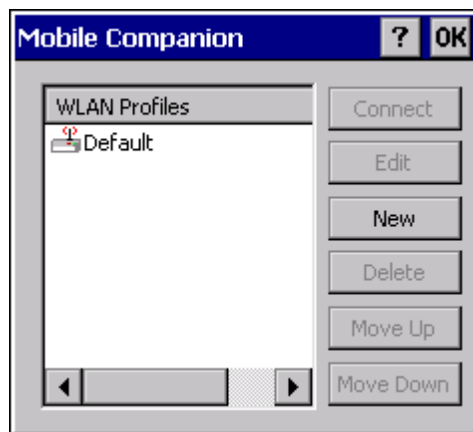


Figure B-2 WLAN Profiles

2. If no changes are required for the profile, select **Default** and tap **Connect** to set this as the active profile. The **Default** profile displays the transmit and receive icon to the left.

To edit the ESSID, operating mode, profile power consumption, and security parameters first, see [Editing Profiles on page B-6](#).

Editing Profiles

Mode Tab

1. To change the ESSID and operating mode for a profile, select the profile and tap **Edit** to display the **Mode** tab.

The image shows a screenshot of the 'Mobile Companion' application window, specifically the 'Mode' tab. The window has a title bar with a question mark, 'OK', and 'X' buttons. Below the title bar are three tabs: 'Mode' (selected), 'Authentication', and 'Encryption'. The 'Mode' tab contains four configuration fields: 'Profile Name' with a text box containing 'Default', '802.11 ESSID' with a text box containing '101', 'Operating Mode' with a drop-down menu showing 'Infrastructure', and 'Country' with a drop-down menu showing 'International'.

Infrastructure Mode

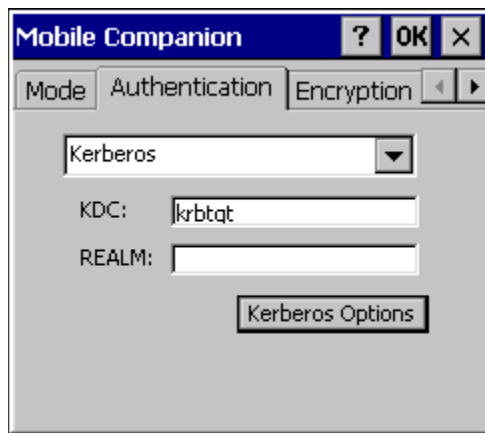
Figure B-3 Mode Tab

2. Set the operating mode from the **Operating Mode** drop-down list. Choose **Infrastructure** (the default mode) to enable the MK2200 to transmit and receive data with an AP.
Select the country of operation for the MK2200 from the **Country:** drop-down list. This should match the APs country setting, and be appropriate for the country of operation. Select **International** if using the MK2200 with a non-Symbol AP or a pre-AP 4131 model.
3. To save the Mobile Companion settings and retain them across cold boot cycles, tap **Start > Tools > Save Spectrum24 Configuration**.

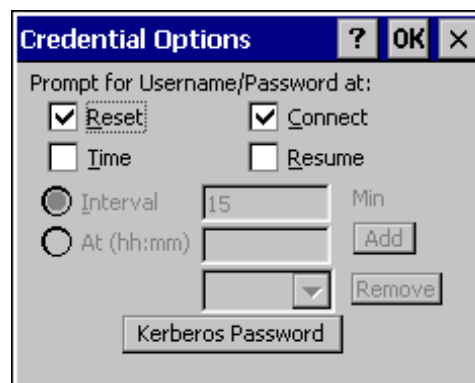
Authentication Tab

Select the Authentication tab to configure server-based authentication. Select one of the following Authentication options from the **Authentication** drop-down list.

- None - Default setting when authentication is not required on the network. The client adapter does not use any authentication scheme when Open System is selected on the **Encryption** tab.
- Kerberos (see [Table B-2](#))
- LEAP (see [Table B-3](#))
- EAP-TLS (see [Table B-4](#))
- PEAP (see [Table B-5](#)).



Kerberos Authentication



Credential Caching Settings
(Kerberos Options)

Figure B-4 Mobile Companion - Authentication Tab (Kerberos)

Table B-2 *Authentication Tab Fields - Kerberos*

Authentication	Description
Kerberos (see Figure B-4)	Kerberos is a different form of 128-bit data security. An adapter is required to have its request for access point resources authenticated with a Kerberos server before the server permits the access point to transmit and receive data with the associated adapter. When Kerberos is selected, the KDC and Realm entry fields appear. The KDC field should remain with the default KDC name (krbtgt) unless it is changed in the server. Enter the name of the server that hosts the Kerberos KDC in the Realm field. The KDC is located on a server and maintains information about the access points and users it supports. The KDC also permits the transmission and receipt of data once the credentials of the user are verified. Tap Kerberos Options to configure different caching modes for Kerberos credentials. When connecting to a Kerberos supported profile, the system can prompt for the associated user name and password at specified instances during the authentication process. Caching of credentials is optional. Kerberos Options: Select any combination of the following Kerberos Credential Caching settings: • Reset: When selected, the system prompts the user for the username and password upon a warm boot. • Connect: When selected, the system prompts the user for login information when the system initiates a connection to the ESSID. • Time: When selected, the system requests a user name and password after the specified time parameter. Available time parameters are specified as an Interval (in minutes) or At (hh:mm) a specified time (chosen with the pull-down menu). If a time option is not selected, authentication continues without a user name and password verification. • Resume: When enabled, the system prompts the user for username and password after the system is suspended and subsequently resumed. If disabled, the system prompts for a username and password only if the user's credentials are not in the registry.

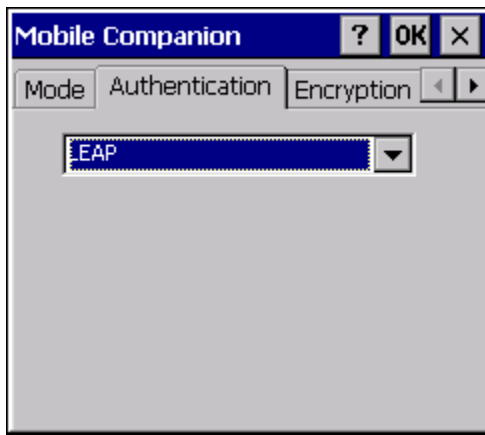
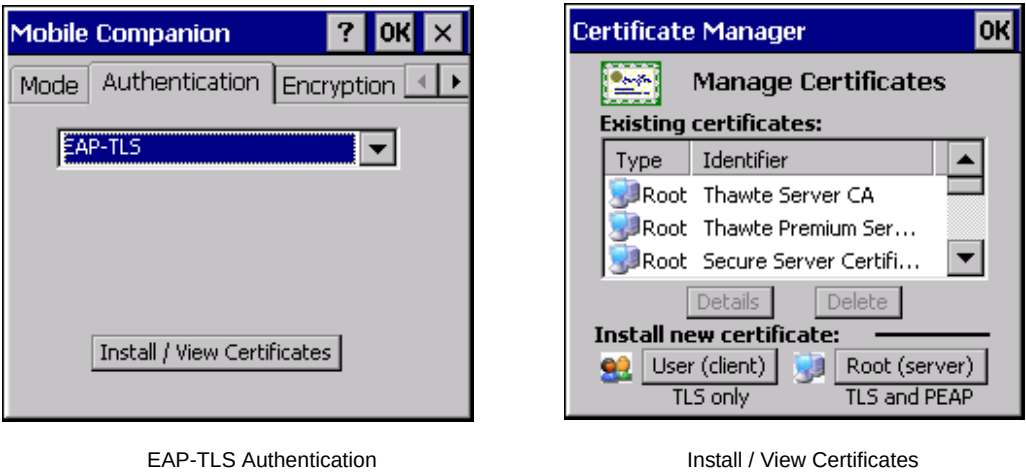


Figure B-5 *Mobile Companion - Authentication Tab (LEAP)*

Table B-3 *Authentication Tab Fields - LEAP*

Authentication	Description
LEAP (see Figure B-5)	Select this option to enable LEAP authentication. LEAP is founded on mutual authentication. The AP and the mobile computer attempting to connect to it require authentication before access to the network is permitted.



EAP-TLS Authentication

Install / View Certificates

Figure B-6 Mobile Companion - Authentication Tab (EAP-TLS)

Table B-4 Authentication Tab Fields - EAP/TLS

Authentication	Description
EAP/TLS (see Figure B-6)	EAP/TLS is an authentication scheme through IEEE 802.1x. It authenticates users and ensures only valid users can connect to the network. It also restricts unauthorized users from accessing transmitted information. EAP/TLS achieves this through secure authentication certificates.

✓ **NOTE** Run **Start > Programs > Tools > Save Certificates** to persist the certificate on the MK2250 across cold boot cycles.

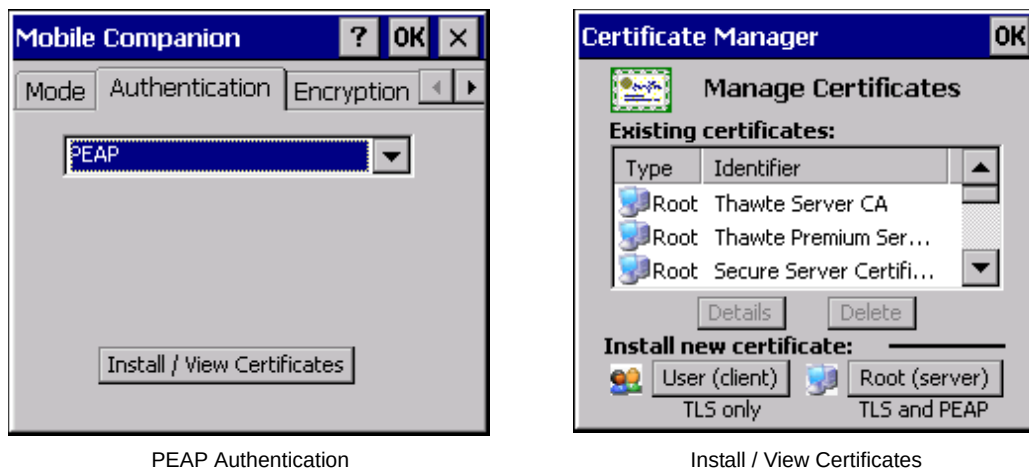


Figure B-7 Mobile Companion - Authentication Tab (PEAP)

Table B-5 Authentication Tab Fields - PEAP

Authentication	Description
PEAP (see Figure B-7)	Select this option to enable PEAP authentication. This method uses a digital certificate to verify and authenticate an user identity.

✓ **NOTE** Run **Start > Programs > Tools > Save Certificates** to persist the certificate on the MK2250 across cold boot cycles.

Encryption Tab

Select the **Encryption** tab to set the adapter profile security level by configuring the encryption scheme and corresponding keys. Select an option (Open System, WEP, Keyguard-MCM, TKIP (WPA)) from the Encryption drop-down list.

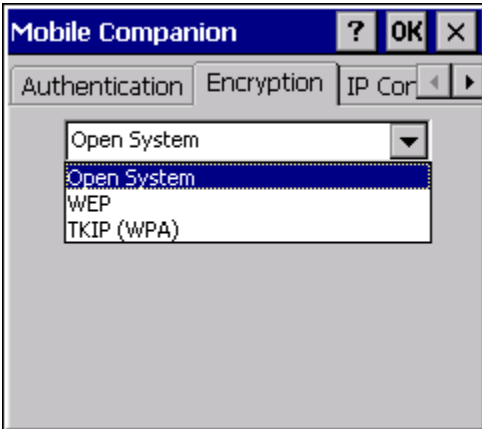


Figure B-8 *Encryption Tab*

The absence of a physical connection makes wireless links vulnerable to information theft. Encryption is an efficient method for preventing data theft and improving data security.

If an Access Point (AP) is set to 40-bit and an adapter is set to 128-bit, the adapter can associate to the AP. However, no data transmission and reception can take place when these settings are in place.

Select one of the following **Encryption** options from the drop-down list:

Table B-6 *Encryption Tab Fields*

Authentication	Description
Open System (no encryption)	Select this option when no data packet encryption is needed over the network. This option provides no security for data transmitted over the network. The window displays only the OK and Cancel buttons.
WEP	Select this option to use WEP keys for encryption. The window displays several radio buttons and edit buttons to configure the WEP keys. Specify the keylength by selecting the 40-bit or the 128-bit radio button (128-bit is the default). Enter WEP keys in the edit boxes. The number of edit boxes is determined by the selected key length (10 Hex digit value for 40 bit keys, 26 Hex digit values for 128-bit keys). Use the Key radio buttons to configure the four WEP keys. The adapter uses the selected key. Select the ResetKeys button to set the encryption key to the default values. The default Hex digit keys are visible any time they are used. As a security precaution the WEP keys appear in asterisks ("*") within the Encryption key fields. If the associated access point uses an optional Passkey, the "active" adapter WLAN profile must use a Passkey as well. The Passkey is a plain text representation of the WEP keys displayed in the Encryption property window. Use the Passkey to enter WEP key data without having to remember the entire 40-bit (10 character) or 128-bit (26 character) Hex digit string. Tap Passkey. On the Passkey screen, enter an easy-to-remember character string in the range 4 to 32 to use as the WEP algorithm, then select OK. The access point transforms the Passkey string into a set of four WEP keys using MD5 algorithms and displays them in the WEP fields. The selected adapter profile uses these new WEP keys, and behaves as if the keys were entered manually.
TKIP (WPA)	Select this option for the client adapter to use Wireless Protected Access (WPA) through TKIP. Enter the pre-shared keys in the edit boxes. Tap ClearKey to clear all keys and enter new key values. Tap Passkey to display the Passkey screen. Enter an easy-to-remember 8 to 63 character string.

IP Config Tab

Tap the **IP Config** tab to configure the following MK2200 profile network address parameters: IP address, subnet, gateway, DNS, and WINS. Changes made within the **IP Config** tab only impact the profile selected in the **Mode** tab and do not impact the network address parameters configured for other profiles.

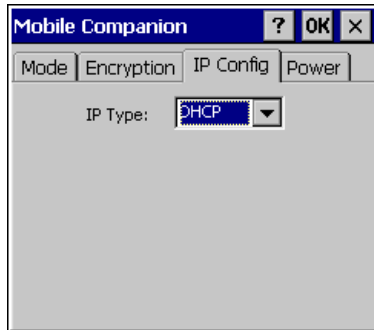


Figure B-9 Mobile Companion - IP Config Tab (DHCP)

- Select **Dynamic Host Configuration Protocol (DHCP)** from the **IP Type** drop-down list to obtain a leased IP address and network configuration information from a DHCP server. DHCP is the default setting for the MK2200 profile. When DHCP is selected, the IP address fields are read-only.
- Select **Static** to manually assign the IP, subnet mask, default gateway, DNS, and WINS addresses used by the MK2200 profile.

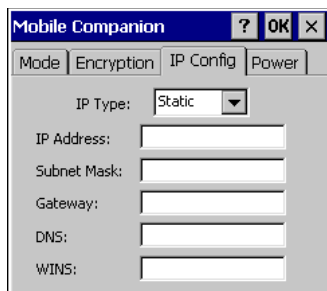


Figure B-10 Mobile Companion - IP Config Tab (Static)

Table B-7 IP Config Tab Fields

Field	Description
IP Address	The Internet is a collection of networks with users that communicate with each other. Each communication carries the address of the source and destination networks and the particular machine within the network associated with the user or host computer at each end. This address is called the IP Address (Internet Protocol address). Each node on the IP network must be assigned a unique IP address made up of a network identifier and a host identifier. Enter the IP address as a dotted-decimal notation with the decimal value of each octet separated by a period, for example, 192.168.7.27.
Subnet Mask	Most TCP/IP networks use subnets to manage routed IP addresses. Dividing an organization's network into subnets allows it to connect to the Internet with a single shared network address, for example, 255.255.255.0.
Gateway	The default gateway is a device used to forward IP packets to and from a remote destination.
DNS	The Domain Name System (DNS) is a distributed Internet directory service. DNS translates domain names and IP addresses, and controls Internet email delivery. Most Internet service requires DNS. For example, if DNS is not configured, Web sites cannot be located and/or email delivery fails.
WINS	WINS is a Microsoft® Net BIOS name server. WINS eliminates the broadcasts needed to resolve computer names to IP addresses by providing a cache or database of translations.

Power Tab

The MK2200 always uses the **Automatic Power Saving Mode** setting, which provides the best network performance.

Persisting Mobile Companion Settings

To permanently save the Mobile Companion settings run **Start > Programs > Tools > Save Spectrum24 Configuration**. This creates **\\Applications\Spectrum24.reg** file containing the configured parameters.

✓ **NOTE** To deploy the same Mobile Companion settings on multiple MK2250 devices, copy the spectrum24.reg file to other devices.

Find WLANs

Select **Find WLANs** from the Mobile Companion menu to list the ESSIDs of active wireless LANs operating in the vicinity of the MK2200.

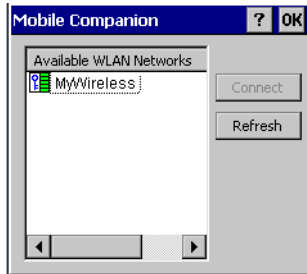


Figure B-11 Available WLAN Networks

Select a WLAN ESSID and tap **Connect** to view the **Mode** tab. The **Profile Name:** and **802.11 ESSID:** fields reflect the ESSID selected.

Status

To view the status of the wireless network connection, select **Status** from the **Mobile Companion** menu.

1. Tap the **Signal** tab to view a real-time graph of the signal quality of the MK2200 to the associated AP (Infrastructure Mode only), including the number of times the MK2200 roams to and from APs, the current data rate, and the network status. Signal quality indicates how clearly the adapter can hear the associated AP.

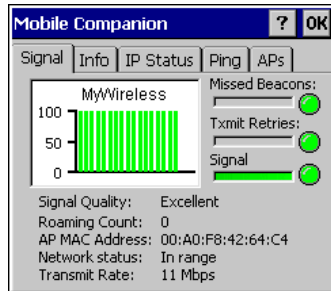


Figure B-12 Mobile Companion - Signal Tab

Table B-8 Signal Tab Fields

Field	Description
Missed Beacons	The amount of beacons (uniform system packets broadcast by the AP to keep the network synchronized) missed by the MK2200. The fewer the missed beacons the better the signal. If the LED to the right of the graph is green the AP association is not jeopardized by an excess of missed AP beacons. If the LED is red, consider associating with a different AP to reduce the amount of missed beacons and improve the signal.
Transmit Retries	The number of data packets retransmitted by the MK2200. The fewer transmit retries the stronger the signal. If the LED to the right of the graph is green the AP association is not jeopardized. If the LED is red, consider associating with a different AP to reduce the amount of transmit retries and improve the signal.
Signal	The Relative Signal Strength Indicator (RSSI) of the signal transmitted between the AP and MK2200. If the LED to the right of the graph is green the AP association is not jeopardized. If the LED is red, an association with a different AP could be warranted to improve the signal.



NOTE The button combination ABCD is mapped to the Signal Strength function (0xC6) and launches the Signal tab. See [Table 8-5 on page 8-8](#).

2. Tap the **Info** tab to view the MK2200 current software and driver revision data and the operating parameters of the current profile.

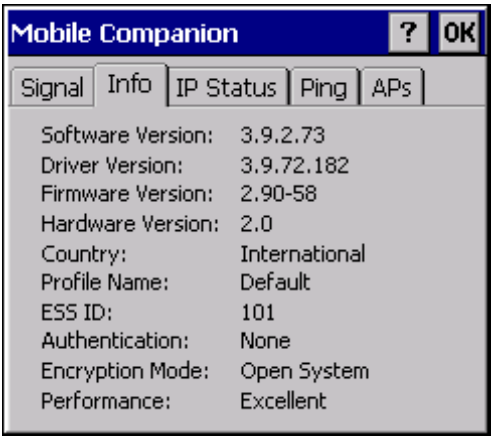


Figure B-13 Mobile Companion - Info Tab

Table B-9 Info Tab Fields

Field	Description
Version Information	The MK2200's software, driver, firmware and hardware versions, and country information. This data is consistent for the MK2200 regardless of the current profile.
Current Status	The MK2200 current Profile Name, ESSID, and Encryption mode. MK2200 performance is displayed using a verbal indicator of signal strength. MK2200 operating information differs depending on the current profile.

3. Tap the **IP Status** tab to view the MK2200 network address information. Unlike the **IP Config** tab in Finding WLANs, the **IP Status** tab is view-only with no user-configurable data fields.

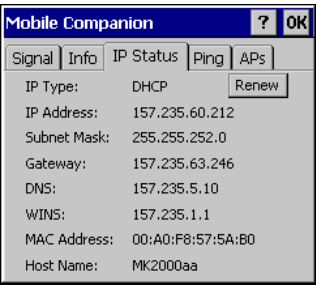


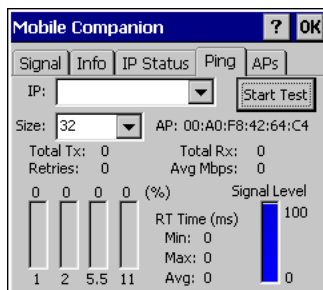
Figure B-14 Mobile Companion - IP Status Tab

Table B-10 *IP Status Tab Fields*

Field	Description
IP Type	If DHCP was selected from the IP Config tab, leased IP address and network address data appears. If Static was selected, the values entered in the IP Config tab on page B-14 appear.
IP Address	Each node on the IP network must be assigned a unique IP address. Enter the IP Address in dotted-decimal notation, for example, 192.168.7.27.
Subnet Mask	All network adapters on a TCP/IP network require a Subnet Mask . See the network administrator for the appropriate mask for the network.
Gateway	The Gateway forwards IP packets to and from a remote destination.
DNS	The Domain Name System (DNS) is a distributed Internet directory service. DNS translates domain names and IP addresses, and controls Internet e-mail delivery. Most Internet service requires DNS . For example, if DNS is not configured, Web sites cannot be located or e-mail delivery fails.
WINS	WINS is a Microsoft Net BIOS name server. WINS eliminates the broadcasts needed to resolve computer names to IP addresses by providing a cache or database of translations.
MAC Address	An IEEE 48-bit address factory-assigned to the MK2200 to uniquely identify the adapter at the physical layer.
Host Name	The name of the MK2200.

Tap **Renew** to refresh the information displayed on the **IP Status** tab.

4. Tap the **Ping** tab to send and receive ICMP ping packets across the network to the specified IP address.

**Figure B-15** *Mobile Companion - Ping Tab*

- Select or enter a target device IP address from the **IP** drop-down list.
- Select the size of the packet transmission from the **Size** drop-down list.
- Tap **Start Test** to begin the ping test.
- Tap **Stop Test** to terminate the ping test.
- The average mega-bits per second, signal strength, data rate currently in use, test statistics, and round trip (RT) times appear for each test. The associated AP MAC address also appears. The signal strength level and the data transmission rate appear in real-time bar graphs.

5. Select the **APs** tab (Infrastructure operating mode only) to view APs with the same ESSID as the MK2200 profile.

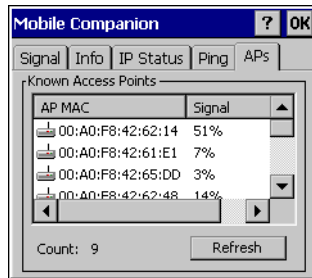


Figure B-16 Mobile Companion - APs Tab

The associated AP displays a radio wave radiating from its antenna to indicate its associated status. Tapping on the icon displays a menu with **Set Mandatory** and **Set Roaming** options.

- Select the **Set Mandatory** item to prohibit the MK2200 from associating with a different AP. The letter **M** displays on top of the icon.
- Select **Set Roaming** to allow the MK2200 to roam to any AP with a better signal. These settings are temporary and never saved to the registry.

Tap **Refresh** to update the list of APs with the same ESSID.

Options

Changes made to **Options** are not persisted across cold boot cycles.

Appendix C Rapid Deployment Client

Overview

The Rapid Deployment (RD) Client facilitates software downloads to a device from a Mobility Services Platform (MSP) Console's FTP server.

The MK2200 ships from the factory with RD Client version 1.6. You can upgrade this client over a network.

When software packages are transferred to the FTP server, the MK2200 on the wireless network can download them to the device. The location of software packages are encoded in RD bar codes. When the MK2200 scans an RD programming bar code(s), the software package(s) is downloaded from the FTP server to the MK2200. Multiple MK2200s can scan a single RD bar code.

✓ **NOTE** For information about the MSP Console, MSP Lite/MSP Enterprise servers, and creating RD bar codes, refer to the MSP User Guide.

Rapid Deployment Window

The **Rapid Deployment** window displays bar code scan status and provides features for resetting and exiting the application. To launch the RD application on the MK2200, tap **Start > Programs > Rapid Deployment Client**.

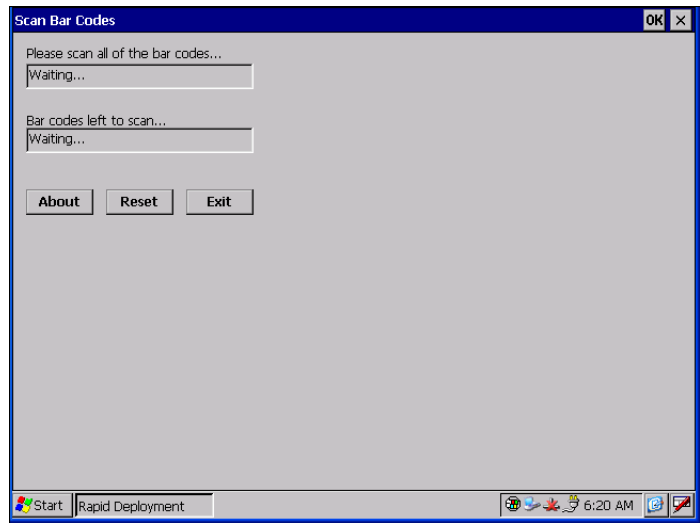
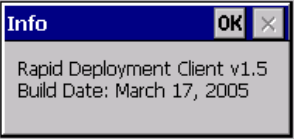
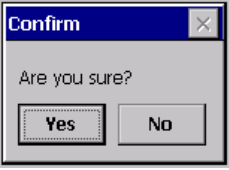


Figure C-1 Rapid Deployment Window

Table C-1 Rapid Deployment Window

Text Box/Button	Description
Please scan all of the bar codes...	This text box displays the status of a scanned bar code. Waiting - indicates the MK2200 is ready to scan a bar code. OK - indicates the MK2200 successfully scanned a bar code. If there are no bar codes left to scan, the Rapid Deployment Configuring window displays (see Figure C-3).
Bar codes left to scan...	This text box displays a list of any remaining bar codes to scan (1D bar codes only). When all required bar codes are scanned successfully, the Rapid Deployment Configuring window displays (see Figure C-3).

Table C-1 *Rapid Deployment Window (Continued)*

Text Box/Button	Description
About	Tap About to display the Rapid Deployment Client Info window. 
Reset	Tap Reset to remove any previously scanned data.
Exit	Tap Exit to close the application. A confirmation window displays:  Note: Closing the application prior to scanning all required bar codes discards any scanned data collected up to that point.

Scanning RD Bar Codes

When the MK2200 scans and successfully decodes a single or multiple RD bar codes, the data encoded in the bar code can:

- Reset the MK2200's connection profile. A connection profile is a set of Mobile Companion parameters that the MK2200 uses to access the wireless network.
- Initiate downloads of one or more software packages from an FTP server to the MK2200.

✓ **NOTE** Currently, RD only recognizes AirBeam version 2.16 software packages.

To scan an RD bar code:

1. Obtain the appropriate RD bar code(s) from the MSP administrator.
2. Launch the MK2200's scan engine by tapping **Start > Programs > System** menu.
3. With the **System** menu open, from the toolbar, click on **Configuration > Turn Scanner On**. Leave the **System** menu open while using RD Client or the scan engine turns off.
4. Launch the RD application on the MK2200 by tapping **Start > Programs > Rapid Deployment Client**. The **Rapid Deployment** window displays.

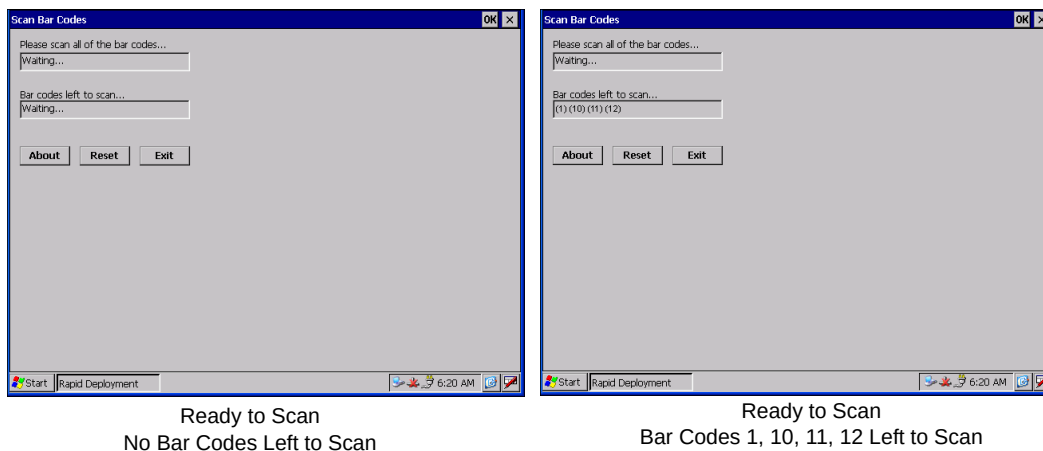


Figure C-2 *Rapid Deployment Window*

5. Scan the appropriate bar code(s) to complete the configuration and/or download. For information about scanning with the MK2200, see [Bar Code Scanning on page 1-8](#).
 - a. A PDF417 bar code (2D bar code) can contain all download data in a single bar code. In this case, only one bar code may be required to scan.
 - b. Multi-part linear bar codes (1D bar codes) can require scanning several bar codes. Scan bar codes in any order. The text box under **Bar codes left to scan...** shows the remaining bar codes to scan (see [Figure C-2](#)).

6. After scanning all appropriate bar codes, the MK2200 connects to the server and the **Rapid Deployment Configuring** window displays while network settings are configured.

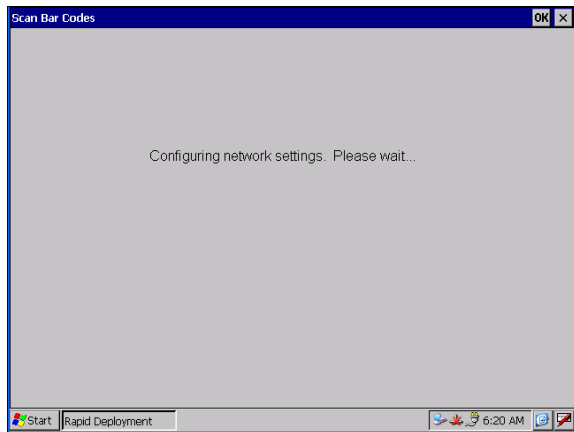


Figure C-3 *Rapid Deployment Window - Configuring*

✓ **NOTE** If the MK2200 cannot connect to the server, it retries until you cancel (exit) the application. If failure to connect to the server persists, see the MSP administrator.

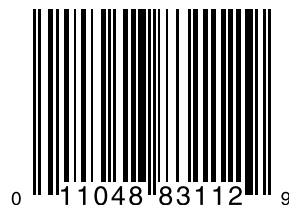
7. When configuration is complete:
 - a. A new Mobile Companion profile is created on the MK2200 from the data encoded in the bar code(s) scanned. See [Appendix B, RF Network Configuration](#) for more information about wireless profiles.
 - b. The designated package(s) are downloaded from the FTP server.

Appendix D Web Kiosk Software Suite Bar Codes

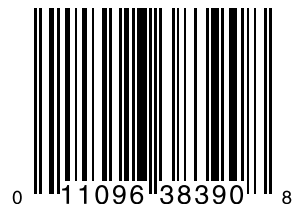
Overview

Use these sample bar codes with the Web Kiosk Software Suite.

Wide Screen TV



DVD Player



White Correction Fluid



Glue Stick



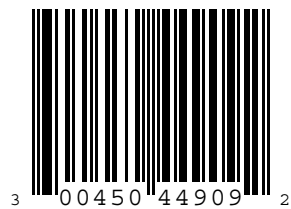
Transparent Tape



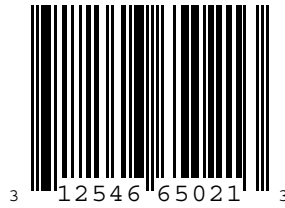
Standard Staples



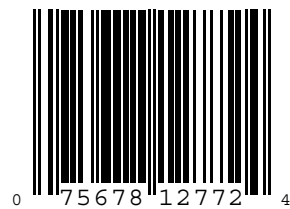
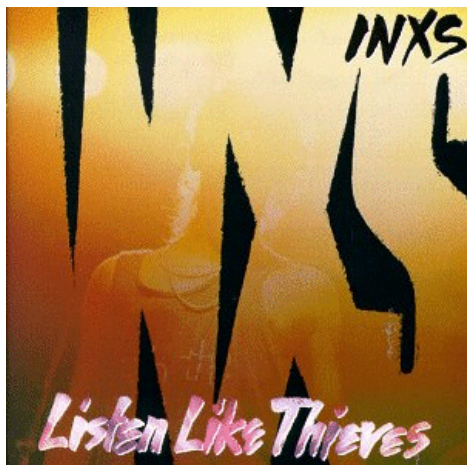
Tylenol



Roloids



CD



Color Printer - Ink Cartridge



KichenAid Mixer



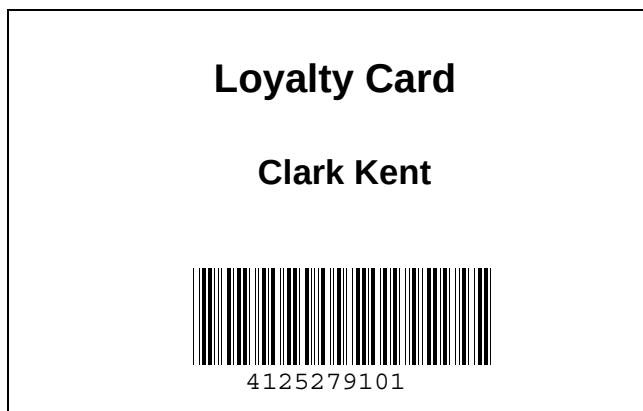
Employee Badge

John Ryan
(Code 128)



Loyalty Card

Clark Kent
(Code 39)



2D Bar Code (PDF417)



Text Reads: "You have just scanned a PDF417 bar code using the MK2000!"

Appendix E C# Kiosk Software Suite Bar Codes

Overview

Use these sample bar codes with the C# Kiosk Software Suite.

Pants UPC-A



Pants UPC-A



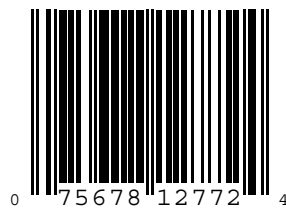
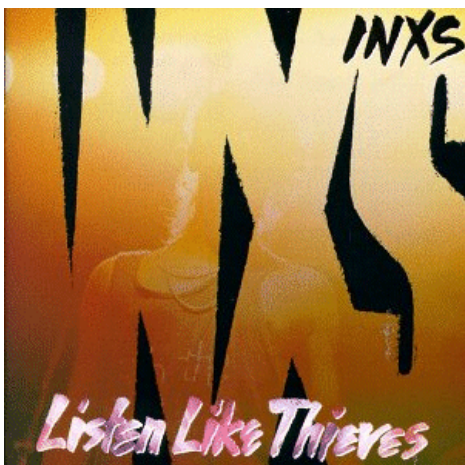
Transparent Tape



Scotch Tape UPC-A



CD



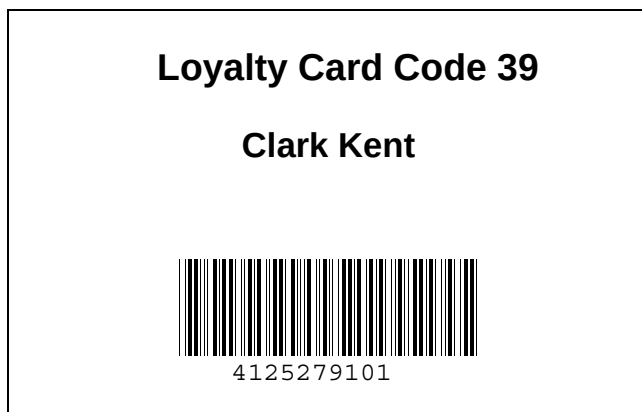
Employee Badge

John Ryan
(Code 128)



Loyalty Card

Clark Kent
(Code 39)



Appendix F Terminal Configuration Manager

Overview

Use the Terminal Configuration Manager (TCM) to specify a group of files to use when creating a partition and to load partitions from a host computer into the MK2200 flash memory over a serial connection using the device's Initial Program Loader (IPL).

TCM creates a **script** that contains information (commands to copy files) for building the image. TCM works with Explorer-type windows to view both the contents of the partitions and the source files directory structure, and performs functions including opening multiple scripts, dragging/dropping items from a drive/directory to the script, and renaming and deleting files in the script. When building the image, TCM adds all the files and directories referenced in the script to the image.

The Symbol MK2200 DCP (Device Configuration Package) includes TCM, standard script, and flash partition source files to use as a base for creating new scripts. These scripts are located in:

C:\Program Files\Symbol Device Configuration Packages\MK2000cXX\vX.X\ TCMScripts

Download the installation files for TCM from <http://devzone.symbol.com>.

✓ **NOTE** Before creating a script to build a hex image, identify the files required (system files, drivers, applications, etc.) and their source directories to simplify the script building process.

To build a hex image using TCM:

- Start TCM.
- Create or modify a script.
- Build the hex image.
- Send the hex image.

Starting Terminal Configuration Manager

To start TCM, select **Start > Programs > Symbol Device Configuration Packages > MK2000cXX vX.X**. The following screen displays two directory windows: **Script1** and **File Explorer**.

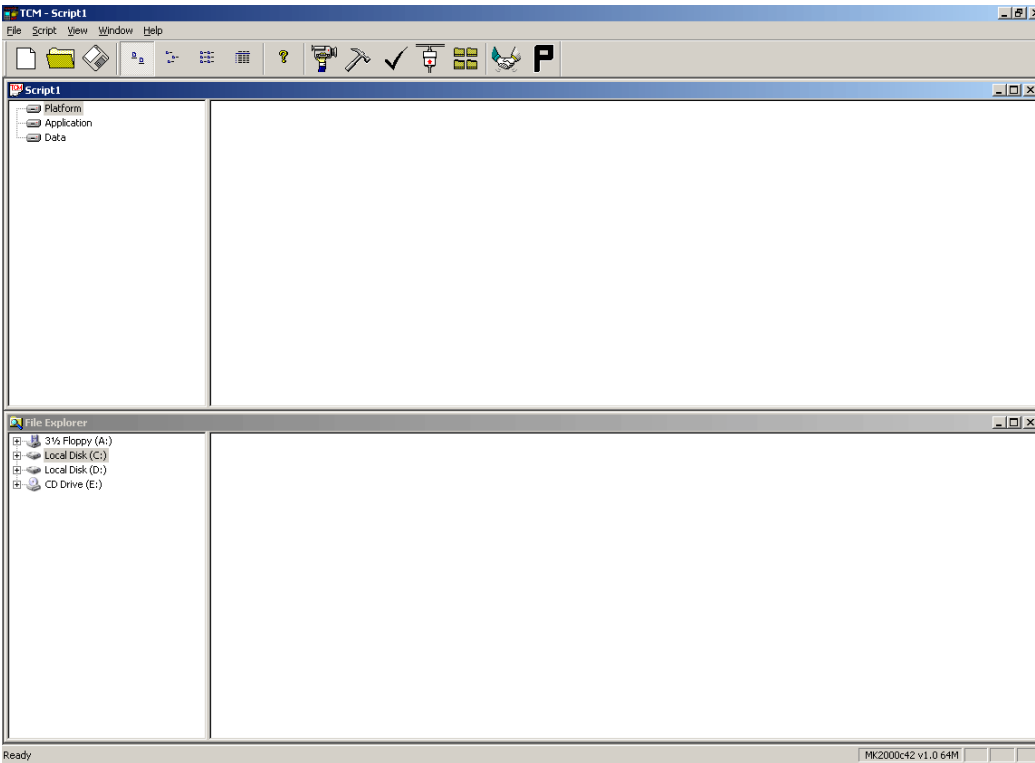


Figure F-1 Terminal Configuration Manager

[Table F-1](#) lists the components of the TCM start-up screen.

Table F-1 TCM Start-Up Screen Components

Component	Description		
Script Window	Associated with a script file containing the information to create a Flash Disk image. This window is the <i>target</i> window, or the primary TCM window to create a script or change a script file contents by copying, deleting, and renaming files and directories. More than one script window can open at a time. The Script Window consists of the Directory Tree Pane on the left and the Directory Contents Pane on the right. The Directory Contents Pane lists subordinate directories and files of each partition.		
File Explorer	A read-only source window for files and/or directories to include in the script.		
Tool Bar	Contains the tools below for taking action on a script.		
		Create a new script file.	 Check script for existing files.
		Open a script file.	 Select the hex image to load.
		Save a script file.	 Tile windows.
		View script properties.	 Build and send the hex image to the device.
		Build a script.	 Preferences.
		View large icons.	 About TCM.
		View small icons.	 View list.

Defining Script Properties

Before a script is created, define script properties, including the type of device, flash type, number of disks being created, and the memory configuration of each disk partition.

To define script properties:

1. With TCM open, click on the Script Window to make it the active window.
2. From the **Script** menu, select the **Properties** option

OR

Click on  from the tool bar. The **Script Properties** window displays.

3. From the **Terminal** drop-down menu, select MK2200.
4. From the **Disks** drop-down menu, select the number of disk partitions to create.

✓ **NOTE** The options available under the disks drop-down menu changes depending on the flash type. Some flash types only have one option for the number of disk partitions, others have two options.

5. If selecting two or more partitions under the **Disk** drop-down menu, change the memory configuration of the two partitions if desired. Click on the up or down arrow for either partition to set the memory configuration to the desired value. As the one partition size is changed, the other partition changes accordingly.
6. For each disk partition, set the Read/Write access option.
7. The Script File Path displays the path of the selected script file.
8. Select a Cushion percentage from the **Cushion** drop-down menu to specify the percent of flash reserved for cushion. Choosing a higher number reduces disk storage space, but also increases write performance on fragmented disks or disks becoming full. To speed the writing process, select as high a number as storage needs permit (up to 25%).
9. Click **OK** to complete the settings.

Creating the Script for the Hex Image

On start-up, TCM displays the screen shown in [Figure F-1 on page F-2](#), with the Script1 window and File Explorer window pointing to the following directory:

C:\Program Files\Symbol Device Configuration Packages\MK2000cXX\vX.X\TCMScripts

The Script1 window directory pane displays three partitions: Platform, Application, and Data. Files can be added to each of the partitions. TCM functionality includes:

- Creating a new script file or open an existing script
- Dragging and dropping existing files and directories to that script
- Setting the script parameters
- Saving the script
- Reviewing and modifying the script.

Open a New or Existing Script

Scripts are created in the Script Window. To open a new script:

- Choose **New** from the **File** menu, OR
- Click on  from the tool bar.

To open an existing script (e.g., a standard script provided in the DCP):

- Choose **Open** from the **File** menu and select the script file name, OR
- Click on  from the toolbar and select the script file name, OR
- Double-click on an existing script in the Script Browser window.

✓ **NOTE** Saving changes made to an existing script overwrites the original script. To use an original or Symbol-supplied standard script as a base and save the changes in a new script, use Save As instead of Save after making the changes and save to a different file name.

Copying Components to the Script

To copy files or directories to the script being generated:

1. Click on the File Explorer Window to make it the active window.
2. Click on the source directory in the Directory Tree Pane. TCM displays the directory contents in the Contents Pane.
3. Click on the file(s) and/or directory in File Explorer.

✓ **NOTE** Optionally, use the standard Windows® Shift+Left-tap and Control+Left-tap features to select multiple files and directories.

4. Drag and drop the selected file(s) and/or directory from File Explorer to the target directory in the Script Window,
OR
Click on the target directory and select the File Explorer Copy icon from the toolbar.

Saving the Script

To save changes to a new script:

1. From the **File** menu, choose **Save As**,
OR

On the toolbar, click  .

2. Enter the path and filename. TCM appends a .TCM extension to the script.
3. Click **OK**.

✓ **NOTE** TCM by default saves untitled scripts to the directory that the Script Browser is pointing to.

To save changes to an existing script:

- From the **File** menu, choose **Save**, OR
- On the toolbar, click  .

✓ **NOTE** Saving changes to an existing script overwrites the original script.

To use an original or Symbol-supplied standard script as a base and save the changes in a new script, use **Save As** instead of **Save** after making the changes and save to a different file name.

Building the Image

Before building the image, TCM checks the script to verify that all files referenced in the script exist.

✓ **NOTE** Performing a check is more important for existing scripts to ensure that files referenced in the script are still in the designated locations.

To check a script:

1. In the Script Window, select the script.
2. Save the script, if not already saved.
3. From the **Script** menu, choose **Check**,
OR

On the toolbar, choose  .

4. TCM verifies that files referenced in the script exist on available drives and lists an error message in the Errors found box for any missing files.
5. Click **OK** to exit.

To build a script:

1. In the Script Window, select the script to be built.
2. From the **Script** menu, select **Build**,
OR

On the toolbar, choose  . The Configure Build window displays.

3. Select the item to build. If an application is selected to build, specify the application.
4. Select Compression for the hex image, which reduces the size of most hex images to speed downloading. Click **OK**.
5. TCM performs a check. If the script has no errors, TCM builds the partition which can be transferred using IPL to the MK2200 as a hex file.

If the build fails, TCM displays a message indicating which file(s) are missing.

If the amount of flash required by the script exceeds the image size, a TCM error results. To correct this, reduce the number of files in the partition. See [Defining Script Properties on page F-4](#) for more information on setting the image size.

Sending the Hex Image

After building the hex file, download it to the device using IPL. See [IPL Menu Navigation on page G-3](#) for detailed procedures.

Saving the Script

Save the script if changes were made since last saving it.

TCM Error Messages

Select the **Execute** button to validate the cells in the partition table. Cells highlighted in red contain an error. Partition loading is disabled until all errors are corrected. Following are errors that TCM can encounter and possible solutions.

Table F-2 TCM Error Messages

Error	Description/Solution
Failed to build images: flash file system DLL not loaded!	TCM could not load the DLL required to build images for the target flash file system. Reinstall TCM or recover the DLL.
Failure finding directory xxx	Build process failed because directory xxx was not found.
Failure creating volume	Build process failed because a certain disk volume could not be created.
Failure adding system file to image	Build process failed because TCM failed to add a certain system file to the disk image.
INVALID PATH	The path for the image file to build is not valid.
Nothing Selected To Build	In the Config Build window, no item is selected to build.
Disk Full	TCM failed to create Hex image file at the selected path. Check available disk space.
Target Disk Full	Build process failed because TCM failed to add file to the image of a disk volume. Remove some files or increase the disk size.
Hex file is READ ONLY	The Hex image file to be created exists and is read-only. Delete the existing file or change its attribute.
Error opening the file xxx with write access	TCM could not open file xxx with write access. Check if file is in use.
Failure creating binary file	TCM failed to open/create an intermediate binary file.
Hex File To load is missing or invalid	In Load Terminal window, the file selected to load has invalid status.
Could not locate device name in TCM.ini file	While loading the Script Properties window, TCM could not find the TCM.ini section corresponding to the device type specified by the current opening script. Either TCM.ini or the script file is invalid.
Incorrect disk sizes in TCM.ini file	The total disk size specified in the script does not match the total disk size defined in the corresponding TCM.ini section. Check if the script is corrupt or the TCM.ini changed after the script was created.

Table F-2 TCM Error Messages (Continued)

Error	Description/Solution
INVALID DIRECTORY	In Script Properties window, the selected System File Path is not a valid directory.
One of the disk sizes is one sector in size	In Script Properties window, one of the disks is too small (one sector in size). This can cause problems when building images, especially when cushion is enabled. Increase the disk size.
INVALID VOLUME NAME	In Script Properties window, one of the volume labels is not valid.
Corrupt TCM.INI file! (Invalid value of VolumeDivisor)	The VolumeDivisor entry is missing or invalid in the TCM.ini. Reinstall TCM or recover TCM.ini.
Invalid version of TCM script file	The TCM script was not created by this version of TCM.
Corrupt or missing TCM.ini file	TCM could not find TCM.ini file.
FAILED CONNECTION TO COM PORT (Could not get status)	While downloading images to device, TCM failed to connect to the selected COM port. Ensure the COM port is free and properly configured.
FAILED CONNECTION TO TERMINAL (Terminal Not Connected Properly/Terminal Not Ready to Receive)	While downloading images, TCM failed to connect to the device. Ensure the correct flow control protocol is set, and the device is properly connected and in a listening state.

Creating a Splash Screen

The **Splash** screen appears briefly when the device cold boots. To generate a custom **Splash** screen, use a bitmap editor, such as **Paintbrush**.

Creating a Splash Screen on Color Terminals

1. Create an 8 or 16-bit color bitmap with dimensions of BX x BY where:
 - BX is less than or equal to 640 pixels
 - BY is less than or equal to 480 pixels
2. Choose **Build**, then check at least the **Splash** screen item. Build other partition images if desired. Click **OK**.
3. Select the source file for the splash screen (the bitmap created above) on the **File Open** window.
4. Specify the output filename for the splash screen on the **Save As** file window.
TCM creates the splash screen HEX file and any other HEX files requested.

✓ **NOTE** The MK2200 ignores images larger than 640 x 480, in either dimension, or that are not 8 or 16-bit color. Images smaller than 640 x 480 are centered in the display.

Appendix G OS Upgrade Procedures

Overview

MK2200 operating system upgrade procedures enable software updates and/or feature enhancements. This appendix provides upgrading instructions using a PC card and the Initial Program Loader (IPL).

To upgrade the MK2200 operating system:

1. Review [Upgrade Requirements on page G-1](#).
2. Perform [Monitor Upgrade on page G-4](#).
3. Perform [Partition Table Upgrade on page G-6](#).
4. Perform [Command File Upgrade on page G-7](#).

Upgrade Requirements

Hardware Requirements

- PC card with the appropriate upgrade files.

✓ **NOTE** Symbol recommends using a freshly formatted PC card for storing the upgrade files. Format the PC card using the FAT file system in the host computer, then copy the upgrade files to the PC card. The upgrade may fail if the PC card contains a corrupt file system.

The PC card uses the same slot as the RF radio card. Removing the RF radio card is not recommended.

- ESD mat and equipment required to properly ground the operator.



CAUTION When removing an access cover, follow proper ESD precautions to avoid damaging sensitive components. These include, but are not limited to, working on an ESD mat and ensuring that the operator is properly grounded. Failure to apply proper ESD precautions can damage the MK2200 and void the warranty.

- ✓ **NOTE** The MK Series includes two different platforms and operating files based on operating systems for the MK2200 (wired) versus the MK2250 (RF).

Software Requirements

The files required to upgrade the MK2200 include:

- Command file for the MK2200:
 - PC_MK2200_XXX.mcf
- Command file for the MK2250:
 - PC_MK2250_XXX.mcf
- The following partition files:
 - Monitor file: 22xxc42Monxxxx.bgz
 - OS file: 22xxc42OSxxxxxx.bgz
 - Platform file: 22xxc42Plat64Mxxx.hex
 - Partition Table file: 22xxc42Pt64Mxxx.hex
 - Splash Screen file: 22xxc42cSplxxx.hex

Procedural Requirements

- [Monitor Upgrade on page G-4](#)
- [Partition Table Upgrade on page G-6](#)
- [Command File Upgrade on page G-7](#)

IPL Menu Navigation

IPL is a menu-based method of downloading partitions to non-volatile storage (flash) on the MK2200. You can download the following partitions:

- OS Partition
- Platform Partition
- Application Partition
- Partition Table
- Splash Screen
- Monitor.

Use the MK2200 buttons to navigate IPL menus and make selections. The buttons and their functions are shown in [Figure G-1](#).

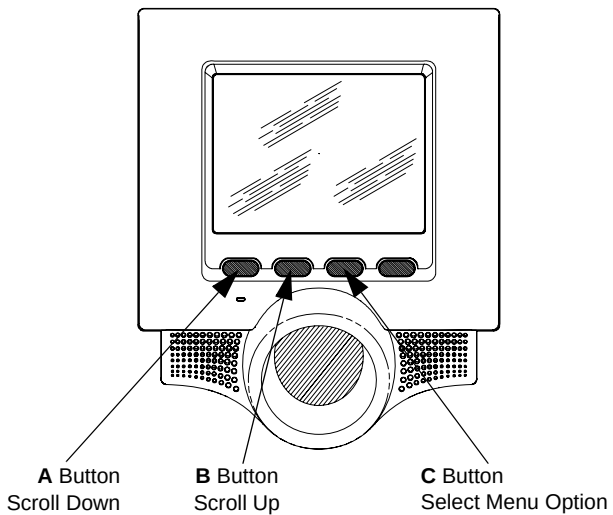


Figure G-1 *Button Functions*

OS Upgrade

To upgrade the MK2200 operating system using a PC card, see the following sections to perform monitor, partition table, and command file upgrades.

To begin the operating system upgrade:

1. Power off the MK2200.
2. Remove the PCMCIA access cover (see [Figure 1-2 on page 1-4](#)).
3. Insert the PC card into the PC card slot.

Monitor Upgrade

✓ **NOTE** A failure during the monitor upgrade can cause the MK2200 to become inoperable.

To perform a monitor upgrade:

1. Enter IPL mode by powering on the MK2200 while holding the **A** button. The **Initial Program Loader** main menu displays.

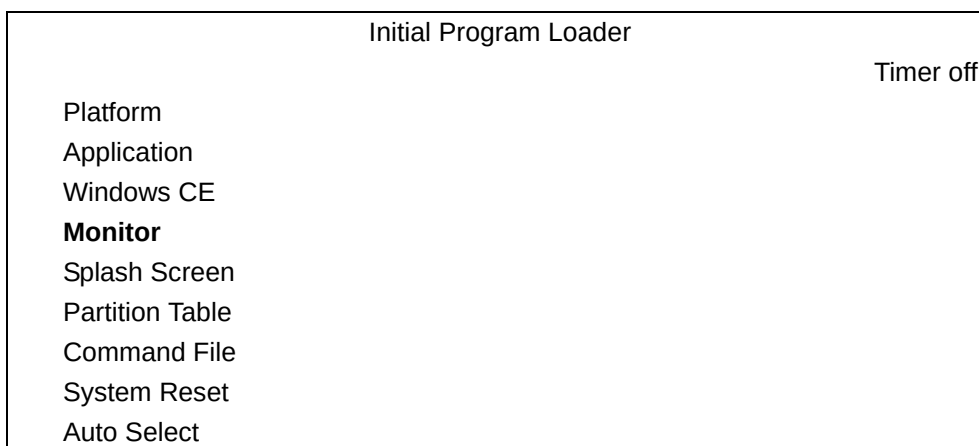


Figure G-2 IPL Main Menu

2. From the **Initial Program Loader** main menu, press the **A** or **B** button to highlight **Monitor**.
3. Press the **C** button to select **Monitor**. The **Select Transport** menu displays.

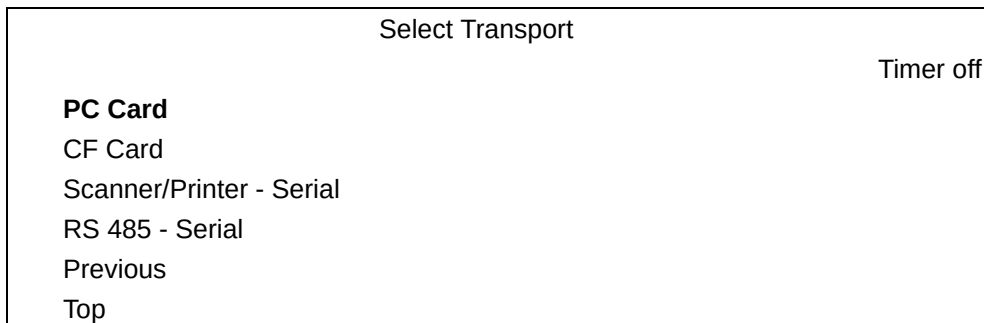


Figure G-3 Select Transport Menu

4. Press the **A** or **B** button to select the file media source and highlight **PC Card**.
5. Press the **C** button to select **PC Card**. The **Select File Name** menu displays.

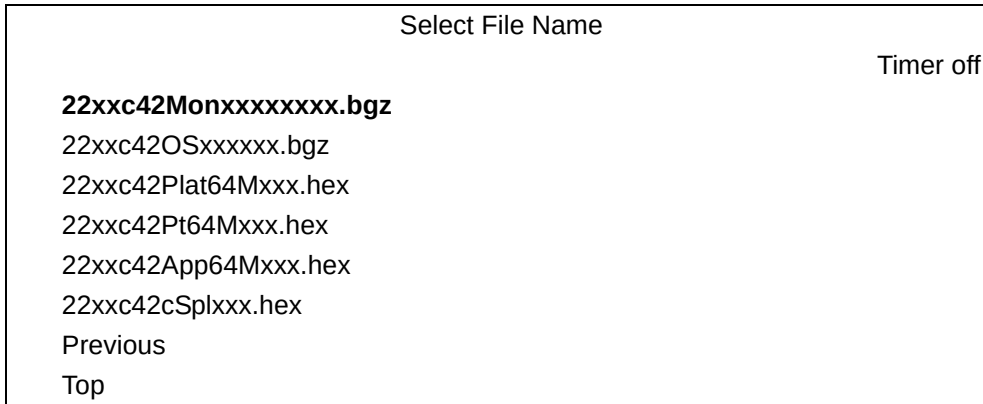


Figure G-4 Select File Name Menu

6. Press the **A** or **B** button to highlight the monitor upgrade file, **22xxc42Monxxxxxxx.bgz**.
7. Press the **C** button to select **22xxc42Monxxxxxxx.bgz**. The **Download File?** menu displays.

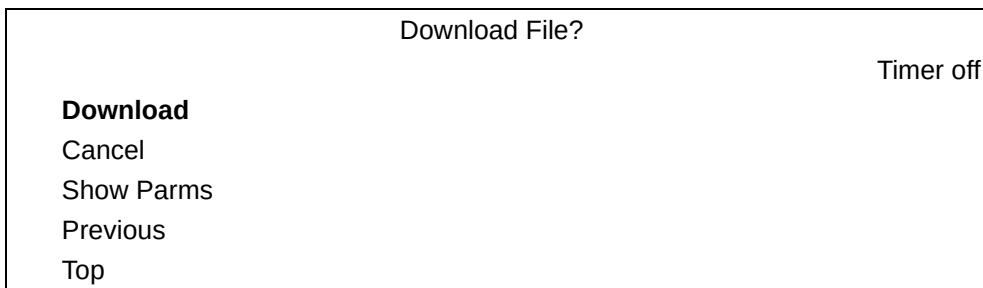


Figure G-5 Download File? Menu

8. Press the **A** or **B** button to highlight **Download**.
9. Press the **C** button to initiate the monitor file download.

When the monitor upgrade begins, the following message displays.

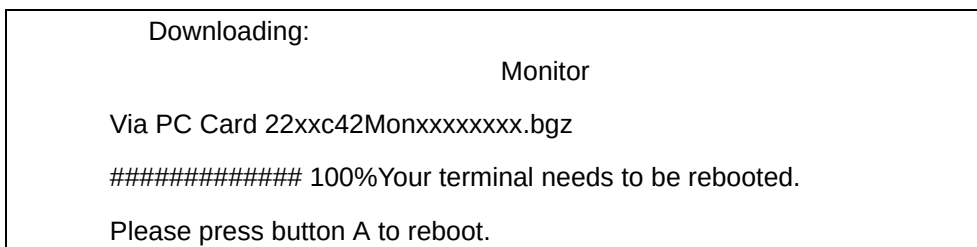


Figure G-6 Monitor Upgrade, Downloading Message

✓ **NOTE** If an error occurs, remove power from the MK2200 and restore power to reboot the MK2200. Hold the **A** button during the reboot. The IPL main menu displays. Repeat the Monitor upgrade procedure.

10. When the new monitor is successfully loaded, the MK2200 prompts to press a button, then reboots.

11. Continue the OS upgrade by holding the **A** button during the reboot to display the **IPL** main menu.
12. Proceed to [Partition Table Upgrade on page G-6](#).

Partition Table Upgrade

To perform a partition table upgrade:

1. From the **IPL** main menu, press the **A** or **B** button to highlight **Partition Table**.
2. Press the **C** button to select **Partition Table**. The **Select Transport** menu displays.

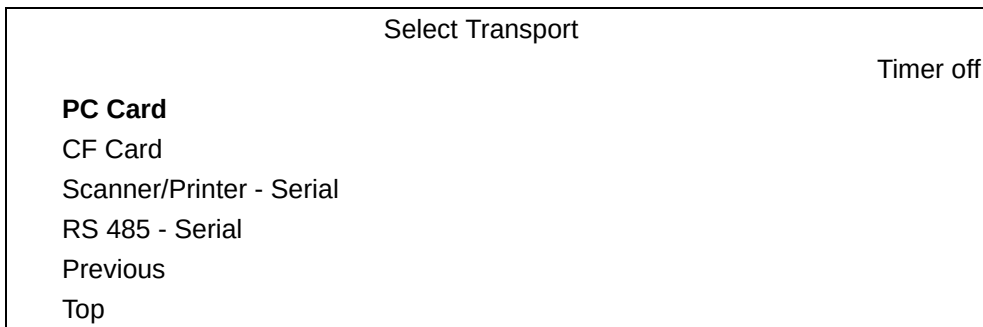


Figure G-7 Select Transport Menu

3. Select the file media source by pressing the **A** or **B** button to highlight **PC Card**.
4. Press the **C** button to select **PC Card**. The **Select File Name** menu displays.

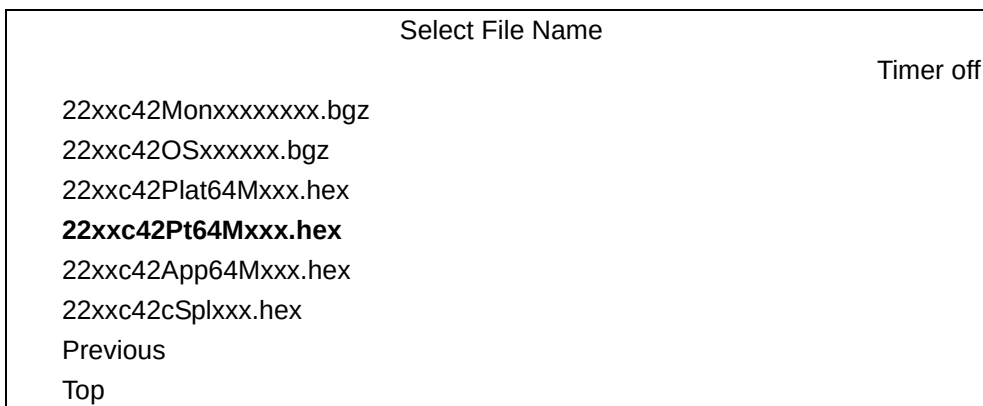


Figure G-8 Select File Name Menu

5. Press the **A** or **B** button to highlight the partition table upgrade file, **22xxc42Pt64Mxxx.hex**.

6. Press the **C** button to select **22xxc42Pt64Mxxx.hex**. The **Download File?** menu displays.

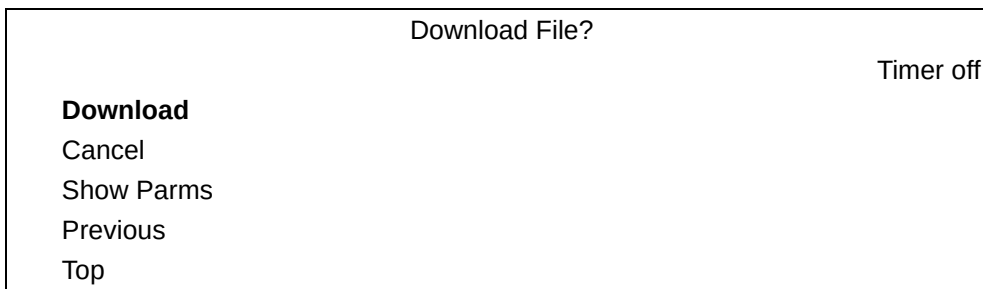


Figure G-9 *Download File? Menu*

7. Press the **A** or **B** button to highlight **Download**.
8. Press the **C** button to select **Download** and initiate the partition table upgrade. When the partition table upgrade begins, the following **Downloading** message displays.

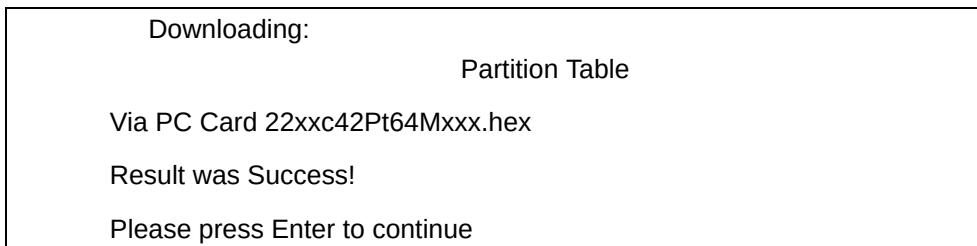


Figure G-10 *Partition Table Upgrade, Downloading Message*

✓ **NOTE** If an error screen displays, remove power from the MK2200 and restore power to reboot the device. Hold the **A** button during the reboot. The IPL main menu displays. Repeat the Partition Table upgrade procedure.

9. When the message **Please press Enter to continue** displays, reboot the device to continue the OS upgrade and proceed to [Command File Upgrade](#).

Command File Upgrade

To perform a command file upgrade:

1. From the **IPL** main menu, press the **A** or **B** button to highlight **Command File**.
2. Press the **C** button to select **Command File**. The **Select Transport** menu displays.

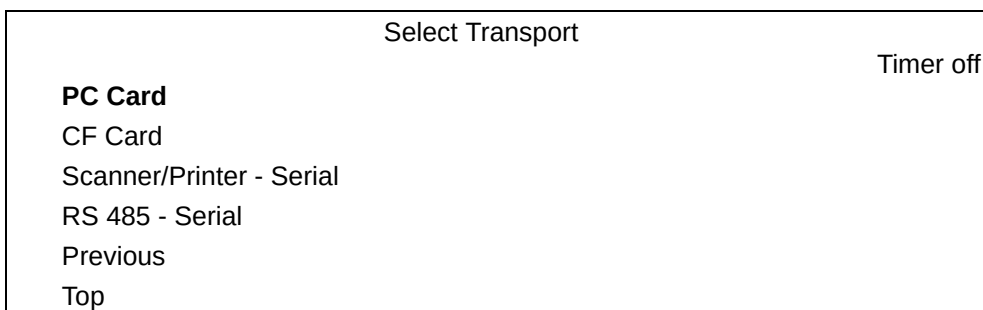


Figure G-11 *Select Transport Menu*

3. Select the file media source by pressing the **A** or **B** button to highlight **PC Card**.
4. Press the **C** button to select **PC Card**. The **Select File Name** menu displays.



Figure G-12 *Select File Name Menu*

5. Select the command file by pressing the **A** or **B** button to highlight the appropriate file to download.

✓ **NOTE** If the mon> error message displays, remove power from the MK2200 and restore power to reboot the device. Hold the **A** button during the reboot. The IPL main menu displays. Repeat the Command File upgrade procedure.

6. Press the **C** button to select the file. The **Download File?** menu displays.

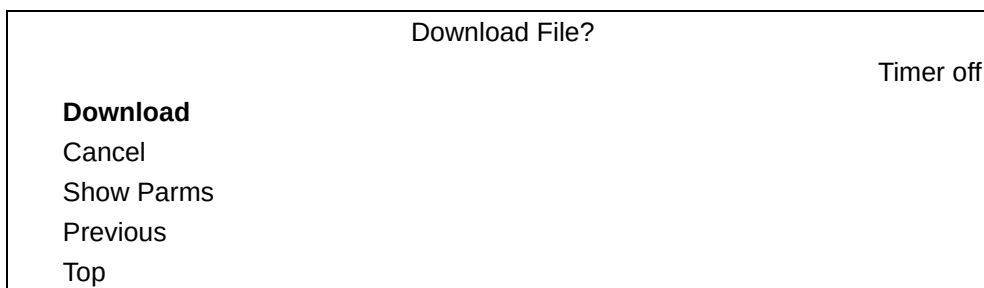


Figure G-13 *Download File? Menu*

7. Press the **A** or **B** button to highlight **Download**.
8. Press the **C** button to select **Download** and initiate the command file upgrade. When the partition table upgrade begins, the following **Downloading** message displays.

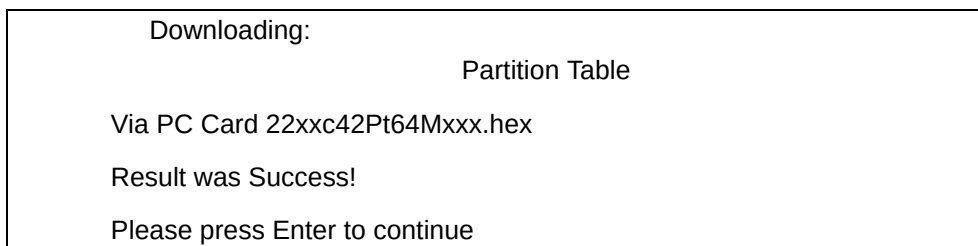


Figure G-14 *Partition Table Upgrade, Downloading Message*

9. When the command file upgrade begins, the following message displays.

```

Downloading:
                                Command File
Via PC Card CF_MK2200_XXX.mcf
Obtaining script file from given transport . . .
##### 100%
Begin script execution
-----
Partition Table
##### 100%
Download complete
in 0.656 seconds
(12487 bytes/second)
-----
Splash Screen
##### 100%
Download complete
in 3.257 seconds
(94131 bytes/second)
-----
Platform
##### 100%
Download complete
in 14.337 seconds
(365000 bytes/second)
-----
Application
##### 100%
Download complete
in 39.38 seconds
(718000 bytes/second)
-----
##### 100%Your terminal needs to be rebooted.
Please press button A to reboot.

```

Figure G-15 Command File Upgrade, Downloading Message



NOTE If an error screen displays, remove power from the MK2200 and restore power to reboot the device. Hold the **A** button during the reboot. The IPL main menu displays. Repeat the Command File upgrade procedure.

10. Press and release button **A** to perform a warm boot. When the desktop displays, remove power from the MK2200. Remove the PC card and replace the PC access cover (see [Figure 1-2 on page 1-4](#)).

Calibrating the Screen

Use the **Calibration** screen to align the touch screen:

1. Remove and restore power to the MK2200 to reboot.
2. From the **Windows CE Desktop** window, press buttons **A**, **C**, and **D** simultaneously to display the **Calibration** screen.

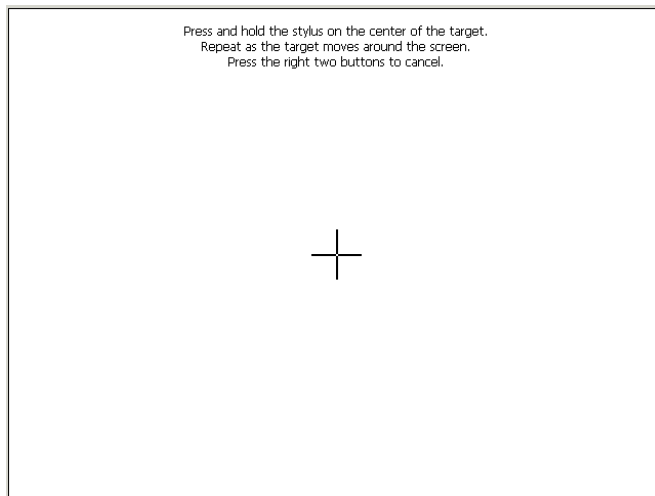


Figure G-16 Calibration Screen



NOTE To access the **Calibration** screen from the Windows CE Control Panel, tap **Start > Settings > Control Panel**. Double-tap the **Stylus** icon, tap the **Calibration** tab, and tap the **Recalibrate** button. The **Calibration** screen displays.

3. Carefully press and briefly hold the stylus tip on the center of the **Calibration** screen target. Repeat the procedure as the target moves and stops at different locations on the screen.
4. The **Confirm Calibration Resave** screen displays. Press the left two buttons (**A** and **B**) to accept the new settings or press the right two buttons (**C** and **D**) to retain the existing calibration settings.



Figure G-17 Save Settings, Calibration Screen

Update Corona Scanner Engine Firmware

Unzip ScanflashVX.X_CE4.x.zip file and copy its contents to the root "\\" directory on the MK2200 device. The zip file contains:

- Corona scanner firmware binary image file (*.FDL)
- ScanFlash.exe
- ScanFlash.bat.

Execute the ScanFlash.bat file to update the Corona Scanner Engine firmware.

✓ **NOTE** Do not disrupt power to the MK2200 while updating scanner engine firmware. Doing so can damage the scanner engine.

Appendix H Troubleshooting

Overview

The MK2200 troubleshooting is provided in three sections:

- [Troubleshooting on page H-2](#) offers troubleshooting scenarios for the MK2200.
- [OS Upgrade Troubleshooting on page H-6](#) provides OS upgrade troubleshooting scenarios for the MK2200.
- [MK2200 Version Information on page H-7](#) describes how to identify the MK2200 version.

Troubleshooting Notes

When configuring the MK2200 System Menu screens, save and reboot the MK2200 to apply the changes. To save some Control Panel changes across cold boot cycles, on the MK2200, select **Start > Programs > Save Configuration** (see [Control Panel Configuration Parameters on page 3-23](#)).

Troubleshooting

- [MK2200 does not turn on on page H-2](#)
- [MK2200 appears to lock up upon bootup on page H-2](#)
- [MK2200 does not respond to polls from the host computer on page H-2](#)
- [MK2200 does not send data to host computer on page H-3](#)
- [Web Kiosk Software Suite does not work after making changes to the MK2200 on page H-3](#)
- [Scanner does not recognize configuration bar codes on page H-3](#)
- [Parameter changes made using System Menu were not retained after the MK2200 was re-booted on page H-3](#)
- [Reg file values are not copied into the Registry at boot time on page H-3](#)
- [The screen does not respond to pen input on page H-3](#)
- [AirBeam fails to start; abstart.exe crashed at boot up on page H-3](#)
- [Need to determine a device MAC address on page H-3](#)

- *The wireless MK2200 does not retain its WEP Key encryption after a reboot on page H-4*
- *The Mobile Companion icon does not appear in the task tray on page H-4*
- *When downloading files to the MK2200 from a .zip file using ActiveSync, a message displays indicating there is not enough free disk space to copy the application on page H-4*
- *When downloading a large file over ethernet, IE issues an insufficient memory message on page H-4*
- *When upgrading using a PC card, the MK2200 cannot find files on the PC card on page H-4*
- *Flash file system is corrupt on page H-5*
- *Copying large amount of files from PC card to the application folder fails with error "Access is denied" on page H-5*

Table H-1 Troubleshooting

Problem	Possible Causes	Possible Solutions
MK2200 does not turn on	No power to the MK2200.	• Power through AC outlet • Connect the Symbol approved power supply to an AC power source and to the MK2200 power connector. See Figure 1-3 on page 1-5. • Power through power-over-Ethernet • Connect 8-wire Ethernet cable to MK2200 LAN port. • Connect other end of Ethernet cable to Bias-T Power-Over-Ethernet (POE). • Connect Bias-T POE power supply to an AC outlet. • Perform continuity check on the Ethernet cable.
MK2200 appears to lock up upon bootup	A utility with no user interface was specified as the first user application, or user application failed to run.	Either specify no user application, or a UI-based application as the first user application. If no user application is specified, Explorer.exe is used. Note: this is a substitution of Explorer.exe as the user application, not protected mode.
MK2200 does not respond to polls from the host computer	No communication between the host and MK2200.	Check cables to the MK2200. Ensure the MK2200 address is the address the host is polling. Check communication parameters. Open a command window using Start > Programs > Command and type ipconfig to list the status of all radio and ethernet interfaces.

Table H-1 Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
MK2200 does not send data to host computer	MK2200 is not programmed to work with the host.	Check setup communication parameters.
	MK2200 is not connected to the host.	Check cables to host computer.
Web Kiosk Software Suite does not work after making changes to the MK2200	Web Kiosk Software Suite parameter settings inconsistent with latest program changes and/or corrupt files.	Locate and delete the files associated with the Web Kiosk Software Suite (in the My Computer/Application folder). Then reload the files associated with the Web Kiosk Software Suite. See Installing the Web Kiosk Software Suite on page 6-3 .
Scanner does not recognize configuration bar codes	The scan driver does not support parameter bar code scanning.	Configure the scanner using scanning C API or Active X scanner object.
Parameter changes made using System Menu were not retained after the MK2200 was re-booted	Parameter changes were not saved.	See Setting Defaults Using the System Menu on page 3-5 .
Reg file values are not copied into the Registry at boot time	More than one .reg file and duplicate registry entries are present.	Review all .reg files in /Application and /Platform and ensure they have no conflicts.
The screen does not respond to pen input	The screen is not properly calibrated, or is off center.	See Stylus Settings/Touch Screen Calibration on page 3-27
AirBeam fails to start; abstart.exe crashed at boot up	System Menu or RDM is used to enable DHCP receive options.	Do not use the System Menu or RDM to enable DHCP receive options 1, 3, 6, 15, 44, 46, 47, 66, and 67. They are already enabled in dhcptions.reg as a part of the AirBeam package. Refer to AirBeam documentation for this configuration.
Need to determine a device MAC address	N/A	Open Start > Programs > CommandPrompt . Type ipconfig /all to display the MAC address next to 'address'.

Table H-1 Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
The wireless MK2200 does not retain its WEP Key encryption after a reboot	Encryption keys not saved in Aegis.reg or Spectrum24.reg.	Set encryption keys using Mobile Companion, then select Start > Tools > Save Spectrum24 or Start > Tools > Save Aegis Settings to save them to Aegis.reg / Spectrum24.reg. Check communication parameter settings. Open a command window using Start > Programs > Command and type ipconfig to list the status of all radio and ethernet interfaces.
The Mobile Companion icon does not appear in the task tray	Poor RF card connection or bad RF card.	Remove the PCMCIA card cover (see Installing/Removing the RF Card on page 2-21). Press the card ejector button to release the card, then press the card back into its connector to secure it in place. Reboot the MK2200. If the Mobile Companion icon still does not appear in the task tray, replace the RF card.
	The radio software is not present in the \platform folder.	Verify presence of radio software or re-install \Platform partition software.
When downloading files to the MK2200 from a .zip file using ActiveSync, a message displays indicating there is not enough free disk space to copy the application	Files cannot download directly from a .zip file.	Extract/unzip the files to the host computer, then transfer the unzipped files to the MK2200 using ActiveSync.
When downloading a large file over ethernet, IE issues an insufficient memory message	For some file types, IE requires free RAM equivalent to twice the file's size.	This is an IE limitation.
When upgrading using a PC card, the MK2200 cannot find files on the PC card	The PC card is not formatted properly for the MK2200.	Format the PC card as FAT16.

Table H-1 *Troubleshooting (Continued)*

Problem	Possible Causes	Possible Solutions
Flash file system is corrupt	Reset or power loss during write to file system.	Format file system partition using Start > Settings > Control Panel > Storage Manager , and re-install partition data.
Copying large amount of files from PC card to the application folder fails with error "Access is denied"	Archive bit of the folder properties set.	Clear the archive bit of folder properties.
When using SaveConfig to save settings and cycling power before the Save Complete message appears, the device does not boot properly. Similarly, when using ActiveX or C API to save configurations, the device does not boot properly.	Corrupt mkconfig.reg file.	Use ActiveSync to delete the existing mkconfig.reg file or use Monitor to repartition the Application partition.

If problems still occur, see [MK2200 Version Information on page H-7](#) for system information before calling for service help.

OS Upgrade Troubleshooting

- [Monitor Upgrade Troubleshooting on page H-6.](#)
- [Partition Table Upgrade Troubleshooting on page H-6](#)
- [Command File Upgrade Troubleshooting on page H-6](#)

✓ **NOTE** If OS upgrading repeatedly fails when using a PC card, use the Fat-16 system to format the PC card before saving the upgrade files.

Table H-2 OS Upgrade Troubleshooting

Problem	Possible Causes	Possible Solutions
Monitor Upgrade Troubleshooting		
Downloading Message, error screen	Monitor upgrade error.	Remove power from the MK2200, and restore power to reboot the MK2200. Hold the A button during the reboot. The IPL main menu displays. Repeat the monitor upgrade procedure.
MK2200 does not boot after performing a monitor update	Monitor upgrade failure.	Failures during the monitor upgrade often render the MK2200 inoperable. If the MK2200 does not boot after performing a monitor update, contact Symbol Support.
Partition Table Upgrade Troubleshooting		
Downloading Message, error screen	Partition table upgrade error.	Remove power from the MK2200, and restore power to reboot the MK2200. Hold the A button during the reboot. The IPL main menu displays. Repeat the partition table upgrade procedure.
Data Abort Exception Error	Partition table upgrade error.	Remove power from the MK2200, and restore power to reboot the MK2200. Hold the A button during the reboot. The IPL main menu displays. Repeat the partition table upgrade procedure.
Command File Upgrade Troubleshooting		
The mon> error message displays	Command file upgrade error.	Remove power from the MK2200, and restore power to reboot the MK2200. Hold the A button during the reboot. The IPL main menu displays. Repeat the partition table upgrade procedure.

MK2200 Version Information

If an MK2200 is configured to launch an application on power-up, bypass this upon booting to access the Windows® CE Desktop. See [Accessing the Windows® CE Desktop on page 8-7](#).

1. From the Windows® task bar, select **Start > Settings > Control Panel**.
2. Select **MK2200** identification from the Control Panel window to view the following information:
 - Device name
 - Description
 - OS version
 - Monitor version
 - Display type
 - Memory sizes.

The Remote Device Manager (RDM) provides more detailed version information. See [Monitoring MK2200s on a Network on page 4-15](#).

Appendix I Setting Scanner Parameters

Overview

This chapter describes the scanning default parameters for the MK2200, useful when developing applications that control the MK2200 scan engine.

Enabling and Disabling Symbologies

See the following for information on where to find programming examples for enabling and disabling symbologies.

C API

Refer to the file **scan.c** in Samples\EVC\Standard\Common in the SMDK for eVC4. See the functions **ScanEnableDecoder** and **ScanDisableDecoder**, which enable and disable a single symbology using the scanner C API functions.

ActiveX API (Browser Applications)

Refer to the file **scanframe.html** in the Web Kiosk Software Suite. See the subroutine **SetLaserMode** which enables and disables symbologies based on whether 2D scanning is enabled.

Default Table

[Table I-1](#) lists the default values for the MK2200 SE 3223 Scan Engine. If desired, change these values within an application, and in the case of HTML (browser) applications, set them independently for each web page.

To change the settings in an application, refer to the *MK2000 SMDK for C*. See the *scanparams* sample application in the SMDK.

For a sample HTML application that includes source code and demonstrates scan engine control, see [Chapter 6, Web Kiosk Software Suite](#).

Table I-1 *Scanning Default Table*

Parameter	Parameter Number	Default
Scanning Options		
Beeper Tone	91h	High Frequency
Laser On Time	88h	5.0 sec
Power Mode	80h	Continuous
Trigger Mode	8Ah	Host
Scanning Mode	8Dh	Smart Raster
Aiming Mode	F0h 7Eh	Disabled
Raster Height	E4h	100
Raster Expansion Rate	E5h	11
Time Delay to Low Power	92h	30 sec
Time-out Between Same Symbol	89h	0.9 sec
Time-out Between Different Symbols	90h	0.0 sec
Beep After Good Decode	38h	Enable
Transmit "No Decode" Message	5Eh	Disable
Parameter Scanning	ECh	Disable
Linear Code Type Security Levels	4Eh	2
Bi-directional Redundancy	43h	Disable
UPC/EAN		
UPC-A	01h	Enable
UPC-E	02h	Enable
UPC-E1	0Ch	Disable
EAN-8	04h	Enable
EAN-13	03h	Enable
Bookland EAN	53h	Disable
Decode UPC/EAN Supplementals	10h	Ignore
Decode UPC/EAN Supplemental Redundancy	50h	5
Transmit UPC-A Check Digit	28h	Enable

Table I-1 Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Transmit UPC-E Check Digit	29h	Disable
Transmit UPC-E1 Check Digit	2Ah	Disable
UPC-A Preamble	22h	System Character
UPC-E Preamble	23h	No Preamble
UPC-E1 Preamble	24h	No Preamble
Convert UPC-E to A	25h	Disable
Convert UPC-E1 to A	26h	Disable
EAN-8 Zero Extend	27h	Disable
UPC/EAN Security Level	4Dh	0
Linear UPC/EAN Decode	44h	Enable
UPC Half Block Stitching	4Ah	Disable
UPC Composite Mode	F0h 58h	Never Linked
Code 128		
Code 128	08h	Enable
UCC/EAN-128	0Eh	Enable
ISBT 128	54h	Enable
Code 128 Decode Performance	48h	Enable
Code 128 Decode Performance Level	49h	Level 1
Code 39		
Code 39	00h	Enable
Trioptic Code 39	0Dh	Disable
Convert Code 39 to Code 32	56h	Disable
Code 32 Prefix	E7h	Disable
Set Length(s) for Code 39	12h 13h	Length within Range: 0-55
Code 39 Check Digit Verification	30h	Disable
Transmit Code 39 Check Digit	2Bh	Disable
Code 39 Full ASCII Conversion	11h	Disable
Code 39 Decode Performance	46h	Enable

Table I-1 Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Code 39 Decode Performance Level	47h	Level 1
Code 93		
Code 93	09h	Disable
Set Length(s) for Code 93	1Ah 1Bh	Length within Range: 0-55
Interleaved 2 of 5		
Interleaved 2 of 5	06h	Disable
Set Length(s) for I 2 of 5	16h 17h	1 Discrete Length: 14
I 2 of 5 Check Digit Verification	31h	Disable
Transmit I 2 of 5 Check Digit	2Ch	Disable
Convert I 2 of 5 to EAN 13	52h	Disable
Discrete 2 of 5		
Discrete 2 of 5	05h	Disable
Set Length(s) for D 2 of 5	14h 15h	1 Discrete Length: 14
Codabar		
Codabar	07h	Enable
Set Lengths for Codabar	18h 19h	Length within Range: 06-55
CLSI Editing	36h	Disable
NOTIS Editing	37h	Disable
MSI Plessey		
MSI Plessey	0Bh	Enable
Set Length(s) for MSI Plessey	1Eh 1Fh	Length Within Range: 04 - 55
MSI Plessey Check Digits	32h	One
Transmit MSI Plessey Check Digit	2Eh	Disable
MSI Plessey Check Digit Algorithm	33h	Mod 11/Mod 10

Table I-1 Scanning Default Table (Continued)

Parameter	Parameter Number	Default
PDF417/MicroPDF417		
PDF417	0fh	Enable
MicroPDF417	E3h	Enable
Code 128 Emulation	7Bh	Disable
RSS		
RSS-14	FOh 52h	Enabled
RSS Limited	FOh 52h	Enabled
RSS Expanded	FOh 52h	Enabled
Data Options		
Transmit Code ID Character	2Dh	None
Prefix/Suffix Values		
Prefix	69h	NULL
Suffix 1	68h	CR
Suffix 2	6Ah	LF
Scan Data Transmission Format	EBh	Data as is
Simple Serial Interface (SSI) Options		
Baud Rate	9Ch	38400
Parity	9Eh	None
Check Parity	97h	Enable
Software Handshaking	9Fh	ACK/NAK
Decode Data Packet Format	EEh	Packeted
Stop Bit Select	9Dh	1
Intercharacter Delay	6Eh	0
Host Serial Response Time-out	9Bh	2 sec
Host Character Time-out	EFh	200 msec
Event Reporting		
Decode Event	F0h 00h	Enable
Boot Up Event	F0h 02h	Enable
Parameter Event	F0h 03h	Enable

Table I-1 Scanning Default Table (Continued)

Parameter	Parameter Number	Default
Macro PDF		
Transmit Each Symbol in Codeword Format	Afh	Disable
Transmit Unknown Codewords	BAh	Disable
Escape Character	E9h	None
ECI		
Delete Character Set ECIs	E6h	Enable
ECI Decoder	E8h	Enable
Transmit Macro PDF User-Selected Field		
Transmit File Name	B0h	Disable
Transmit Block Count	B1h	Disable
Transmit Time Stamp	B2h	Disable
Transmit Sender	B3h	Disable
Transmit Addressee	B4h	Disable
Transmit Checksum	B6h	Disable
Transmit File Size	B5h	Disable
Transmit Macro PDF Control Header	B7h	Disable
Last Block Marker	B9h	Disable

Set Default Parameters

Scanning the below bar code sets the scan engine to the default settings listed in [Table I-1](#). After scanning this bar code, reboot the MK2200 to apply the settings.



SET DEFAULTS

Glossary

ACK/NAK.	ACK/NAK is the default software handshaking.
AirBeam Manager.	AirBeam Manager is a comprehensive wireless network management system that provides essential functions that are required to configure, monitor, upgrade and troubleshoot the Spectrum24® wireless network and its components (including networked terminals). Some features include event notification, access point configuration, diagnostics, statistical reports, auto-discovery, wireless proxy agents and monitoring of access points and mobile devices.
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.
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.
Decryption.	Decryption is the decoding and unscrambling of received encrypted data. Also see, Encryption and Key.
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 in 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. Also see, Decryption and Key.
ESD.	Electro-Static Discharge
ESS_ID.	Extended Service Set Identifier, defines the coverage area. Prior to the release of the 802.11 specification the ESS_ID was called the Net_ID or Network Identifier. ESS_ID: 32 Alphanumeric characters, (case sensitive).
Flash Memory.	Flash memory is responsible for storing the system firmware and is non-volatile. If the system power is interrupted the data will not be lost.
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 an IP network. Every client and server station must have a unique IP address. A 32-bit address used by a computer on a 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.
Key.	A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, Encryption and Decrypting.
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.
MU.	The MU (Mobile Unit) searches for APs with the same ESS_ID and associates with an AP to establish communications.
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.
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).
Open System Authentication.	Open System authentication is a null authentication algorithm.
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.
Protected Mode.	An application can be assigned password protection so that it can only run when a password is entered. The password can be assigned for a specific application using the RDM, System Menu or the Control Panel.
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.
SMDK.	Symbol Mobility Developer Kit
Self-Checking Code.	A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol.
Shared Key.	Shared Key authentication is an algorithm where both the AP and the MU share an authentication key.
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.
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 firmware, 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 IP 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 using 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.

WEP.	Wired Equivalent Privacy, is specified by IEEE for encryption and decryption of RF (wireless) communications.
WNMP.	(Wireless Network Management Protocol) This is Symbol proprietary MAC layer protocol used for inter access point communication and other MAC layer communication.
WNMS (has been renamed to AirBeam Manager).	See AirBeam Manager

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