Intermec

User's Manual

CN2B Mobile Computer

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Document Change Record

This page records changes to this document. The document was originally released as version 001.

	Date	Description of Change
002	06/2006	Added Intermec Settings > Printers information, improved configuration information, adapted for RoHS compliance.

Contents

Before You Begin

This section provides you with safety information, technical support information, and sources for additional product information.

Safety Information

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

This section explains how to identify and understand dangers, warnings, cautions, and notes that are in this document.

A warning alerts you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Note: Notes either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

Global Services and Support

Warranty Information

To understand the warranty for your Intermec product, visit the Intermec web site at **www.intermec.com** and click **Service & Support**. The **Intermec Global Sales & Service** page appears. From the **Service & Support** menu, move your pointer over **Support**, and then click **Warranty**.

Disclaimer of warranties: The sample code included in this document is presented for reference only. The code does not necessarily represent complete, tested programs. The code is provided "as is with all faults." All warranties are expressly disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.

Web Support

Visit the Intermec web site at **www.intermec.com** to download our current manuals in PDF format. To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

Visit the Intermec technical knowledge base (Knowledge Central) at **intermec.custhelp.com** to review technical information or to request technical support for your Intermec product.

Telephone Support

These services are available from Intermec Technologies Corporation.

	Description	In the U.S.A. and Canada call 1-800-755-5505 and choose this option
Order Intermec products	• Place an order. • Ask about an existing order.	1 and then choose 2
Order Intermec media	Order printer labels and ribbons.	1 and then choose 1
Order spare parts	Order spare parts.	1 or 2 and then choose 4
Technical Support	Talk to technical support about your Intermec product.	2 and then choose 2
Service	• Get a return authorization number for authorized service center repair. • Request an on-site repair technician.	2 and then choose 1
Service contracts	• Ask about an existing contract. • Renew a contract. • Inquire about repair billing or other service invoicing questions.	1 or 2 and then choose 3

Outside the U.S.A. and Canada, contact your local Intermec representative. To search for your local representative, from the Intermec web site, click **Contact**.

Who Should Read This Document?

The *CN2B Mobile Computer User's Manual* is written for the person who is responsible for installing, configuring, maintaining, and troubleshooting the product.

Before you install and configure your product, you should be familiar with your network and general networking terms, such as IP address.

Related Documents

This table contains a list of related Intermec documents and part numbers.

Document Title	Part Number
CN2B Mobile Computer Quick Start Guide	962-054-053

The Intermec web site contains Intermec documents (in PDF) that you can download for free.

To download documents

1 Browse to www.intermec.com.

2 Click **Service & Support** > **Manuals**.

3 In the **Select a Product** field, choose the product whose documentation you want to download.

To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

Patent Information

This product is protected by one or more of the following patents:

4,455,523; 4,553,081; 4,709,202; 4,845,419; 4,961,043; 5,195,183; 5.216,233; 5,218,187; 5,218,188; 5,227,614; 5,241,488; 5,278,487; 5,322,991; 5,331,136; 5,331,580; 5,349,678; 5,397,885; 5,371,858; 5,373,478; 5,410,141; 5,488,575; 5,500,516; 5,504,367; 5,508,599; 5,530,619; 5,567,925; 5,568,645; 5,592,512; 5,598,007; 5,617,343; 5,627,360; 5,657,317; 5,671,436; 5,684,290; 5,777,309; 5,793,604; 5,805,807; 5,818,027; 5,821,523; 5,828,052; 5,831,819; 5,834,753; 5,841,121; 5,844,222; 5,883,492; 5,883,493; 5,886,338; 5,889,386; 5,898,162; 5,969,328; 5,986,435; 6,075,340; 6,109,528; 6,158,661; 6,234,395; 6,244,512; 6,330,975; 6,431,451; 6,497,368; 6,538,413; Des. 417,445.

There may be other U.S. and foreign patents pending.

1 Using the CN2B Computer

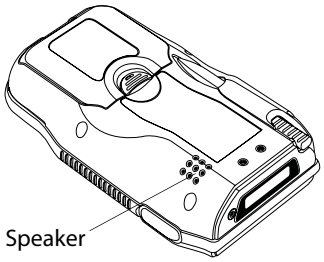
This chapter introduces the CN2B Mobile Computer, developed by Intermec to enhance wireless connectivity needs. This chapter contains hardware and software configuration information to assist you in making the most out of your CN2B Computer.

Note: Desktop icons and applet icons are shown to the left.

Audio System

Speaker

A speaker capable of variable volume levels is located on the back of the computer. This speaker has a transducer maximum volume of 85 dB at 10 cm, a frequency range of 1 to 8KHz, and a separate volume control.



Warning

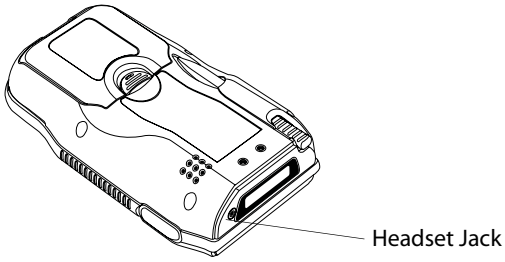
Warning: Do not place the speaker next to your ear when the speaker volume is set to "Loud" (maximum), or you may damage your hearing.

Microphone

The built-in microphone is located on the front, left corner of the keypad, to the left of the **BkSp** and ◄▭ key.

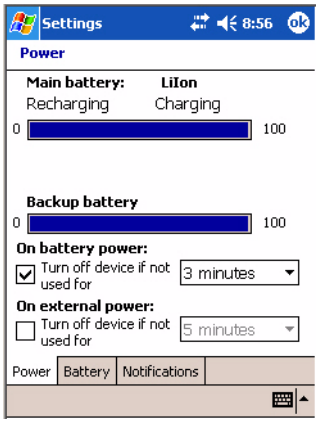
External Headset Jack

The external headset jack connects a mobile phone style headset to your mobile computer for use in noisy environments. The jack is a 2.5 mm, three-conductor jack, with autosensing of the headset jack insertion which disables the internal speaker and microphone. The external headset jack is located on the top of the mobile computer next to the scanner.



Battery

The CN2B Computer comes with an 7.95 Watt-hour, 3.7V, 2150mAh, replaceable LiIon battery. To view the status of this battery, tap **Start** > **Settings** > the **System** tab > the **Power** icon > the **Power** tab to view the current status of both the main battery and the backup battery. Tap **ok** to exit.



If your computer shuts down because of low battery conditions, your computer does not operate. This is done to ensure that data is protected. Although the battery does protect the data against loss for several hours, you should connect your computer to a power source when you first detect a low battery condition.

Your computer contains an internal supercapacitor, a temporary power storage device, that protects data for up to ten minutes. This is to give you time to replace the main battery pack before that data is lost. *Be sure to put the computer in a suspend mode before doing so.*

The lithium-ion battery pack that is used in this device may present a fire or chemical burn hazard if it is mistreated. Do not disassemble it, heat it above 100°C (212°F), or incinerate it.

Removing the main battery when the backup battery low or critically low icon appears on the status bar may cause your CN2B Computer to cold boot and you may lose data.

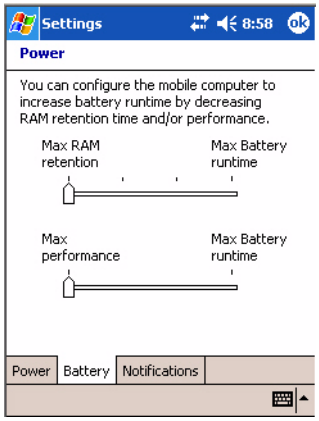
If you fail to replace the battery immediately, you may lose important data or applications.

If you have at least one device in your CN2B Computer (radio, scanner, or imager), the battery power fail level is set so that after the system shuts down in a low battery condition, there is still sufficient charge to allow the unit to remain configured, keep proper time, and maintain DRAM (Dynamic Random Access Memory) for at least 23 to 32 hours at room temperature *if* the main battery remains in the mobile computer.

The configuration and time are lost if:

- The battery discharges beyond this level.
- The battery is removed when the computer is *not in suspend mode.*
- A cold reset is performed on the computer.

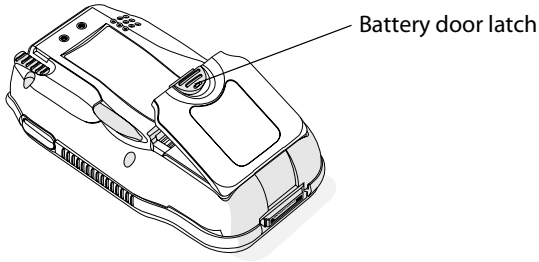
You can modify RAM maintenance in a limited way. On the CN2B Computer, tap **Start** > **Settings** > the **System** tab > the **Power** icon > the **Battery** tab. Drag the top slider bar to the left to change the suspend voltage to favor suspend time over rundown time, then click **ok** to exit.



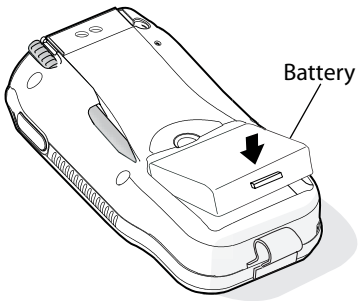
Installing and Charging the Battery

Make sure you fully charge the battery before you use your CN2B Computer. To charge the battery, you need to install it in the CN2B Computer.

1 Push down on the battery door latch, pull up on and remove the battery door, then set it aside.



2 Align the battery contacts, then slide the battery into the compartment. Press on the battery until it clicks in place, then replace the battery door.



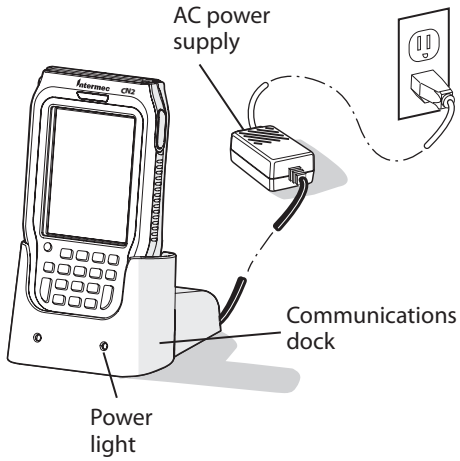
3 Connect the AC power supply to the power connector on the back of the CN2B Communications Dock, and then connect the power cord to the AC power supply.

Caution

You must use only the Intermec power supply approved for use with the CN2B Computer. Using any other power supply will damage the CN2B Computer.

Note: For help installing and using the communications dock, see the *CN2 Communications Dock Quick Start Guide* (P/N: 930-061-001), which shipped with the dock.

4 Connect the power cord to an AC power outlet. The green Power light on the CN2B Communications Dock turns on.



5 Place the CN2B Computer in the communications dock. The battery is fully charged in approximately four hours.

Removing the Battery

Follow these instructions to remove the battery from the CN2B Computer.

Caution

Only use either the stylus or the bottom tabs on the battery door to dislodge and remove the battery. Using any other tool or method to remove the battery may damage the battery or the CN2B Computer.

Caution

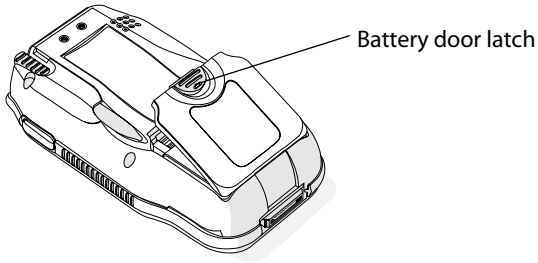
Removing the main battery when the backup battery low or critically low icon appears on the status bar may cause your CN2B Computer to cold boot and you may lose data.

Caution

If you fail to replace the battery immediately, you may lose important data or applications.

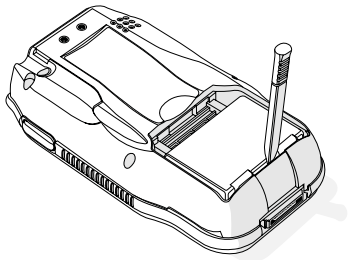
To remove the battery

1 Push down on the battery door latch, and pull up on the battery door.



2 Remove the battery door and set it aside.

3 Insert the stylus between the battery and the CN2B case, and press straight down until the battery is released.



4 Lift the battery out of the battery compartment.

Maximizing Battery Life

- Set the **Backlight Timeout** to 10 seconds.
- Verify that **Radio Power Management** is enabled (Fast PSP). Enabling radio power management allows your radio to switch between awake and sleep modes based on network traffic.
- Verify that each setting under **Power Management** has a value of 1 minute for a combined automatic shutoff time of 3 minutes.

Beeper

Note: Each time a cold-boot is performed on the CN2B Computer, all default settings are restored unless registry storage is enabled. See page 193 for information about enabling the registry storage.

To learn how to set volume levels for screen taps, ActiveSync alert noises, etc., tap **Start** > **Help** > **Pocket PC Basics**, then select **Notifications**.

Enabling the Beeper

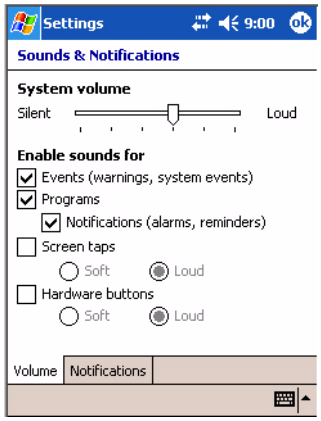
Tap **Start** > **Settings** > the **Personal** tab > **Sounds & Notifications** > the **Volume** tab, then drag the **System volume** slider bar away from the "Silent" position.

Adjusting the Beeper Volume

Tap or drag the **System volume** slider bar to your most comfortable level.

Disabling the Beeper

Drag the **System volume** slider bar completely to the left to the "Silent" position, then tap **ok** to exit this applet.

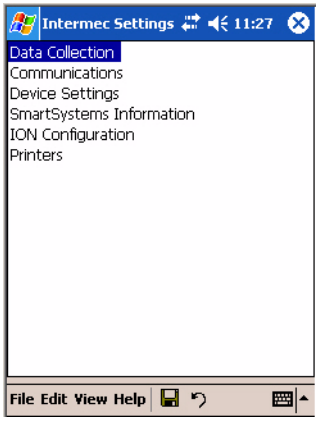


Intermec Settings Applet

Use the Intermec Settings applet to gather, view, and update device configuration settings. Information about the settings you can configure with the Intermec Settings applet is in the *Intermec Computer Command Reference Manual* (P/N: 073529) available online at **www.intermec.com**.

See the Data Collection Resource Kit in the Intermec Developer Library (IDL) for information about data collection functions. The IDL is available as a download from the Intermec web site at **www.intermec.com/idl**. Contact your Intermec representative for more information.

Tap **Start** > **Settings** > the **System** tab > the **Intermec Settings** icon to access the applet.



Key Sequences

[Orange] Plane Keys

The **orange** plane key provides you access to display controls, special characters, and Pocket PC options.

Press the **orange** key for each orange plane key stroke you wish to make. For example to turn on the front light, press and hold the **orange** key plus the **[3]** key. To turn the front light off, press the appropriate keys again. Below and on the next page are the key sequences.

This table lists sequences that use the **orange** plane key. See **Chapter 2, "Windows Mobile 2003"** to learn about the Pocket PC applications.

	To Do This
orange [3]	Toggles the backlight (also goes through backlight power levels if this key is held down)
orange [.]	Access the Pocket PC Record application *(see Note)*.
orange [4]	Access the Pocket PC Calendar application *(see Note)*.
orange [5]	Access the Pocket PC Contacts application *(see Note)*.
orange [6]	Access the Pocket PC Tasks application *(see Note)*.
orange [7]	Move up one page.
orange [8]	Enter an asterisk (*).
orange [9]	Move down one page.
orange [0]	Access the Pocket PC Start menu.
orange [ENTER]	Enter an at symbol (@).
orange [BkSp]	Enter a backslash (/).
orange [Esc]	Enter a minus sign (–).
orange [Action]	Enter a plus sign (+).
orange [⇥]	Tab to the right.
orange [⇤]	Tab to the left.

Pocket PC applications are accessible only if configured to do so via Utilitiese > App Launch.

Alpha (Green) Plane Keys

You can enter the alphabet using the Alpha (green) plane keys. Below and on the next page are the key sequences.

When you press **[Alpha]**, the Scanning/Alpha LED shows red for the Alpha mode. The keypad stays in Alpha mode until you press **[Alpha]** again.

To type a lowercase "c," press **[Alpha] [2] [2] [2]**. To type a letter on the same key as the last letter entered, wait two seconds, then enter the correct series of keystrokes to create the next letter.

While in the Alpha mode and you press [**1**] to initiate the CAPS mode, you will render a CAPS LOCK until you press [**1**] again. Once you are in CAPS mode, you stay in CAPS until it is pressed again. Press [**0**] to enter a space.

	Press the Keys	To Enter	Press the Keys
a	**[Alpha] [2]**	A	**[Alpha] [1] [2]**
b	**[Alpha] [2] [2]**	B	**[Alpha] [1] [2] [2]**
c	**[Alpha] [2] [2] [2]**	C	**[Alpha] [1] [2] [2] [2]**
d	**[Alpha] [3]**	D	**[Alpha] [1] [3]**
e	**[Alpha] [3] [3]**	E	**[Alpha] [1] [3] [3]**
f	**[Alpha] [3] [3] [3]**	F	**[Alpha] [1] [3] [3] [3]**
g	**[Alpha] [4]**	G	**[Alpha] [1] [4]**
h	**[Alpha] [4] [4]**	H	**[Alpha] [1] [4] [4]**
i	**[Alpha] [4] [4] [4]**	I	**[Alpha] [1] [4] [4] [4]**
j	**[Alpha] [5]**	J	**[Alpha] [1] [5]**
k	**[Alpha] [5] [5]**	K	**[Alpha] [1] [5] [5]**
l	**[Alpha] [5] [5] [5]**	L	**[Alpha] [1] [5] [5] [5]**
m	**[Alpha] [6]**	M	**[Alpha] [1] [6]**
n	**[Alpha] [6] [6]**	N	**[Alpha] [1] [6] [6]**
o	**[Alpha] [6] [6] [6]**	O	**[Alpha] [1] [6] [6] [6]**
p	**[Alpha] [7]**	P	**[Alpha] [1] [7]**
q	**[Alpha] [7] [7]**	Q	**[Alpha] [1] [7] [7]**
r	**[Alpha] [7] [7] [7]**	R	**[Alpha] [1] [7] [7] [7]**
s	**[Alpha] [7] [7] [7] [7]**	S	**[Alpha] [1] [7] [7] [7] [7]**
t	**[Alpha] [8]**	T	**[Alpha] [1] [8]**
u	**[Alpha] [8] [8]**	U	**[Alpha] [1] [8] [8]**
v	**[Alpha] [8] [8] [8]**	V	**[Alpha] [1] [8] [8] [8]**
w	**[Alpha] [9]**	W	**[Alpha] [1] [9]**
x	**[Alpha] [9] [9]**	X	**[Alpha] [1] [9] [9]**
y	**[Alpha] [9] [9] [9]**	Y	**[Alpha] [1] [9] [9] [9]**
z	**[Alpha] [9] [9] [9] [9]**	Z	**[Alpha] [1] [9] [9] [9] [9]**

LEDs

The battery status LED and the scanning/keypad shift and notification LED turn red, green, or yellow.

Battery Status LED

LED Color and Action	Description
Steady Green	Battery is more than 95% charged and the CN2B Computer is on charger.
Blinking Red	Battery is less than 10% charged and the CN2B Computer is not on charger.
Red	The CN2B Computer is on charge.
Yellow	The CN2B Computer is on a charging source and there is no battery pack installed. The mobile computer may also be out of the charging range of 32° to 104° F (0° to 40° C). When back in range, charging resumes and the LED changes to red or green.

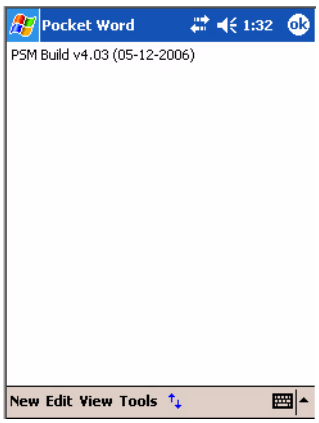
Scanning/Keypad Shift and Notification LED

LED Color and Action	Description
Momentary Green	Indicates the scanner has initialized and had a good scan.
Steady Red	Indicates the keypad is shifted to the Alpha plane and the CN2B Computer is turned on.

PSM Build Version

The Persistent Storage Manager (PSM) is an area of storage which is embedded in a section of the system's FLASH memory. This storage area is *not* erased when a cold-boot is performed. It may, however, erase during the reflashing process. In addition to storing applications and data files, you do have the option to store a persistent registry to the PSM region.

To determine what PSM Build is on your CN2B Computer, tap **Start** > **Programs** > **File Explorer**. Access the **Flash File Store** folder from the **My Device** root directory, then tap the **PSMinfo** text file. Tap **ok** to exit.



Resetting Your CN2B Computer

Performing a Warm-Boot

Performing a warm-boot may be necessary to correct conditions where an application stops responding to the system. It does, however, unload all running programs.

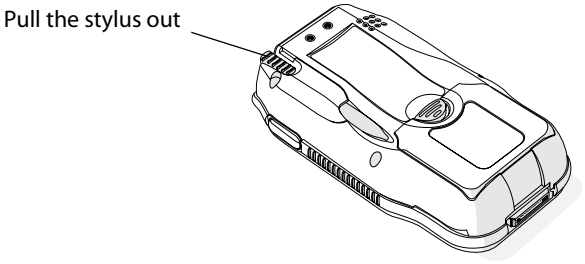
Press and hold the I/O key for ten seconds, then the CN2B Computer continues from the screen you were at before you performed the warm-boot.

Performing a Cold-Boot

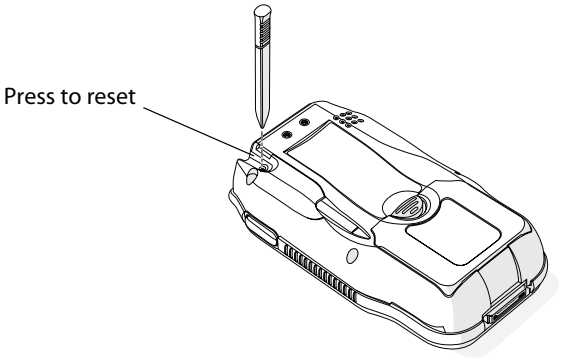
In some cases where the CN2B Computer completely stops responding, it may be necessary to perform a cold-boot. Because this may result in data loss, this procedure is not recommended unless all other recovery methods have failed.

Note: This deletes all programs and data stored in RAM including the Object Store. Make sure data is backed up to your host computer or a storage card before performing a cold-boot.

1 Pull the stylus from its place in the back of the CN2B Computer.



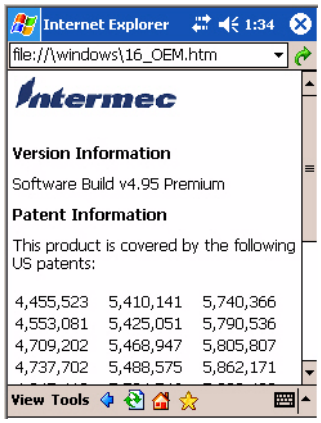
2 Using the stylus, press the reset button in the stylus holder.



Software Build Version

To check to see if your CN2B Computer has the latest software build, select **Start** > **Internet Explorer** > the **Intermec** logo.

The latest software build version is displayed beneath the **Version Information** title. This information is useful should you need assistance.



Software Tools

The following Intermec software tools are available as free downloads:

SmartSystems Foundation Console (www.intermec.com/SmartSystems)

This tool includes a management console that provides a default method to configure and manage Intermec devices "out-of-the-box," without the purchase of additional software licenses. This is for anyone who must configure and deploy multiple devices or manage multiple licenses.

Intermec Resource Kits (www.intermec.com/IDL)

Resource Kits provide tools that build applications using the features of Intermec devices. Resource kits include: Bluetooth, Communications, Data Collection, Device Settings, Mobile Gadgets, Printing, and RFID.

This is for anyone who develops software for the CN2B Computer.

Storage Media

Note: MultiMediaCards (MMCs) and CompactFlash (CF) storage cards are not supported in CN2B Computers.

Note: The CN2B Computer currently supports Delkin Devices Secure Digital cards only. Intermec cannot guarantee that other SD cards will work with the CN2B Computer.

The CN2B Computer supports the Secure Digital storage card. The CompactFlash card slot is embedded in the CN2B Computer and cannot be removed.

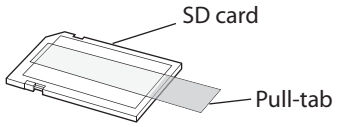
The following procedures explain how to:

- insert an SD card.
- access the files on an SD card.
- remove an SD card.

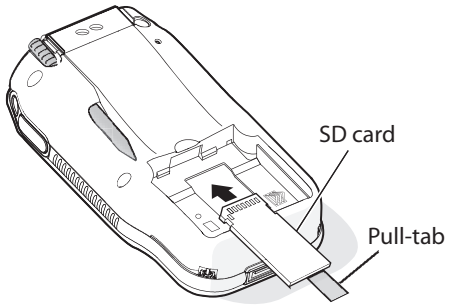
For help using a Secure Digital card to install applications and files, see **"Using a Secure Digital Card to Upgrade the CN2B Computer" on page 81**.

To insert the SD card

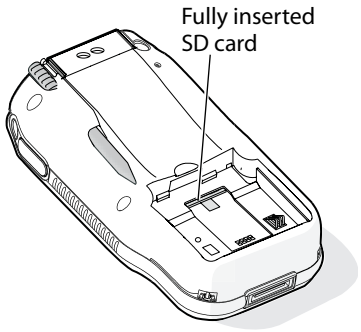
1 Before inserting the Secure Digital card, you must attach one of the pull-tabs that ships with the CN2B Computer. A Secure Digial card without a pull-tab can be very difficult to remove.



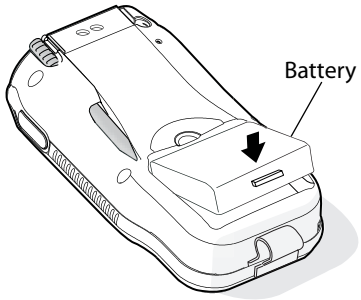
2 Align the Secure Digital card as shown in the next illustration, and insert the Secure Digital card into the slot.



3 Push the card into the slot until it is fully inserted.



4 Align the battery contacts as shown in the next illustration, and insert the battery in the battery compartment. Press down on the battery until it clicks into place.



5 Install the battery door.

To access files stored on the Secure Digital card

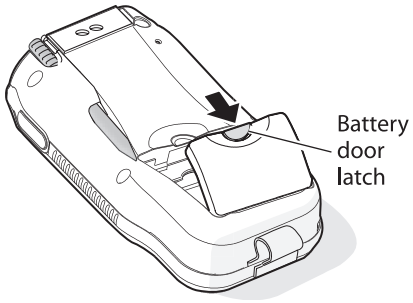
If you have a Secure Digital card inserted in your CN2B Computer, it appears as the "\Storage Card" folder. To access this folder, select My Device, then tap the "\Storage Card" folder. You can copy files to and from this folder just as you would any other folder on the CN2B Computer.

To remove the Secure Digital card

1 Press and hold the **Power** key for two to three seconds, and then release the **Power** key to turn off the CN2B Computer.

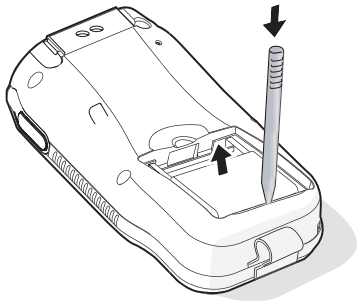
2 Place the CN2B Computer face-down on a clean, flat, stable surface.

3 Push down on the battery door latch, and pull up on the battery door.



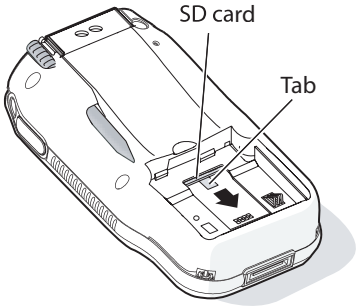
4 Remove the battery door and set it aside.

5 Insert the stylus between the battery and the CN2B case, and press straight down until the battery is released.



6 Remove the battery and set it aside.

7 Pull the tab toward the bottom on the CN2B Computer to remove the Secure Digital card.



Wireless Network Support

Radios are installed at the factory and cannot be installed by a user. The CN2B Computer must be serviced to install or replace radios. Contact your Intermec representative for more information. See **Chapter 4, "Network Support"** for information about supported radios.

Note: Changes or modifications not expressly approved by Intermec could void the user's authority to operate the equipment.

Accessories

The following accessories are available for the CN2B Computer. *Note that this is not a complete list.* Contact your Intermec representative for information about these and other accessories that are not in this list.

AC Wall Adaptor
Battery
Car Charger
Handstrap
Holster
Modem Dock
Replacement Stylus Kit - tethered stylus
Screen Cleaner Kit
Screen Protector Kit - 3 pack
Single USB Client Dock
Two-Wire Phone Cord
Universal Power Supply
USB Type B Interface Cable

Physical and Environmental Specifications

Use these specifications to locate technical information about the CN2B Computer and its available features and options.

Display

Transflective: TFT all-light readable color display with LED backlight

Pixels:	240x320
Diagonal:	89 mm (3.52 in)
Colors:	65 K

Environmental

Operating Temperature:	-10° to 50°C (14° to 122°F)
Storage Temperature:	-20° to 60°C (-4° to 140°F)
Relative Humidity:	5% to 95% noncondensing
Rain and Dust Resistance:	IP54 compliant
Drop Specifications:	0.9 m (3 ft) drop, 26 times on concrete

Secure Digital Expansion Slots

The CN2B Computer supports the Delkin Devices Secure Digital storage card.

Integrated Scanner Options
EV10 Linear Imager

Integrated Wireless
802.11b/g (Wi-Fi® certified): WLAN (802.11b/g)
Bluetooth™ compatible module

Keypad Options
Numeric

Memory and Storage
RAM Memory: 64 MB
Flash ROM: 64 MB, includes ROM folder for application storage

Microprocessor
Intel® XScale™ PXA255 Application Processor, 400 MHz

Operating System
Microsoft® Windows® Mobile software for Pocket PC

Physical Dimensions
Length: 147 mm (5.8 in)
Width: 86 mm (3.4 in)
Height: 35 mm (1.4 in)
Weight: 370 g (11.9 oz)

Power
Battery Type: Lithium-Ion (LiIon), 3.7V, (1x2150 mAh cells), customer-replaceable
Battery Capacity: 7.95 Watt-hours
Battery Life: 6-10 hours, application dependent
Recharging Time: 4 hours
Charging Range: 0° to 40°C (32° to 104°F)

Regulator Approvals
FCC Part 15 Class B; UL Listing; CE Mark; CB Report

Standard Communications
RS232; USB

2 Windows Mobile 2003

This chapter introduces Microsoft Windows Mobile 2003 for Pocket PC. While using your CN2B Computer, keep these key points in mind:

- Tap **Start** on the navigation bar, located at the top of the screen, to quickly move to programs, files, and settings. Use the command bar at the bottom of the screen to perform tasks in programs. The command bar includes menus, icons, and the onscreen keyboard.
- Tap and hold an item to see a pop-up menu containing a list of actions you can perform. Pop-up menus give you quick and easy access to the most common actions.

Below is a list of Windows Mobile 2003 components described in this chapter. Tap **Start** > **Help** on your CN2B Computer to find additional information on Windows Mobile components.

Software Builds

Go to "Software Build Version" on page 12 to determine which Intermec build of Windows Mobile 2003 is on your unit.

Where to Find Information

This chapter describes your CN2B Computer hardware, provides an overview of the programs on your CN2B Computer, and explains how to connect your CN2B Computer to a desktop, a network, or the Internet. For instructions on setting up your CN2B Computer and installing ActiveSync, see the Quick Start Guide. The following is a guide to more information to assist you use your CN2B Computer.

	See this Source:
Programs on the mobile computer.	This chapter and mobile computer Help. To view Help, tap **Start** > **Help**.
Additional programs that can be installed on the mobile computer.	The *Windows Mobile Companion CD*.
Connecting to and synchronizing with a desktop.	The Quick Start Guide or *ActiveSync Help* on your desktop. To view Help, click **Help** > **Microsoft ActiveSync Help**.
Last-minute updates and detailed technical information.	The Read Me files, located in the Microsoft ActiveSync folder on the desktop and on the *Windows Mobile Companion CD*.
Up-to-date information on your Windows Mobile.	**www.microsoft.com/windowsmobile/resources/communities/default.mspx**

Windows Mobile and many of the technologies supported by the CN2B Computer are not from Intermec. Many of the utilities and features on a Windows Mobile device come directly from Microsoft without any modification from Intermec. There may be certain Microsoft-specific issues that Intermec would not be able to support, so contact our front-line support personnel to determine the best source of assistance.

Use these URLs for additional information about Microsoft Windows Mobile (Pocket PC):

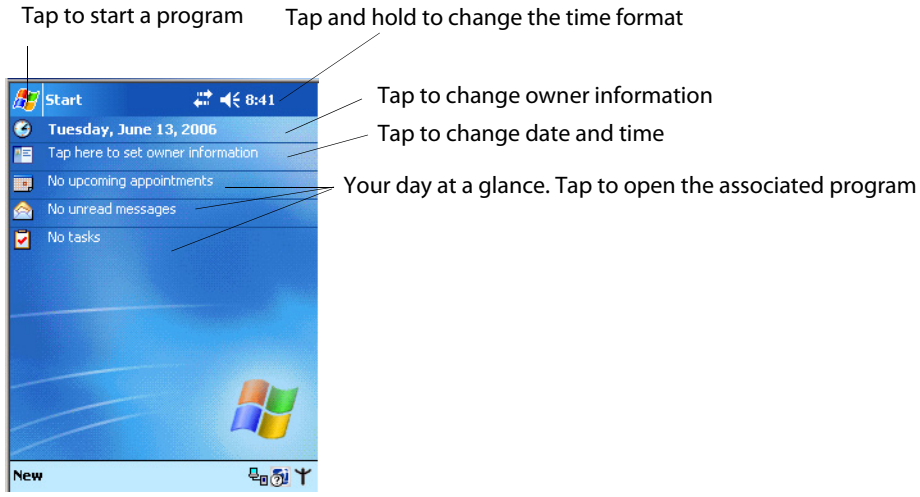
- **msdn.microsoft.com/support/**
- **support.microsoft.com/**
- **news://news.microsoft.com** *(a free support option)*

Basic Skills

Learning to use your CN2B Computer is easy. This section describes the basic concepts of using and customizing your CN2B Computer.

Today Screen

When you turn on your CN2B Computer for the first time each day *(or after four hours of inactivity)*, you see the **Today** screen. You can also display it by tapping the **Start** flag *(shown left)* and then **Today**. On the Today screen, you can see important information for the day.



To customize what is displayed on the Today screen, including the background image, tap **Start** > **Settings** > the **Personal** tab > **Today**.

Status icons display information such as low batteries or when the CN2B Computer is connected to a desktop or to the Internet. You can tap an icon to open the associated setting or program.

Programs

You can switch from one program to another by selecting it from the **Start** menu. (You can customize which programs you see on this menu. For information, see "Adjusting Settings" on page 31.) To access some programs, tap **Start** > **Programs**, and then the program name.

You can also switch to some programs by pressing a program icon. Your CN2B Computer has one or more program icons located on the front or side of the computer. The icons on the icons identify the programs to which they switch.

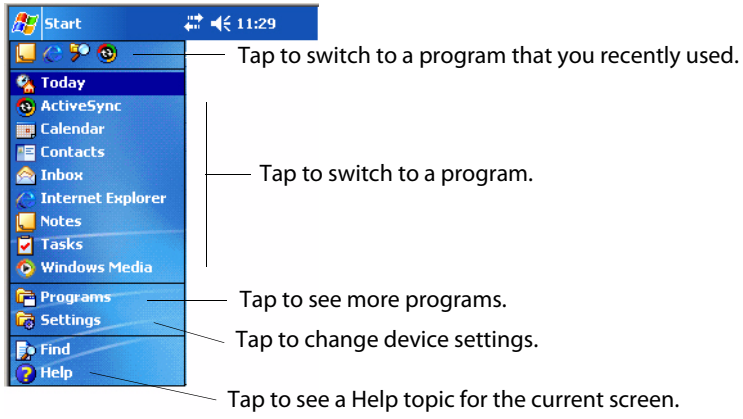
Note: Some programs have abbreviated labels for check boxes and drop-down menus. To see the full spelling of an abbreviated label, tap and hold the stylus on the label. Drag the stylus off the label so that the command is not carried out.

The following is a partial list of programs that are on your CN2B Computer. Look on the *Windows Mobile Companion CD* for additional programs that you can install onto your CN2B Computer.

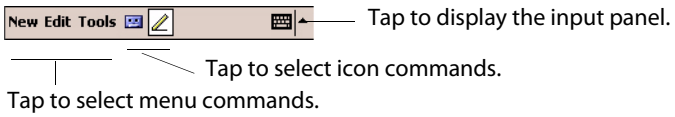
ActiveSync	Synchronize information between your CN2B Computer and desktop.
Calendar	Keep track of your appointments and create meeting requests.
Contacts	Keep track of your friends and colleagues.
Inbox	Send and receive e-mail messages.
Internet Explorer	Browse Web and WAP (Wireless Application Protocol) sites, and download new programs and files from the Internet.
Notes	Create handwritten or typed notes, drawings, and recordings.
Tasks	Keep track of your tasks.
Windows Media	Play digital audio and video files that are stored on your CN2B Computer or on a network.

Navigation Bar and Command Bar

The navigation bar is located at the top of the screen. It displays the active program and current time, switches to programs, and closes screens.

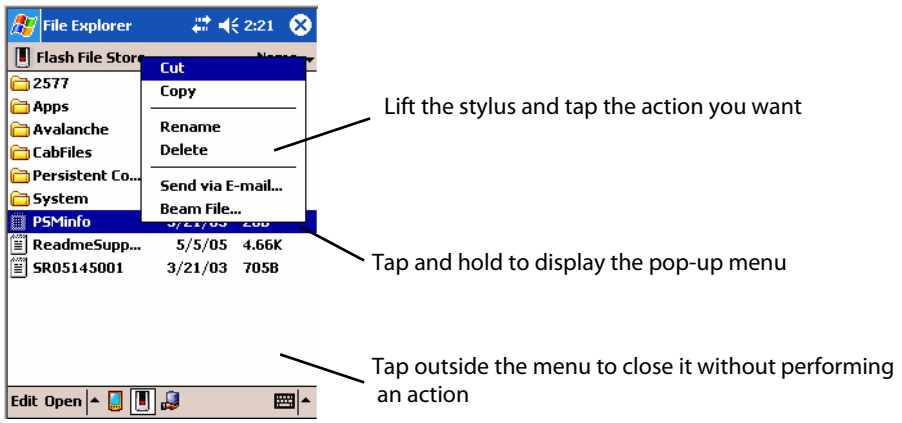


Use the command bar at the bottom of the screen to perform tasks in programs. The command bar includes menu names, icons, and the **Input Panel** icon. To create a new item in the current program, tap **New**. To see the name of an icon, tap and hold the stylus on the icon. Drag the stylus off the icon so that the command is not carried out.



Pop-up Menus

Use pop-up menus to quickly perform an action on an item. For example, you can use a pop-up menu to delete or make a copy of an item. To access a pop-up menu, tap and hold the item on which you want to perform the action. When the menu appears, tap the action to perform, or tap anywhere outside the menu to close the menu without performing the action.



Notifications

When you have something to do, your device notifies you in a variety of ways. For example, if you have set up an appointment in Calendar, an e-mail message arrives, or a friend sends you an instant message, you are notified in any of the following ways:

- A message box appears on the screen.
- A sound, which you can specify, is played.
- A light flashes on your CN2B Computer.

You can choose the notification types.

Entering Information

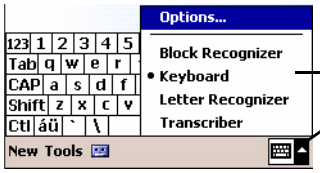
You can enter information on your CN2B Computer in several ways, depending on the type of device you have and the program you are using:

- **Synchronizing**
  Using Microsoft ActiveSync, synchronize or copy information between your desktop and CN2B Computer. For more information on ActiveSync, see *ActiveSync Help* on your desktop.
- **Typing**
  Using the input panel, enter typed text into the CN2B Computer either by tapping keys on the onscreen keyboard or using handwriting recognition software.
- **Writing**
  Using the stylus, write directly on the screen.

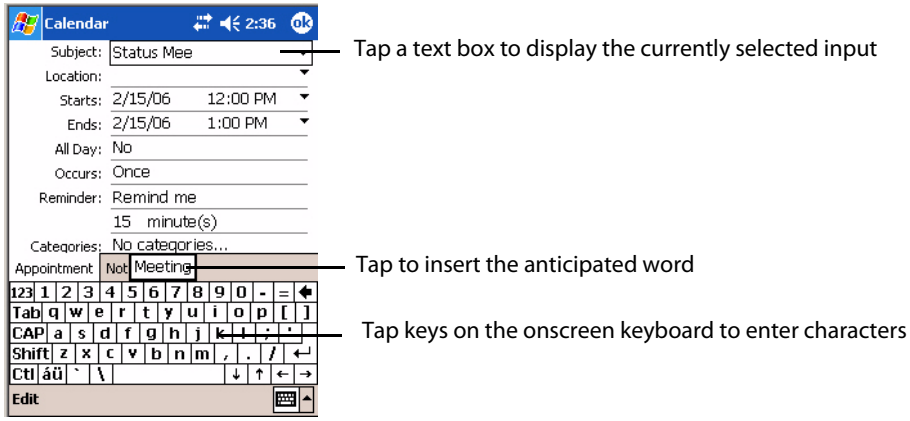
- **Drawing**
  Using the stylus, draw directly on the screen.
- **Recording**
  Create a stand-alone recording or embed a recording into a document or note.

Use the input panel to enter information in any program on your CN2B Computer. You can either type using the onscreen keyboard or write using **Block Recognizer**, **Letter Recognizer**, or **Transcriber**. In either case, the characters appear as typed text on the screen.

To show or hide the input panel, tap the **Input Panel** icon. Tap the arrow next to the **Input Panel** icon to see your choices.



When you use the input panel, your CN2B Computer anticipates the word you are typing or writing and displays it above the input panel. When you tap the displayed word, it is inserted into your text at the insertion point. The more you use your CN2B Computer, the more words it anticipates.

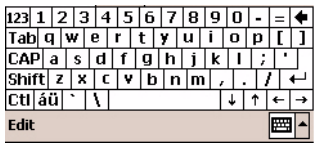


Typing With the Onscreen Keyboard

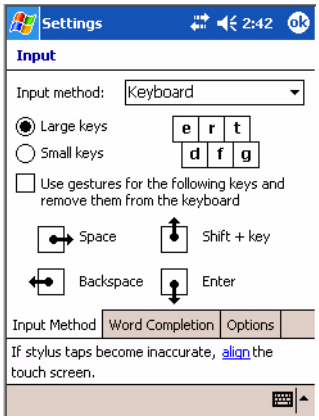
Tap the input panel arrow, then tap **Keyboard**. On the soft keyboard that is displayed, tap the keys with your stylus.

- To type lowercase letters, tap the keys with the stylus.
- To type a single uppercase letter or symbol, tap the **Shift** key. To tap multiple uppercase letters or symbols, tap the **CAP** key.
- To convert a letter to uppercase, tap and hold the stylus on the letter and drag up.
- To add a space, drag the stylus to the right across at least two keys.
- To backspace a character, drag the stylus to the left over at least two keys.

- To insert a carriage return, tap and hold the stylus anywhere on the keyboard and drag down.



To use larger keys, tap the input panel arrow, tap **Options**, select "Keyboard" from the **Input method** drop-down list, then select **Large keys**.

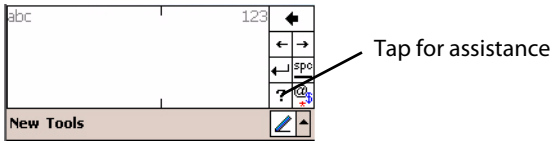


Using Block Recognizer

Character recognition software gives you a fast and easy method for entering information in any program on your CN2B Computer. Letters, numbers, and punctuation you write are translated into typed text.

Tap the input panel arrow, then tap **Block Recognizer**. Write a letter in the box, which then is converted to typed text that appears on the screen.

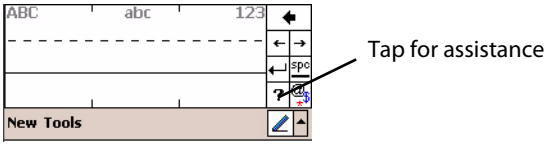
For specific instructions on using Block Recognizer, with Block Recognizer open, tap the question mark next to the writing area.



Using Letter Recognizer

With Letter Recognizer, you can write letters using the stylus just as you would on paper.

Tap the input panel arrow, then tap **Letter Recognizer**. Write a letter in the box. When you write a letter, it is converted to typed text that appears on the screen. For specific instructions on using Letter Recognizer, with Letter Recognizer open, tap the question mark next to the writing area.

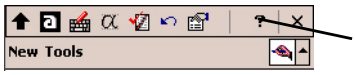


Using Transcriber

With Transcriber, you can write anywhere on the screen using the stylus just as you would on paper. Unlike Letter Recognizer and Block Recognizer, you can write a sentence, then pause and let Transcriber change the written characters to typed characters.

Tap the input panel arrow, then tap **Transcriber**. Tap **ok**, then write anywhere on the screen.

For specific instructions on using Transcriber, with Transcriber open, tap the question mark in the lower, right-hand corner of the screen.



Selecting Typed Text

To edit or format typed text, you must select it first. Drag the stylus across the text you want to select. You can cut, copy, and paste text by tapping and holding the selected words and then tapping an editing command on the pop-up menu, or by tapping the command on the **Edit** menu.

Writing on the Screen

In any program that accepts writing, such as the Notes program, and in the **Notes** tab in Calendar, Contacts, and Tasks, you can use your stylus to write directly on the screen. Write the way you do on paper. You can edit and format what you have written and convert the information to text at a later time.

- Tap the **Pen** icon to switch to writing mode. This action displays lines on the screen to help you write.

Note: Some programs that accept writing may not have the **Pen** icon. See related documentation to find out how to switch to writing mode.

Selecting the Writing

If you want to edit or format writing, you must select it first.

1 Tap and hold the stylus next to the text you want to select until the insertion point appears.

2 Without lifting, drag the stylus across the text you want to select.

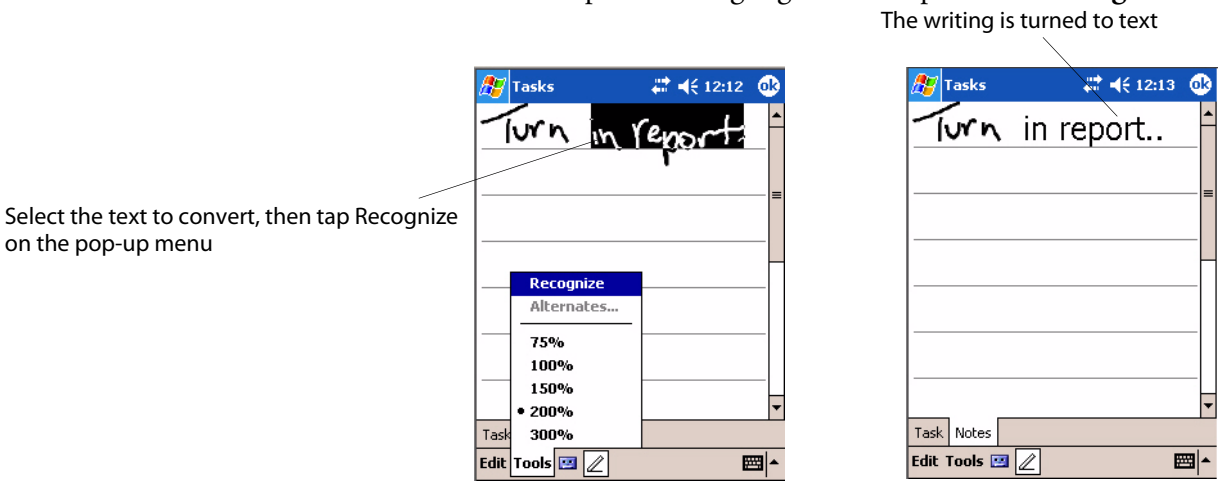
If you accidentally write on the screen, tap **Tools** > **Undo** and try again. You can also select text by tapping the **Pen** icon to deselect it and then dragging the stylus across the screen.

You can cut, copy, and paste written text in the same way you work with typed text: tap and hold the selected words and then tap an editing command on the pop-up menu, or tap the command on the **Edit** menu.

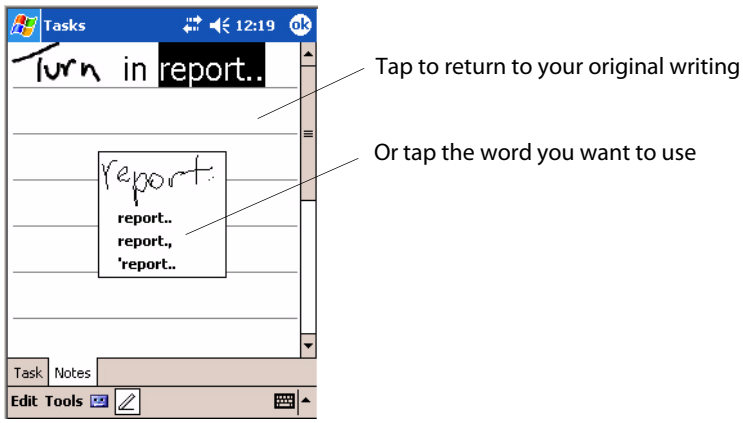
Converting Writing to Text

You can convert words you write in print or cursive to text by tapping **Tools** > **Recognize**. If a word is not recognized, it keeps its original form.

To convert only certain words, tap **Pen** to disable the writing function, tap twice over the word or phrase to highlight, then tap **Tools** > **Recognize**.



If the conversion is incorrect, you can choose different words from a list of alternates or return to the original writing. To do so, tap and hold the incorrect word (tap one word at a time). On the pop-up menu, tap **Alternates**. Tap the word use from the menu with a list of alternate words, or tap the writing at the top of the menu to return to the original writing.



Tips for getting good recognition:

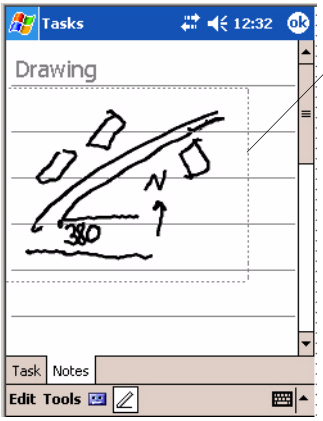
- Write neatly.
- Write on the lines and draw descenders below the line. Write the cross of the "t" and apostrophes below the top line so they are not confused with the word above. Write periods and commas above the baseline.
- For better recognition, increase the zoom level to 300% by using the **Tools** menu. Recognition does not work well below a 150% zoom level.
- Write the letters of a word closely and leave big gaps between words so the CN2B Computer can easily tell where words begin and end.
- Hyphenated words, foreign words that use special characters such as accents, and some punctuation cannot be converted.
- If you add writing to a word to change it (such as changing a "3" to an "8") after you attempt to recognize the word, the writing you add is not included if you attempt to recognize the writing again.

Drawing on the Screen

You can draw on the screen in the same way that you write on the screen. The difference between writing and drawing on the screen is how you select items and how they are edited. For example, you can resize selected drawings, while you cannot resize writing.

Creating a Drawing

- After your first stroke, wait for a drawing box to appear around the area you marked. Subsequent strokes in or touching the drawing box become part of the drawing. Drawings that do not cross the borders of the box are considered writing.



The drawing box indicates the boundary

Note: You may want to change the zoom level so that you can more easily work on or view your drawing. Tap **Tools** and then a zoom level.

Selecting a Drawing

To edit or format a drawing, select it first. Tap and hold the stylus on the drawing until the selection handle appears. To select multiple drawings, deselect the **Pen** icon and then drag to select the drawings you want.

You can cut, copy, and paste selected drawings by tapping and holding the selected drawing and then tapping an editing command on the pop-up menu, or by tapping the command on the **Edit** menu. To resize a drawing, make sure the **Pen** icon is not selected, and drag a selection handle.

Recording a Message

In any program where you can write or draw on the screen, you can also capture thoughts, reminders, and phone numbers by recording a message.

In the Inbox program, you can add a recording to an e-mail message. In Calendar, Tasks, and Contacts, you can include a recording in the **Notes** tab. In the Notes program, you can create a stand-alone recording or add a recording to an open note.

Creating a Recording

1 Hold the CN2B Computer microphone near your mouth or source of sound. Tap the red recording button and make your recording.

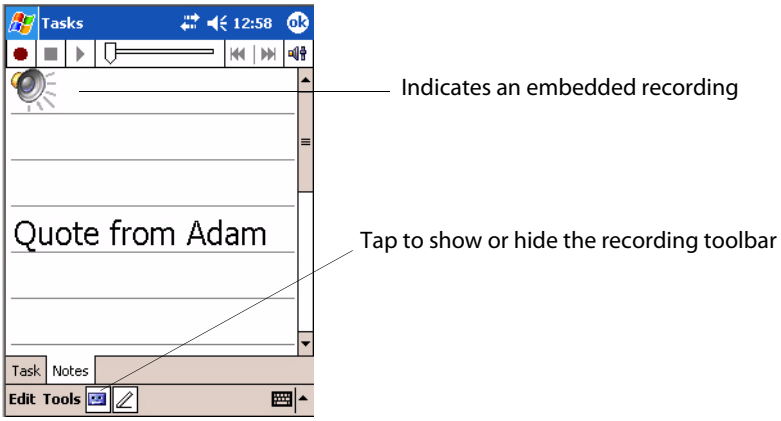
2 Tap the black stop recording button when finished. If you are recording in an open note, an icon appears in the note. If you are creating a stand-alone recording, it appears in the note list.

3 To play a recording, tap the recording icon in the open note or tap the recording in the note list.

Note: To quickly create a recording, hold down the **Record** hardware icon. When you hear the beep, begin your recording. Release the icon when you are finished. The new recording is stored in the open note or as a stand-alone recording if no note is open.

Playing a Recording

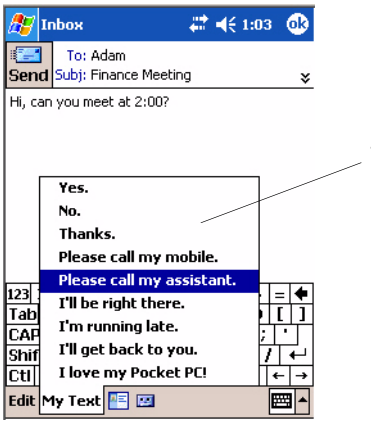
To play a recording, tap it in the list or tap its icon in the note.



Using My Text

When using Inbox or MSN Messenger, use **My Text** to quickly insert preset or frequently used messages into the text entry area. To insert a message, tap **My Text** and tap a message.

- To quickly add common messages, tap **My Text**, then tap a message.
- To edit a My Text message, tap **Tools** > **Edit My Text Messages**. Tap the message to edit and enter new text at the bottom of the screen.



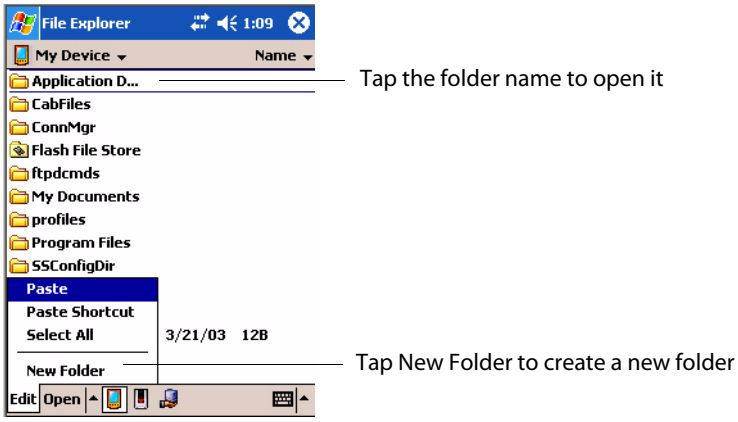
Finding and Organizing Information

The **Find** feature on your CN2B Computer helps you quickly locate information. Tap **Start** > **Find**. Enter the text you want to find, select a data type, and then tap **Go** to initiate the search.

Note: To quickly find information that is taking up storage space on your CN2B Computer, select **Larger than 64 KB in Type**.


File Explorer

You can also use the File Explorer to find files on your CN2B Computer and to organize these files into folders. Tap **Start** > **Programs** > **File Explorer**.



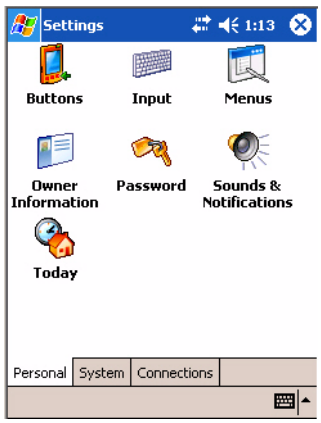
Note: You can move files in File Explorer by tapping and holding the item to move, and then tapping **Cut** or **Copy** and **Paste** on the pop-up menu.

Customizing Your CN2B Computer

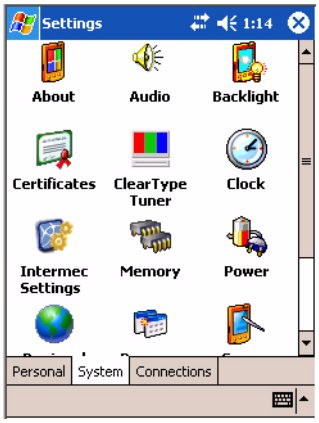
You can customize your CN2B Computer by adjusting settings and installing additional software.

Adjusting Settings

You can adjust settings to suit the way you work. To see available options, tap **Start** > **Settings** > either the **Personal** tab or the **System** tab located at the bottom of the screen. You might want to adjust the following:



Personal tab



System tab

Menus	To customize what appears on the **Start** menu, and to enable a pop-up menu from the **New** icon.
Owner Information	To enter your contact information.
Password	To limit access to your CN2B Computer.
Today	To customize the look and information displayed on the **Today** screen.
Clock	To change the time or to set alarms.
Power	To maximize battery life.

Adding or Removing Programs

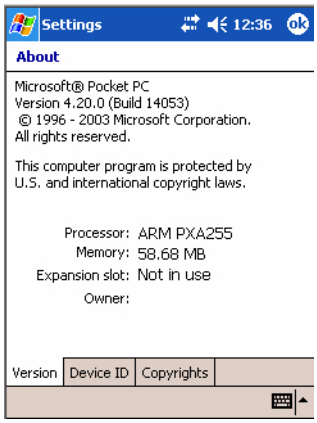
Programs added to your CN2B Computer at the factory are stored in ROM (Read Only Memory). You cannot remove this software, and you cannot accidentally lose ROM contents. ROM programs can be updated using special installation programs with a *.XIP extension. All other programs and data files added to your CN2B Computer after factory installation are stored in RAM (Random Access Memory).

Install any program created for your CN2B Computer, as long as there is enough memory. The most popular place to find software for your CN2B Computer is on the Windows Mobile Web site (**www.microsoft.com/windowsmobile/resources/communities/default.mspx**).

Adding Programs Using ActiveSync

Install the appropriate software for your CN2B Computer on your desktop before installing it on your CN2B Computer.

1 Determine your CN2B Computer and processor type so that you know which version of the software to install. Tap **Start** > **Settings** > the **System** tab > **About** > the **Version** tab, then make a note of the information in **Processor**.



2 Download the program to your desktop (or insert the CD or disk that contains the program). You may see a single *.XIP, *.EXE, or *.ZIP file, a SETUP.EXE file, or several versions of files for different CN2B Computer types and processors. Be sure to select the program designed for the Windows Mobile and your CN2B Computer processor type.

3 Read any installation instructions, Read Me files, or documentation.

4 Connect your CN2B Computer and desktop.

5 Double-click the *.EXE file.

- If the file is an installer, the installation wizard begins. Follow the directions on the screen. Once the software is installed, the installer automatically transfers the software to your CN2B Computer.
- If the file is not an installer, an error message stating that the program is valid but it is designed for a different type of computer is displayed. Move this file to your CN2B Computer. If you cannot find any installation instructions for the program in the Read Me file or documentation, use ActiveSync Explore to copy the program file to the Program Files folder on your CN2B Computer. For more information on copying files using ActiveSync, see *ActiveSync Help*.

Once installation is complete, tap **Start** > **Programs**, and then the program icon to switch to it.

Adding a Program Directly from the Internet

1 Determine your CN2B Computer and processor type so that you know which version of the software to install. Tap **Start** > **Settings** > the **System** tab > **About** > the **Version** tab, then make a note of the information in **Processor**.

2 Download the program to your CN2B Computer straight from the Internet using Pocket Internet Explorer. You may see a single *.XIP, *.EXE, or *.ZIP file, a SETUP.EXE file, or several versions of files for different CN2B Computer types and processors. Be sure to select the program designed for the Windows Mobile and your CN2B Computer processor type.

3 Read program installation instructions, Read Me files, or other documentation. Many programs provide installation instructions.

4 Tap the file, such as a *.XIP or *.EXE file to start the installation wizard. Follow the directions on the screen.

Adding a Program to the Start Menu

Tap **Start** > **Settings** > **Menus** > the **Start Menu** tab, and then the check box for the program. If you do not see the program listed, you can either use File Explorer on the CN2B Computer to move the program to the **Start Menu** folder, or use ActiveSync on the desktop to create a shortcut to the program and place the shortcut in the **Start Menu** folder.

Using File Explorer on the CN2B Computer

Tap **Start** > **Programs** > **File Explorer**, and locate the program (tap the folder list, labeled **My Documents** by default, and then **My Device** to see a list of all folders on the CN2B Computer). Tap and hold the program and tap **Cut** on the pop-up menu. Open the **Start Menu** folder located in the Windows folder, tap and hold a blank area of the window, and tap **Paste** on the pop-up menu. The program now appears on the **Start** menu. For more information on using File Explorer, see "Finding and Organizing Information" on page 30.

Using ActiveSync on the desktop

Use the Explorer in ActiveSync to explore your CN2B Computer files and locate the program. Right-click the program, and then click **Create Shortcut**. Move the shortcut to the Start Menu folder in the Windows folder. The shortcut now appears on the Start menu. For more information, see *ActiveSync Help*.

Removing Programs

Tap **Start** > **Settings** > the **System** tab > **Remove Programs**.

If the program does not appear in the list of installed programs, use File Explorer on your CN2B Computer to locate the program, tap and hold the program, and then tap **Delete** on the pop-up menu.

Microsoft ActiveSync

Visit the following Microsoft Web site for the latest in updates, technical information, and samples:

www.microsoft.com/windowsmobile/resources/communities/default.mspx

Using Microsoft ActiveSync, you can synchronize the information on your desktop with the information on your CN2B Computer. Synchronization compares the data on your CN2B Computer with your desktop and updates both computers with the most recent information. For example:

- Keep Pocket Outlook data up-to-date by synchronizing your CN2B Computer with Microsoft Outlook data on your desktop.
- Synchronize Microsoft Word and Microsoft Excel files between your CN2B Computer and desktop. Your files are automatically converted to the correct format.

Note: By default, ActiveSync does not automatically synchronize all types of information. Use ActiveSync options to turn synchronization on and off for specific information types.

With ActiveSync, you can also:

- Back up and restore your CN2B Computer data.
- Copy (rather than synchronize) files between your CN2B Computer and desktop.
- Control when synchronization occurs by selecting a synchronization mode. For example, you can synchronize continually while connected to your desktop or only when you choose the synchronize command.
- Select which information types are synchronized and control how much data is synchronized. For example, you can choose how many weeks of past appointments you want synchronized.

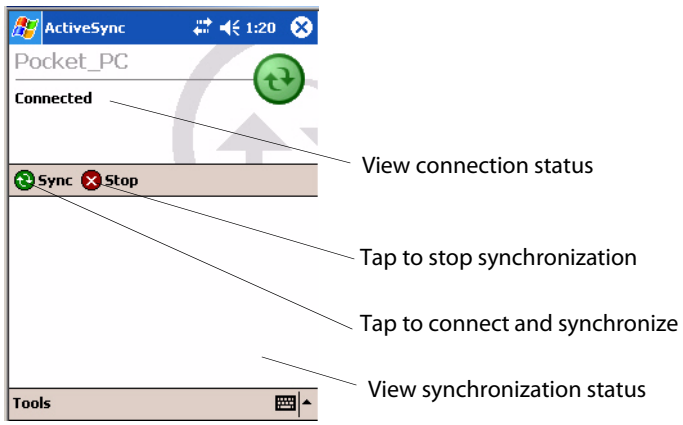
Before you begin synchronization, install ActiveSync on your desktop from the *Windows Mobile Companion CD*. For more information on installing ActiveSync, see your Quick Start card. ActiveSync is already installed on your CN2B Computer.

After installation is complete, the ActiveSync Setup Wizard helps you connect your CN2B Computer to your desktop, set up a partnership so you can synchronize information between your CN2B Computer and your desktop, and customize your synchronization settings. Your first synchronization process automatically begins when finished using the wizard.

After your first synchronization, look at Calendar, Contacts, and Tasks on your CN2B Computer. Notice that information you have stored in Microsoft Outlook on your desktop was copied to your CN2B Computer, and you did not have to type a word. Disconnect the CN2B Computer from your computer and you are ready to go!

Once you have set up ActiveSync and completed the first synchronization process, you can initiate synchronization from your CN2B Computer. To switch to ActiveSync on your CN2B Computer, tap **Start** > **ActiveSync**. Note that if you have a wireless LAN card, you can synchronize remotely from your CN2B Computer.

For information about using ActiveSync on your desktop, start ActiveSync on your desktop, and then see *ActiveSync Help*.



For more information about ActiveSync on your CN2B Computer, switch to ActiveSync, then tap **Start** > **Help**.

Microsoft Pocket Outlook

Microsoft Pocket Outlook includes Calendar, Contacts, Tasks, Inbox, and Notes. You can use these programs individually or together. For example, you can use e-mail addresses stored in Contacts to address e-mail messages in Inbox.

Using ActiveSync, you can synchronize information in Microsoft Outlook or Microsoft Exchange on your desktop with your CN2B Computer. You can also synchronize this information directly with a Microsoft Exchange server. Each time you synchronize, ActiveSync compares the changes you made on your CN2B Computer and desktop or server and updates both computers with the latest information. For information on using ActiveSync, see *ActiveSync Help* on the desktop.

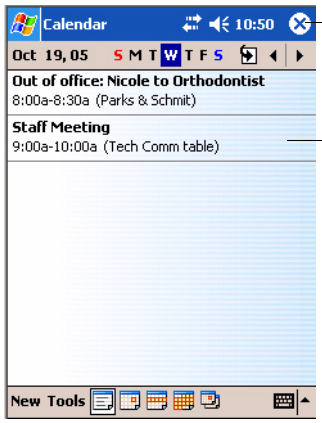
You can switch to any program by tapping it on the **Start** menu.

Calendar: Scheduling Appointments and Meetings

To switch to Calendar on the CN2B Computer, tap **Start** > **Calendar**.

Use Calendar to schedule appointments, including meetings and other events. You can check your appointments in one of several views (Day, Week, Month, Year, and Agenda) and set Calendar to remind you of appointments with a sound or other method. Appointments for the day can display on the Today screen.

If you use Outlook on your desktop, you can synchronize appointments between your device and desktop.



Synchronizing Calendar

Calendar items stored on your device can be synchronized with calendar items on your desktop or Microsoft Exchange Server. (Note you can only synchronize information directly with an Exchange Server if your company is running Microsoft Mobile Information Server 2002 or later.) Calendar synchronization is automatically selected in ActiveSync.

Calendar items entered on one computer are copied to the other during synchronization. Handwritten notes and drawings are saved as metafiles (pictures). For information on synchronization, see *ActiveSync Help* on the desktop.

Why Use Categories in the Calendar?

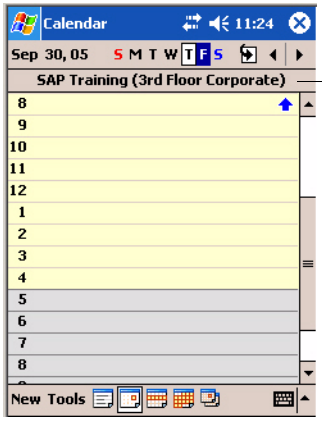
Use categories to group related tasks, contacts, and appointments. Then, use these groupings to quickly display only the information you want. For example, you can share your device with another by assigning appointments to a category with a special project's name. You can then use this category to filter Calendar and only display appointments for that project.

Note: In Month View, the day of an appointment assigned to the Holiday category appears in red.

What's an All Day Event?

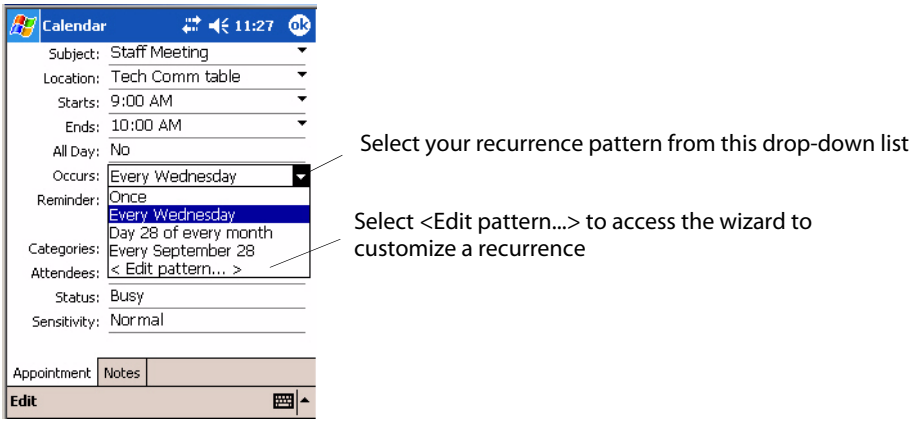
An appointment can either be a normal appointment or an all day event, which lasts the full day or spans many days. Examples include a trade show, a vacation, or a seminar. You can also use all day events to schedule an annual event, such as a birthday or anniversary. In this case, change the Status box to Free (you may need to scroll to see it) so that it does not show time as busy in your calendar. All day events do not occupy blocks of time in Calendar; they appear in banners at the top of the calendar.

Note: You cannot modify or create all-day events with attendees on the device. If you create all-day events with attendees on your desktop, use ActiveSync to copy such events to the device. Then, view them in Calendar. For more information on copying files, see *ActiveSync Help*. To use the device to schedule an appointment with attendees lasting all day, set type to "Normal," then adjust the date and time appropriately.



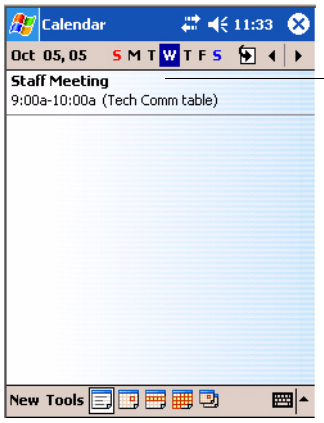
What's a Recurrence Pattern?

If you have an appointment or task that you do on a regular basis, such as a weekly team meeting or a monthly status report, enter the item once and set a recurrence pattern for it. If the default patterns in the list are not what you need, you can create your own pattern using the wizard.

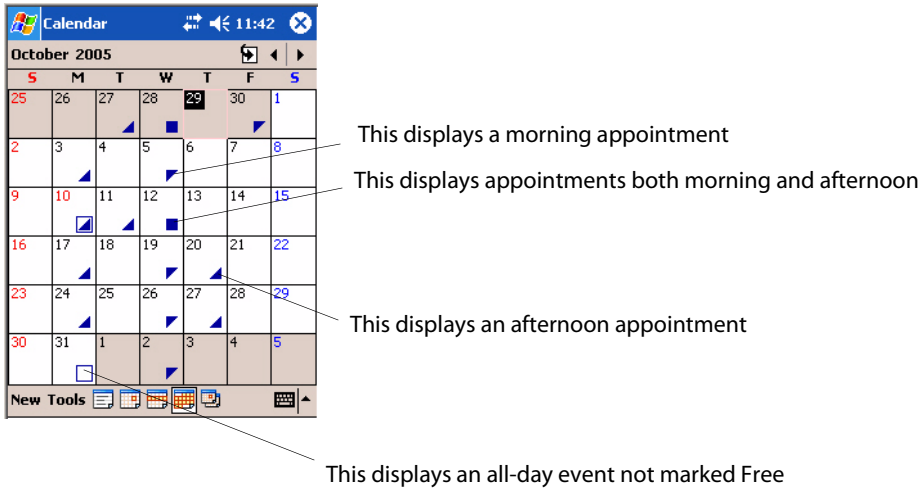


Viewing Appointments

You can view appointments in one of several views (Agenda, Day, Week, and Month). In Agenda view, upcoming appointments are displayed in bold. To see detailed appointment information in any view, tap the appointment. To see a list of available actions for an appointment, tap and hold the appointment. Tap **Start** > **Today** to quickly see your appointments for the day.



Month view displays symbols to indicate the types of appointments you have on a given day. An upward triangle indicates a morning appointment; a downward triangle indicates an afternoon appointment. If you have appointments in the morning and afternoon, a solid square is displayed. If you have an all-day event not marked Free, a hollow square is displayed.



Creating or Changing an Appointment

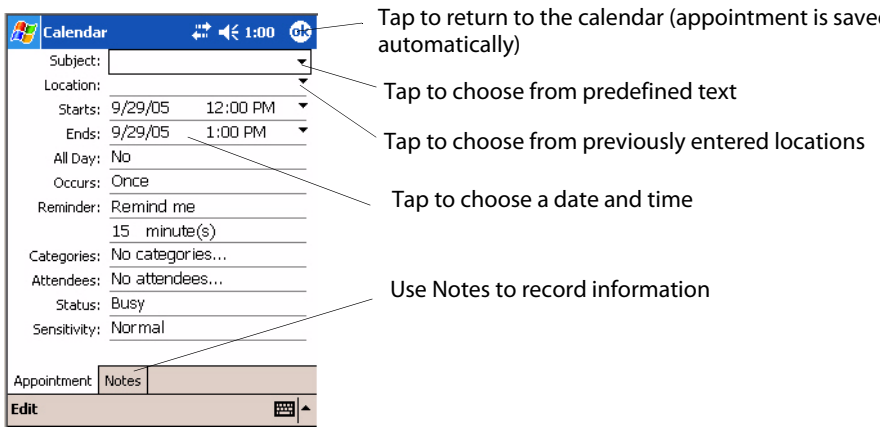
To create an appointment, tap **New**. To select a new date from a pop-up calendar, tap the display date. To enter or select a new time, tap the display time. Enter the appointment details, and when finished, tap **OK** to return to the calendar.

If you are working in Day view, tap the time slot for the new appointment and then tap **New** to have the time automatically entered for you.

To change an appointment, tap it in the calendar, then tap **Edit**. Change any appointment detail by tapping it and entering the new information.

Note: Tap the arrows to the right of the description and location boxes to choose from previous entries.

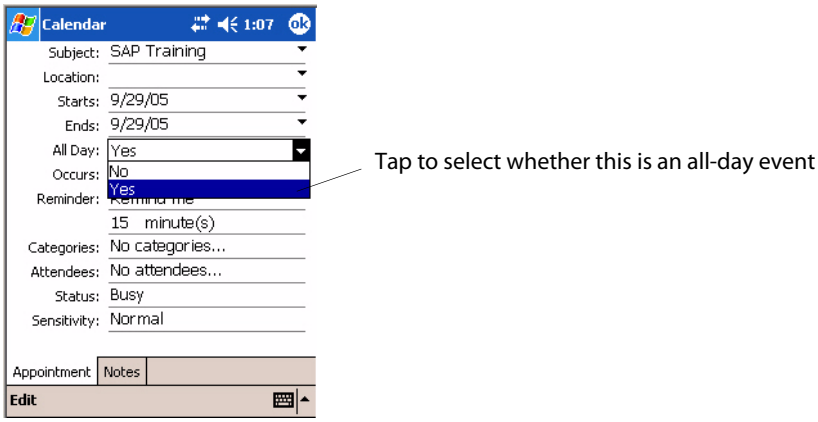
When entering a time, you can type military and abbreviated time forms, such as 2300 (becomes 11:00 PM), 913pm (becomes 9:13 PM), 911 (becomes 9:11 AM), and 9p (becomes 9:00 PM).



Creating an All Day Event

To create an all day event, do the following:

1. Tap **New**.
2. Tap **All Day**, then select **Yes**.



Note: To change an all-day event, switch to Day or Agenda view, tap the event listed at the top of the calendar, then tap **Edit**. Change any appointment detail by tapping it and entering the new information.

You cannot modify or create all day events with attendees on the CN2B Computer. If you create all day events with attendees on your desktop, use ActiveSync to copy such events to the CN2B Computer. Then, view them in Calendar. For more information on copying files, see *ActiveSync Help*. To use the device to schedule an appointment with attendees lasting all day, set type to Normal, then adjust date and time accordingly.

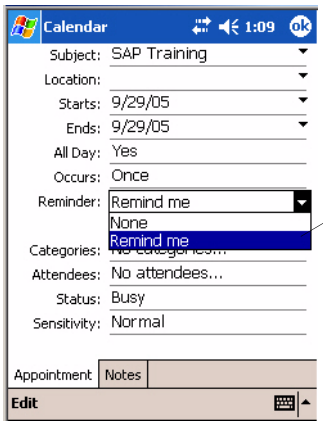
Setting a Reminder for an Appointment

Do the following to set a reminder for an appointment in the calendar:

1 Tap the appointment, then tap **Edit** to change the appointment.

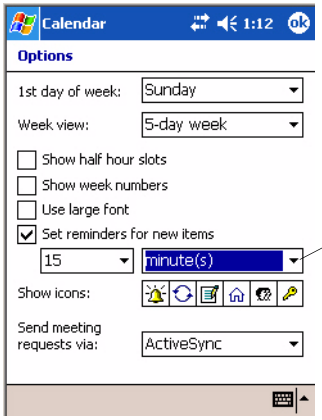
2 Tap **Reminder** and select **Remind me**.

3 To change how many minutes before the appointment you are reminded, tap the minutes displayed, then select the new minutes from a drop-down or enter the new minutes. Tap **minutes** to change hours, days, or weeks.



Tap whether to enable the reminder feature

Note: To automatically set a reminder for all new appointments, in the calendar, tap **Tools** > **Options**, select **Set reminders for new items**, then tap the number and timeframe options to change the information given.



Tap this to set reminders for new appointments

Sounds & Notifications

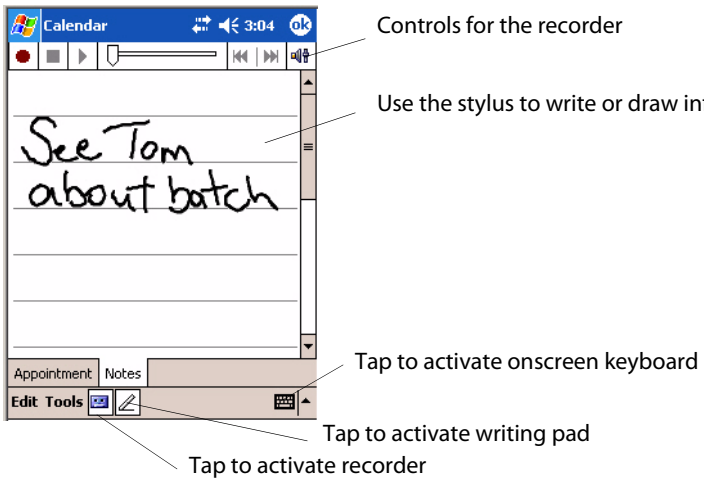
To choose how you are reminded, for example by a sound, tap **Start** > **Settings** > the **Personal** tab > the **Sounds & Notifications** icon.

Adding a Note to an Appointment

You can add written or typed notes and even recordings (if your device supports recordings) to an appointment. This is a good place for maps, drawings, and other detailed information.

1 In the calendar, tap the appointment, then tap **Edit**.

2 Tap the **Notes** tab to enter notes. For specific instructions, tap **Start** > **Help** > **Notes** to see *Notes Help*.



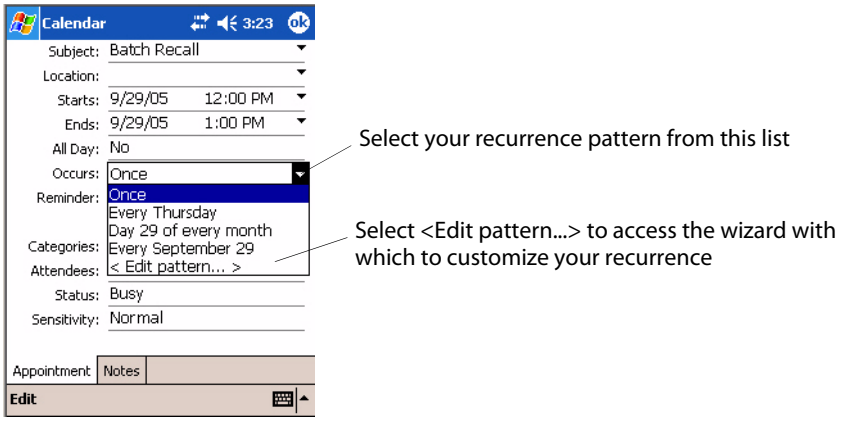
Note: To edit an existing note, tap the appointment in the calendar, tap **Edit**, then tap the **Notes** tab.

Making an Appointment Recurring

Do the following to make a recurring appointment:

1 In the calendar, tap the appointment, then tap **Edit**.

2 Tap **Occurs** and select a pattern from the list. Or, to create a new pattern, tap **<Edit pattern...>**, and follow the steps in the wizard.



Assigning an Appointment to a Category

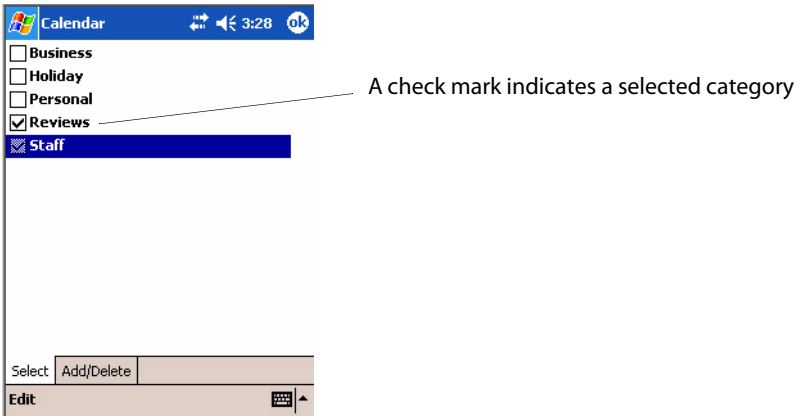
1 In the calendar, tap the appointment, then tap **Edit**.

2 Tap **Categories**.

3 On the **Select** tab, select the categories to which you want to assign the appointment.

4 To create a new category, tap the **Add/Delete** tab, enter the category name, then tap **Add**. The new category is automatically selected in the **Select** tab.

5 Tap **ok** to return to the appointment.



Note: To find an appointment assigned to a category, tap **Tools** > **Categories** and select the type of appointment that you want displayed. To show all appointments again, tap **Tools** > **Categories** and clear all categories.

Sending a Meeting Request

Use Calendar to schedule meetings with people who use Outlook or Pocket Outlook. When attendees receive a meeting request, they can accept or decline the meeting. If accepted, the meeting is added to their schedule, their response is sent back to you, and your calendar is updated.

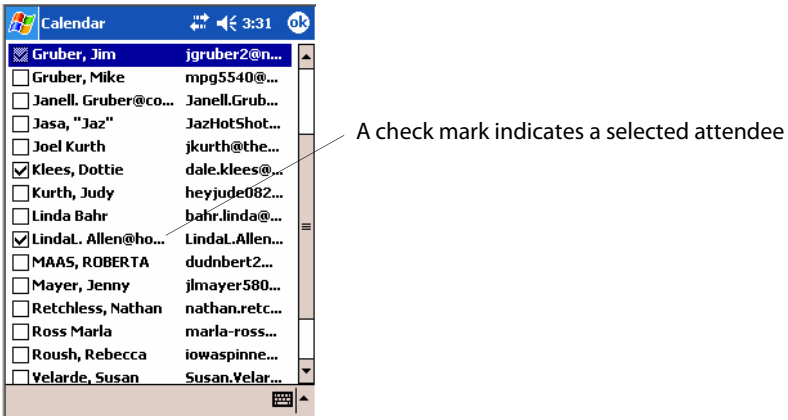
Before sending a meeting request, enter e-mail addresses in Contacts Help and set up Inbox to send and receive messages. For more information on sending and receiving meeting requests, tap **Start** > **Help** > **Calendar** to see *Calendar Help*, and tap **Start** > **Help** > **Inbox** to see *Inbox Help*.

1 Tap **New**, then enter the meeting information.

2 Hide the onscreen keyboard, if needed, then tap **Attendees**. Only those contacts with e-mail addresses are displayed. Select the contacts you want to invite, then tap **ok** to return to the appointment.

3 Select other desired options and then tap **ok**.

4 Inbox automatically creates a meeting request and sends it to the attendees the next time you synchronize with your desktop. Textual notes entered in the **Notes** tab (excluding writing or recordings) are sent also.

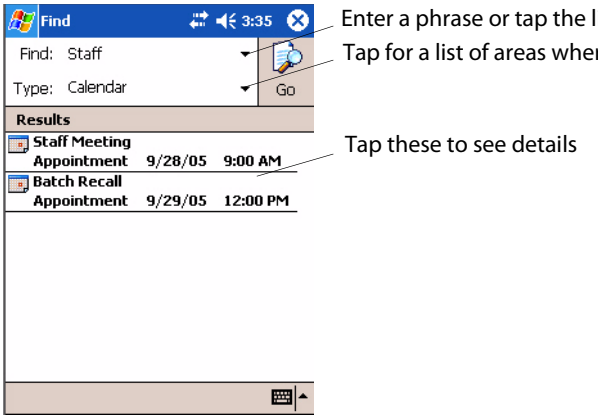


Note: If you are sending the meeting request through a connection to an ISP or the network, rather than through synchronization with your desktop, tap **Tools** > **Options**. From the Send meeting requests via drop-down list, tap the service to use to send the meeting request.

Finding an Appointment

There are two ways to find an appointment:

- Tap **Start** > **Find**, enter the appointment name, tap the **Type** arrow and select **Calendar** from the drop-down list, and then tap **Go**.
- In the calendar, tap **Tools** > **Categories** and select the type of appointment you want displayed. To show all appointments again, tap **Tools** > **Categories** and clear all categories.



Note: In Find, you can tap the **Find** arrow to select from a list of items of previously searched items or phrases.

Deleting an Appointment

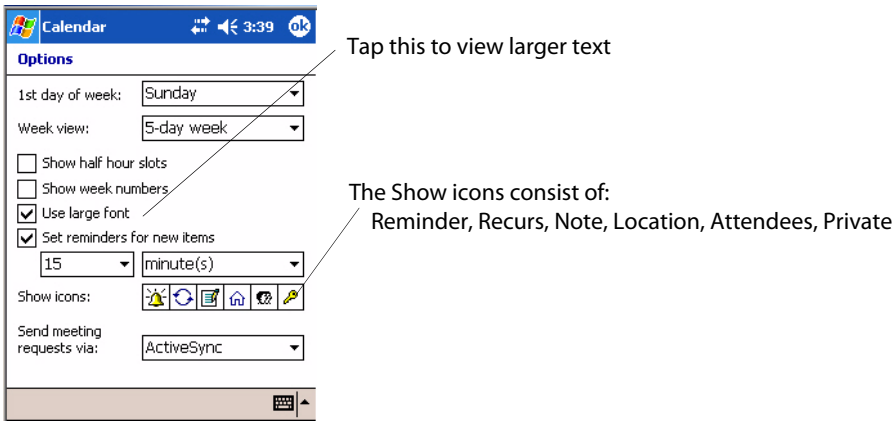
1. In the calendar, tap and hold the appointment.
2. On the pop-up menu, tap **Delete Appointment**. The next time you synchronize, the appointment is also deleted from the desktop.

Changing Calendar Options

In the calendar, tap **Tools** > **Options**.

- To see appointment indicators, select icons to display in **Show icons**. You can choose to display indicators for such things as recurring appointments, appointments with notes, and appointments with reminders. Tap and hold an icon to see its name.

- If you are having trouble reading the calendar, select **Use large font**. You may see less appointment information.

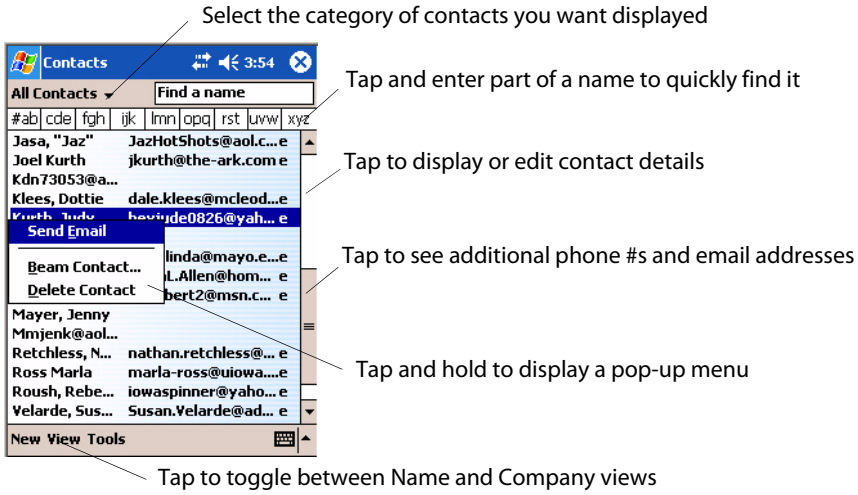


Contacts: Tracking Friends and Colleagues

Contacts To switch to Contacts on the CN2B Computer, tap **Start** > **Contacts**.

Contacts maintains a list of your friends and colleagues so that you can easily find the information you are looking for, whether you are at home or on the road. You can enter both personal and business information.

If you use Microsoft Outlook on your desktop, you can synchronize contacts between your CN2B Computer and your desktop.

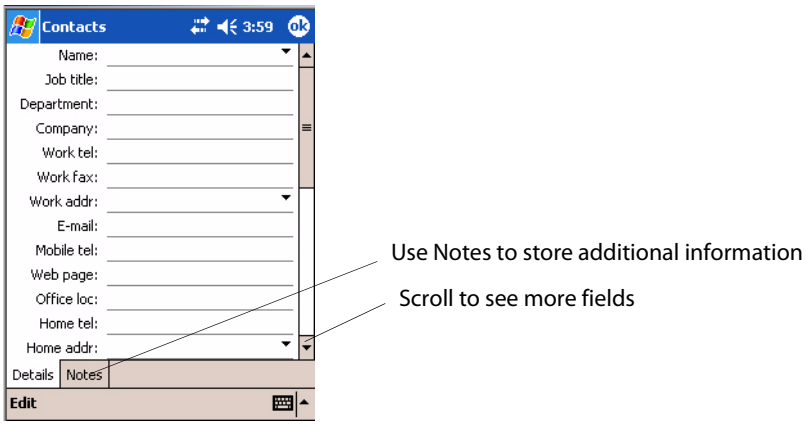


Creating a Contact

1. Tap **New**, then use the input panel to enter a name and other contact information. Scroll down to see all available fields.
2. To assign the contact to a category, scroll to and tap **Categories**, then select a category from the list, which can display contacts by category.

3 To add notes, tap the **Notes** tab. You can enter text, draw, or create a recording. For more information on creating notes, see "Notes: Capturing Thoughts and Ideas" on page 52.

4 When finished, tap **OK** to return to the contact list.



Synchronizing Contacts

Contacts stored on your device can be synchronized with Outlook contacts stored on your desktop or with Mobile Information Server 2002 or later.

New items entered in a location are copied to another during synchronization. Handwritten notes and drawings are saved as pictures when synchronizing with the desktop, but are removed when synchronizing with a server.

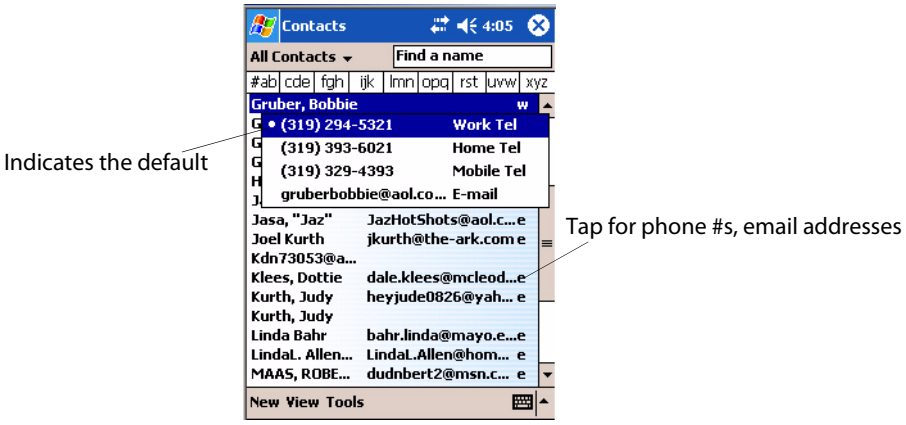
For information on synchronization, see *ActiveSync Help* on the desktop.

Viewing Contacts

The contact list displays the contact name and the first primary phone number or e-mail address specified for that contact. Contacts are ordered by name of contact or company.

- Tap the default letter (**h**ome, **w** ork, **m**obile, or **e**-mail) to the right of the contact to see additional phone numbers and e-mail addresses.
- Use your up/down controls on your keypad to select a contact, then press the left/right controls on your keypad to change the default number, displayed as a letter to the right of the contact name.
- To see more contact information, tap the contact.
- To see a list of available actions for a contact via a pop-up menu, tap and hold the contact.
- To see a list of contacts employed by a specific company, tap **View** > **By Company**. Then, tap the desired company name.

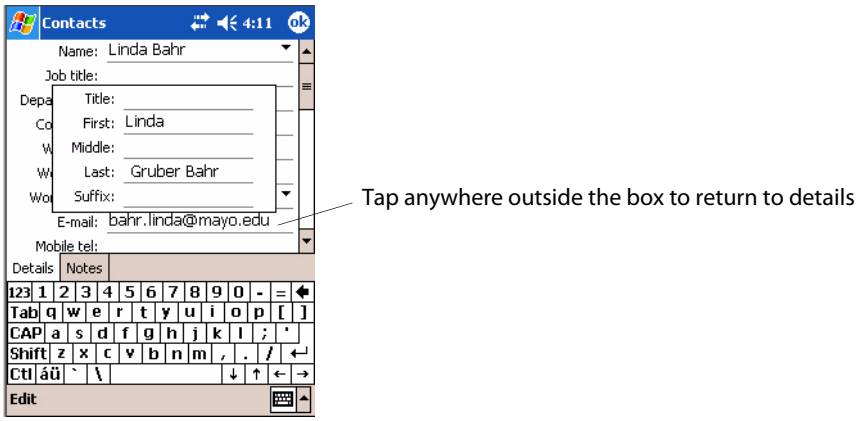
Note: You can change the appearance of the contact list by tapping **Tools** > **Options**.



Creating or Changing a Contact

- To create a contact, tap **New**. To enter notes, tap the **Notes** tab. When finished, tap **ok** to return to the contact list.
- To change a contact, tap it in the contact list, and then tap **Edit**. To cancel edits, tap **Edit** > **Undo**. When finished making changes, tap **ok** to return to the contact list.

Note: If you enter a name with more than two words, the middle word is recorded as a middle name. If your contact has a double first or last name, tap the **Name** arrow and enter the names in the proper boxes.



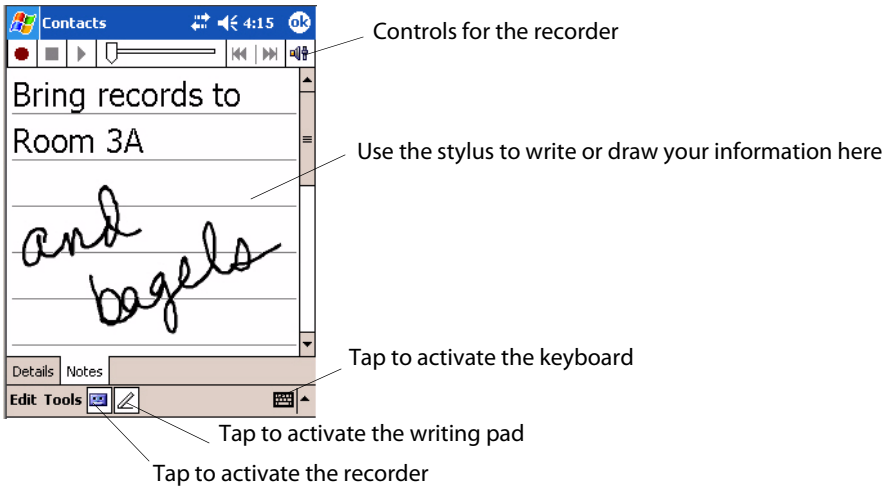
Note: New contacts are added to the displayed category.

Adding a Note to a Contact

You can add written or typed notes and even recordings (if your device supports recordings) to a contact. Notes are handy for maps and drawings.

1 In the contact list, tap the contact.

2 Tap the **Notes** tab. For specific instructions, tap **Start** > **Help** > **Notes** to see *Notes Help*.



Note: To edit an existing note, tap the contact, tap **Edit**, then tap the **Notes** tab.

Assigning a Contact to a Category

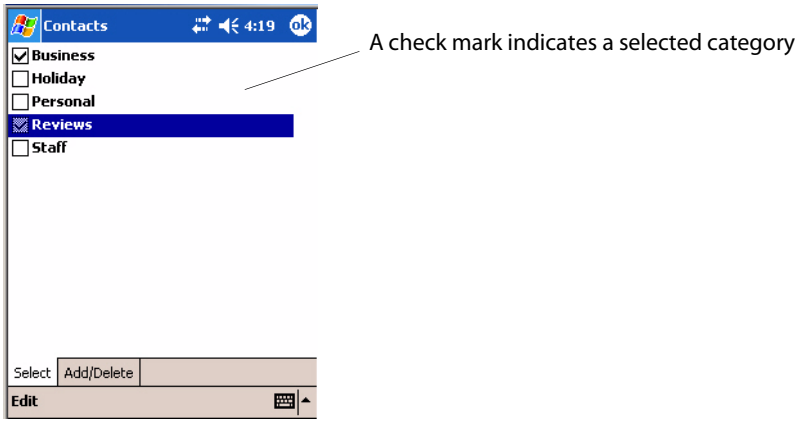
1 In the contact list, tap the contact, and then tap **Edit**.

2 Scroll to and tap **Categories**.

3 On the **Select** tab, check the categories to assign to the contact.

4 To create a new category, tap the **Add/Delete** tab, enter the category name, then tap **Add**. The new category is automatically checked in the **Select** tab.

5 Tap **ok** to return to the contacts.



Copying a Contact

1 In the contact list, select the contact. For multiple contacts, tap and drag.

2 Tap **Tools**, and then select **Copy Contacts**.

Sending a Message to a Contact

1 In the contact list, tap and hold the contact. To select multiple contacts, tap and drag. Then, tap and hold the selected contacts.

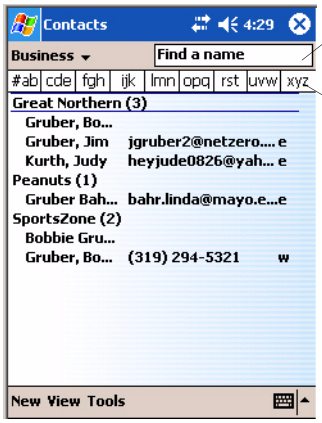
2 On the pop-up menu, select **Send Email** or **Send SMS**, depending upon the type of message to send.

Note: To send an e-mail message, use an e-mail address configured for the contact. To send an SMS (Short Messaging Service) message, use an SMS number for the contact, which is usually the mobile phone number.

Finding a Contact

- Tap **Start** > **Find**, enter the contact name (first, last, or middle), phone number, or address, select **Contacts** for the type, then tap **Go**.
- From Contacts, start typing a contact name until you see it displayed on the screen. To show all contacts again, tap the text box at the top of the screen and clear the text, or tap the arrow to the right of the text box.
- In the contact list, tap the category list (labeled **All Contacts** by default) and tap the category to which you have assigned a contact. To show all contacts again, select **All Contacts**.
- To view the names of companies for which your contacts work, in the contact list, tap **View** > **By Company**. The number of contacts that work for that company is displayed to the right of the company name.

Note: To quickly move through the contacts, tap a set of letters at the top. This takes you to the contact names beginning with those letters.



Deleting a Contact

1. In the contact list, tap and hold the contact. To select multiple contacts, tap and drag. Then, tap and hold the selected contacts.
2. On the pop-up menu, tap **Delete Contact**. The next time you synchronize, the contact is deleted from the desktop also.

Adding a Contact to Speed Dial

You can create speed dials to call frequently-called numbers with a single tap. Before you can create a speed dial entry for a phone number, that number must already exist in Contacts.

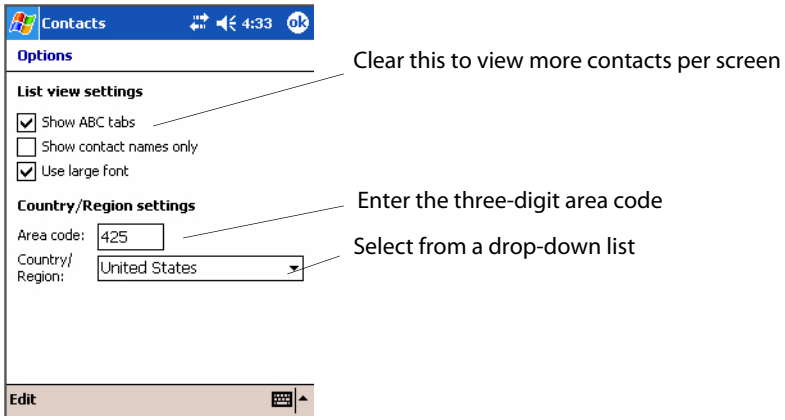
1. From the Phone keypad, tap **Speed Dial** > **New**.
2. Tap the desired contact name and number.
3. In the **Location** field, tap the **Up/Down** arrows to select an available location to assign as the new speed dial entry. The first speed dial location is reserved for your voice mail.

To delete a speed dial entry, go to the Speed Dial list, tap and hold the contact name in the box to the right of the assigned speed dial number, then tap **Delete**.

Changing Contacts Options

In the contact list, tap **Tools** > **Options**.

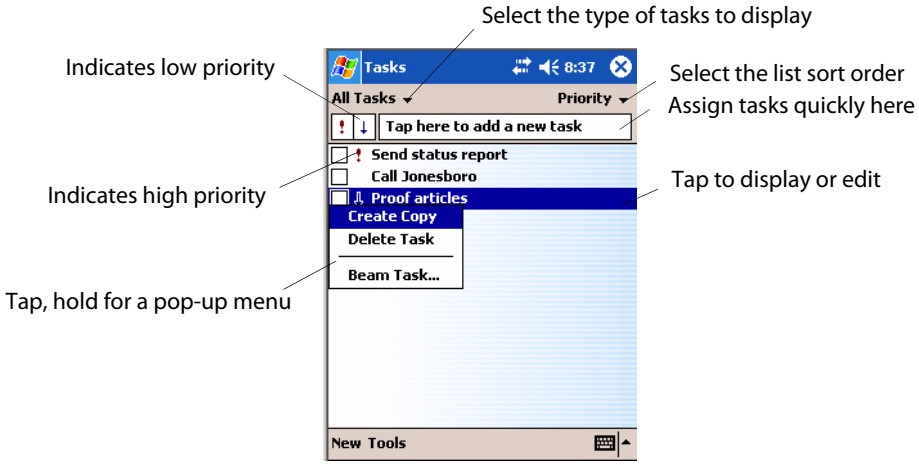
- The area code and country/region for new contacts are automatically entered based on the information in **Country/Region settings**.
- If you are having trouble reading the contacts in the contact list, select **Use large font**.
- To increase the available space for displaying contacts in the list, clear **Show ABC tabs**.



Tasks: Keeping a To Do List

To switch to Tasks on your CN2B Computer, tap **Start** > **Tasks**.

Use Tasks to keep track of what you have to do. A variety of task information can display on the Today screen. If you use Microsoft Outlook on your desktop, you can synchronize tasks between your device and desktop.



Note: To change the way information is displayed in the list, tap **Tools** > **Options**.

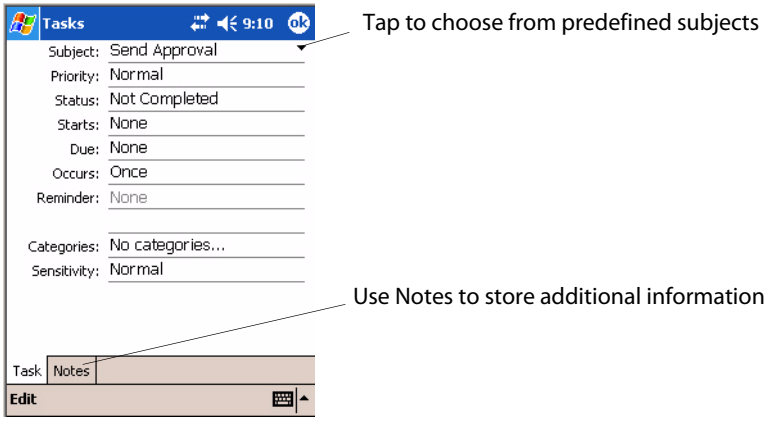
Creating a Task

- To create a task, enter text in the **Tap here to add a new task** box at the top of the screen. If you do not see this box, tap **Tools** > **Entry Bar**.
- To create a task with detailed information, such as start and due dates, tap **New**. To enter notes, tap the **Notes** tab.

  You can enter a start date and due date or enter other information by first tapping the field. If the input panel is open, you need to hide it to see all available fields.

You can enter text, draw, or create a recording. For more information on creating notes, see "Notes: Capturing Thoughts and Ideas" on page 52.

- To change a task, tap it in the task list, and then tap **Edit**.
- Using the onscreen keyboard, enter a description.
- To assign the task to a category, tap **Categories** and select a category from the list. In the task list, you can display tasks by category.
- When finished, tap **ok** to return to the task list.



Note: To create a task with only a subject, tap **Entry Bar** on the **Tools** menu. Then, tap **Tap here** to add a new task and enter the information.

Synchronizing Tasks

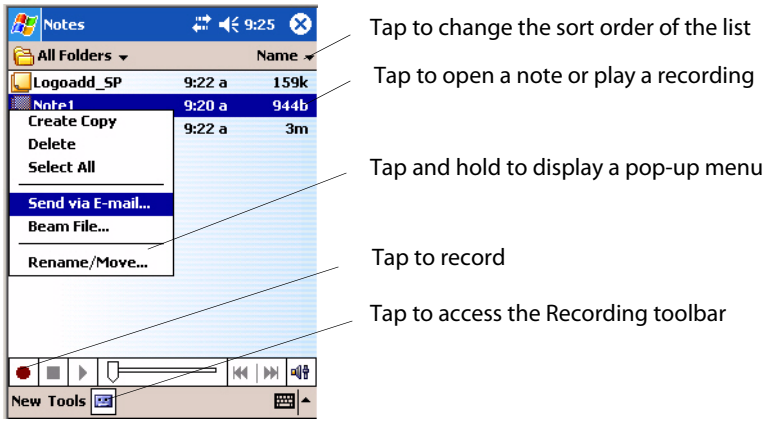
Tasks stored on your CN2B Computer can synchronize with Microsoft Outlook on your desktop. Task synchronization is automatically selected in ActiveSync.

New items entered on one computer are copied to the other during synchronization. Handwritten notes and drawings are saved as metafiles (pictures). For more information on synchronization, see *ActiveSync Help* on the desktop.

Notes: Capturing Thoughts and Ideas

To switch to Notes on your CN2B Computer, tap **Start** > **Notes**.

Notes helps you quickly capture your ideas, notes, and thoughts. You can create a note using written and typed text, drawings, and recordings. You can also share your notes with others through e-mail, infrared, and synchronization with your desktop.



Note: To create documents with advanced formatting or templates, such as bulleted lists and tabs, use word processing software developed for your device, such as Pocket Word.

Creating a Note

To create your note, tap **New**, then write, draw, type, or record your information. For information about using the input panel, writing and drawing, and creating recordings, see "Basic Skills" on page 21.

- **Writing**
  Using the stylus, write directly on the screen.
- **Drawing**
  Using the stylus, draw directly on the screen.
- **Typing**
  Using the input panel, enter typed text into the CN2B Computer. Do this by tapping keys on the onscreen keyboard or by using handwriting recognition software.
- **Recording**
  Create a stand-alone recording or embed a recording into a note.

Synchronizing Notes

Notes can be synchronized between your desktop and device either through notes synchronization or file synchronization. Notes synchronization synchronizes the notes on the CN2B Computer with Outlook Notes on the desktop. File synchronization does all notes on the CN2B Computer with the My Documents folder for the CN2B Computer on the desktop.

To synchronize notes through synchronization, first select the Notes information type for synchronization in ActiveSync. The next time you synchronize, all notes in My Documents and its subfolder on your device appear in Outlook Notes on your desktop. Notes that contain only text appear as regular notes in Outlook on your desktop, while notes containing written text or drawings appear in the device format. In addition, all notes in the Notes group in Outlook on the desktop appear in Notes on the device.

To synchronize your notes as files, in ActiveSync, select the Files information type for synchronization and clear the Notes information type. When you select Files, the My Documents folder for the CN2B Computer is created on your desktop. All .PWI files placed in the My Documents folder on your device and all .DOC files placed in the My Documents folder for the CN2B Computer on your desktop are synchronized. Password-protected files cannot be synchronized.

ActiveSync converts documents during synchronization. For information on synchronization or file conversion, see *ActiveSync Help* on the desktop.

Note: When you delete or change an item on either your desktop or CN2B Computer, the item is changed or deleted in the other location the next time you synchronize.

Note: If you synchronize your notes using file synchronization and then later decide to use notes synchronization, all of your notes are synchronized with Outlook on your desktop and no longer store in the **My Documents** folder for the CN2B Computer.

Inbox: Sending and Receiving E-mail Messages

To switch to Inbox on your CN2B Computer, tap **Start** > **Inbox**.

You can receive Internet e-mail messages and SMS messages in Inbox. Internet e-mail messages are sent by using an address you receive from your Internet service provider (ISP) or your employer. SMS messages are sent and received through your wireless phone service provider by using a phone number as the message address.

You can send and receive e-mail by synchronizing with your desktop, or by connecting to a Post Office Protocol 3 (POP3) or Internet Message Access Protocol 4 (IMAP4) mail server. You need to set up an e-mail account for each method that you use except for Microsoft ActiveSync, which is set up by default. The ActiveSync folder on your CN2B Computer stores messages that you send and receive through synchronization with a desktop. Account names appear as folders in the folder list (located on the left, under the navigation bar) in the Inbox message list.

With synchronization, messages are synchronized between the device Inbox and the PC Inbox by using ActiveSync and Microsoft Exchange or Microsoft Outlook. For more information, see "Synchronizing E-mail Messages" on page 54.

Synchronizing E-mail Messages

After selecting Inbox for synchronization in ActiveSync, e-mail messages are synchronized as part of the general synchronization process. During synchronization:

- Messages are copied from the Inbox folder on your desktop or the Microsoft Exchange server to the Inbox folder on your CN2B Computer. (Note that you can only synchronize information directly with an Exchange Server if your company is running Microsoft Mobile Information Server 2002 or later.) By default, you receive messages from the last three days only, the first 100 lines of each new message, and file attachments of less than 100 KB in size.
- Messages in the Outbox folder on your device are transferred to Exchange or Outlook and then sent from those programs.
- The messages on the two computers are linked. When you delete a message on your CN2B Computer, it is deleted from your desktop the next time you synchronize.
- Messages in subfolders in other e-mail folders in Outlook are synchronized only if they were selected for synchronization in ActiveSync.

For information on initiating Inbox synchronization or changing synchronization settings, see *ActiveSync Help* on your desktop or select **Start** > **Help** > **Connections** to see *Connections Help*.

Managing E-mail Messages and Folders

Each e-mail account and SMS account has its own folder hierarchy with five default folders: Inbox, Outbox, Deleted Items, Drafts, and Sent Items. The messages you receive and send through the mail account are stored in these folders. You can also create additional folders within each hierarchy. The Deleted Items folder contains messages that were deleted on the device. The behavior of the Deleted Items and Sent Items folders depends on the Inbox options you have chosen.

The behavior of the folders you create depends on whether you are using ActiveSync, SMS, POP3, or IMAP4.

- *If you use ActiveSync,*
  e-mail messages in the Inbox folder in Outlook automatically synchronize with your device. You can select to synchronize additional folders by designating them for ActiveSync. The folders you create and the messages you move are then mirrored on the server. For example, if you move two messages from the Inbox folder to a folder named Family, and you have designated Family for synchronization, the server creates a copy of the Family folder and copies the messages into that folder. You can then read the messages while away from your desktop.
- *If you use SMS,*
  messages are stored in the Inbox folder.

- *If you use POP3*
  and you move e-mail messages to a folder you created, the link is broken between the messages on the device and their copies on the mail server. The next time you connect, the mail server sees that the messages are missing from the device Inbox and deletes them from the server. This prevents you from having duplicate copies of a message, but it also means that you no longer have access to messages that you move to folders created from anywhere except the CN2B Computer.
- *If you use IMAP4*,
  the folders created and the e-mail messages moved are mirrored on the server. Thus, messages are available to you anytime you connect to your mail server, whether it is from your CN2B Computer or desktop. This synchronization of folders occurs whenever you connect to your mail server, create new folders, or rename or delete folders when connected.

For all accounts except ActiveSync, you can access folder options by tapping **Tools** > **Manage Folders**.

Connecting to a Mail Server

In addition to synchronizing e-mail messages with your desktop, you can send and receive e-mail messages by connecting to an e-mail server using a network card connected to your CN2B Computer. You need to set up a remote connection to a network or an ISP, and a connection to your e-mail server. For more information, see **"Remote Access (Modems)" on page 100**.

When you connect to the e-mail server, new messages are downloaded to the CN2B Computer Inbox folder, messages in the CN2B Computer Outbox folder are sent, and messages that were deleted on the e-mail server are removed from the CN2B Computer Inbox folder.

Messages that you receive directly from an e-mail server are linked to your e-mail server rather than your desktop. When you delete a message on your CN2B Computer, it is also deleted from the e-mail server the next time you connect based on the settings selected in ActiveSync.

You can work online or offline. When working online, you read and respond to messages while connected to the e-mail server. Messages are sent as soon as you tap **Send**, which saves space on your CN2B Computer.

When working offline, once you have downloaded new message headers or partial messages, you can disconnect from the e-mail server and then decide which messages to download completely. The next time you connect, Inbox downloads the complete messages you have marked for retrieval and sends the messages you have composed.

Setting Up or Changing an Account

- To set up a POP3 or IMAP4 e-mail account, tap **Accounts** > **New Account**. Follow the instructions in the New Account Wizard.
- To set up an SMS account, tap **Accounts** > **Accounts**, and then tap **SMS**. Follow the instructions on the screen.

To change options for an account, tap **Accounts** > **Accounts**, then tap the name of the account, and follow the instructions on the screen.

To delete an account, tap **Accounts** > **Accounts**, tap and hold the name of the account, then tap **Delete**.

Note: You can set up several e-mail accounts including your ActiveSync account, but you can set up, but not delete, only one SMS account. You cannot add a new account while connected. Tap **Accounts** > **Disconnect** to disconnect.

Downloading Messages from the Server

In Inbox, tap **Accounts** > **Connect** to open a connection to the Internet or your corporate network, depending on the account. For more information, tap **Start** > **Help** > **Connections** to see *Connections Help*.

1. Tap **Accounts** and ensure that the account you want to use is selected (marked by a bullet.)
2. Tap **Connect**. The messages on your CN2B Computer and e-mail server are synchronized: new messages are downloaded to the CN2B Inbox folder, messages in the CN2B Outbox folder are sent, and messages that were deleted from the server are removed from the CN2B Inbox. Tap a message in the message list to open it.
3. If you read a message and decide that you need the full copy, tap **Edit** > **Mark for Download** while in the message window. If you are in the message list, tap and hold the message, and then tap **Mark for Download**. This also downloads message attachments if you selected those options when you set up the e-mail account. You can also choose to download full copies of messages by default.
4. When finished, tap **Accounts** > **Disconnect**.

Note: Receiving entire messages consumes storage memory.

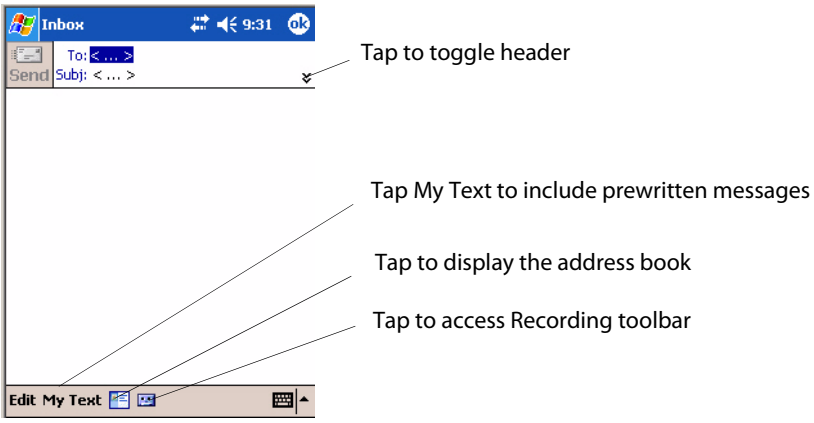
Note: The size column in the message list displays the local size and server size of a message. Even when a message has downloaded fully, these numbers may differ because the size of a message can vary between the server and the device.

Composing and Sending Messages

1. In the message list, tap **New**.
2. To select an account, tap the **From** list and select "ActiveSync," "SMS," or the desired e-mail account.
3. Enter the e-mail address or SMS address of one or more recipients, separating them with semicolons. To access addresses and phone numbers from Contacts, tap **To**.
4. Enter your message. To quickly add common messages, tap **My Text** and tap a desired message.

5 To check spelling, tap **Edit** > **Spell Check**.

6 Tap **Send**. If you are working offline, the message is moved to the Outbox folder and is sent the next time you connect.



Note: If you are sending an SMS message and want to know if it was received, before sending the message, tap **Edit** > **Options** > **Request SMS text message delivery notification**.

You can directly call the sender of an SMS message by tapping the **SMS** icon, then selecting **Call**.

Note: Depending on the e-mail address options that you select, you can use a directory service in addition to your contact list to verify names.

Companion Programs

The companion programs consist of Microsoft Pocket Word, Microsoft Pocket Excel, Windows Media Player, and Microsoft Reader. To switch to a companion program on your CN2B Computer, tap **Start** > **Programs**.

Pocket Word

Pocket Word works with Microsoft Word on your desktop to give you access to copies of your documents. You can create new documents on your CN2B Computer, or you can copy documents from your desktop to your CN2B Computer. Synchronize documents between your desktop and your CN2B Computer to have up-to-date content in both locations.

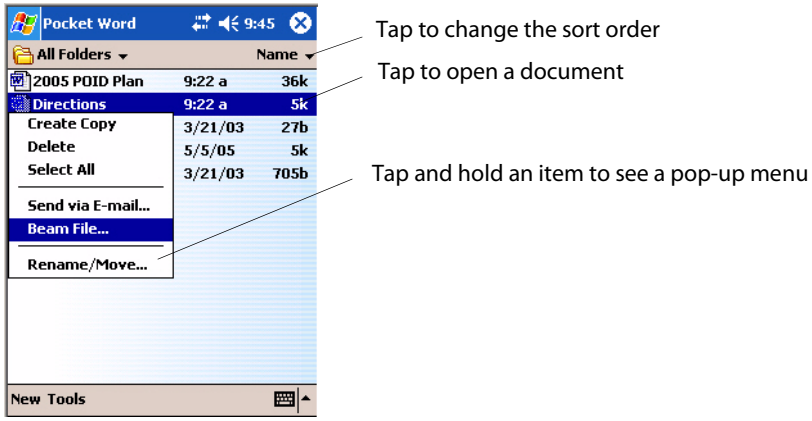
Creating a Document

Pocket Word

Use Pocket Word to create documents, letters, meeting minutes, etc. To create a new file, tap **Start** > **Programs** > **Pocket Word** > **New** for either a blank document or a template, depending on what you have selected under **Tools** > **Options**. Select an input mode from the View menu.

You can open only one document at a time; when you open a second document, you have to save the first. You can save a document you create or edit in formats such as Word (.DOC), Pocket Word (.PSW), Rich Text Format (.RTF), and Plain Text (.TXT).

Pocket Word contains a list of files stored on your CN2B Computer. Tap a file in the list to open it. To delete, make copies of, and send files, tap and hold a file in the list, then, select the action on the pop-up menu.



You can enter information in Pocket Word in one of four modes (typing, writing, recording, and drawing), which are displayed on the **View** menu. Each mode has its own toolbar, which you can show and hide by tapping the **Show/Hide Toolbar** icon on the command bar.

You can change the zoom magnification by tapping **View** > **Zoom**, then select the percentage you want. Select a higher percentage to enter text and a lower one to see more of your document.

If you are opening a Word document created on a desktop, you may select **View** > **Wrap to Window** so that you can see the entire document.

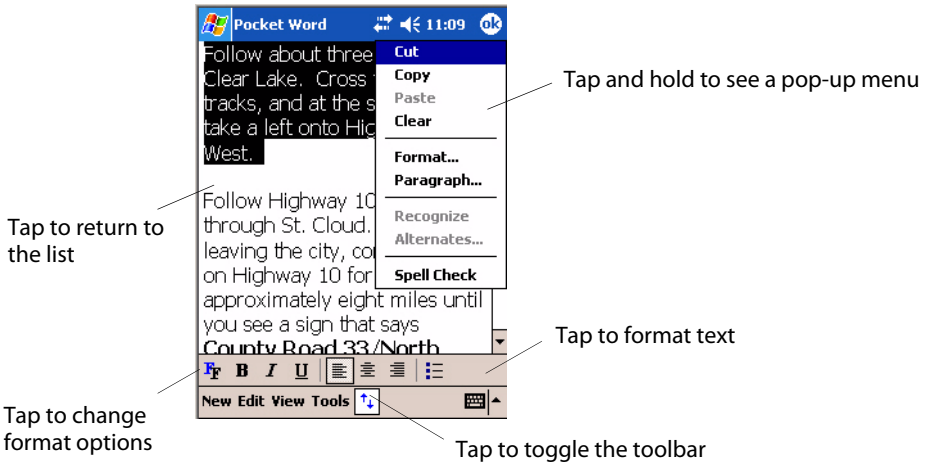
To check spelling, select text, then tap **Tools** > **Spell Check**. To use your new document as a template, move the document to the Templates folder.

You can insert the data in a document. First, make sure that no drawings are selected, tap and hold anywhere on the document, then tap **Insert Date** from the pop-up menu.

Typing Mode

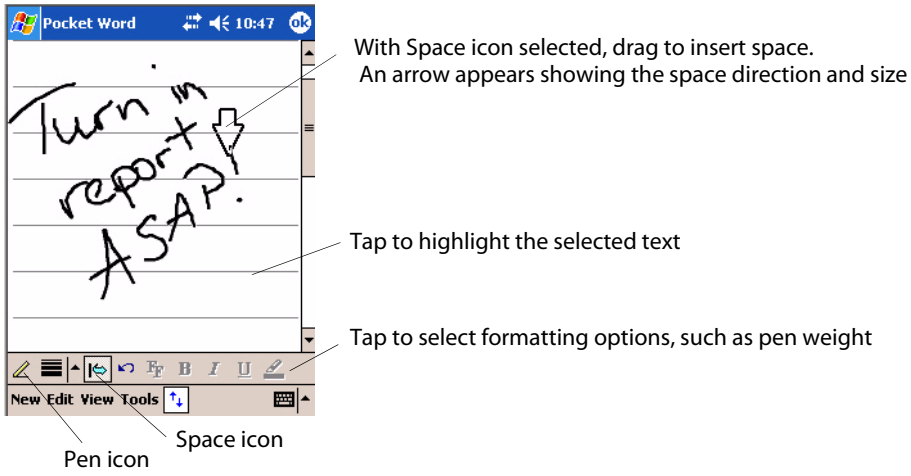
Using the input panel, enter typed text into the document. For more information on entering typed text, see "Basic Skills" on page 21.

To format existing text and to edit text, first select the text. You can select text as you do in a Word document, using your stylus instead of the mouse to drag through the text you want to select. You can search a document to find text by tapping **Edit** > **Find/Replace**.



Writing Mode

In writing mode, use your stylus to write directly on the screen. Ruled lines are displayed as a guide, and the zoom magnification is greater than in typing mode to allow you to write more easily. For more information on writing and selecting writing, see "Basic Skills" on page 21.



Note: If you cross three ruled lines in a single stylus stroke, the writing becomes a drawing, and can be edited and manipulated as described in "Drawing Mode" on page 60.

Note: Written words are converted to graphids (metafiles) when a Pocket Word document is converted to a Word document on your desktop.

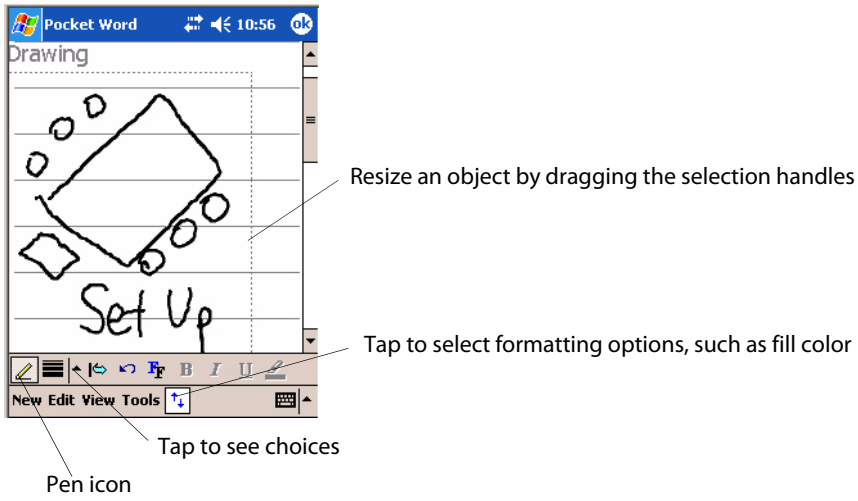
Recording Mode

In recording mode, embed a recording into your document. Recordings are saved as .WAV files. For more information on recording, see "Basic Skills" on page 21.

For more information on using Pocket Word, tap **Start** > **Help** > **Pocket Word** to see *Pocket Word Help*.

Drawing Mode

In drawing mode, use your stylus to draw on the screen. Grid lines appear as a guide. When you lift your stylus off the screen after the first stroke, a drawing box indicating the boundaries of the drawing appears. Every subsequent stroke within or touching the drawing box becomes part of the drawing. For more information on drawing and selecting drawings, see "Basic Skills" on page 21.



Synchronizing Pocket Word Documents

Pocket Word documents can be synchronized with Word documents on your desktop. To synchronize files, first select the Files information type for synchronization in ActiveSync. When you select Files, the My Documents folder for the CN2B Computer is created on your desktop. Place all files you want to synchronize with the device in this folder. Password-protected files cannot be synchronized.

All Pocket Word files stored in My Documents and its subfolders are synchronized with the desktop. ActiveSync converts documents during synchronization.

For more information on synchronization or file conversion, see *ActiveSync Help* on the desktop.

Note: When you delete a file on either your desktop or your CN2B Computer, the file is deleted in the other location the next time you synchronize.

Pocket Excel

You can create and edit workbooks and templates in Microsoft Pocket Excel as you do in Microsoft Excel on your desktop. Pocket Excel workbooks are usually saved as .PXL files, and also in .XLS format.

When you close a workbook, it is automatically named and placed in the Pocket Excel workbook list. You can attach a password to a workbook to help ensure privacy.

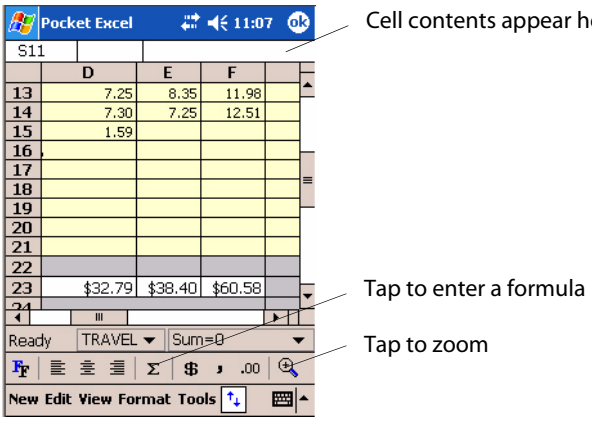
Creating a Workbook

Pocket Excel

Use Pocket Excel to create workbooks, such as expense reports and mileage logs. To create a new file, tap **Start** > **Programs** > **Pocket Excel** > **New**. A blank workbook appears. Or, if you have selected a template for new workbooks in the **Tools** > **Options** dialog, that template appears with appropriate text and formatting already provided. You can open only one workbook at a time; when you open a second workbook, save the first. You can save a workbook you create or edit in a variety of formats, including Pocket Excel (.PXL) and Excel (.XLS). You can also save a workbook as a template by moving the workbook to the Templates folder.

Pocket Excel contains a list of the files stored on your CN2B Computer. Tap a file in the list to open it. To delete, make copies of, and send files, tap and hold a file in the list. Then select the appropriate action from the pop-up menu.

Pocket Excel provides fundamental spreadsheet tools, such as formulas, functions, sorting, and filtering. Tap **View** > **Toolbar** to see the toolbar.



Note: If your workbook contains sensitive information, you can protect it with a password. To do so, open the workbook, tap **Edit** > **Password**. Every time you open the workbook, enter a password, preferably one that is easy for you to remember but hard for others to guess.

Tips for Working in Pocket Excel

Note the following when working in large worksheets in Pocket Excel:

- View in full-screen mode to see as much of your worksheet as possible. Tap **View** > **Full Screen**. To exit full-screen mode, tap **Restore**.
- Tap **View** > **Zoom** and select a percentage so that you can easily read the worksheet.
- Show and hide window elements. Tap **View** and then tap the elements you want to show or hide.
- Freeze panes on a worksheet to keep certain rows and columns visible as you work. Select the cells, then tap **View** > **Freeze Panes** to freeze them. Tap **View** > **Unfreeze Panes** to undo this process.

- Split panes to view different areas of a large worksheet. Tap **View** > **Split**. Then drag the split bar to where you want it. To remove the split, tap **View** > **Remove Split**.
- Show and hide rows. To hide a row, select a cell in the row you want to hide. Then tap **Format** > **Row** > **Hide**. To show a hidden row, tap **Tools** > **Go To**, and then type a reference that is in the hidden row. Then tap **Format** > **Row** > **Unhide**.
- Do the same to show and hide columns. To hide a column, select a cell in the column you want to hide. Then tap **Format** > **Column** > **Hide**. To show a hidden column, tap **Tools** > **Go To**, and then type a reference that is in the hidden column. Then tap **Format** > **Column** > **Unhide**.

For more information on using Pocket Excel, tap **Start** > **Help** > **Pocket Excel** to see *Pocket Excel Help*.

MSN Messenger

MSN Messenger on your CN2B Computer provides the same chat environment as MSN Messenger on your desktop. These features include:

- Seeing who is online
- Sending and receiving instant messages
- Having an instant message conversation with a group of contacts
- Telling contacts that you are unavailable
- Blocking contacts from seeing your status or sending you messages

To use MSN Messenger, you need a Microsoft Passport account, or a Microsoft Exchange e-mail account that your employer provides. Once you have one of these accounts, do the following:

1. Set up a connection on your CN2B Computer, such as a wireless connection, that enables you to connect to the Internet.
2. Set up an account in MSN Messenger.
3. Sign in to MSN Messenger.

Note: To set up a free Hotmail account, go to **www.hotmail.com**.
To set up a Microsoft Passport account, go to **www.passport.com**.
To set up an Exchange account, see your network administrator.

For more information on using MSN Messenger, tap **Start** > **Help** > **MSN Messenger** to see *MSN Messenger Help*.

To switch to MSN Messenger, tap **Start** > **Programs** > **MSN Messenger**.

Setting Up an Account

Before you can use MSN Messenger, you must set up the instant messaging accounts to use. For MSN Messenger Service, you must have a Microsoft Passport or Hotmail account. For Exchange Instant Messaging, you must have an Exchange account.

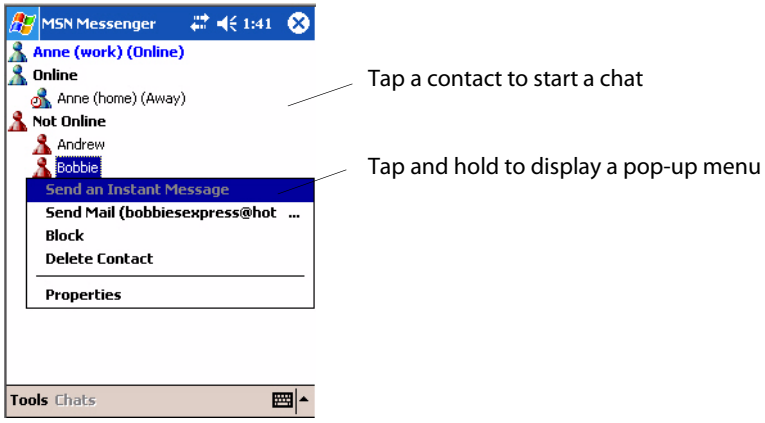
1. Create a connection for your device. To use MSN Messenger Service, set up a connection to the Internet; to use Exchange Instant Messaging, set up a connection to your corporate network. See "Remote Access (Modems)" on page 100 for more information on getting connected.
2. In MSN Messenger, tap **Tools** > **Options** > the **Accounts** tab.
3. Select either **Enable MSN Messenger Service**, or **Enable Exchange Instant Messaging**, or both.
4. Enter your sign-in name and password for the selected accounts. Your sign-in name is usually in the username@domain.com form.
5. If you selected both accounts, under **Sign in using this account first**, select which account to sign in to first.

Signing In and Out

- To sign in, tap anywhere on the screen and follow the directions.
- To sign out, tap **Tools** > **Sign Out**.
- To sign in upon connecting, tap **Tools** > **Options** > **General** and select the **Run this program upon connection** box.
- Signing in to an Exchange account may take several minutes depending upon your connection speed. Reducing the number of Exchange contacts decreases your sign-in time.

Working with Contacts

The MSN Messenger window shows all of your messenger contacts at a glance, divided into Online and Not Online categories. From this view, while connected, you can chat, send e-mail, block the contact from chatting with you, or delete contacts from your list using the pop-up menu.

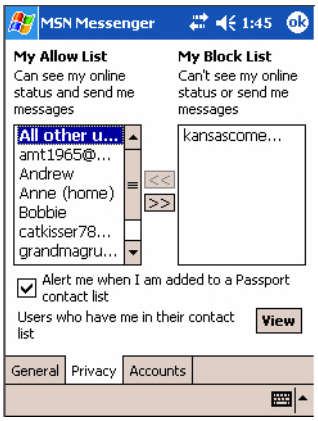


To add a contact, tap **Tools** > **Add a Contact** and follow the directions on the screen. To delete a contact, tap and hold the contact's name, then tap **Delete Contact** from the pop-up menu. To see others online without being seen, tap **Tools** > **My Status** > **Appear Offline**.

Managing Contacts

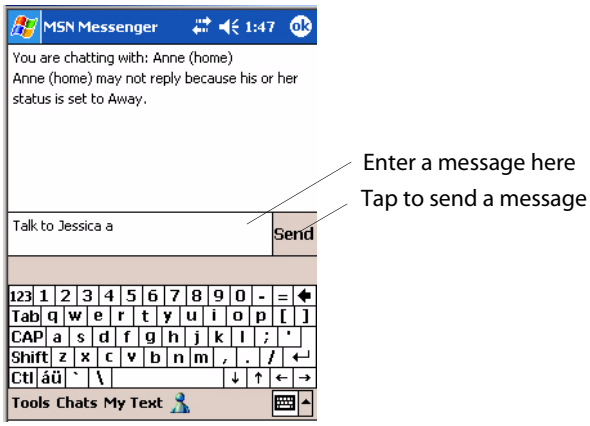
To be alerted each time you are added to a contact list, tap **Tools** > **Options** > the **Privacy** tab.

- To block a contact from seeing your status and sending you messages, tap the contact and tap the right arrow. This moves the contact to the **My Block List**.
- To unblock a contact, tap the contact and tap the left arrow. This moves the contact to the **My Allow List**.
- To receive an alert when someone adds you to their contacts list, select **Alert me when I am added to a Passport contact list**.
- To see who has you listed as a contact, tap **View**.



Sending a Message

- Tap a contact to whom you want to send a message. Enter your message in the text entry area at the bottom of the screen and tap **Send**. To quickly add common messages, tap **My Text** and tap a desired message.
- To invite another contact to an ongoing chat, tap **Tools** > **Invite** and tap a contact.
- To see who is already chatting or to switch between chats, tap **Chats**.

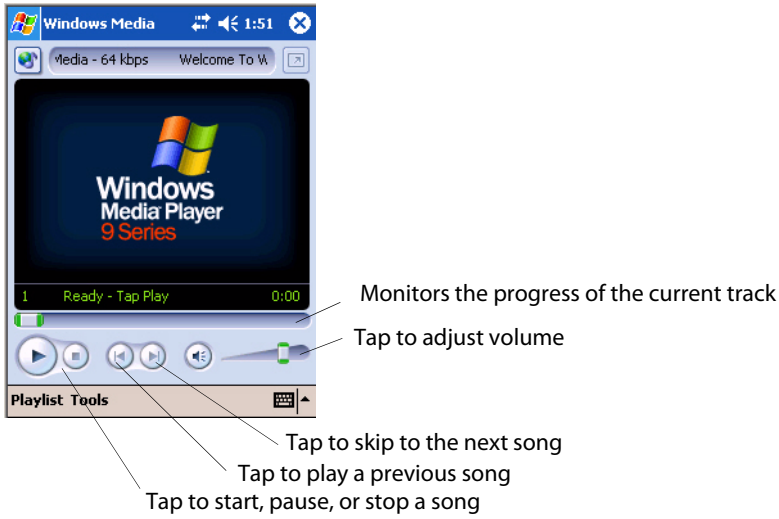


Windows Media Player for Windows Mobile

Windows Media

Use Microsoft Windows Media Player for Windows Mobile to play digital audio and video files that are stored on your CN2B Computer or on a network. To switch to Windows Media Player on your CN2B Computer, tap **Start** > **Windows Media**.

Use Microsoft Windows Media Player on your desktop to copy digital audio and video files to your CN2B Computer. You can play Windows Media and MP3 files on your Windows Mobile.



For more information about using Windows Media Player for Windows Mobile, tap **Start** > **Help** > **Windows Media Player**.

Microsoft Reader

Use Microsoft Reader to read eBooks on your CN2B Computer. Download books to your desktop from your favorite eBook Web site. Then, use ActiveSync to copy the book files to your activated CN2B Computer. The books appear in the Reader Library, where you can tap them in the list to open them. Each book consists of a cover page, an optional table of contents, and the pages of the book. You can:

- Page through the book by using the Up/Down control on your CN2B Computer or by tapping the page number on each page.
- Annotate the book with highlighting, bookmarks, notes, and drawings.
- Search for text and look up definitions for words.

The Guidebook contains the information needed to use the software. To open the Guidebook, tap **Help** on the Reader command bar. Or, on a book page, tap and hold the book title, and then tap **Help** on the pop-up menu.

To switch to Microsoft Reader, tap **Start** > **Programs** > **Microsoft Reader.**

Getting Books on Your CN2B Computer

You can download book files from the Web. Just visit your favorite eBook retailer and follow the instructions to download the book files.

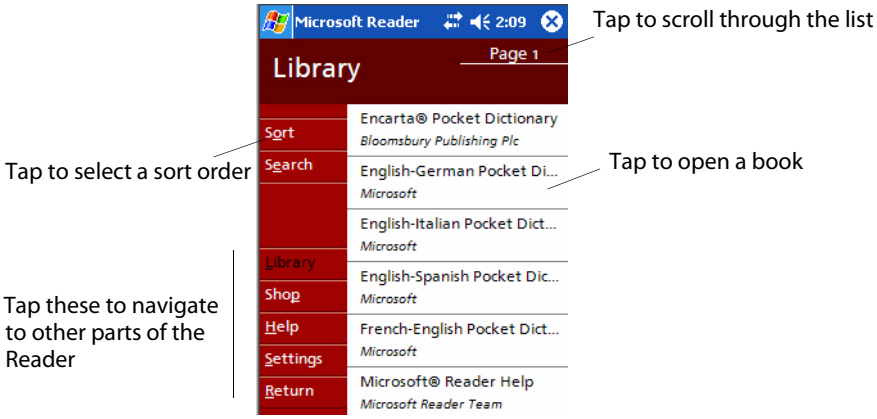
Sample books and a dictionary are also included in the "\Extras\MSReader" path on the *Windows Mobile Companion CD*.

Use ActiveSync to download the files from your desktop to your activated mobile computer described in the *Read Me* file in the "\MSReader" folder.

Using the Library

The Library is your Reader home page; it displays a list of all books stored on your CN2B Computer or storage card. To open the Library:

1. On the Reader command bar, tap **Library**.
2. On a book page, tap the book title, then tap **Library** on the menu.
3. To open a book, tap its title in the Library list.

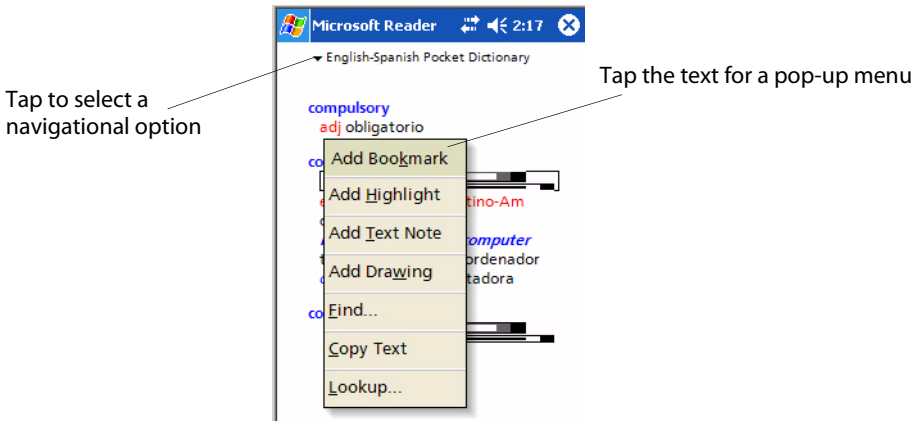


Reading a Book

Each book consists of a cover page (which includes navigation options), an optional table of contents, and the pages of the book.

The first time you open a book, go to the first page or to the table of contents, if there is one. Subsequently, whenever you open the book, you are automatically taken to the last page read.

With the text, each book page includes a page number and book title. You can also page through a book by using the Up/Down/Left/Right controls on your CN2B Computer.



Using Reader Features

Reading a book electronically gives you several options not available with paper books. These options are available from any book page.

Select text by dragging across the text on the page. Then, tap an option on the pop-up menu, as described here:

Searching for Text	Find text in a book by tapping **Find** on the pop-up menu. Enter the word you want to search for, and tap the desired **Find** option. Reader highlights found text on the page. To close **Find**, tap outside the box. To return to your original page, tap the title and then tap **Return** on the pop-up menu.
Copying Text	You can copy text from books that support this feature into any program that accepts text. On a book page, select the text you want to copy. Then, tap **Copy Text** on the pop-up menu. The text can be pasted into the program of your choice.
Adding Bookmarks	When you add a bookmark to a book, a color-coded bookmark icon appears in the right margin. You can add multiple bookmarks to a book. Then, from anywhere in the book, tap the bookmark icon to go to the bookmarked page.
Highlighting Text	When you highlight text, it appears with a colored background.
Attaching Notes to Text	When you attach a note to text, you enter the text in a notepad that appears on top of the book page. A **Note** icon displays in the left margin. To show or hide the note, tap the icon.
Adding Drawings	When you add a drawing, a **Drawing** icon appears in the bottom, left corner of the page, and drawing tools appear across the bottom of the page. Draw by dragging your stylus.
Annotations Index	To see a list of a book's annotations, including bookmarks, highlights, text notes, and drawings, tap **Annotations Index** on the book's cover page. You can tap an entry in the list to go to the annotated page.

Removing a Book

When you finish reading a book, you can delete it to conserve space on your CN2B Computer. If a copy of the book is stored on your desktop, you can download it again at any time.

To remove a book from your CN2B Computer, tap and hold the title in the Library list, and then tap **Delete** on the pop-up menu.

Pocket Internet Explorer

Use Microsoft Pocket Internet Explorer to view Web or WAP pages in either of these ways:

- During synchronization with your desktop, download your favorite links and mobile favorites that are stored in the Mobile Favorites subfolder in Internet Explorer on the desktop.
- Connect to an ISP or network and browse the Web. To do this, create the connection first, as described in **"Remote Access (Modems)" on page 100**.

When connected to an ISP or network, you can also download files and programs from the Internet or intranet.

To switch to Pocket Internet Explorer on your CN2B Computer, tap **Start** > **Internet Explorer**.

The Mobile Favorites Folder

Only items stored in the Mobile Favorites subfolder in the Favorites folder in Internet Explorer on your desktop are synchronized with your CN2B Computer. This folder was created automatically with ActiveSync installed.

Favorite Links

During synchronization, the list of favorite links in the Mobile Favorites folder on your desktop is synchronized with Pocket Internet Explorer on your CN2B Computer. Both computers are updated with changes made to either list each time you synchronize. Unless you mark the favorite link as a mobile favorite, only the link is downloaded to your CN2B Computer. Connect to your ISP or network to view the content.

1. In ActiveSync on your desktop, click **Tools** > **Options**, and select "Favorites" from the **Mobile Device** list. For more information on using ActiveSync, see *ActiveSync Help* on the desktop.
2. In Internet Explorer on your desktop, save or move favorite links to the Mobile Favorites subfolder in the Favorites list via **Favorites** > **Organize Favorites**. For more information on using Internet Explorer, see *Internet Explorer Help* on the desktop.
3. Connect your CN2B Computer to your desktop. If synchronization does not start automatically, in ActiveSync on your desktop, click **Sync**.

Mobile Favorites

If you are using Microsoft Internet Explorer 5.0 or later on your desktop, you can download mobile favorites to your CN2B Computer. Synchronizing mobile favorites downloads Web content to your CN2B Computer so that you can view pages while disconnected from your ISP and desktop.

Use the Internet Explorer plug-in installed with ActiveSync to create mobile favorites quickly. To create a mobile favorite:

1. In ActiveSync on your desktop, click **Tools** > **Options**, and select "Favorites" from the **Mobile Device** list. For more information on using ActiveSync, see *ActiveSync Help* on the desktop.
2. In Internet Explorer 5.0 or greater on your desktop, browse to the page you want to view offline, then click **Tools** > **Create Mobile Favorite**.
3. To change the link name, enter a new name in the **Name** box.
4. In the **Update** box, select a desired update schedule to keep the page in the Mobile Favorites folder up to date. You can also update content by clicking **Tools** > **Synchronize** in Internet Explorer.
5. To save the link in a subfolder of Mobile Favorites, click **Create In** and select the desired subfolder.
6. Click **OK**. Internet Explorer downloads the latest version of the page to your desktop.
7. To download the pages that are linked to the mobile favorite you just created, in Internet Explorer on the desktop, right-click the mobile favorite, then click **Properties**. On the **Download** tab, specify the number of links deep you want to download. *To conserve CN2B Computer memory, go only one level deep.*
8. Connect your CN2B Computer to your desktop. If synchronization between your CN2B Computer and desktop does not start, in ActiveSync on your desktop, click **Sync**.

Mobile favorites take up storage memory on your CN2B Computer. To minimize the amount of memory used:

- In the settings for the Favorites information, type in ActiveSync options, turn off pictures and sounds, or stop some mobile favorites from being downloaded to the CN2B Computer. For more information, see *ActiveSync Help*.
- Limit the number of downloaded linked pages. In Internet Explorer on the desktop, right-click the mobile favorite you want to change and then **Properties**. In the **Download** tab, specify "0" or "1" for the number of linked pages you want to download.

Using AvantGo Channels

AvantGo is a free interactive service that gives you access to personalized content and thousands of popular Web sites. You subscribe to AvantGo channels directly from your CN2B Computer, then synchronize your CN2B Computer and desktop, or connect to the Internet to download the content. Visit the AvantGo website for information. Tap the **Add** or **Remove** link to add or remove channels. Do the following to synchronize an AvantGo channel:

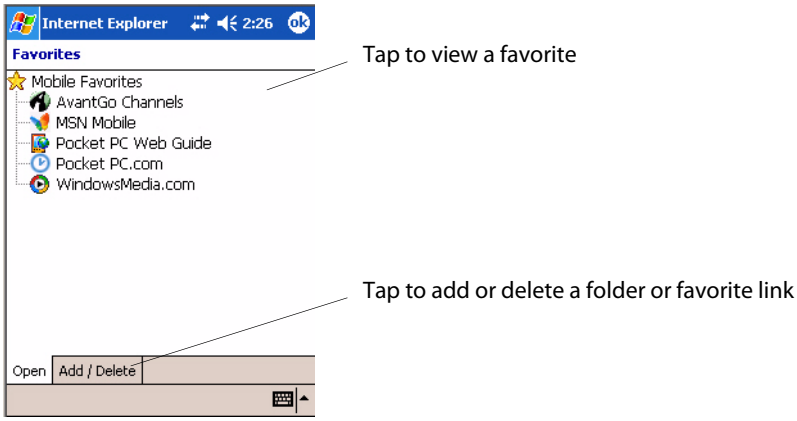
1. In Pocket Internet Explorer on your CN2B Computer, tap  to display your list of favorites.
2. Tap the **AvantGo Channels** link.
3. Tap **Activate**.
4. Follow instructions on the screen. Synchronize the CN2B Computer with the desktop, then tap **My Channels** to complete the setup.
5. When synchronization is complete, tap the **AvantGo Channels** link in your list of favorites to see a few of the most popular channels.

Using Pocket Internet Explorer

You can use Pocket Internet Explorer to browse mobile favorites and channels that were downloaded to your CN2B Computer without connecting to the Internet. You can also connect to the Internet through an ISP or a network connection and browse the Web.

Viewing Mobile Favorites and Channels

1. Tap the **Favorites** icon to display your list of favorites.
2. Tap the page you want to view.



The page that was downloaded the last time you synchronized with your desktop opens. If the page is not on your CN2B Computer, the favorite is dimmed. Synchronize with your desktop again to download the page to your CN2B Computer, or connect to the Internet to view the page.

Browsing the Internet

1 Set up a connection to your ISP or corporate network using **Connections**, as described in "Remote Access (Modems)" on page 100.

2 To connect and start browsing, do one of the following:

- Tap the **Favorites** icon, and then tap the favorite you want to view.
- Tap **View** > **Address Bar**. In the address bar that appears at the top of the screen, enter the Web address you want to visit and then tap **Go**. Tap the arrow to choose from previously entered addresses.

Note: To add a favorite link while using the CN2B Computer, go to the page you want to add, tap and hold on the page, and tap **Add to Favorites**.

3 Installing Applications

There are multiple ways to get an application to your CN2B Mobile Computer; like there are multiple ways to package the application for delivery.

Packaging an Application

Use any of these methods to package an application for installation:

- For very simple applications, the application itself might be the only file that needs to be delivered.
- It could be a directory structure that contains the application, supporting files like ActiveX controls, DLLs, images, sound files, and data files.
- Or, you could package an application via a CAB file.

Consider any of the following when choosing a location into which to store your application:

- In the basic CN2B Computer, there are two built-in storage options: the Object Store and the Persistent Storage Manager (PSM). The Object Store is RAM that looks like a disk. Anything copied here is deleted when a cold-boot is performed on the CN2B Computer. The PSM is an area of storage which is embedded in a section of the system's FLASH memory. This storage area is *not* erased during a cold-boot. It may, however, be erased during the reflashing process. In addition to storing applications and data files, you do have the option to store a persistent registry to the PSM region.
- If the optional Secure Digital storage card is in the system, then consider this card the primary location for placing an applications install files. This storage card creates the "\Storage Card" folder.
- Use the small nonvolatile Flash File Store region to hold CAB files that rebuild the system at cold-boot or install applications from a CAB file *into* the Flash File Store so they are "ready-to-run" when a cold-boot is performed. Since the FLASH in the system has a limited number of write cycles, do not use the Flash File Store for excessive writing purposes; however, reading is okay.

Files copied to any of these locations are safe when a cold-boot is performed on a CN2B Computer — *providing the AutoRun system is installed in the appropriate location* You can find this system in the CN2B Management Tools portion. Copying a CAB file to the "\CabFiles" folder on one of these cards automatically extracts that CAB file on every cold-boot to ensure that your system is properly set up (see **page 83**).

Installing Applications

Consider any of these options to get the package to the preferred location on your CN2B Computer: Microsoft ActiveSync (**page 75**), FTP Server *(**page 76**),* Secure Digital storage cards *(**page 76**)*, Wavelink Avalanche (**page 76**), SmartSystems™ Console (**page 77**), or Registry *(**page 77**)*.

Using Microsoft ActiveSync

Note: These instructions assume the CN2B Management Tools were installed on your desktop.

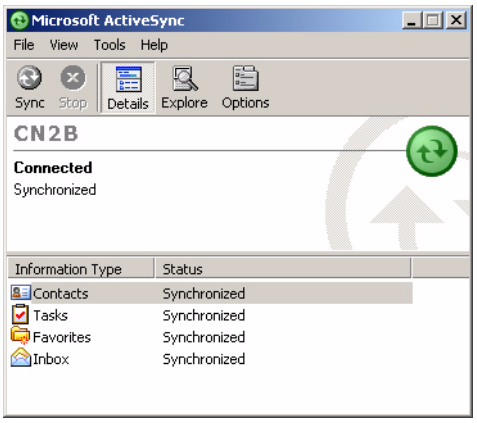
The Microsoft ActiveSync tool is located on the *CN2B Companion CD*. See Chapter 2, "Windows Mobile 2003" for information about this tool as provided by Microsoft Corporation.

This can be a serial, USB, or InfraRed ActiveSync connection. Files can be copied using File Explorer on a desktop or a laptop computer. This is usually good when updating few CN2B Computers.

These instructions assume that Microsoft ActiveSync was installed onto your desktop and is up and running. If not, go to Chapter 2, "Windows Mobile 2003" for an URL from which to download the latest application.

1 Connect your CN2B Computer to your desktop computer via an ActiveSync cable.

2 Wait for a "Connected" message to appear in the Microsoft ActiveSync application to signal a connection to the CN2B Computer. If necessary, select **File** > **Get Connected** to initiate a connection.



3 Click **Explore** to access the Mobile Device folder on your unit.

4 From your desktop, select **Start** > **Windows Explorer**, then browse the "C:\Intermec\CN2B Mgmt Tools\CabFiles" path for any CAB files needed for your CN2B Computer. Select the appropriate file, right-click the file for a pop-up menu, then select **Copy**.

5 Within the Mobile Device directory, go to the directory where you want the files located on the CN2B Computer, do a right-click for a pop-up menu, then select **Paste**.

6 When all of the files are pasted, perform a warm-boot on the CN2B Computer. When the computer reboots, wait for the LED on the top left of your keypad to stop blinking. Tap **Start** > **Programs** > **File Explorer** to locate the newly copied executable files, then tap these files to activate their utilities.

Using the FTP Server

The CN2B Computer has a built-in FTP Server that connects to a network via 802.11b/g or WAN (Wireless Access Network). This allows connections to the CN2B Computer to perform file transfers or computer management functions. Another benefit is you can create FTP scripts to automate the process of copying files to the CN2B Computer. This option is good for when a large number of CN2B Computers need updating. See Chapter 7, "Programming" for information.

Copying a Secure Digital Storage Card

Use these steps to install an application using a Secure Digital storage card:

1 Suspend the CN2B Computer, remove the battery from the CN2B Computer, then remove its Secure Digital storage card.

2 Using a Secure Digital card reader connected to your desktop PC, insert the Secure Digital card into your card reader.

3 Create a "\CabFiles" directory on the Secure Digital card, then copy (build into cabfiles) your application, data files, and all required DLLs and drivers into this directory.

4 Remove the Secure Digital card from your card reader and reinstall it into the CN2B Computer.

5 Perform a warm-boot on the CN2B Computer to install these files.

Using Wavelink Avalanche

You can use the Wavelink Avalanche device management system to install applications on all of your wireless CN2B Computers.

The wireless CN2B Computer ships with the Avalanche Enabler already loaded on it. The Avalanche Enabler is configured to activate automatically (typically on a warm boot).

Note: If you manually activate the Avalanche Enabler on the CN2B Computer, you may be prompted for a password when you exit the Avalanche Enabler. The default password is `leave`.

When the Avalanche Enabler is activated, the CN2B Computer attempts to connect to the Avalanche Agent. When the CN2B Computer connects to the Agent, the Agent determines whether an update is available and immediately starts the software upgrade, file transfer, or configuration update.

To use Avalanche to remotely manage the CN2B Computer

1 Install software packages and updates for the CN2B Computer using the Avalanche Management Console. For help using the console, see the online help.

2 Schedule the CN2B Computer updates or manually initiate an update using the Avalanche Management Console.

For information on using Wavelink Avalanche, contact your local Intermec representative or visit the Wavelink web site at **www.wavelink.com**.

Using the SmartSystems Console

You can use the SmartSystems Console to drag-and-drop Intermec applications onto your CN2B Computers. The CN2B Computer ships with the SmartSystems client loaded on it. The console is part of SmartSystems Foundation and is available from the Intermec web site. To download SmartSystems Foundation, go to **www.intermec.com/idl** and open the Device Management page.

To use SmartSystems Console to install an application

1 Download your application file from the Intermec web site and unzip it on your desktop.

2 From the SmartSystems Console, drag-and-drop the application onto each CN2B Computer discovered in your network.

For information on using the SmartSystems Console, see its online help.

Replicating Settings Using the Registry

The following information updates the registry on your CN2B Computer, confirms the registry update, then copies the information onto other CN2B Computers in your network.

If you are using DHCP, no changes are necessary.

If using Static IP, the new CN2B Computer has the IP address of the original CN2B Computer because the copied registry includes this information. When you change the IP address using the Intermec Settings applet, the information is lost when a warm-boot is performed, and the original IP address is used.

Load the REGFLUSH.CAB file to install the Registry Save application, run this application, then perform a warm-boot to keep the new IP address.

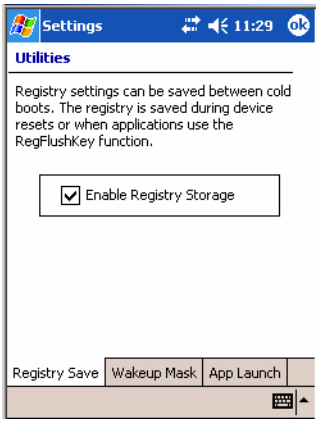
To install the Registry Save application after a cold-boot is performed, change the properties of the REGFLUSH.CAB file to that of read-only. Using ActiveSync, copy the CAB file to the "Flash File Store\Persistent Copy\CabFiles" folder on the CN2B Computer, then perform a cold-boot to load this file.

Deleting the Old Registry File

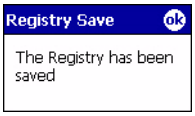
1 On the original CN2B Computer, select **Start** > **Programs** > **File Explorer**, then tap **My Device** > **Flash File Store**. Scroll down to the bottom of the list of files and folders, press and hold your stylus in the white area beneath for a pop-up menu, then select **View All Files**.

2 Look for a "registry" file. If one exists, select to highlight that file, press and hold for a pop-up menu, select **Delete**, then **Yes** to remove this file.

3 Select **Start** > **Settings** > the **System** tab > the **Utilities** icon > the **Registry Save** tab, then check **Enable Registry Storage** to enable the registry save flag. Tap **ok** to close, then close the Settings.



4 Select **Start** > **Registry Save**, then tap **ok** when told the registry is saved.

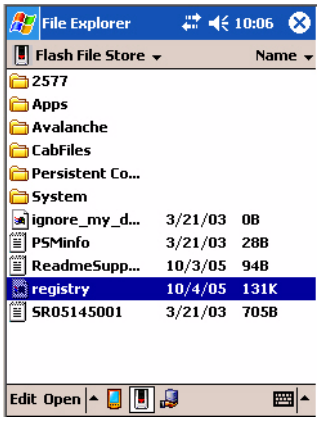


Confirming the New Registry File

To confirm whether the new registry file exists, do the following:

1 On the CN2B Computer, select **Start** > **Programs** > **File Explorer**, then tap **My Device** > **Flash File Store**. Press and hold your stylus in the white area beneath for a pop-up menu, then select **View All Files**.

2 The new registry file should be on the root of the Flash File Store folder with today's date.



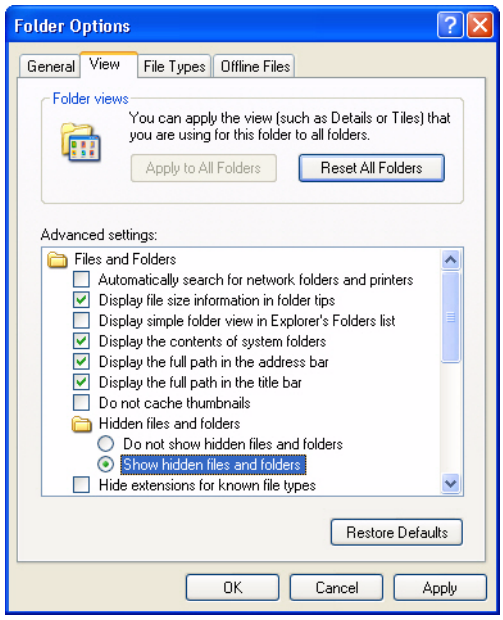
Updating Other Computers in Your Network

These instructions assume you have Windows XP on your desktop.

1 Connect your CN2B Computer to your desktop using Microsoft ActiveSync and a cradle. Make sure the ActiveSync application on your desktop is up and running and connected to your CN2B Computer.

2 On your desktop, select **Start** > **Settings** > **Control Panel**, double-click **Folder Options**, then click the **View** tab.

3 Beneath "Hidden files and folders," check **Show hidden files and folders**, then click **OK** to close.



4 Remove the CN2B Computer from the cradle, and put another CN2B Computer in its place. The ActiveSync application on your desktop should connect to the new unit.

5 Follow the instructions for "Deleting the Old Registry File" on page 78, put the new registry file in the root of the Flash File Store folder on the new CN2B Computer, enable the registry save flag via the Utilities applet, perform a warm-boot. and make sure these settings are saved.

Updating the System Software

When you upgrade your CN2B Computer, you are updating the operating system (OS) and the Persistent Storage Manager (PSM) files.

The PSM files are stored in the Flash File Store region, and deliver Intermec value-added functionality such as data collection, unit configuration and diagnostics, and Intermec's wireless security suite.

You need to download the latest upgrade files from the Intermec web site to your desktop PC.

1 Start your web browser and go to the Intermec web site at **www.intermec.com/wm2003**.

2 Click the **PPC 2003 OS** link, fill out the appropriate information, then click **Submit Information**. Click **OK** to continue.

3 Click the link and download the .zip file to your PC.

4 Follow the steps in one of the next sections:

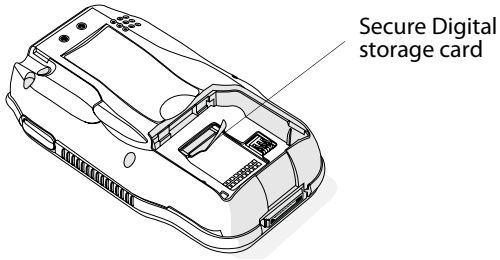
- If you are using a Secure Digital card to upgrade the CN2B Computer, see below.
- If you are using the SmartSystems Console to upgrade the CN2B Computer, see **"Using the SmartSystems Console to Upgrade the CN2B Computer" on page 82**.

Using a Secure Digital Card to Upgrade the CN2B Computer

To use a Secure Digital card to upgrade the CN2B Computer, you need a Secure Digital card reader and a Secure Digital card formatted as FAT.

Note: The CN2B Computer currently supports Delkin Devices Secure Digital cards only. Intermec cannot guarantee that other Secure Digital cards will work with the CN2B Computer.

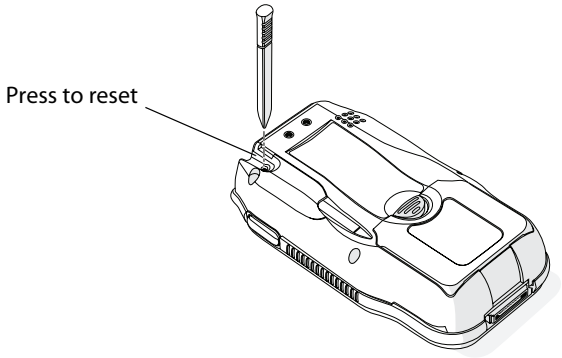
1 Suspend the CN2B Computer, remove the battery from the CN2B Computer, then remove its Secure Digital storage card.



2 Place the Secure Digital storage card in your desktop PC card drive, then copy all required upgrade files to the storage card.

3 Remove the Secure Digital card from your desktop, reinstall it into the CN2B Computer, and insert the CN2B Computer into a dock connected to external power.

4 Press the **Reset** button inside the stylus holder to perform a cold-boot. *Do not use force or a sharp object when pressing the **Reset** button, or you may damage the **Reset** button.*



5 When the Bootloader Menu shows "complete," remove the Secure Digital card, insert the battery, then install the battery door. Press the **Reset** button again to load the new operating system.

Note: The upgrade will fail if the CN2B Computer is not connected to external power. For help, see "Accessories" on page 16.

When the CN2B Computer finishes booting, you may use it. You have reset the CN2B Computer to its default configuration. You need to set the date and time and to set its network communications parameters to reestablish communications with the other devices in the wireless network.

Using the SmartSystems Console to Upgrade the CN2B Computer

You can use the SmartSystems Console to upgrade the operating system on your CN2B Computer. The console is part of SmartSystems Foundation and is available from the Intermec web site via the Intermec Developer Library (IDL). Before you can upgrade your computer, you need:

- the SmartSystems Foundation. To download SmartSystems Foundation, go to **www.intermec.com/idl** and open the Device Management page.
- the device upgrade .exe file. This file is available from the Intermec web site at **www.intermec.com**. Go to **Service & Support** > **Downloads**. Make sure the file you select is for your language.

1 Install SmartSystems Foundation on your desktop PC, then open the console.

2 Make sure the console and CN2B Computers are on the same subnet.

3 Make sure your CN2B Computers are either in a CN2B Communications Dock or charging dock, or that power management is disabled.

4 Download the device upgrade .exe file to your desktop PC.

5 Double-click the .exe file on your desktop PC. An InstallShield application starts and walks you through the process of extracting the upgrade files in the default location.

Note: Do not change the default location where InstallShield extracts the files. The SmartSystems Console requires the files be in this location.

6 From the SmartSystems Console, locate the device upgrade to install.

7 Drag-and-drop the device upgrade onto each CN2B Computer you want to upgrade. The SmartSystems Console will tell you that it is installing the upgrade on your CN2B Computer.

Once the upgrade is done downloading to your CN2B Computer, your CN2B Computer replaces the operating system and then automatically performs a cold boot. Progress messages do appear on the CN2B screen.

The SmartSystems Console will show your CN2B Computer as offline *(note the red stop sign)* until the device reboots and reconnects to the system.

Migrating from Another Computer

As you migrate from another mobile computer to a CN2B Computer, you need to consider the following: When converting an application to run on the CN2B Computer, most APIs should work. Below are a few exceptions:

- The other computer may use the "\SDMMC Disk" folder for nonvolatile storage. You may need to change the application to store data onto the "Storage Card" folder instead of the "\SDMMC Disk" folder if a Secure Digital storage card is present in the system.
- If the application uses the RegFlushKey() API, it must first verify that the proper media is available in the system.
- Keyboard remapping is available on the CN2B Computer should you need to map these keys like that of the original computer (see page 182).
- Targeting the ARM (SA1110) processor which creates applications that run on the CN2B Computer requires the Windows Mobile 2003 SDK.

Installing Cabinet Files

CAB files *(short form of "cabinet" files)* are compressed folders as defined by Microsoft. A "cabinet" file is a single file, usually suffixed with .CAB, that stores compressed files in a file library. A compressed file can be spread over several cabinet files. During installation, the setup application decompresses the files stored in a cabinet and copies them to the user's system.

For the CN2B Computer, CAB files register DLLs, create shortcuts, modify registry entries, and run custom setup programs. Tap a CAB file to extract that file or place the CAB file on one of the approved storage devices in the "\CabFiles" folder, then perform a warm-boot on the CN2B Computer.

There are two methods available to extract a CAB file:

- Tap a CAB file to extract it. With this method, the CAB file is automatically deleted when the extraction process is successful, *unless* the CAB file is set with the read-only attribute.
- Use AUTOCAB to extract all files when a cold-boot is performed on the CN2B Computer. See the *Software Tools User's Manual* for information.

4 Network Support

This chapter includes information about the different networks supported by the CN2B Mobile Computer, and ways to configure and manage those networks. Note that the CN2B Mobile Computer automatically installs the appropriate software for radio or phone use when the unit is turned on.

Below are the main topics of this chapter:

Personal Area Networks

"Bluetooth" is the name given to a technology standard using short-range radio links, intended to replace cables connecting portable and fixed electronic devices. The standard defines a uniform structure for a range of devices to communicate with each other with minimal user effort. Its key features are robustness, low complexity, low power, and low cost. The technology offers wireless access to LANs, the mobile phone network, and the internet for a host of home appliances and mobile computer interfaces.

Wireless Printing can also be done with Microsoft APIs, including Bluetooth extensions for Winsock, and Bluetooth virtual COM ports. Information about other Bluetooth software is in the Bluetooth Resource Kit and the *Bluetooth Resource Kit User's Guide* via the Intermec Developer Library (IDL), which is available as a download from the Intermec web via **www.intermec.com/idl**. See your Intermec representative for information.

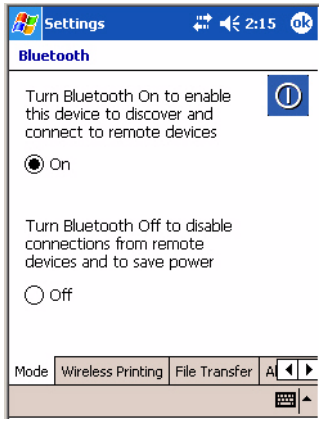
About the Application

Bluetooth is not started automatically by default after a cold-boot is performed. To run Bluetooth, tap **Start** > **Settings** > the **Connections** tab > the **Bluetooth** icon. The CN2B Computer retains the Bluetooth state when warm-boots are performed, for example:

- *If Bluetooth is active*, and a warm-boot was performed, the CN2B Computer boots up with the Bluetooth state activated and Bluetooth virtual COM ports (such as printing) registered. However, you must reactivate connections, as the system does not do these automatically.
- *If Bluetooth is inactive*, and a warm-boot was performed, the CN2B Computer boots up with Bluetooth deactivated.

Mode

The default tab activates or deactivates Bluetooth. When Bluetooth is activated, the CN2B Computer discovers and connects to remote devices.



Wireless Printing

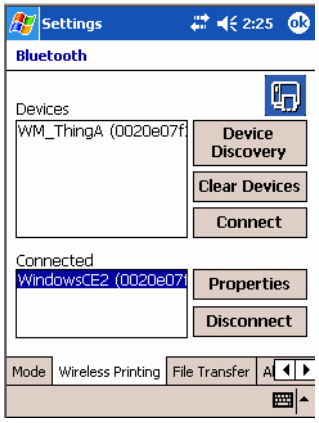
Use this tab to print via Bluetooth devices. Tap **Device Discovery** to discover (or scan) for remote Bluetooth devices. When the CN2B Computer is finished scanning, any newly discovered devices appear in the upper **Devices** box.

Tap **Clear Devices** to remove the list from the **Devices** box.

To print to a Bluetooth device, select any of the devices listed in the **Devices** box, then tap **Connect**. Once connected, the selected device moves to the lower **Connected** box.

To view connection information or register a COM port for a device, from the lower **Connected** box, select a device, then tap **Properties**. *See "Properties" below for information.*

When done printing to a device, select that device in the **Connected** box, then tap **Disconnect**. This moves the device in question back to the upper **Devices** box.



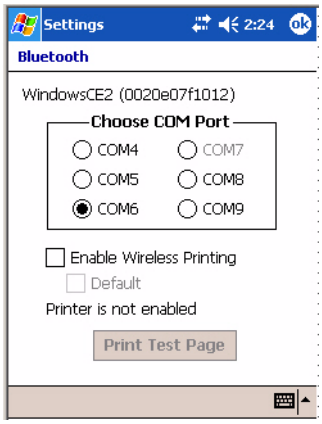
Properties

Select a COM Port from the **Choose COM Port** box to register for this device, then check **Enable Wireless Printing** to complete the COM port registration. To change your COM port selection, clear (uncheck) the **Enable Wireless Printing** box, select a new COM port, then check **Enable Wireless Printing** again. **Choose COM Port** items already in use are grayed out.

When you enable Wireless Printing, a status message is shown near the bottom of the screen to confirm your action. To print a test page to your printer, tap **Print Test Page**.

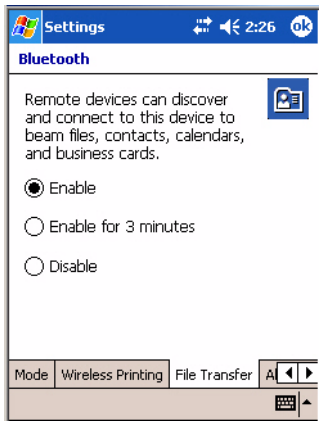
Check **Default** to set this printer to identify the assigned COM Port as the WPPort in the registry. See the *Bluetooth Resource Kit User's Guide* for more details on WPPort.

Tap **ok** to return to the Wireless Printing page.



File Transfer

Use this page to enable your unit to receive files from another Bluetooth device, or from any device that supports this function.



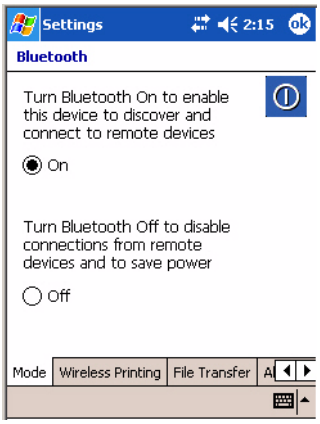
Connecting with Bluetooth

Note: While these instructions apply to many Bluetooth devices, these instructions use the Nokia 3650 for example purposes.

Before you connect to the network, make sure Bluetooth is enabled on your CN2B Computer so you can discover and connect to remote devices.

Bluetooth

Tap **Start** > **Settings** > the **Connections** tab > the **Bluetooth** icon. Tap **On** to activate Bluetooth, then tap **ok** to exit the applet.



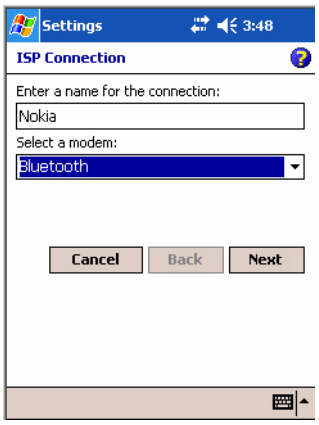
Also make sure Bluetooth is enabled on your mobile phone. For example, with the Nokia 3650, go to its menu, select **Connect** > **Bluetooth**, then set **My phone's visibility** to "Shown to all."

Do the following to establish a Bluetooth connection between your CN2B Computer and your mobile phone, then establishing a dial-up networking session with your wireless network. Once connected, you should be able to browse Internet websites and use other online resources from your CN2B Computer.

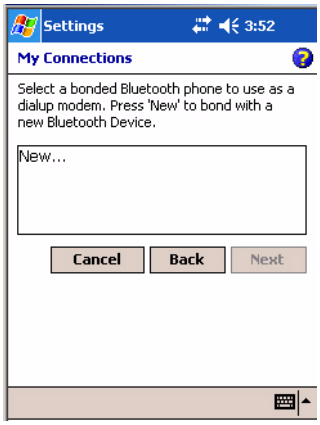
Connections

1 Tap **Start** > **Settings** > the **Connections** tab > the **Connections** icon, then tap **Add a new modem connection**.

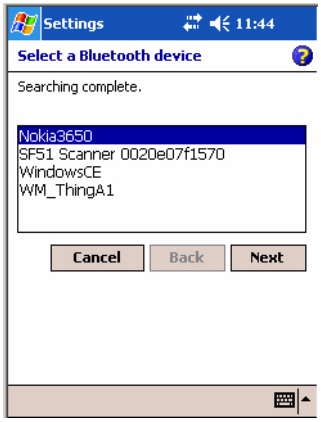
2 Enter a name for the connection, such as "Nokia." In the **Select a modem** list, select "Bluetooth," then tap **Next** to continue.



3 Tap **New...** if the phone is not listed in the known devices. Make sure your Bluetooth device is turned on before you start the search.

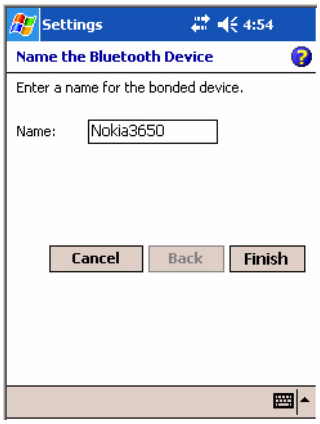


4 When the discovery of devices is complete, select your Bluetooth device, then tap **Next** to continue.

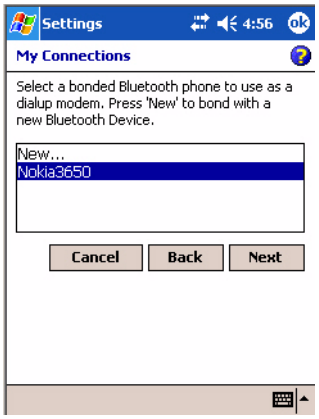


5 Enter the correct **Device PIN** on both the Bluetooth device and the CN2B Computer, then tap **Next** to continue.

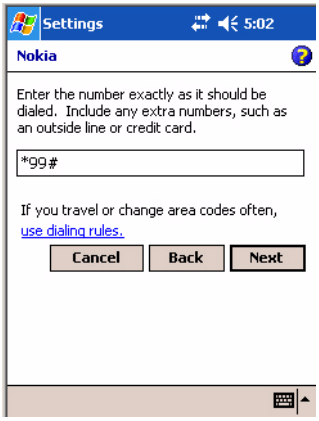
6 Enter a name for the device if needed, then tap **Finish**.



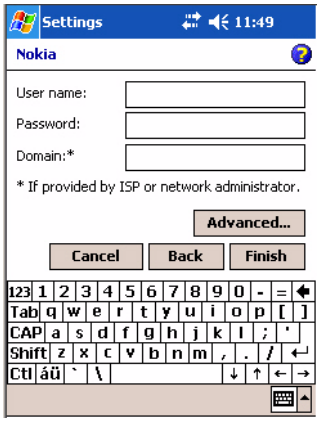
7 After bonding completes, select your Bluetooth device from the list of bonded devices, then tap **Next**.



8 Enter the appropriate number as it should be dialed for your Bluetooth connection, then tap **Next** to continue.



9 Enter the user name, password, and domain required for your Bluetooth device, then tap **Finish.**



Now you can establish a connection to your network via the Internet Explorer application. To disconnect, tap the Connectivity icon in the top menu bar, then select **Disconnect**.

Local Area Networks

By default, the CN2B Computer comes with a 802.11b/g radio and Bluetooth. The CN2B Computer is capable of supporting 802.11i security requirements.

The CN2B Computer is a versatile mobile computer that you can easily add to your wired or wireless data collection network. You can connect your CN2B Computer to your network using:

- USB communications
- 802.11b/g radio communications

Configuring USB Communications

You can place the CN2B in the CN2B Modem Dock or the CN2B Communications Dock to transfer data to and receive data from another device using USB communications. The USB cable, communications dock, and modem dock are sold separately. For more information on accessories and how to order them, see "Accessories" on page 16.

To use USB communications with your CN2B Computer

1 Connect the CN2B Communications Dock to the USB port of the other device using an appropriate USB cable.

2 Make sure that your USB device is configured for USB communications.

3 Insert the CN2B Computer into the CN2B Communications Dock.

4 Turn on the CN2B Computer.

Configuring 802.11b/g Radio Communications

Make sure all components with antennas are at least 30 cm (1 ft) apart when power is applied. Failure to comply could result in equipment damage.

The wireless CN2B has an internal 802.11b/g radio to transfer data using wireless communications. This manual assumes you have already set up your wireless communications network, including your access points. If you are using a UDP Plus network, you also need to have your Intermec Application Server communicating with a host computer.

Your CN2B Computer supports TCP/IP and UDP Plus.

Configuring the Network Parameters for a TCP/IP Network

In a TCP/IP network, the CN2B Computer communicates with a host computer directly using TCP/IP. The access point acts as a bridge to allow communications between the wired and wireless networks.

1 Configure the infrastructure mode, network name (SSID), host IP address, and IP settings (if not using DHCP) on each CN2B Computer in the network.

2 Configure security. For help, see "Configuring Your Wireless Network" on page 197.

Configuring the Network Parameters for a UDP Plus Network

In a UDP Plus network, the CN2B Computer communicates with a host computer through the Intermec Application Server. The Intermec Application Server translates UDP Plus packets on the wireless network into TCP/IP packets on the wired network and vice versa. The access point acts as a bridge to allow communications between wired and wireless networks.

1 Configure the network name (SSID), controller IP address, IP settings (if not using DHCP), and controller port (set to 5555) on each CN2B Computer in the network.

2 Configure security. For help, see "Configuring Your Wireless Network" on page 197.

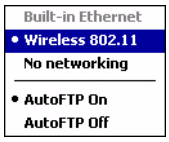
The easiest way to configure the network parameters on the CN2B Computer is to use the Intermec Settings applet. For help, see "Intermec Settings Applet" on page 192.

Network Adapters

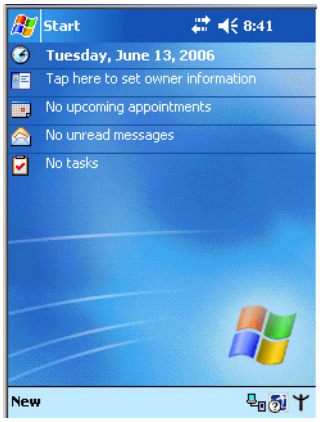
The CN2B Computer has the 802.11b/g radio and wireless printing. It does not have an external antenna. Other radios are *not* supported. See the Developer's Support web site for information on network adapters.

Wireless 802.11 Communications

When "Wireless 802.11" is selected via the NDISTRAY pop-up menu,



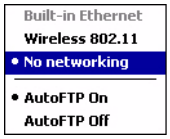
the **Wireless 802.11 antenna** icon *(shown to the left)* appears in the Windows system tray.



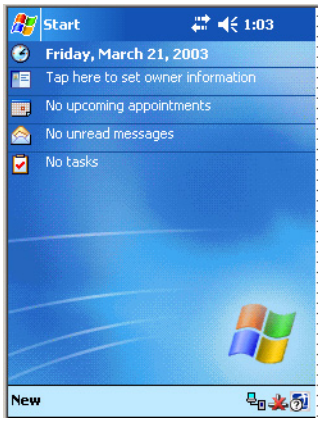
To configure wireless 802.11 communications on the CN2B Computer, tap **Start** > **Settings** > the **System** tab > the **Wireless Network** icon. Go to Appendix A, "Configurable Settings" for information.

No Networking

When "No networking" is selected via the NDISTRAY pop-up menu,



the **disconnected** icon *(shown to the left)* appears in the Windows system tray.

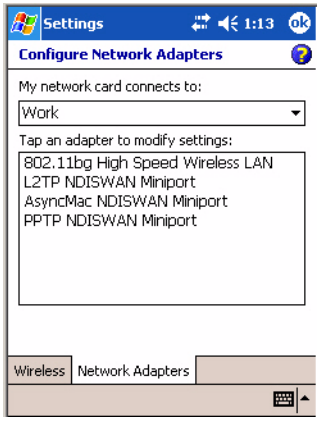


Network Selection APIs

These APIs change the network adapter configuration programmatically. Both drivers support the same IOCTL function numbers for loading and unloading the drivers. Go to **Chapter 7, "Programming"** to see the APIs.

Network Connections

Tap **Start** > **Settings** > the **Connections** tab > the **Connections** icon > the **Advanced** tab > **Network Card** > the **Network Adapters** tab to access the network connections for this unit, then tap **ok** when finished.



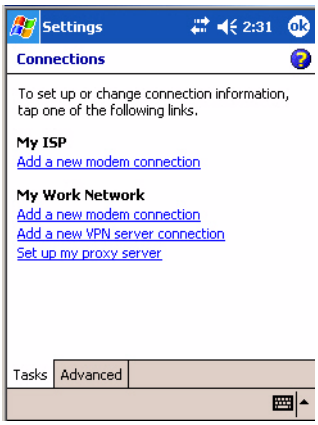
Creating a Wireless Network Connection

Microsoft Corporation's wireless network configuration tool is called "Wireless Zero Config." Intermec recommends that you use the Wireless Network applet instead as it offers more security choices and exhibit better roaming behavior. Go to page 195 for information about the Wireless Network applet.

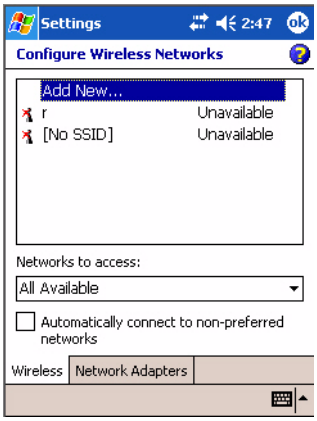
Networks already configured are preferred networks and are listed in Wireless networks. You can connect to only preferred networks or search for and connect to any available network.

A wireless network can be added either when the network is detected, or manually by entering settings information. To determine if authentication information is needed, see your network administrator.

1 Tap **Start** > **Settings** > the **Connections** tab > the **Connections** icon.



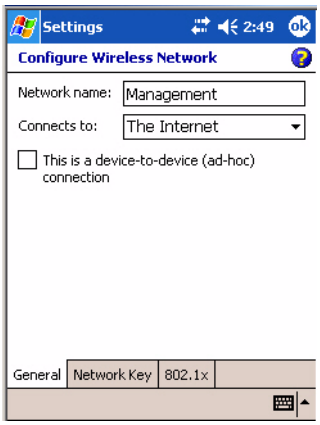
2 Tap the **Advanced** tab > **Network Card** > the **Wireless** tab > **Add New**.



3 Tap the **General** tab, then enter a network name. If the network was detected, the network name is entered and cannot be changed.

From **Connects to**, select to what your network is to connect. If you select "Work," you can do a vpn connection or use proxy servers. If you select "The Internet," you can connect directly to the internet.

To connect to an ad-hoc connection, select **This is a device-to-device (ad-hoc) connection**.

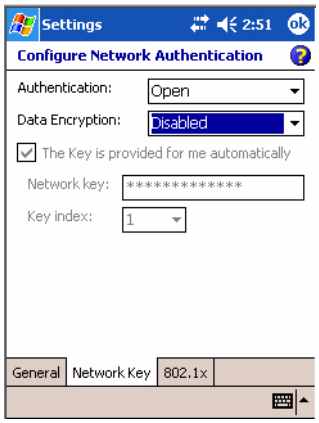


4 Tap the **Network Key** tab, then do the following:

To Disable Authentication

a Set **Authentication** to either "Open" if WEP keys are not required; or "Shared" when WEP keys are required for association.

b Set **Data Encryption** to "Disabled."

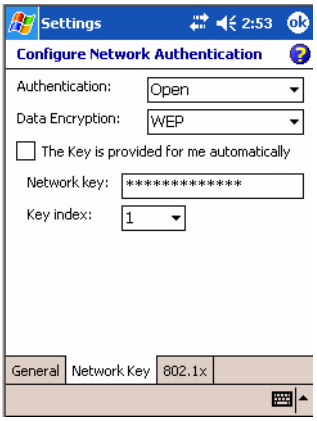


To Enable WEP Encryption

a Set **Authentication** to either "Open" if WEP keys are not required; or "Shared" when WEP keys are required for association.

b Set **Data Encryption** to "WEP."

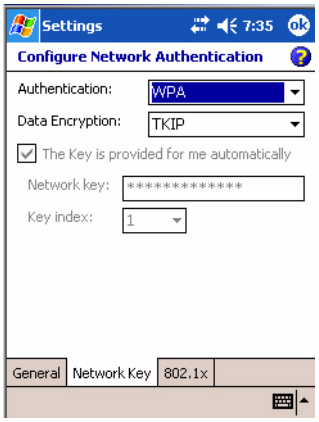
c To change the network key, clear **The Key is provided for me automatically** box, then enter the new **Network key** and select the appropriate **Key index**.



Note: The following information applies when you have **Enable Microsoft's Wireless Zero Config** checked via the Wireless Network applet (see page 195).

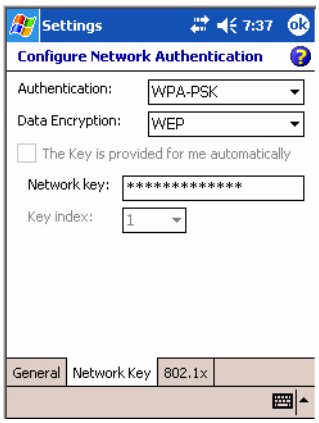
To Enable WPA Authentication

Set **Authentication** to "WPA" (page 197) and **Data Encryption** to "WEP" (page 197) or "TKIP" (page 196).

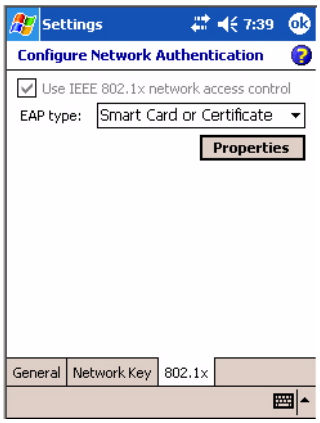


To Enable WPA Authentication Using a Preshared Key

Set **Authentication** to "WPA-PSK" (page 197), **Data Encryption** to "WEP" (page 197) or "TKIP" (page 196), and enter the new **Network key**.



5 Tap the **802.1x** tab, select either "PEAP" or "Smart Card or Certificate" for the **EAP type**, then tap **Properties** to adjust its settings.

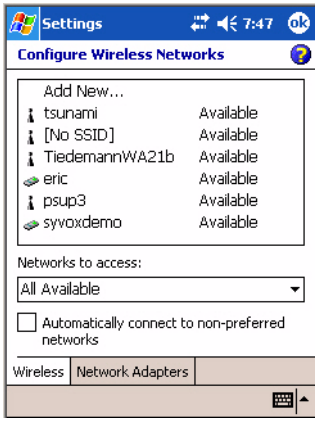


6 Tap **ok** to return to the Configure Wireless Network screen.

7 From the **Networks to access** drop-down list, select "All Available," "Only access points," or "Only computer-to-computer" depending on the type of networks to which you connect.

To connect only to networks you have already configured, clear **Automatically connect to non-preferred networks**.

Tap **ok** to close this screen.



Note: If you select to automatically connect to non-preferred networks, your device detects new networks and provide you the opportunity to configure them.

AutoIP/DHCP

Automatic Private IP Addressing (AutoIP) is enabled by default in Windows Mobile 2003. To remain compatible with other versions of Pocket PC, this setting needs to be enabled. You can configure the registry settings in `HKEY_LOCAL_MACHINE\Comm\NETWLAN1\TcpIp` to set the required AutoIP/DHCP behavior.

AutoInterval, AutoMask, AutoSubnet, AutoIP, and AutoSeed are other registry keys that can modify the behavior of AutoIP. You can find the appropriate settings and behavior of each of these keys in Microsoft Help.

When a TCP/IP client cannot find a DHCP server, it generates an AutoIP address from the 169.254.xxx.xxx block. The client then tries to check for a DHCP server every 15 seconds and if a DHCP server is found, the client drops the AutoIP address and uses the address from the DHCP server.

In the MSDN Windows CE documentation available out on the Microsoft Developer Network web site (**www.msdn.com**), see "Automatic Client Configuration" for more information on AutoIP.

To disable AutoIP, set the AutoCfg registry entry to "0." If a DHCP server cannot be found, instead of using AutoIP, the system will display the "Unable to obtain a server assigned IP address" message.

Note: If you try to disable AutoIP using a CAB file to set the registry value for AutoIP, remember to set the EnableDHCP value to "1" to keep DHCP enabled.

Note: For more attempts a DHCP client makes to get a DHCP address, use the DhcpRetryDialogue and DhcpMaxRetry registry settings.

Note: Change the AutoInterval registry key value to make the client retry more often to obtain a DHCP address.

Wide Area Networks

The CN2B Computer does not support wide area networks.

Remote Access (Modems)

You can set up connections to the Internet and corporate network at work to browse the Internet or intranet, send and receive e-mail and instant messages, and synchronize information using ActiveSync. Connections can be made using a wireless network.

Your CN2B Computer has two groups of connection settings: My ISP and My Work Network. Use My ISP settings to connect to the Internet. Use My Work Network settings to connect to any private network.

- My ISP: Once connected, you can send and receive e-mail messages by using Inbox and view Web or WAP pages by using Pocket Internet Explorer. The communication software for creating an ISP connection is already installed on your CN2B Computer. Your service provider provides the software needed to install other services, such as paging and fax services. If this is the method you want to use, see **"Connecting to an Internet Service Provider (ISP)" on page 101**.

- My Work Network: Connect to the network at your company or organization where you work. Once connected, you can send and receive e-mail messages by using Inbox, view Web or WAP pages by using Pocket Internet Explorer, and synchronize with your desktop. If this is the method you want to use, see "Connecting to Work" on page 103.

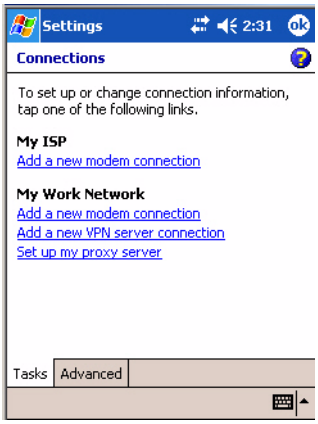
Connecting to an Internet Service Provider (ISP)

You can connect to your ISP, and use the connection to send and receive e-mail messages and view Web or WAP pages.

Obtain your ISP dial-up access telephone number, user name, and password from your ISP. Some ISPs require information in front of the user name, such as MSN/username.

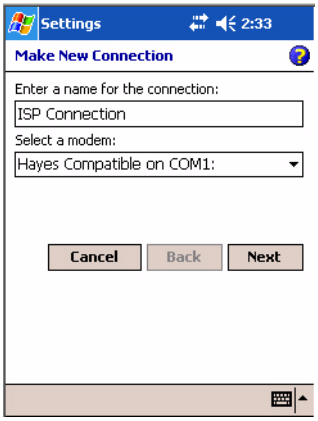
To view additional information for any screen in the wizard or while changing settings, tap the **Help** icon.

1 Tap **Start** > **Settings** > the **Connections** tab > the **Connections** icon. In My ISP, tap **Add a new modem connection**.

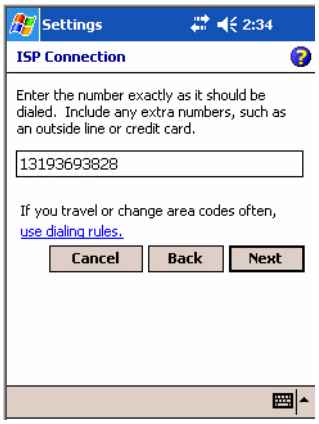


2 Enter a name for the connection, such as "ISP Connection."

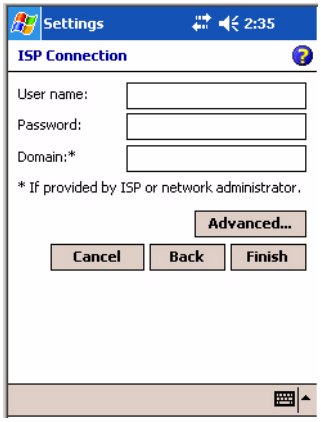
If using an external modem connected to your CN2B Computer with a cable, select "Hayes Compatible on COM1" from the **Select a modem** list. Tap **Next** to continue.



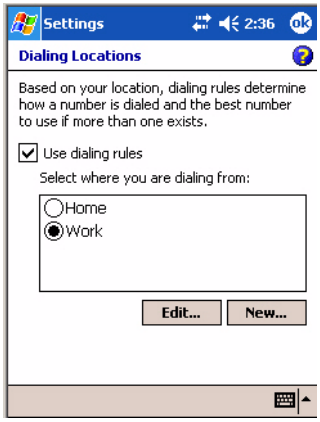
3 Enter the access phone number, then tap **Next**.



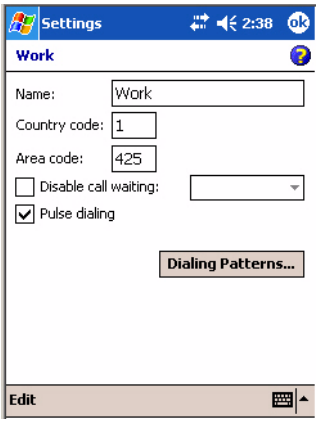
4 Enter the user name, password, and domain (if provided by an ISP or your network administrator), then tap **Finish**.



5 Tap the **Advanced** tab from the Connections screen, then tap **Select Location** to specify your current location. These settings apply to all connections. Tap **Use dialing rules**, tap **OK, then** tap **Edit** to continue.



6 Specify your current phone type. If your phone type is pulse dialing, check the **Pulse dialing** box. If your type is tone dialing (as most phone lines are), then clear the **Pulse dialing** box. Continue to tap **ok** to close each page and return to the Settings page.



To start the connection, start using one of the following programs. Once connected, you can:

- Send and receive e-mail messages by using Inbox. Before you can use Inbox, you need to provide the information it needs to communicate with the e-mail server.
- Visit Web and WAP pages by using Pocket Internet Explorer. For more information, see "Pocket Internet Explorer" on page 68.
- Send and receive instant messages with MSN Messenger. For more information, see "MSN Messenger" on page 62.

Note: To change modem connection settings in My ISP, tap **Manage existing connections**. Select the desired modem connection, tap **Settings**, and follow the instructions on the screen.

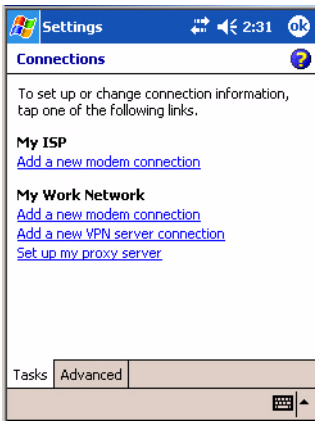
Connecting to Work

If you have access to a network at work, you can send e-mail messages, view intranet pages, synchronize your CN2B Computer, and possibly access the Internet. You can connect to work by creating a modem connection via a RAS (Remote Access Server) account. Before you can create this modem connection, your network administrator needs to set up a RAS account for you. Your network administrator may also give you Virtual Private Network (VPN) settings.

Note: To change modem connection settings in My Work Network, tap **Manage existing connections**. Select the desired modem connection, tap **Edit**, and follow the instructions on the screen.

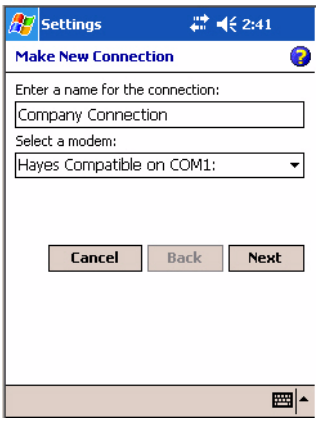
To view additional information for any screen in the wizard or while changing settings, tap the **Help** icon.

1 Tap **Start** > **Settings** > the **Connections** tab > the **Connections** icon. In My Work Network, tap **Add a new modem connection**.



2 Enter a name for the connection, such as "Company Connection." In the **Select a modem** list, select your modem type, then tap **Next** to continue. If your modem type does not appear, try reinserting your CN2B Computer into your CN2B Modem Dock.

- If using an external modem connected to your CN2B Computer with a cable, select "Hayes Compatible on COM1."
- If using any type of external modem, select the modem by name. If a listing does not exist for your external modem, select "Hayes Compatible on COM1."
- Wireless connections can be made via a mobile phone network or GPRS. If using a mobile phone network to connect, select "Cellular Line." If using GPRS, tap "Cellular Line (GPRS)."



3 Enter the access phone number, using some of the following guidelines. If you know part of the phone number changes frequently as you travel, create dialing rules to avoid creating numerous modem connections for the same phone number. For more information, tap **Use Dialing Rules**.

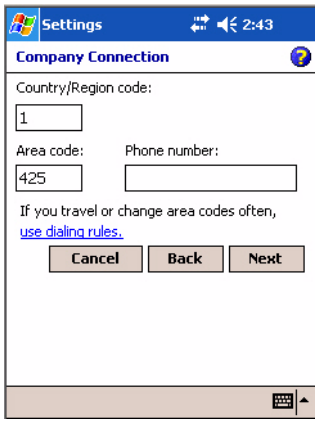
- Enter the phone number exactly as you want it dialed. For example, if you call from a business complex or hotel that requires a nine before dialing out, enter "9" in front of the phone number.

- Enter the APN provided by your mobile phone service provider.
- When using dialing rules, phone numbers are entered differently. To use additional numbers, such as a "9" to dial from an office complex or hotel, you must use additional dialing rules or change dialing patterns. See "Create Dialing Rules" via the online help for information.

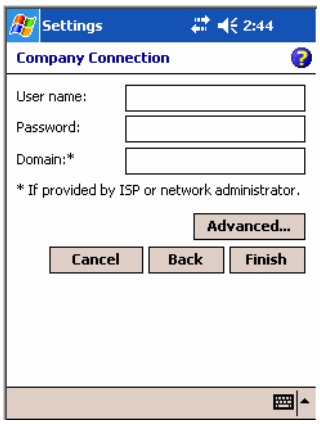
a In the **Country/Region** box, enter the appropriate code when dialing internationally. For more information, contact an operator at your local phone company.

b In the **Area code** box, enter the area code, if needed.

c Enter the main phone number, then tap **Next** to continue.



4 Enter the user name, password, and domain (if provided by an ISP or your network administrator). If a domain name was not provided, try the connection without entering a domain name, then tap **Finish**.



Creating a VPN Server Connection to Work

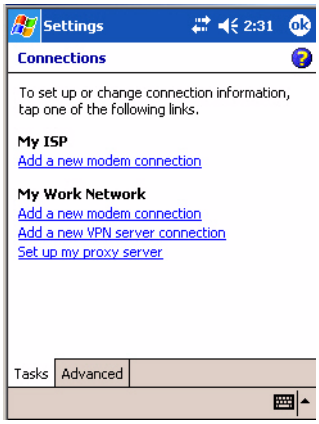
A VPN connection helps you to securely connect to servers, such as a corporate network, via the Internet. Ask your network administrator for the user name, password, domain name, TCP/IP settings, and host name or IP address of the VPN server.

To view additional information for any screen in the wizard or while changing settings, tap the **Help** icon.

Note: To change existing settings in My Work Network, tap **Manage existing connections** > the **VPN** tab. Select the desired VPN connection, tap **Settings**, and follow the instructions on the screen.

Connections

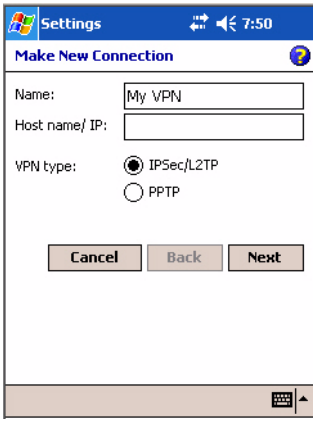
1 Tap **Start** > **Settings** > the **Connections** tab > the **Connections** icon. Tap **Add a new VPN server connection** beneath My Work Network to initiate this procedure.



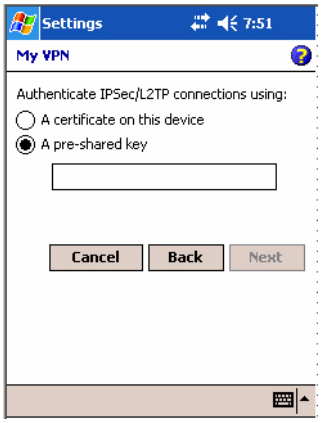
2 In **Name**, enter a name for the connection, such as a company's name.

In **Host name/ IP**, enter the VPN server name or IP address.

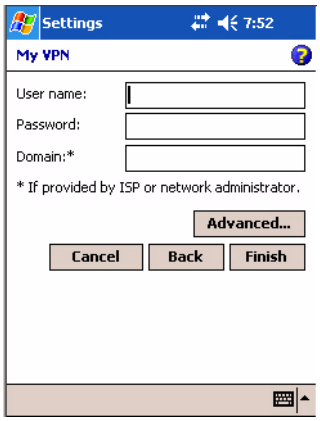
Next to **VPN type**, select the type of authentication to use with your device: "IPSec/L2TP" or "PPTP." If you are not sure which option to choose, ask your network administrator. Tap **Next** to continue.



3 Select the type of authentication. If you select **A pre-shared key**, enter the key provided by your network administrator.



4 Enter your user name, password, and domain name as provided by your ISP or network administrator. If a domain name was not provided, try the connection without entering a domain name.



5 You should not need to change any **Advanced** settings. Instances where to change advanced settings include the server to which you are connecting does not use dynamically-assigned addresses, and you need to enter your TCP/IP settings; or to change server DNS or WINS settings.

To change advanced settings, tap **Advanced**. Otherwise, tap **Finish**. Insert necessary equipment, such as a network card, into the device, and use a desired program to automatically begin connecting.

Ending a Connection

- When connected via modem or VPN, tap the **Connectivity** icon on the navigation bar, then tap **Disconnect**.
- When connected via cable or cradle, detach your device.
- When connected via Infrared, move away from other computers.
- When connected via a wireless network, switch off the connection.

Management

Use the following tool and information to configure and manage your network. You can also contact your Intermec representative for support.

SmartSystems™ Foundation Console (www.intermec.com/SmartSystems)

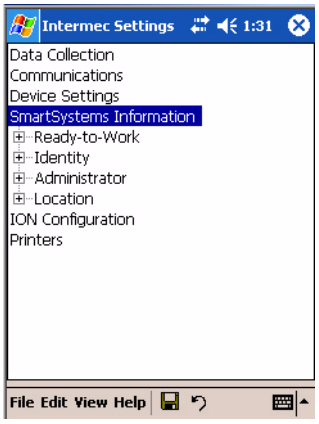
This tool, available as a free download from Intermec, includes a management console that provides a default method to configure and manage Intermec devices "out-of-the-box," without the purchase of additional software licenses. This is for anyone who must configure and deploy multiple devices or manage multiple licenses.

Use the Intermec Settings applet to gather, view, and update device configuration settings within the SmartSystems Foundation. Information about the settings you can configure with the Intermec Settings applet is in the *Intermec Computer Command Reference Manual* (P/N: 073529) available online at www.intermec.com.

Information about the SmartSystems Foundation is available as an online help within the SmartSystems Console application. Select **SmartSystems** > **Help** in the console to access the manual.

See the Data Collection Resource Kit in the IDL for information about data collection functions. The IDL is available as a download from the Intermec web site at www.intermec.com/idl. Contact your Intermec representative for more information.

Tap **Start** > **Settings** > the **System** tab > the **Intermec Settings** icon, then tap to expand the SmartSystems Information option.



SNMP Configuration on the Mobile Computer

In short, SNMP is an application-layer protocol that uses the exchange of management information between network devices. The CN2B Computer is such an SNMP-enabled device. Use SNMP to control and configure the CN2B Computer anywhere on an SNMP-enabled network.

The CN2B Computer supports four proprietary Management Information Bases (MIBs) and Intermec provides SNMP support for MIB-II through

seven read-only MIB-II (RFC1213-MIB) Object Identifiers (OIDs). *Note that you can query these seven OIDs through an SNMP management station.*

Management Information Base

The Management Information Base is a database that contains information about the elements to be managed. The information identifies the management element and specifies its type and access mode (Read-Only, Read-Write). MIBs are written in ASN.1 (Abstract Syntax Notation.1) — a machine independent data definition language. *Note: Elements to manage are represented by objects. The MIB is a structured collection of such objects.*

You will find the following MIB files either in the CN2B Management Tools or on the web via **www.intermec.com**:

- **INTERMEC.MIB**
  Defines the root of the Intermec MIB tree.
- **ITCADC.MIB**
  Defines objects for Automated Data Collection (ADC).
- **ITCSNMP.MIB**
  Defines objects for Intermec SNMP parameters and security methods, such as an SNMP security IP address.
- **ITCTERMINAL.MIB**
  Defines objects for parameters, such as key clicks.

Object Identifiers

Each object has a unique identifier called an OID, which consist of a sequence of integer values represented in dot notation. Objects are stored in a tree structure and OIDs are assigned based on the position of the object in the tree. For example, the internet OID is equal to 1.3.6.1. Seven MIB OIDs are shown in the following table:

MIB Object Identifiers

MIB-II Item	OID	Group or Table	Description
ifNumber	1.3.6.1.2.1.2.1.0	Interfaces Group	Indicates the number of adapters present in the system. For the CN2B Computer, if one adapter is present in the system, then *ifNumber* = 1 and ifIndex = 1.
ifIndex	1.3.6.1.2.1.2.2.1.1.ifIndex	Interfaces Table (ifTable)	A unique value for each interface. The value ranges between 1 and the value of *ifNumber*.
ifDescr	1.3.6.1.2.1.2.2.1.2.ifIndex	Interfaces Table (ifTable)	A textual string containing information about the interface.
ifType	1.3.6.1.2.1.2.2.1.3.ifIndex	Interfaces Table (ifTable)	An integer containing information about the type of the interface. It is equal to 1 for Other.

MIB Object Identifiers

MIB-II Item	OID	Group or Table	Description
ipAdEntAddr	1.3.6.1.2.1.4.20.1.1.IpAddress	IP address Table (ipAddrTable)	The IP address to which this entry's addressing information pertains *(same as CN2B IP address)*, where IP Address is the valid non-zero IP address of the CN2B Computer.
ipAdEntIfIndex	1.3.6.1.2.1.4.20.1.2.IpAddress	IP address Table (ipAddrTable)	Index value that uniquely identifies the interface that this entry is applicable *(same as ifIndex)*.
ipAdEntNetMask	1.3.6.1.2.1.4.20.1.3.IpAddress	IP address Table (ipAddrTable)	The subnet mask associated with the IP address of this entry *(same as Subnet Mask)*.

Configuring with SNMP

The community string allows an SNMP manager to manage the CN2B Computer with a specified privilege level. The default read-only or read/write community string is "public" and "private." See the specific configuration parameter for its OID.

1. Configure CN2B Computers for RF or Ethernet communications.
2. Determine the OID (Object Identifier) for the parameter to change. The Intermec base OID is 1.3.6.1.4.1.1963.
3. Use your SNMP management station to get and set variables that are defined in the Intermec MIBs. You can set the traps, identification, or security configuration parameters for SNMP.

5 Printer Support

The CN2B Mobile Computer works with the following printers from Intermec. Contact an Intermec representative for information about these printers.

- **6820** Portable or Fixed Mount 80-Column Printer
- **PB20** 2" Belt-Mount Printer
  with a Bluetooth compatible module from Socket Communications
- **PB40** 4" Belt-Mount Printer
  with a Bluetooth compatible module from Socket Communications
- **PB42** 4" Printer

Printing ASCII

The methods for printing using Pocket PC at this time are as follows:

- Add port drivers to print ASCII directly to the port.
- Use LinePrinter ActiveX Control from the Printing Resource Kit via the Intermec Developer Library (IDL) available as a download from the Intermec webs site at **www.intermec.com/idl**. Contact your Intermec representative for more information.
- Via wireless printing - *see the Bluetooth Resource Kit User's Guide for more information.*

Directly to a Port

Printing directly to the port sends RAW data to the printer. The format of this data depends upon your application and the printer capabilities.

You must understand the printer commands available for your specific printer. Generally, applications just send raw ASCII text to the printer. Since you are sending data to the printer from your application directly to the port you are in complete control of the printers operations. This allows you to do line printing *(print one line at a time)* rather than the page format printing offered by the GDI approach. It is also much faster since data does not have to be converted from one graphics format to the other (display to printer). Most Intermec printers use Epson Escape Sequences to control print format operations.

These commands are available in documentation you receive with your printers or from technical support. Win32 APIs are required to print directly to the port.

Directly to a Generic Serial Port

To print directly to a generic serial port printer (non-Intermec printers):

- Use CreateFile() to open ports — COM1 can open on most devices.
- Use WriteFile() to send data directly to the printer.
- Use CloseHandle() when you are finished printing to close the port.

NPCP Printer Driver

The NPCP printer communications driver (NPCPPORT.DLL) is a Stream Device Driver built into the operating system. The driver supports only NPCP communications to and from the 6820 Printers over a selected serial port.

All applications use WIN32 API functions to access the drivers. Basic operations are easily implemented by applications through the CreateFile(), WriteFile(), ReadFile(), DeviceIOControl(), and CloseHandle() Win32 APIs.

Operations to upgrade printer modules, perform printer diagnostics, and get printer configuration are performed largely via DeviceIOControl() functions.

About NPCP

NPCP (Norand® Portable Communications Protocol) is a proprietary protocol that provides session, network, and datalink services for Intermec mobile computers in the Intermec LAN environment used with printers and data communications.

NPCP Driver Installation and Removal

Use LPT9: for the NPCP printer device and COM1 for the last parameter. COM1 is the connection available via the CN2B Computer.

Applications use the RegisterDevice() function to install the driver. DeregisterDevice() uninstalls the device driver and frees memory space when the driver is not required. Use the HANDLE returned by RegisterDevice() as the parameter to DeregisterDevice().

Use the RegisterDevice() function call as demonstrated below. Specify the full path name to the driver starting at the root for the RegisterDevice() function to work properly. The last parameter to RegisterDevice() is a DWORD that represents the name of the port for the NPCP stream driver to use. Build this parameter on the stack if it is not to be paged out during the call. The first parameter "LPT" (Device Name) and the second parameter "9" (index), indicate the name of the registered device, such as LPT9. This is used in the CreateFile() function call.

```
Install()
{
HANDLE hDevice;
TCHAR port[6];
port[0] = TCHAR('C');
port[1] = TCHAR('O');
port[2] = TCHAR('M');
port[3] = TCHAR('1');
port[4] = TCHAR(':');
port[5] = TCHAR(0);
hDevice = RegisterDevice ( (TEXT("LPT"), 9,
TEXT("\\STORAGE CARD\\WINDOWS\\NPCPPORT.dll"), (DWORD)port);
}
```

Opening the NPCP Driver

The application opens the NPCP driver by using the CreateFile() function. The call can be implemented as follows. The first parameter "LPT9:" must reflect the device name and index used in the RegisterDevice() function call and will fail for any of the following reasons:

```
hFile = CreateFile(_T("LPT9:"), GENERIC_WRITE |
GENERIC_READ, 0, NULL, OPEN_ALWAYS, FILE_ATTRIBUTE_NORMAL,
NULL);
```

- The port associated with the device during RegisterDevice() is in use.
- The NPCP device is already open.
- The share mode is not set to zero. The device cannot be shared.
- Access permissions are not set to GENERIC_WRITE | GENERIC_READ. Both modes must be specified.

Closing the NPCP Driver

Using the CloseHandle() (hFile) function closes the NPCP driver. Where *hFile* is the handle returned by the CreateFile() function call.

- TRUE = the device is successfully closed.
- FALSE = an attempt to close NULL HANDLE or an already closed device.

Reading from the NPCP Driver

Reading of the NPCP printers is not supported since all responses from the printer are the result of commands sent to the printer. DeviceIoControl() functions are provided where data is to be received from the printer.

Writing to the NPCP Driver

All Print data can be sent to the printer using the WriteFile() function. The print data written to the driver must contain the proper printer commands for formatting. If the function returns FALSE, the NPCP error may be retrieved using IOCTL_NPCP_ERROR. See the description on the next page.

NPCP Driver I/O Controls

An application uses the DeviceIoControl() function to specify an printer operation to perform. Certain I/O controls are required to bind and close communication sessions with the printer, and must be completed before any other commands to the driver can execute properly.

The function returns TRUE to indicate the device successfully completed its specified I/O control operation, otherwise it returns FALSE. The following I/O control codes are defined:

```
#define IOCTL_NPCP_CANCEL
CTL_CODE(FILE_DEVICE_SERIAL_PORT,0x400,METHOD_BUFFERED,FILE_ANY_ACCESS)

#define IOCTL_NPCP_BIND
CTL_CODE(FILE_DEVICE_SERIAL_PORT,0x401,METHOD_BUFFERED,FILE_ANY_ACCESS)

#define IOCTL_NPCP_CLOSE
CTL_CODE(FILE_DEVICE_SERIAL_PORT,0x402,METHOD_BUFFERED,FILE_ANY_ACCESS)

#define IOCTL_NPCP_ERROR
CTL_CODE(FILE_DEVICE_SERIAL_PORT,0x403,METHOD_BUFFERED,FILE_ANY_ACCESS)

#define IOCTL_NPCP_FLUSH
CTL_CODE(FILE_DEVICE_SERIAL_PORT,0x404,METHOD_BUFFERED,FILE_ANY_ACCESS)
```

```
#define IOCTL_NPCP_IOCTL
CTL_CODE(FILE_DEVICE_SERIAL_PORT,0x405,METHOD_BUFFERED,FILE_ANY_ACCESS)

#define IOCTL_NPCP_PRTVER
CTL_CODE(FILE_DEVICE_SERIAL_PORT,0x406,METHOD_BUFFERED,FILE_ANY_ACCESS)
```

- **IOCTL_NPCP_CANCEL**
  This cancels all printing at the printer. It flushes the printer buffers and re initializes the printer to its default state. No parameters are required.
- **IOCTL_NPCP_BIND**
  This command is required before any data is sent or received by the printer. Once the driver is opened, the application must bind the communications session with the printer before any data can be sent or received by the printer. If an error occurs during the bind, the application may use IOCTL_NPCP_ERROR to get the current extended error code. No parameters are required.
- **IOCTL_NPCP_CLOSE**
  This command closes the current session with the printer. This function always returns TRUE. No parameters are required.
- **IOCTL_NPCP_ERROR**
  This command returns the extended NPCP error code in PL/N format. The word returned will contain the PL/N compatible error code in the low byte and completion flags in the high byte. If the frame that returned an error was not received correctly by the printer the FRAME_NOT_ACKED bit is set in the high byte. This operation always returns TRUE. An output buffer of at least two bytes is required. See "NPCP Error Codes" on page 116.
- **IOCTL_NPCP_FLUSH**
  This command allows the application to poll the printer for errors while the report is completing the print process at the printer. If an error occurs during the polling process, the operation will return FALSE and the application can get the extended error code by using IOCTL_NPCP_ERROR. No parameters are required.

NPCP Printer Communications

All NPCP printer communications should be based on the following flow:

1. Use CreateFile(); to open the printer driver.
2. Use IOCTL_NPCP_BIND to bind a session with the printer; IOCTL_NPCP_ERROR to check for errors on the bind to ensure success; and IOCTL_NPCP_CANCEL to cancel outstanding print jobs.
3. Use IOCTL_NPCP_FLUSH to poll the printer to free up printer buffer resources. Use IOCTL_NPCP_FLUSH to poll the printer's status. If an error is reported by the IOCTL, then use IOCTL_NPCP_ERROR to get the error and determine the correct recovery procedure.

4 Use WriteFile(); to write your data to the printer. Check for errors and that all data were written. Use IOCTL_NPCP_ERROR to get the extended error. If the error is critical in nature, use IOCTL_NPCP_CLOSE, followed by CloseFile(), to end the communications session. Start a new session, beginning with step 1 to ensure proper printing. For noncritical errors display the error and retry the operation.

5 After all data is sent to the printer, ensure that the printer continues to print the report properly by polling the printer's status. Use IOCTL_NPCP_FLUSH to poll the printer's status. If an error is reported by the IOCTL, then use IOCTL_NPCP_ERROR to get the error and determine the correct recovery procedure.

Sample Code

See sample code in the "\CN2B Dev Tools\Installable Drivers\Port Drivers\Npcp\NPCPPrint\" directory for more details on printing, printer communications and error code handling.

NPCP Error Codes

Call the IOCTL_NPCP_ERROR I/O control function to receive PL/N compatible error codes. Applications must decide how to act upon the data returned.

```
// Definition of NPCP communications Errors and Printer Errors
#define PNRDY (BYTE)102 // link not ready error
#define RXTMO (BYTE)104 // link no receive error
#define TXTMO (BYTE)106 // link no transmit error
#define BADADR (BYTE)111 // frame address error
#define GAPERR (BYTE)112 // link gap error (timeout) in receive data
#define LSRPE (BYTE)113 // frame parity error on length field
#define IFTS (BYTE)120 // session layer - invalid frame this state
#define NS_NE_VR (BYTE)121 // session layer sequence error
#define NR_NE_VS (BYTE)122 // session layer sequence error
#define MAC_CRCERR (BYTE)124 // MAC CRC error
#define RLENERR (BYTE)123 // MAC too much data received
#define FRMERR (BYTE)200 // Frame Reject
#define FRMERR_IF (BYTE)201 // Frame Reject - Invalid Frame
#define FRMERR_NR (BYTE)202 // Frame Reject - NR Mismatch
#define FRMERR_NS (BYTE)203 // Frame Reject - NS Mismatch
#define NDMERR (BYTE)204 // Normal Disconnect mode error
#define BINDERR (BYTE)210 // bind error
#define IPLDUR (BYTE)221 // invalid presentation layer response
#define HEADJAM (BYTE)222 // printer head jam
#define PAPEROUT (BYTE)223 // printer paper out
#define LOWVOLTS (BYTE)224 // printer low voltage
#define HIVOLTS (BYTE)225 // printer over voltage
#define LOWBAT (BYTE)226 // printer low battery
#define COVEROFF (BYTE)227 // printer cover off error
#define HEADFAULT (BYTE)228 // printer head short or driver short error
#define PFFAULT (BYTE)229 // paper feed motor fault.
#define FRAME_NOT_ACKED 0x8000 // frame was not received by printer and need to
be resent.
```

O'Neil Printer Driver

The DTR printer communications driver is a Stream Device Driver named ONEIL.DLL.

All applications use WIN32 API functions to access drivers. Basic operations are easily implemented by applications through the CreateFile(), WriteFile(), DeviceIOControl() and CloseHandle() Win32 APIs.

The driver supports communications to PB20, PB40, and PB42 printers over a selected serial port.

DTR Driver Installation and Removal

Your application must install the device driver by using the RegisterDevice() function. The driver name is ONEIL.DLL. We recommend that you use "DTR" for the Device Name parameter, "1" for the Device Driver index parameter, and use any of the following strings for the last parameter:

- NULL (==0) Defaults to COM1 @ 9600
- "COM1" only COM port specified defaults to 9600
- "COM1:9600" sets to COM port and specified bit rate
- "COM1:19200" sets to COM port and specified bit rate

Use the HANDLE returned by RegisterDevice() as the parameter to DeregisterDevice(). The correct usage of the RegisterDevice() function call is demonstrated below. You may use DeregisterDevice() to uninstall the driver.

```
Install()
{

HANDLE hDevice;
TCHAR port[6];
port[0] = TCHAR('C');
port[1] = TCHAR('O');
port[2] = TCHAR('M');
port[3] = TCHAR('1');
port[4] = TCHAR(':');
port[5] = TCHAR(0);
hDevice = RegisterDevice ( (TEXT("DTR"), 1, TEXT("\\WINDOWS\\ONEIL.DLL"),
(DWORD)port);

}
```

Opening the DTR Driver

The application opens the DTR driver by using the CreateFile() function. The call can be implemented as follows:

```
hFile = CreateFile(_T("DTR1:"), GENERIC_WRITE, 0, NULL,
OPEN_ALWAYS, FILE_ATTRIBUTE_NORMAL, NULL);
```

The first parameter “DTR1:” must reflect the device name and index used in the RegisterDevice() function call.

The function call will fail for any of the following reasons:

- The port associated with the device during RegisterDevice() is currently in use.
- The DTR device is already open.
- The share mode is not set to zero. The device cannot be shared.
- Access permissions are not set to GENERIC_WRITE.

Closing the DTR Driver

Using the CloseHandle() (hFile) function closes the DTR driver. Where *hFile* is the handle returned by the CreateFile() function call.

- TRUE indicates the device is successfully closed.
- FALSE indicates an attempt to close a NULL HANDLE or an already closed device.

Writing to the DTR Driver

You can use the WriteFile() function to send all Print data to the printer. The print data being written must contain the proper formatting printer commands.

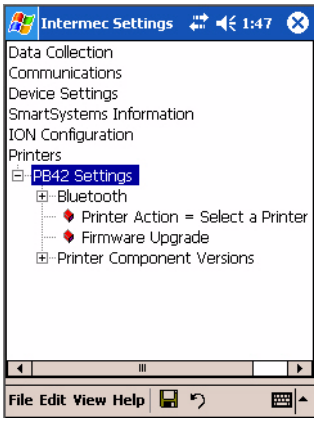
DTR Printer Communications

All DTR printer communications should be based on the following flow:

1. Use CreateFile() to open the printer driver.
2. Use WriteFile() to write your data to the printer. Check for errors and that all data were written.
3. Use CloseHandle() to close the driver.

Configuring PB42 Printers Via Intermec Settings

Tap **Start** > **Settings** > the **System** tab > the **Intermec Settings** icon to access the applet. Tap (+) to expand the **Printers** option, then tap (+) to expand the **PB42 Settings** option and make your adjustments.



6 Scanner Support

The CN2B Mobile Computer is available with linear imaging technologies, such as the APS Linear Imager, which includes the EV10 Scan Engine.

The APS Imager reads 1D symbologies and PDF417 bar codes. Linear imaging using Vista Scanning technologies reads low-contrast bar codes, laminated bar codes, and bar codes displayed on CRT or TRT displays. This imaging uses harmless LEDs for illumination and does not require any warning labels. Vista Scanning is more reliable than lasers as it is a completely solid state with no moving parts or oscillating mirrors.

An ImageDemo application shows the more common features of the CN2B Computer imager. See the *ImageDemo User's Guide* for information.

Scanner Control and Data Transfer

Note: To use these methods, enable the Data Collection functionality on the CN2B Computer using the bootloader configuration menu.

The Data Server and associated software provide several ways to manipulate scanner control and data transfer between the scanner subsystem and user applications:

- **Automatic Data Collection COM Interfaces**:
  These COM interfaces allow user applications to receive bar code data, and configure and control the bar code reader engine.
- **ITCAxBarCodeReaderControl functions**:
  These ActiveX controls allow user applications to collect bar code data from the scanner, to configure the scanner, and to configure audio and visual notification when data arrives.
- **ITCAxReaderCommand functions**:
  Use these ActiveX controls to modify and retrieve configuration information using the reader interface commands.
- **Scanning EasySet bar code labels**:
  You can use the EasySet bar code creation software from Intermec to print configuration labels. Scan the labels to change the scanner configuration and data transfer settings.

  Use the Intermec EasySet software to print configuration labels you can scan to change your configuration settings. For more information, see the EasySet online help. EasySet is available from the Intermec Data Capture web site.

For more information, see the Data Collection Resource Kit in the Intermec Developer Library (IDL), which is available as a download from the Intermec web site at **www.intermec.com/idl**. Contact your Intermec representative for more information.

Data Collection Configuration

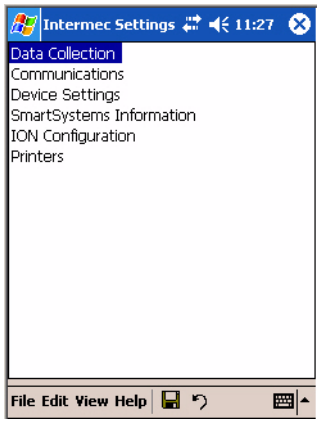
You can configure scanner settings for the CN2B Computer via the Intermec Settings applet. From the CN2B Computer, tap **Start** > **Settings** > the **System** tab > the **Intermec Settings** icon. See the *Intermec Computer Command Reference Manual* (P/N: 073529) for information about the settings you can configure with this applet. This online manual is available from the Intermec web site at **www.intermec.com**.

Internal Scanners

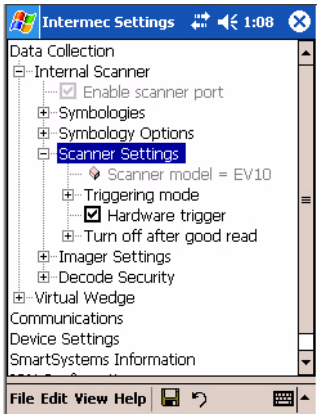
The Intermec Internal Scanner feature allows Automatic Data Collection (ADC) by accepting data from the COM1 port and wedging it into the keyboard interface. You can enable or disable this feature from the Today screen on the CN2B Computer.

Do the following from the Intermec Settings applet. Information about the settings you can configure with this applet is described in the *Intermec Computer Command Reference Manual*. The online manual is available from the Intermec web site at **www.intermec.com**.

1 From the CN2B Computer, tap **Start** > **Settings** > the **System** tab > the **Intermec Settings** icon.



2 Tap the **Data Collection** option, then tap (+) to expand **Internal Scanner**. *This sample screen is for the EV10 scanner model.*



Linear Imager Settings

Depending on what is selected as the scanner model, image settings, decode security, and virtual wedge are configured from the Intermec Settings applet. See the the *Intermec Computer Command Reference Manual*, available from the Intermec web site at **www.intermec.com**, for more information about each enabled option.

Internal Scanner Supported Symbologies

The EV10 Scanner supports these symbologies:

Code 39, UPC/EAN, Code 128, Interleaved 2 of 5, Code 93, Codabar, Standard 2 of 5, MSI, Plessey, Code 11, Matrix 2 of 5, Telepen, RSS, Vest Code 39, ISBT 128, Code 93i

The EV10 also supports the following stacked symbologies:

PDF 417, Micro PDF, Macro PDF, Codablock, RSS

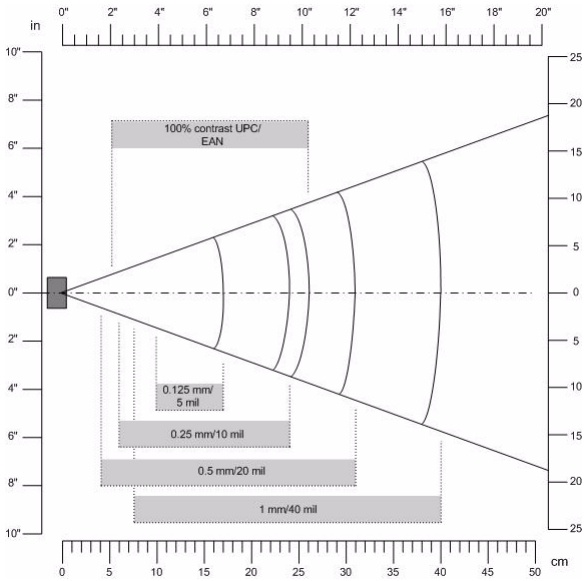
Reading Distances

Typical reading distances are done in an office environment using office lights (4 lux). Minimum distances are measured in the dark (0 lux). Both reading distances are provided in respective scan engine integration guides. Contact your Intermec representative for more information.

Below are the minimum standard reading distances for the CN2B Computers built with the EV10 integrated scan engine. When correctly mounted, an exit window reduces reading distances by about 4%.

EV10 Minimum Reading Distances with 0.04" Setbacks

Symbology	Bar Code Content	Density	Minimum Distances	Maximum Distances
Code 39	RESO 0.100 MM R 0.125 MM 0.25 .5 R1MM	0.1mm/ 4 mil 0.125 mm/ 5 mil 0.25 mm/ 10 mil 0.5 mm/ 20 mil 1 mm/ 40 mil	6.25 cm/ 4.26" 9.80 cm/ 3.86" 5.99 cm/ 2.36" 3.96 cm/ 1.56" 7.53 cm/ 2.96"	13.87 cm/ 5.46" 16.92 cm/ 6.66" 23.77 cm/ 9.36" 30.89 cm/ 12.16" 39.78 cm/ 15.66"
UPC/EAN	120010010100	0.33 mm/ 13 mil	4.98 cm/ 1.96"	25.81 cm/ 10.16"
PDF417	10 mil 15 mil	0.254 mm/ 10 mil 0.381 mm/ 15 mil	9.80 cm/ 3.86" 7.77 cm/ 3.06"	16.92 cm/ 6.66" 18.95 cm/ 7.46"



7 Programming

The following programming information pertains to the CN2B Mobile Computer:

Creating CAB Files

The Windows CE operating system uses a .CAB file to install an application on a Windows CE-based device. A .CAB file is composed of multiple files that are compressed into one file. Compressing multiple files into one file provides the following benefits:

- All application files are present.
- A partial installation is prevented.
- The application can be installed from several sources, such as a desktop computer or a Web site.

Use the CAB Wizard application (CABWIZ.EXE) to generate a .CAB file for your application.

Creating Device-Specific CAB Files

Do the following to create a device-specific .CAB file for an application, *in the order provided*:

1. Create an .INF file with Windows CE-specific modifications *(see below)*.
2. *Optional* Create a SETUP.DLL file to provide custom control of the installation process *(page 136)*.
3. Use the CAB Wizard to create the .CAB file, using the .INF file, the optional SETUP.DLL file, and the device-specific application files as parameters *(page 139)*.

Creating an .INF File

An .INF file specifies information about an application for the CAB Wizard. Below are the sections of an .INF file:

[Version]

This specifies the file creator, version, and other relevant information.

Required? Yes

- **Signature**: "*signature_name*"
  "$Windows NT$"
- **Provider**: "*INF_creator*"
  The company name of the application, such as "Microsoft."
- **CESignature**
  "$Windows CE$"

Example

```
[Version]
Signature = "$Windows NT$"
Provider = "Intermec"
CESignature = "$Windows CE$"
```

[CEStrings]

This specifies string substitutions for the application name and the default installation directory.

Required? Yes

- **AppName**: *app_name*
  Name of the application. Other instances of %AppName% in the .INF file are replaced with this string value, such as RP32.
- **InstallDir**: *default_install_dir*
  Default installation directory on the device. Other instances of %InstallDir% in the .INF file are replaced with this string value. Example: \SDMMC_Disk\%AppName%

Example

```
[CEStrings]
AppName="Game Pack"
InstallDir=%CE1%\%AppName%
```

[Strings]

This section is optional and defines one or more string keys. A string key represents a string of printable characters.

Required? No

- **string_key**: *value*
  String of letters, digits, or other printable characters. Enclose *value* in double quotation marks "" if the corresponding string key is used in an item that requires double quotation marks. No string_keys is okay.

Example

```
[Strings]
reg_path = Software\Intermec\My Test App
```

[CEDevice]

Describes the targeted application platform. All keys are optional. If a key is nonexistent or has no data, Windows CE does not perform any checking with the exception being *UnsupportedPlatforms*. If the *UnsupportedPlatforms* key exists but no data, the previous value is not overridden.

Required? Yes

- **ProcessorType**: *processor_type*
  The value that is returned by **SYSTEMINFO**.dwProcessorType.For example, the value for the ARM CPU is 2577
- **UnsupportedPlatforms**: *platform_family_name*
  This lists known unsupported platform family names. If the name specified in the [**CEDevice.xxx**] section is different from [**CEDevice**], both *platform_family_name* values are unsupported for the microprocessor specified by xxx. The unsupported platform family names list is appended to the previous list. Application Manager does not display the

application for an unsupported platform. Also, a user is warned during the setup process if the .CAB file is copied to an unsupported device.

Example

```
[CEDevice]
UnsupportedPlatforms = pltfrm1 ; pltfrm1 is unsupported
[CEDevice.SH3]
UnsupportedPlatforms = ; pltfrm1 is still unsupported
```

- **VersionMin**: *minor_version*
  Numeric value returned by **OSVERSIONINFO**.dwVersionMinor. The .CAB file is valid for the currently connected device if the version of this device is greater than or equal to **VersionMin**.
- **VersionMax**: *major_version*
  Numeric value returned by **OSVERSIONINFO**.dwVersionMajor. The .CAB file is valid for the currently connected device if the version of this device is less than or equal to **VersionMax**.
- **BuildMin**: *build_number*
  Numeric value returned by **OSVERSIONINFO**.dwBuildNumber. The .CAB file is valid for the currently connected device if the version of this device is greater than or equal to **BuildMin**.
- **BuildMax**: *build_number*
  Numeric value returned by **OSVERSIONINFO**.dwBuildNumber. The .CAB file is valid for the currently connected device if the version of this device is less than or equal to **BuildMax**.

Example

This shows three [**CEDevice**] sections: one giving basic information for any CPU and two specific to the SH3 and the MIPS microprocessors.

```
[CEDevice] ; A "template" for all platforms
UnsupportedPlatforms = pltfrm1; Does not support pltfrm1

; The following specifies version 1.0 devices only.
VersionMin = 1.0
VersionMax = 1.0

[CEDevice.ARM]; Inherits all [CEDevice] settings
; This will create a .CAB file specific to ARM devices.
ProcessorType = 2577; ARM .cab file is valid for ARM microprocessors.
UnsupportedPlatforms = ; pltfrm1 is still unsupported

; The following overrides the version settings so that no version checking is
performed.
VersionMin =
VersionMax =

[CEDevice.MIPS] ; Inherits all [CEDevice] settings
; This will create a .CAB file specific to "MIPS" devices.
ProcessorType = 4000; MIPS .CAB file is valid for MIPS microprocessor.
UnsupportedPlatforms =pltfrm2; pltfrm1, pltfrm2 unsupported for MIPs .CAB
file.
```

Note: To create the two CPU-specific .CAB files for the SETUP.INF file in the previous example, run the CAB Wizard with the "/cpu arm mips" parameter.

[DefaultInstall]

This describes the default installation of your application. Note that under this section, you will list items expanded upon later in this description.

Required? Yes

- **Copyfiles**: *copyfile_list_section*
  Maps to files defined later in the .INF file, such as Files.App, Files.Font, and Files.Bitmaps.
- **AddReg**: *add_registry_section*
  Example: RegSettings.All
- **CEShortcuts**: *shortcut_list_section*
  String that identifies one more section that defines shortcuts to a file, as defined in the [**CEShortcuts**] section.
- **CESetupDLL**: *setup_DLL*
  Optimal string that specifies a SETUP.DLL file. It is written by the Independent Software Vendor (ISV) and contains customized functions for operations during installation and removal of the application. The file must be specified in the [**SourceDisksFiles**] section.
- **CESelfRegister**: *self_reg_DLL_filename*
  String that identifies files that self-register by exporting the **DllRegisterServer** and **DllUnregisterServer** Component Object Model (COM) functions. Specify these files in the [**SourceDiskFiles**] section. During installation, if installation on the device fails to call the file's exported **DllRegisterServer** function, the file's exported **DllUnregisterServer** function is not called during removal.

Example

```
[DefaultInstall]
AddReg = RegSettings.All
CEShortcuts = Shortcuts.All
```

[SourceDiskNames]

This section describes the name and path of the disk on which your application resides.

Required? Yes

- **disk_ordinal**: *disk_label,,path*
  1=,"App files" , C:\Appsoft\RP32\...
  2=,"Font files",,C:\RpTools\...
  3=,"CE Tools" ,,C:\windows ce tools...
- **CESignature**: "$Windows CE$"

Example

```
[SourceDisksNames]; Required section
1 = ,"Common files",,C:\app\common; Using an absolute path
[SourceDisksNames.SH3]
2 = ,"SH3 files",,sh3; Using a relative path
[SourceDisksNames.MIPS]
2 = ,"MIPS files",,mips; Using a relative path
```

[SourceDiskFiles]

This describes the name and path of the files in which your application resides.

Required? Yes

- **filename**: *disk_number[,subdir]*
  RPM.EXE = 1,c:\appsoft\...
  WCESTART.INI = 1
  RPMCE212.INI = 1
  TAHOMA.TTF = 2

Note: [,subdir] is relative to the location of the INF file.

Example

```
[SourceDisksFiles]; Required section
begin.wav = 1
end.wav = 1
sample.hlp = 1
[SourceDisksFiles.SH3]
sample.exe = 2; Uses the SourceDisksNames.SH3 identification of 2.
[SourceDisksFiles.MIPS]
sample.exe = 2; Uses the SourceDisksNames.MIPS identification of 2.
```

[DestinationDirs]

This describes the names and paths of the destination directories for the application on the target device. *Note Windows CE does not support directory identifiers.*

Required? Yes

- **file_list_section**:*0,subdir*
  String that identifies the destination directory. The following list shows the string substitutions supported by Windows CE. Use these only for the beginning of the path. \
  %CE1% \Program Files
  %CE2% \Windows
  %CE3% \My Documents
  %CE4% \Windows\Startup
  %CE5% \My Documents
  %CE6% \Program Files\Accessories
  %CE7% \Program Files\Communication
  %CE8% \Program Files\Games

%CE9% \Program Files\Pocket Outlook
%CE10% \Program Files\Office
%CE11% \Windows\Start Menu\Programs
%CE12% \Windows\Start Menu\Programs\Accessories
%CE13% \Windows\Start Menu\Programs\Communications
%CE14% \Windows\Start Menu\Programs\Games
%CE15% \Windows\Fonts
%CE16% \Windows\Recent
%CE17% \Windows\Start Menu
%InstallDir%
Contains the path to the target directory selected during installation. It is declared in the [**CEStrings**] section
%AppName%
Contains the application name defined in the [**CEStrings**] section.

Example

```
[DestinationDirs]
Files.Common  = 0,%CE1%\My Subdir; \Program Files\My Subdir
Files.Shared  = 0,%CE2%; \Windows
```

[CopyFiles]

This section, under the [**DefaultInstall**] section, describes the default files to copy to the target device. Within the [**DefaultInstall**] section, files were listed that must be defined elsewhere in the INF file. This section identifies that mapping and may contain flags.

Required? Yes

- **copyfile_list_section**: *destination_filename,[source_filename]*
  The *source_filename* parameter is optional if it is the same as *destination_filename*.
- **copyfile_list_section**: *flags*
  The numeric value that specifies an action to do while copying files. The following table shows values supported by Windows CE.

Flag	Value	Description
COPYFLG_WARN_IF_SKIP	0x00000001	Warn user if skipping a file is attempted after error.
COPYFLG_NOSKIP	0x00000002	Do not allow a user to skip copying a file.
COPYFLG_NO_OVERWRITE	0x00000010	Do not overwrite files in destination directory.
COPYFLG_REPLACEONLY	0x00000400	Copy the source file to the destination directory only if the file is already in the destination directory.
CE_COPYFLG_NO_DATE_DIALOG	0x20000000	Do not copy files if the target file is newer.
CE_COPYFLG_NODATECHECK	0x40000000	Ignore date while overwriting the target file.
CE_COPYFLG_SHARED	0x80000000	Create a reference when a shared DLL is counted.

Example

```
[DefaultInstall.SH3]
CopyFiles = Files.Common, Files.SH3
[DefaultInstall.MIPS]
CopyFiles = Files.Common, Files.MIPS
```

[AddReg]

This section, under the [**DefaultInstall**] section, is optional and describes the keys and values that the .CAB file adds to the device registry. Within the [**DefaultInstall**] section, a reference may have been made to this section, such as "AddReg=RegSettings.All". This section defines the options for that setting.

Required? No

- **add_registry_section**:*registry_root_string*
  String that specifies the registry root location. The following list shows the values supported by Windows CE.
  - HKCR Same as HKEY_CLASSES_ROOT
  - HKCU Same as HKEY_CURRENT_USER
  - HKLM Same as HKEY_LOCAL_MACHINE
- **add_registry_section**:*value_name*
  Registry value name. If empty, the "default" registry value name is used.
- **add_registry_section**:*flags*
  Numeric value that specifies information about the registry key. The following table shows the values that are supported by Window CE.

Flag	Value	Description
FLG_ADDREG_NOCLOBBER	0x00000002	If the registry key exists, do not overwrite it. Can be used with any of the other flags in this table.
FLG_ADDREG_TYPE_SZ	0x00000000	REG_SZ registry data type.
FLG_ADDREG_TYPE_MULTI_SZ	0x00010000	REG_MULTI_SZ registry data type. Value field that follows can be a list of strings separated by commas.
FLG_ADDREG_TYPE_BINARY	0x00000001	REG_BINARY registry data type. Value field that follows must be a list of numeric values separated by commas, one byte per field, and must not use the 0x hexadecimal prefix.
FLG_ADDREG_TYPE_DWORD	0x00010001	REG_DWORD data type. The noncompatible format in the Win32 Setup .INF documentation is supported.

Example

```
AddReg = RegSettings.All

[RegSettings.All]
HKLM,%reg_path%,,0x00000000,alpha; <default> = "alpha"
HKLM,%reg_path%,test,0x00010001,3; Test = 3
HKLM,%reg_path%\new,another,0x00010001,6; New\another = 6
```

[CEShortCuts]

This section, a Windows CE-specific section under the [**DefaultInstall**] section, is optional and describes the shortcuts that the installation application creates on the device. Within the [**DefaultInstall**] section, a reference may have been made to this section, such as "ShortCuts.All". This section defines the options for that setting.

Required? No

- **shortcut_list_section**:*shortcut_filename*
  String that identifies the shortcut name. It does not require the .LNK extension.
- **shortcut_list_section**:*shortcut_type_flag*
  Numeric value. Zero or empty represents a shortcut to a file; any non-zero numeric value represents a shortcut to a folder.
- **shortcut_list_section**:*target_file_path*
  String value that specifies the destination location. Use the target file name for a file, such as MyApp.exe, that must be defined in a file copy list. For a path, use a *file_list_section* name defined in the [**DestinationDirs**] section, such as *DefaultDestDir*, or the *%InstallDir%* string.
- **shortcut_list_section**:*standard_destination_path*
  Optional string value. A standard *%CEx%* path or *%InstallDir%*. If no value is specified, the *shortcut_list_section* name of the current section or the *DefaultDestDir* value from the [**DestinationDirs**] section is used.

Example

```
CEShortcuts = Shortcuts.All
[Shortcuts.All]
Sample App,0,sample.exe; Uses the path in DestinationDirs. Sample App,0,sam-
ple.exe,%InstallDir%; The path is explicitly specified.
```

Sample .INF File

```
[Version]; Required section
Signature = "$Windows NT$"
Provider = "Intermec Technologies Corporation"
CESignature = "$Windows CE$"

;[CEDevice]
;ProcessorType =

[DefaultInstall]; Required section
CopyFiles = Files.App, Files.Fonts, Files.BitMaps, Files.Intl, Files.Tele-
comNcsCE, Files.Windows, Files.Import, Files.Export, Files.Work, Files.Data-
base, Files.WinCE AddReg = RegSettings.All ;CEShortcuts = Shortcuts.All

[SourceDisksNames]; Required section
1 = ,"App files" ,,c:\appsoft\...
2 = ,"Font files" ,,c:\WinNT\Fonts
3 = ,"CE Tools"  ,,c:\windows ce tools\wce400\700ie\mfc\lib\x86

[SourceDisksFiles]; Required section
rpm.exe   = 1,C:\Appsoft\program\wce400\WCEX86Rel700
```

```
wcestart.ini = 1
rpmce212.ini = 1
intermec.bmp = 1
rpmlogo.bmp = 1
rpmname.bmp = 1
import.bmp  = 1
export.bmp  = 1
clock.bmp  = 1
printer.bmp = 1
filecopy.bmp = 1
readme.txt  = 1
lang_eng.bin = 1
rpmdata.dbd = 1,database\wce1
tahoma.ttf  = 2
mfcce212.dll = 3
olece212.dll = 3
olece211.dll = 1,c:\windows ce tools\wce400\NMSD61102.11\mfc\lib\x86
rdm45wce.dll = 1,c:\rptools\rdm45wce\4_50\lib\wce400\wcex86rel
picfmt.dll  = 1,c:\rptools\picfmt\1_00\wce400\wcex86rel6110
fmtctrl.dll = 1,c:\rptools\fmtctrl\1_00\wce400\wcex86rel6110
ugrid.dll  = 1,c:\rptools\ugrid\1_00\wce400\wcex86rel6110
simple.dll  = 1,c:\rptools\pspbm0c\1_00\wce400\wcex86rel
psink.dll = 1,c:\rptools\psink\1_00\wce400\WCEX86RelMinDependency
pslpwce.dll =1,c:\rptools\pslpm0c\1_00\wce400\WCEX86RelMinDependency
npcpport.dll = 1,c:\rptools\cedk\212_03\installable drivers\printer\npcp
;dexcom.dll  = 1,c:\rptools\psdxm0c\1_00\x86
ncsce.exe  = 1,c:\rptools\ncsce\1_04
nrinet.dll  = 1,c:\rptools\ncsce\1_04

[DestinationDirs];Required section
;Shortcuts.All = 0,%CE3%  ; \Windows\Desktop
Files.App= 0,%InstallDir%
Files.DataBase= 0,%InstallDir%\DataBase
Files.BitMaps= 0,%InstallDir%\Bitmaps
Files.Fonts= 0,%InstallDir%\Fonts
Files.Intl= 0,%InstallDir%\Intl
Files.TelecomNcsCE= 0,%InstallDir%\Telecom\NcsCE
Files.Windows= 0,%InstallDir%\Windows
Files.Import= 0,%InstallDir%\Import
Files.Export= 0,%InstallDir%\Export
Files.Work= 0,%InstallDir%\Work
Files.WinCE= 0,\storage_card\wince

[CEStrings]; Required section
AppName = Rp32
InstallDir = \storage_card\%AppName%

[Strings]; Optional section
;[Shortcuts.All]
;Sample App,0,sample.exe; Uses the path in DestinationDirs.
;Sample App,0,sample.exe,%InstallDir%; The path is explicitly specified.

[Files.App]
rpm.exe,,,0
rpm.ini,rpmce212.ini,,0
mfcce212.dll,,,0
olece212.dll,,,0
olece211.dll,,,0
rdm45wce.dll,,,0
```

```
picfmt.dll,,,0
fmtctrl.dll,,,0
ugrid.dll,,,0
simple.dll,,,0
psink.dll,,,0
pslpwce.dll,,,0
npcpport.dll,,,0
;dexcom.dll,,,0

[Files.DataBase]
rpmdata.dbd,,,0

[Files.Fonts]
tahoma.ttf,,,0

[Files.BitMaps]
intermec.bmp,,,0
rpmlogo.bmp,,,0
rpmname.bmp,,,0
import.bmp,,,0
export.bmp,,,0
clock.bmp,,,0
printer.bmp,,,0
filecopy.bmp,,,0

[Files.Intl]
lang_eng.bin,,,0

[Files.TelecomNcsCE]
ncsce.exe,,,0
nrinet.dll,,,0

[Files.Windows]
readme.txt,,,0

[Files.Import]
readme.txt,,,0

[Files.Export]
readme.txt,,,0

[Files.Work]
readme.txt,,,0

[Files.WinCE]
wcestart.ini,,,0

[RegSettings.All]
HKLM,"SOFTWARE\Microsoft\Shell\AutoHide",,0x00010001,1; Autohide the taskbar
HKLM,"SOFTWARE\Microsoft\Shell\OnTop",,0x00010001,0; Shell is not on top
HKLM,"SOFTWARE\Microsoft\Clock",SHOW_CLOCK,0x00010001,0
; Clock is not on taskbar
```

Using Installation Functions in SETUP.DLL

SETUP.DLL is an optional file that enables you to perform custom operations during installation and removal of your application. The following list shows the functions that are exported by SETUP.DLL.

Note: Use **[DefaultInstall]** > **CESelfRegister** (page 129) in the .INF file to point to SETUP.DLL.

Install_Init	Called before installation begins. Use this function to check the application version when reinstalling an application and to determine if a dependent application is present.
Install_Exit	Called after installation is complete. Use this function to handle errors that occur during application installation.
Uninstall_Init	Called before the removal process begins. Use this function to close the application, if the application is running.
Uninstall_Exit	Called after the removal process is complete. Use this function to save database information to a file and delete the database and to tell the user where the user data files are stored and how to reinstall the application.

After the CAB File Extraction

Cab files that need to cause a warm reset after cab extraction need to create the __RESETMEPLEASE__.TXT file in the "\Windows" directory. The preferred method to create this file is within the DllMain portion of the SETUP.DLL file. It looks like this:

```
#include <windows.h>
#include <Tlhelp32.h>
#include <winioctl.h>
#include <ce_setup.h>   // in the public SDK dir

#define IOCTL_TERMINAL_RESET CTL_CODE (FILE_DEVICE_UNKNOWN,FILE_ANY_ACCESS,
2050, METHOD_NEITHER)

BOOL APIENTRY DllMain( HANDLE h, DWORD reason, LPVOID lpReserved )
{
return TRUE;
} // DllMain


//*********************************************************************
// $DOCBEGIN$
// BOOL IsProcessRunning( TCHAR * pname );
//
// Description: Get process table snapshot, look for pname running.
//
// Arguments: pname - pointer to name of program to look for.
// for example, app.exe.
//
// Returns: TRUE - process is running.
//          FALSE - process is not running.
// $DOCEND$
//*********************************************************************
```

```
BOOL IsProcessRunning( TCHAR * pname )
{
HANDLE hProcList;
PROCESSENTRY32 peProcess;
DWORD thDeviceProcessID;
TCHAR lpname[MAX_PATH];

if ( !pname || !*pname ) return FALSE;

_tcscpy( lpname, pname );
_tcslwr( lpname );

hProcList = CreateToolhelp32Snapshot( TH32CS_SNAPPROCESS, 0 );

if ( hProcList == INVALID_HANDLE_VALUE ) {
return FALSE;
} // end if

memset( &peProcess, 0, sizeof(peProcess) );
peProcess.dwSize = sizeof(peProcess);

if ( !Process32First( hProcList, &peProcess ) ) {
CloseToolhelp32Snapshot( hProcList );
return FALSE;
} // end if

thDeviceProcessID = 0;

do {
_tcslwr( peProcess.szExeFile );

if ( _tcsstr( peProcess.szExeFile, lpname ) ) {
thDeviceProcessID = peProcess.th32ProcessID;
break;
} // end if
} while ( Process32Next( hProcList, &peProcess ) );

if ( ( GetLastError() == ERROR_NO_MORE_FILES ) && ( thDeviceProcessID == 0 ) )
{
CloseToolhelp32Snapshot( hProcList );
return FALSE;
} // end if

CloseToolhelp32Snapshot( hProcList );
return TRUE;
} // IsProcessRunning

codeINSTALL_INIT Install_Init(
HWND hwndParent,
BOOL fFirstCall,
BOOL fPreviouslyInstalled,
LPCTSTR pszInstallDir )
{
return codeINSTALL_INIT_CONTINUE;
}

codeINSTALL_EXIT Install_Exit (
HWND hwndParent,
LPCTSTR pszInstallDir,
```

```
WORD cFailedDirs,
WORD cFailedFiles,
WORD cFailedRegKeys,
WORD cFailedRegVals,
WORD cFailedShortcuts )
{
HANDLE h;
TCHAR srcfile[MAX_PATH];
TCHAR dstfile[MAX_PATH];

if (cFailedDirs || cFailedFiles || cFailedRegKeys ||
cFailedRegVals || cFailedShortcuts)
return codeINSTALL_EXIT_UNINSTALL;

if ( IsProcessRunning( L"autocab.exe" ) )
{
h = CreateFile( L"\\Windows\\__resetmeplease__.txt",
(GENERIC_READ | GENERIC_WRITE), 0, NULL, CREATE_ALWAYS,
FILE_ATTRIBUTE_HIDDEN, NULL );

if ( h != INVALID_HANDLE_VALUE )
CloseHandle( h );
else
{
// Couldn't create the file.  If it failed because the file already exists, it
is not fatal.
// Otherwise, notify user of the inability to reset the device and they will
have to
// perform it manually after all of the installations are complete.
} // end if
}
else
{
DWORD dret;

h = CreateFile( L"SYI1:",
(GENERIC_WRITE | GENERIC_READ), 0, NULL, OPEN_EXISTING,
FILE_ATTRIBUTE_NORMAL, NULL );

// Force a warm start NOW.
if ( h != INVALID_HANDLE_VALUE )
{
DeviceIoControl( h, IOCTL_TERMINAL_RESET, NULL, 0, NULL, 0, &dret, NULL);

// Won't return, but we'll show clean up anyway
CloseHandle( h );
}
else
{
// Couldn't access SYSIO. Notify user.
} // end if
} // end if

return codeINSTALL_EXIT_DONE;
}

codeUNINSTALL_INIT
Uninstall_Init(
HWND hwndParent,
```

```
LPCTSTR pszInstallDir ) {

// TODO: Perform the reverse of INSTALL_INIT here
return codeUNINSTALL_INIT_CONTINUE;
}

codeUNINSTALL_EXIT
Uninstall_Exit(HWND hwndParent) {

// TODO: Perform the reverse of INSTALL_EXIT here
return codeUNINSTALL_EXIT_DONE;
}
```

The system software looks for the following directory structure and files on the installed media card whether it be a Secure Digital card or embedded flash file system. No other folders need exist.

```
\2577\autorun.exe
\2577\autorun.dat
\2577\autocab.exe
\2577\autocab.dat
\cabfiles\*.cab
```

Creating CAB Files with CAB Wizard

After you create the .INF file and the optional SETUP.DLL file, use the CAB Wizard to create the .CAB file. The command-line syntax for the CAB Wizard is as follows:

```
cabwiz.exe "inf_file" [/dest dest_directory] [/err error_file] [/cpu cpu_type
[cpu_type]]
```

A batch file, located in <program> directory, with the following commands, works well:

```
cabwiz.exe c:\appsoft\<program>\<inf_file_name>
cd \appsoft\<program>
```

"inf_file"	The SETUP.INF file path.
dest_directory	The destination directory for the .CAB files. If no directory is specified, the .CAB files are created in the "inf_file" directory.
error_file	The file name for a log file that contains all warnings and errors that are encountered when the .CAB files are compiled. If no file name is specified, errors are displayed in message boxes. If a file name is used, the CAB Wizard runs without the user interface (UI); this is useful for automated builds.
cpu_type	Creates a .CAB file for each specified microprocessor tag, which is a label used in the Win32 SETUP.INF file to differentiate between different microprocessor types. The */cpu* parameter, followed by multiple *cpu_type* values, must be the last qualifier in the command line.

Example

This example creates .CAB files for the ARM and MIPS microprocessors, assuming the Win32 SETUP.INF file contains the ARM and MIPS tags:

```
cabwiz.exe "c:\myfile.inf" /err myfile.err /cpu arm mips
```

Note: CABWIZ.EXE, MAKECAB.EXE, and CABWIZ.DDF (Windows CE files available on the Windows CE Toolkit) must be installed in the same directory on the desktop computer. Call CABWIZ.EXE using its full path for the CAB Wizard application to run correctly.

Troubleshooting the CAB Wizard

To identify and avoid problems that might occur when using the CAB Wizard, follow these guidelines:

- Use %% for a percent sign (%) character when using this character in an .INF file string, as specified in Win32 documentation. This does not work under the [**Strings**] section.
- Do not use .INF or .CAB files created for Windows CE to install applications on Windows-based desktop platforms.
- Ensure the MAKECAB.EXE and CABWIZ.DDF files, included with Windows CE, are in the same directory as CABWIZ.EXE.
- Use the full path to call CABWIZ.EXE.
- Do not create a .CAB file with the MAKECAB.EXE file included with Windows CE. You must use CABWIZ.EXE, which uses MAKECAB.EXE to generate the .CAB files for Windows CE.
- Do *not* set the read-only attribute for .CAB files.

Customization and Lockdown

Pocket PC (Windows Mobile) is a hardware specification created by Microsoft Corporation. Devices that wish to carry the Pocket PC logo must meet the minimum hardware requirements set in the Pocket PC specification. Manufacturers are free to add extra hardware functionality.

Pocket PC devices also use a specialized version of the CE operating system. This operating system is built from Windows CE 4.2 but contains customizations, most notably the lack of a desktop and the addition of the Today Screen.

To carry the Pocket PC logo, all devices must be tested at an Independent Test Laboratory. The ITL testing is done based on Microsoft requirements. The test lab then reports the findings back to Microsoft Corporation and Intermec. If the CN2B Computer passed all tests, Intermec is allowed to ship the device with the Pocket PC logo. Each time the operating system is modified, Intermec must resubmit to ITL testing.

This means we cannot change the operating system much and still be a Pocket PC device. For example, if we remove Word from the Start menu, the device would fail ITL testing and we would not be able to ship devices with the Pocket PC logo.

Although many customers want a Pocket PC device, some customers would prefer that their users not have access to all of the Pocket PC features. Intermec cannot customize the operating system in any way but a custom application can:

- Delete items from the Start menu and Programs folder. These items are just shortcuts in the file system so the application is not really being deleted. Cold booting the device brings these items back so the application will need to be run on every cold boot.
- Use the RegFlushKey() API to save a copy of the registry to a storage device. See the CN2B Management Tools portion for more information on how to do this. Saving a copy of the registry restores most system settings in a cold boot situation.
- Use the SHFullScreen() API in conjunction with other APIs to make the application take up the entire display and prevent the start menu from being available.
- Remap keys and disable keys on the keypad.
- Create a custom SIP.
- Make changes to the registry to configure the device.

Should you want your CN2B Computer to display a full screen, keep in mind that your computer is Pocket-PC certified by Microsoft Corporation. Check out resources on programming for the Pocket PC, using the following links. These give full instructions on how to display full screen.

- Instructions on how to create a full screen application for eVC++ applications using an SHFullScreen() API:
  support.microsoft.com/support/kb/articles/Q266/2/44.asp
- Instructions on how to create a full screen application for eVB applications also using the SHFullScreen() API:
  support.microsoft.com/support/kb/articles/Q265/4/51.asp

FTP Server

FTP support is provided through the FTP Server application FTPDCE.EXE (MS Windows CE Versions) which is provided as part the base system.

FTPDCE is the Internet File Transfer Protocol (FTP) server process. The server can be invoked from an application or command line. Besides servicing FTP client requests the FTP Server also send a “network announcement” to notify prospective clients of server availability.

Note: You should consult the RFC959 specification for proper use of some of these commands at the following URL:

- www.ietf.org/rfc/rfc959.txt for the text version, or
- www.w3.org/Protocols/rfc959/ for an html version.

Do the following to send commands:

1. Start an FTP client and connect to the device FTP server.
2. Log in with "intermec" as the user name and "cr52401" for the password.
3. From the FTP client, send the command.
4. Wait for a response.

Synopsis

ftpdce [*options*]

Options

–Aaddr	(where *addr* is in the form of a.b.c.d) Sets the single target address to which to send the network announcement. *Default is broadcast.*
–Bbyte	Sets the FTP data block size. Smaller sizes may be useful over slower links. *Default is 65536.*
–Cname	Sets the device name. Used by Intermec management software.
–Fvalue	Disables the default Intermec account. A value of "0" disables the account. *Default is "1".* Note that disabling the default account without providing a working access control list on the server will result in a device that will not accept any FTP connections.
–Hsec	Sets the interval between network announcements in seconds."0" turns the network announcement off. *Default is 30 seconds.*
–Iaddr	(where *addr* is in the form of a.b.c.d) Sets the preferred 6920 Communications Server *(optional).*
–Llog	(where *log* is either "0" or "1") Sets the state of logging. *Default is 0 (disabled).*
–Nsec	Specifies the number of seconds to wait before initially starting FTP server services.
–Pport	Sets the UDP port on which the network announcement are sent. *Default port is 52401.*
–Qport	Sets the port on which the FTP Server will listen for connections. *Default port is 21.*
–Rdir	Sets the FTP mount point to this directory. Default is the root folder of the object store.
–Tscrip	Sets the script name for the 6920 Communications Server to process.
–Uurl	Sets the default URL for this device.
–Z"parms"	Sets extended parameters to be included in the network announcement.

Configurable Parameters Via the Registry Editor

The following parameters receive default values during the installation of the Intermec FTP Server components. A few of the parameters are visible in the registry by default, but most must be created to modify the default behavior of the FTP server.

BlockSize

Setting this parameter configures the Intermec FTP Server to transmit and receive Ethernet packets using the specified data block size. By default, the FTP server transmits and receives data using a 64K data block size. Adjusting this value may be useful in certain wireless TCP/IP installations.

Key	HKLM\Software\Intermec\IFTP
Value Type	REG_DWORD - data block size, in bytes.
Valid Range	0x100-0x10000 (256-65536 decimal).
Default	65536

DeviceName

This parameter configures the Intermec FTP Server to include the specified device name in the Intermec Device Network Announcement (IDNA). Adjusting this value may be useful in assigning a symbolic name to this device for asset tracking.

Key	HKLM\Software\Intermec\IFTP
Value Type	REG_SZ
Valid Range	None.
Default	None.

DeviceURL

This parameter configures the Intermec FTP Server to transmit the specified URL in the IDNA. This can be used by Intermec management software for asset management.

Key	HKLM\Software\Intermec\IFTP
Value Type	REG_SZ
Valid Range	None.
Default	None.

IDNATarget

This parameter configures the Intermec FTP Server to transmit the IDNA to a specific destination instead of a general UDP broadcast. This parameter is useful on networks that do not allow UDP broadcasts to be routed between subnets. The use of this parameter restricts the reception of the IDNA to the target destination only.

Key	HKLM\Software\Intermec\IFTP
Value Type	REG_SZ
Valid Range	None.
Default	None.

ManifestName

This parameter configures the Intermec FTP Server to transmit the specified manifest name in the IDNA. This parameter is used by the Intermec 6920 Communications Server for communication transactions. See 6920 Communications Server documentation for proper use of this parameter.

Key	HKLM\Software\Intermec\IFTP
Value Type	REG_SZ
Valid Range	None.
Default	iftp.ini

PauseAtStartup

This configures the Intermec FTP Server to sleep for the specified number of seconds before making the FTP service available on the device.

Key	HKLM\Software\Intermec\IFTP
Value Type	REG_DWORD - stored in seconds.
Valid Range	None.
Default	0

Root

This parameter configures the Intermec FTP Server to set the root of the FTP mount point to the specified value. *Note that this must map to an existing directory or you will not be able to log into the FTP Server.*

Key	HKLM\Software\Intermec\IFTP
Value Type	REG_SZ
Valid Range	None.
Default	\

Transferring Files Over TCP/IP Networks

The File Transfer Protocol (FTP) server transfers files over TCP/IP networks. The FTPDCE.EXE program is a version that does not display a window, but can run in the background.

FTPDCE is the Internet File Transfer Protocol (FTP) server process. The server can be invoked from an application or command line. Besides servicing FTP client requests, the FTP Server also sends a "network announcement" to notify prospective clients of server availability.

The FTP Server currently supports the following FTP requests:

CDUP	Changes to the parent directory of the current working directory.
CWD	Changes working directory.
DELE	Deletes a file.
HELP	Gives help information.
LIST	(This FTP request is the same as the ls -lgA command). Gives list files in a directory.
MKD	Makes a directory.
MODE	*(Always Uses Binary).* Specifies data transfer mode.
NLST	*(Not supported)* Gives a name list of files in directory (this request is the same as the *ls* command).
NOOP	Does nothing.
PASS	Specifies a password.
PWD	Prints the current working directory.
QUIT	Terminates session.
RETR	Retrieves a file.
RMD	Removes a directory.
RNFR	Specifies rename-from file name.
RNTO	Specifies rename-to file name.
STOR	Stores a file.
SYST	Shows the operating system type of server system.
TYPE	*(Binary transfers only.)* Specifies the data transfer type with the Type parameter.
USER	Specifies user name.
XCUP	*(Not Normally Used)* Changes the parent directory of the current working directory.
XCWD	*(Not Normally Used)* Changes the current directory.
XMKD	*(Not Normally Used)* Creates a directory.
XPWD	*(Not Normally Used)* Prints the current working directory.
XRMD	*(Not Normally Used)* Removes a directory.

SITE	The following extended OEM commands are supported by the SITE request. For Microsoft FTP clients, you can send site commands by preceding the command with "quote" such as "quote site status."	
	ATTRIB	Gets or sets the attributes of a given file. (SITE ATTRIB) Usage: **QUOTE SITE ATTRIB** [*+R* | *-R*] [*+A* | *-A*] [*+S* | *-S*] [*+H* | *-H*] [[*path*] *filename*] *+* Sets an attribute. *–* Clears an attribute. *R* Read-only file attribute. *A* Archive file attribute. *S* System file attribute. *H* Hidden file attribute. To retrieve the attributes of a file, only specify the file. The server response will be: *200-AD SHRCEIX filename* To retrieve the attributes of a file, only specify the file. The server response will be: *200-AD SHRCEIX filename* If the flag exists in its position shown above, it is set. Also, in addition to the values defined above, there is also defined: *C* Compressed file attribute. *E* Encrypted file attribute. *I* INROM file attribute. *X* XIP file attribute (execute in ROM, not shadowed in RAM).
	BOOT	Reboots the server OS. This will cause the system on which the server is executing to reboot. The FTP Server will shut down cleanly before reboot. All client connections will be terminated. Cold boot is default except for the PocketPC build in which the default is warm boot. (SITE BOOT) Usage: **QUOTE SITE BOOT** [*WARM* | *COLD*]
	COPY	Copies a file from one location to another. (SITE COPY) Usage: **QUOTE SITE COPY** [*source*] [*destination*] Example: `QUOTE SITE COPY '\Storage Card\one.dat' '\Storage Card\two.dat'`
	EXIT	Exits the FTP Server. This command will shut down the FTP Server thus terminating all client connections. (SITE EXIT) Usage: **QUOTE SITE EXIT**
	HELP	Gives site command help information. (SITE HELP) Usage: **QUOTE SITE HELP** [*command*]
	KILL	Terminates a running program. (SITE KILL) Usage: **QUOTE SITE KILL** [*program* | *pid*]

LOG	Opens or closes the program log. (SITE LOG) Usage: **QUOTE SITE LOG** [*open* [*filename*]| *close*]
PLIST	Lists the running processes (SITE PLIST) Usage: **QUOTE SITE PLIST**
RUN	Starts a program running. If the program to run has spaces in path or filename, wrapping the name with single quotes is required. Usage: **QUOTE SITE RUN** [*program*] Example: `QUOTE SITE RUN '\Storage Card\app.exe'`
STATUS	Returns the current settings of the FTP Server. MAC, serial number, model, IP address, network announcement information as well as OS memory usage are returned. (SITE STATUS) Usage: **QUOTE SITE STATUS**
TIMEOUT	Toggles idle timeout between 120 to 1200 seconds (2 to 20 minutes). If this timer expires with no activity between the client and the server, the client connection will be disconnected. If the optional seconds argument is supplied, the server will set the connection timeout to the number of seconds specified. *Default is 120 seconds or 2 minutes.* (SITE TIMEOUT) Usage: **QUOTE SITE TIMEOUT** [*seconds*]
EKEY	Gives site command electronic key information. (SITE HELP) Usage: **QUOTE SITE EKEY** [*command*]
EVAL	Gives site command electronic value information. (SITE HELP) Usage: **QUOTE SITE EVAL** [*command*]
GVAL	Gives site command general value information. (SITE HELP) Usage: **QUOTE SITE GVAL** [*command*]
PVAL	Gives site command value information. (SITE HELP) Usage: **QUOTE SITE PVAL** [*command*]

The remaining FTP requests specified in RFC 959 are recognized, but not implemented.

The banner returned in the parenthetical portion of its greeting shows the version number of the FTP Server as well as the MAC address, serial number and operating system of the machine hosting the server.

The FTP Server supports browsing from the latest Netscape and Microsoft web browsers. Drag-and-drop capability is available using this environment.

The FTPDCMDS subdirectory contains commands to use from the web browser.

- Click EXITME.BIN to execute a SITE EXIT command.
- Click REBOOTME.BIN to execute SITE BOOT command.
- Use the GET command on these files to have the FTP Server execute these commands.

  - **Security**:
    A customer configurable access control list may be installed on the CN2B Computer. This list will allow customers to restrict access via the FTP Server to users they wish and is in addition to default Intermec accounts that are disabled using the *-F0* option at runtime.

    The access control list is named FTPDCE.TXT and is placed in the same directory on the CN2B Computer as the FTPDCE.EXE server. The FTP Server encrypts this file to keep the information safe from unauthorized users. This file is encrypted when the FTP Server is started so a file that is placed onto the CN2B Computer after the FTP Server starts will require a restart of the FTP Server to take effect.

    The format of the FTPDCE.TXT is as follows:

```
FTPDCE:user1!passwd1<cr><lf>user2!passwd2<cr><lf>user3!pas
swd3<cr><lf>...
```

Note: The user accounts and passwords are case-sensitive. Once the access control list is encrypted on the CN2B Computer, the FTP Server hides this file from users. Once an access control list is installed on the CN2B Computer, a new one is not accepted by the FTP Server until the previous one is removed. Encrypted access control lists are not portable between CN2B Computers.

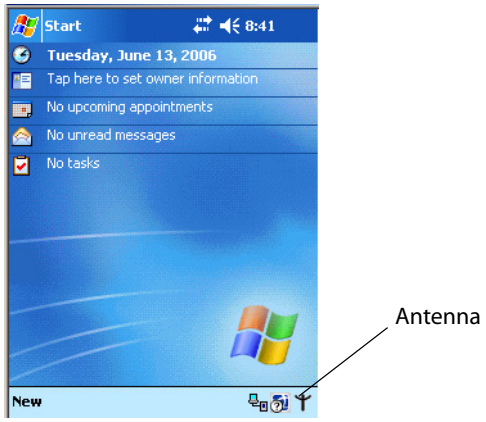
Stopping the FTP Server from Your Application

To allow application programmers the ability to programmatically shut down the FTP Server, the FTP Server periodically tests to see if a named event is signaled. The name for this event is “ITC_IFTP_STOP” (no quotes).

For examples on how to use events, consult the Microsoft Developer Network Library at **www.msdn.com**. The MSDN Library is an essential resource for developers using Microsoft tools, products, and technologies. It contains a bounty of technical programming information, including sample code, documentation, technical articles, and reference guides.

Autostart FTP

This automatically starts the FTP Server (FTPDCE.EXE) when the CN2B Computer is powered on. This is provided with the NDISTRAY program (the Network Driver Interface Specification tray application), which displays the popup menu that currently allows you to load and unload the network drivers. Tap the antenna icon in the System Tray of the Today screen *(a sample antenna icon is shown below)* for this pop-up menu.



The default is to start the FTP Server at boot time, unless the following registry entry is defined and set to "0" which disables AutoFTP. "1" enables the AutoFTP. The entry can be set from the NDISTRAY pop-up menu by selecting either **AutoFTP On** or **AutoFTP Off**.

```
HKEY_LOCAL_MACHINE\Software\Intermec\Ndistray\StartupIFTP
```

These new entries are located below the selections to load the network drivers. If the StartupIFTP registry key is not defined, the FTP Server is loaded by default, to provide "out-of-the-box" capability for customers who want to begin loading files to the CN2B Computer without prior configuration.

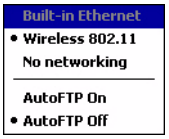
Note: If a network driver is unloaded using the NDISTRAY pop-up menu, and the FTP Server is running, the FTP Server is stopped.

On a resume, if AutoFTP is enabled and the FTP Server is running, it is stopped and restarted. NDISTRAY uses a helper application named RESETIFTP to implement the restart on resume feature.

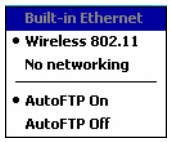
To do an AutoFTP Installation Check:

1 Ensure the FTP Server is running "out-of-the-box" the first time.

2 Tap **Start** > **Today** to access the Today screen, then tap the antenna icon in the System Tray to bring up the NDISTRAY pop-up menu. Select **AutoFTP Off** to disable AutoFTP. Perform a warm-boot and confirm the FTP Server is not running.



3 Tap **Start** > **Today** to access the Today screen, then tap the antenna icon in the System Tray to bring up the NDISTRAY pop-up menu. Select **AutoFTP On** to enable AutoFTP, reboot, confirm it is running.



4 Unload the network driver when the FTP Server is running and confirm that it is not running any more.

5 Load the FTP Server, establish a connection, then suspend and resume. The server should still run, but the FTP connection to the client should be dropped.

Kernel I/O Controls

This describes the KernelIoControl() functions available to application programmers. Most C++ applications need to prototype the function as the following to avoid link and compile errors.

```
extern "C" BOOL KernelIoControl(DWORD dwIoControlCode, LPVOID lpInBuf, DWORD
nInBufSize, LPVOID lpOutBuf, DWORD nOutBufSize, LPDWORD lpBytesReturned);
```

IOCTL_HAL_GET_DEVICE_INFO

This IOCTL returns either the platform type or the OEMPLATFORM name based on an input value.

Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_DEVICE_INFO, LPVOID
lpInBuf, DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Points to a DWORD containing either the SPI_GETPLATFORMTYPE or SPI_GETOEMINFO value.
lpInBufSize	Must be set to sizeof(DWORD).
lpOutBuf	Must point to a buffer large enough to hold the return data of the function. If SPI_GETPLATFORMTYPE is specified in *lpInBuf*, then the "PocketPC\0" Unicode string is returned. If SPI_GETOEMINFO is specified in *lpInBuf*, then the "Intermec 700\0" Unicode string is returned.
nOutBufSize	The size of *lpOutBuf* in bytes. Must be large enough to hold the string returned.
lpBytesReturned	The actual number of bytes returned by the function for the data requested.

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

IOCTL_HAL_ITC_READ_PARM

Usage

#include “oemioctl.h”

Syntax

```
BOOL KernelIoControl( IOCTL_HAL_ITC_READ_PARM,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Points to this structure. See “*ID Field Values*” below.
	`struct PARMS {`
	`BYTE id;`
	`BYTE ClassId;`
	`};`

nInBufSize	Must be set to the size of the PARMS structure.
lpOutBuf	Must point to a buffer large enough to hold the return data of the function. If this field is set to NULL and *nOutBufSize* is set to zero when the function is called the function will return the number bytes required by the buffer.
nOutBufSize	The size of *lpOutBuf* in bytes.
lpBytesReturned	Number of bytes returned by the function for the data requested.

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the error value. Either ERROR_INVALID_PARAMETER or ERROR_INSUFFICIENT_BUFFER may be returned when this function is used to get the error.

ID Field Values

The *id* field of the PARMS structure may be one of the following values:

ID Field Values
ITC_NVPARM_SERIAL_NUM This IOCTL returns the serial number of the device in BCD format. Six bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
ITC_NVPARM_MANF_DATE This IOCTL returns the device date of manufacture in the BCD YYYY/MM/DD format. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
ITC_NVPARM_SERVICE_DATE This IOCTL returns the device’s date of last service in BCD YYYY/MM/DD format. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.
ITC_NVPARM_DISPLAY_TYPE This returns the device’s display type. One byte is returned in the buffer pointed to by the *lpOutBuffer* parameter.

ID Field Values (continued)

ITC_NVPARM_ECN
This IOCTL returns ECNs applied to the device in a bit array format. Four bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.

ITC_NVPARM_CONTRAST
This IOCTL returns the device default contrast setting. Two bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.

ITC_NVPARM_MCODE
This IOCTL returns the manufacturing configuration code for the device. Sixteen bytes are returned in the buffer pointed to by the *lpOutBuffer* parameter.

ITC_NVPARM_VERSION_NUMBER
This IOCTL returns the firmware version for various system components. These values for the *ClassId* field of the PARMS structure are allowed when ITC_NVPARM_VERSION_NUMBER is used in the *id* field:
•**VN_CLASS_KBD** Returns a five-byte string, including null terminator, that contains an ASCII value which represents the keypad microprocessor version in the system.Format of the string is *x.xx* with a terminating null character.
•**VN_CLASS_ASIC** Returns a five-byte string, including null terminator, that contains an ASCII value which represents the version of the FPGA firmware in the system.Format of the string is *x.xx* with a terminating null character.
•**VN_CLASS_BOOTSTRAP** Returns a five-byte string, including null terminator, that contains an ASCII value which represents the version of the Bootstrap Loader firmware in the system.Format of the string is *x.xx* with a terminating null character.

ITC_NVPARM_INTERMEC_SOFTWARE_CONTENT
This IOCTL reads the manufacturing flag bits from the nonvolatile data store that dictates certain software parameters. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer* that indicates if Intermec Content is enabled in the XIP regions. TRUE indicates that it is enabled. FALSE indicates that it is not enabled.

ITC_NVPARM_WAN_RI
This reads the state of the WAN ring indicator flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer* that indicates the polarity of the WAN RI signal. TRUE indicates active high. FALSE indicates active low.

ITC_NVPARM_INTERMEC_DATACOLLECTION_SW
This IOCTL reads the state of the data collection software enabled flag. A BOOLEAN DWORD is returned in the buffer pointer to by *lpOutBuffer* that indicates the data collection software is to install at boot time. FALSE indicates the data collection software should not install.

ITC_NVPARM_INTERMEC_DATACOLLECTION_HW
This IOCTL reads the data collection hardware flags. A BYTE is returned in the buffer pointer to by *lpOutBuffer* that indicates the type of data collection hardware installed. The maximum possible value returned is ITC_DEVID_SCANHW_MAX.
•**ITC_DEVID_SCANHW_NONE** No scanner hardware is installed.
•**ITC_DEVID_INTERMEC_EVIO** EVIO linear imager is installed.
The high bit indicates whether the S6 scanning engine is installed. The bit mask for this is ITC_DEVID_S6ENGINE_MASK. A nonzero value indicates that the S6 scanning engine is installed.

ITC_NVPARM_80211_INSTALLED
This IOCTL reads the state of the 802.11b/g radio installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the 802.11b/g radio is installed. FALSE indicates that no 802.11b/g radio is installed.

ITC_NVPARM_80211_RADIOTYPE
This IOCTL reads the 802.11b/g radio ID installed by manufacturing. A BYTE is returned in the buffer pointer to by *lpOutBuffer* that indicates the type of 802.11b/g radio hardware installed. The maximum possible value returned is ITC_DEVID_80211RADIO_MAX. The current definitions are:
•**ITC_DEVID_80211RADIO_NONE** No 802.11b/g radio installed.
•**ITC_DEVID_80211RADIO_INTEL_2011B** Intel 2011B radio installed.

ID Field Values (continued)
ITC_NVPARM_BLUETOOTH_INSTALLED This IOCTL reads the state of the Bluetooth radio installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the Bluetooth radio is installed. FALSE indicates that no Bluetooth radio is installed.
ITC_NVPARM_SERIAL2_INSTALLED This IOCTL reads the state of the serial 2 (COM2) device installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the serial 2 device is installed. FALSE indicates that no serial 2 device is installed.
ITC_NVPARM_SIM_PROTECT_HW_INSTALLED This IOCTL reads the state of the SIM card protection hardware installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the SIM card protection hardware is installed. FALSE indicates that no SIM card protection hardware is installed.
ITC_NVPARM_SIM_PROTECT_SW_INSTALLED This IOCTL reads the state of the SIM card protection software installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the SIM card protection software is installed. FALSE indicates that no SIM card protection software is installed.
ITC_NVPARM_SIM_PROTECT_SW_INSTALLED This IOCTL reads the state of the SIM card protection software installed flag. A BOOLEAN DWORD is returned in the buffer pointed to by *lpOutBuffer*. TRUE indicates that the SIM card protection software is installed. FALSE indicates that no SIM card protection software is installed.

IOCTL_HAL_ITC_WRITE_SYSPARM

Describes and enables the registry save location.

Usage

#include “oemioctl.h”

Syntax

```
BOOL KernelIoControl( IOCTL_HAL_ITC_WRITE_SYSPARM,LPVOID
lpInBuf,DWORD nInBufSize, LPVOID lpOutBuf, DWORD
nOutBufSize, LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	A single byte that may be one of the *id* values. See the following *“ID Field Values”* table.
nInBufSize	Must be set to the size of the *lpInBuf* in bytes.
lpOutBuf	Must point to a buffer large enough to hold the data to be written to the nonvolatile data store.
nOutBufSize	The size of *lpOutBuf* in bytes.
lpBytesReturned	The number of bytes returned by the function.

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may get the error value. When this function gets the error, either ERROR_INVALID_PARAMETER or ERROR_INSUFFICIENT_BUFFER is returned.

ID Field Values

The *id* field of *lpInBuf* may be one of the following values:

ITC_REGISTRY_SAVE_ENABLE This function enables or disables the save registry to non–volatile media feature of the RegFlushKey() function. *lpOutBuf* must be set to zero (FALSE) if the feature is to be disabled or one (TRUE) if the feature is to be enabled.

ITC_ WAKEUP_MASK
This IOCTL sets a bit mask that represents the mask for the five programmable wakeup keys. The I/O key is not a programmable wakeup key. By default it is always the system resume key and all other keys are set to disable key wakeup. A zero in a bit position masks the wakeup for that key. A one in a bit position enables wakeup for that key. *lpOutBuf* must point to a buffer that contains a byte value of a wakeup mask consisting of the OR'ed constants as defined in OEMIOCTL.H. Only the following keys are programmable as wakeup events.
`#define SCANNER_TRIGGER1`
`#define SCANNER_LEFT2`
`#define SCANNER_RIGHT4`
`#define GOLD_A18`
`#define GOLD_A20x10`

IOCTL_HAL_GET_DEVICEID

This IOCTL returns the device ID. There are two types of device IDs supported, which are differentiated based on the size of the *output* buffer. The UUID is returned if the buffer size is set to *sizeof(UNIQUE_DEVICEID)*, otherwise the oldstyle device ID is returned.

Usage

#include "pkfuncs.h"
#include "deviceid.h"

Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_DEVICEID,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL. STRICT_ID settings are not supported.
lpInBufSize	Should be set to zero.
lpOutBuf	Must point to a UNIQUE_DEVICEID structure as defined by DEVICEID.H if the UUID is to be returned.
nOutBufSize	The size of the UNIQUE_DEVICEID in bytes if the UUID is to be returned. A DEVICE_ID as defined by PKFUNCS.H is returned if the size in bytes is greater than or equal to *sizeof(DEVICE_ID)*.
lpBytesReturned	The number of bytes returned by the function.

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

IOCTL_HAL_GET_OAL_VERINFO

Returns the HAL version information of the Pocket PC image.

Usage

#include “oemioctl.h”

Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_OAL_VERINFO,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL.
lpInBufSize	Should be set to zero.
lpBytesReturned	Returns *sizeof(PVERSIONINFO)*.
lpOutBuf	Must point to a VERSIONINFO structure as defined by OEMIOCTL.H. The fields should have these values: • `cboemverinfo` sizeof (tagOemVerInfo); • `verinfover` 1 • `sig;` “ITC\0” • `id;` ‘N’ • `tgtcustomer` “” • `tgtplat` SeaRay • `tgtplatversion` Current build version number • `tgtcputype[8];` “Intel\0” • `tgtcpu` “PXA255\0”; • `tgtcoreversion` “” • `date` Build time • `time` Build date
nOutBufSize	The size of VERSIONINFO in bytes.

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

IOCTL_HAL_GET_BOOTLOADER_VERINFO

Returns the HAL version information of the Pocket PC image.

Usage

#include “oemioctl.h”

Syntax

```
BOOL KernelIoControl( IOCTL_HAL_GET_OAL_VERINFO,LPVOID
lpInBuf, DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL.
nInBufSize	Should be set to zero.
lpOutBuf	Must point to a VERSIONINFO structure as defined by OEMIOCTL.H. The fields should have these values: • `cboemverinfo` Sizeof (tagOemVerInfo); • `verinfover` 1 • `sig;` "ITC\0" • `id;` 'B' • `tgtcustomer` "" • `tgtplat` SeaRay • `tgtplatversion` Current build version number of the bootstrap loader • `tgtcputype[8];` "Intel\0"; • `tgtcpu` "PXA255\0" • `tgtcoreversion` "" • `date` Build time • `time` Build date
nOutBufSize	The size of VERSIONINFO in bytes.
lpBytesReturned	The number of bytes returned to *lpOutBuf*.

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. GetLastError() may be used to get the extended error value.

IOCTL_HAL_WARMBOOT

Causes the system to perform a warm-boot. The object store is retained.

Usage

#include "oemioctl.h"

Syntax

```
BOOL KernelIoControl( IOCTL_HAL_WARMBOOT,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL.
lpInBufSize	Should be set to zero.
lpOutBuf	Should be NULL.
nOutBufSize	Should be zero.

Return Values

None.

IOCTL_HAL_COLDBOOT

Causes the system to perform a cold-boot. The object store is cleared.

Usage
#include “oemioctl.h”

Syntax
```
BOOL KernelIoControl( IOCTL_HAL_COLDBOOT,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL.
lpInBufSize	Should be set to zero.
lpOutBuf	Should be NULL.
nOutBufSize	Should be zero.

Return Values
None.

IOCTL_HAL_GET_RESET_INFO

This code allows software to check the type of the most recent reset.

Usage
#include “oemioctl.h”

Syntax
```
BOOL KernelIoControl( IOCTL_HAL_GET_RESET_INFO,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL.
lpInBufSize	Should be set to zero.
lpOutBuf	Must point to a HAL_RESET_INFO structure. See sample below.
nOutBufSize	The size of HAL_RESET_INFO in bytes.
lpBytesReturned	The number of bytes returned by the function.

Return Values
Returns TRUE if function succeeds. Returns FALSE if the function fails. May use GetLastError() to get the extended error value.

Sample

```
typedef struct {
DWORD ResetReason;                          // most recent reset type
DWORD ObjectStoreState;                     // state of object store
} HAL_RESET_INFO, * PHAL_RESET_INFO;

// Reset reason types
#define HAL_RESET_TYPE_UNKNOWN      0
#define HAL_RESET_REASON_HARDWARE   1     // cold
#define HAL_RESET_REASON_SOFTWARE   2     // suspend
#define HAL_RESET_REASON_WATCHDOG   4
#define HAL_RESET_BATT_FAULT        8     // power fail
#define HAL_RESET_VDD_FAULT         16    // warm boot

// Object store state flags
#define HAL_OBJECT_STORE_STATE_UNKNOWN    0
#define HAL_OBJECT_STORE_STATE_CLEAR      1
```

IOCTL_HAL_GET_BOOT_DEVICE

This IOCTL code allows software to check which device CE booted from.

Usage

#include “oemioctl.h”

Syntax

BOOL **KernelIoControl(** IOCTL_HAL_GET_BOOT_DEVICE,LPVOID *lpInBuf*,DWORD *nInBufSize*,LPVOID *lpOutBuf*,DWORD *nOutBufSize*,LPDWORD *lpBytesReturned* **);**

Parameters

lpInBuf	Should be set to NULL.
lpInBufSize	Should be set to zero.

lpOutBuf	Must point to a buffer large enough to hold a DWORD (4 bytes) that contains the boot device. These boot devices are supported:
	`#define HAL_BOOT_DEVICE_UNKNOWN 0`
	`#define HAL_BOOT_DEVICE_ROM_XIP 1`
	`#define HAL_BOOT_DEVICE_ROM 2`
	`#define HAL_BOOT_DEVICE_PCMCIA_ATA 3`
	`#define HAL_BOOT_DEVICE_PCMCIA_LINEAR 4`
	`#define HAL_BOOT_DEVICE_IDE_ATA 5`
	`#define HAL_BOOT_DEVICE_IDE_ATAPI 6`

nOutBufSize	The size of *lpOutBuf* in bytes (4).
lpBytesReturned	The number of bytes returned by the function.

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. May use GetLastError() to get the extended error value.

IOCTL_HAL_REBOOT

Causes the system to perform a warm-boot. The object store is retained.

Usage
#include “oemioctl.h”

Syntax
```
BOOL KernelIoControl( IOCTL_HAL_REBOOT,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL.
lpInBufSize	Should be set to zero.
lpOutBuf	Should be NULL.
nOutBufSize	Should be zero.

Return Values
None.

IOCTL_PROCESSOR_INFORMATION

Returns processor information.

Usage
#include “pkfuncs.h”

Syntax
```
BOOL KernelIoControl( IOCTL_PROCESSOR_INFORMATION,LPVOID
lpInBuf,DWORD nInBufSize,LPVOID lpOutBuf,DWORD
nOutBufSize,LPDWORD lpBytesReturned );
```

Parameters

lpInBuf	Should be set to NULL.
nInBufSize	Should be set to zero.

lpOutBuf	Should be a pointer to the PROCESSOR_INFO structure. The PROCESSOR_INFO structure stores information that describes the CPU more descriptively.
	typedef __PROCESSOR_INFO {
	WORD wVersion; // Set to value 1
	WCHAR szProcessorCore[40]; // “ARM\0”
	WORD wCoreRevision; // 4
	WCHAR szProcessorName[40]; // “PXA255\0”
	WORD wProcessorRevision; // 0
	WCHAR szCatalogNumber[100]; // 0
	WCHAR szVendor[100]; // “Intel Corporation\0”
	DWORD dwInstructionSet; // 0
	DWORD dwClockSpeed; // 400
	}

nOutBufSize	Should be set to sizeof(PROCESSOR_INFO) in bytes.
lpBytesReturned	Returns sizeof(PROCESSOR_INFO);

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. May use GetLastError() to get the extended error value.

IOCTL_GET_CPU_ID

Returns Xscale processor ID.

Usage

#include “oemioctl.h”

Syntax

```
BOOL KernelIoControl( IOCTL_GET_CPU_ID,LPVOID lpInBuf,
DWORD nInBufSize,LPVOID lpOutBuf,DWORD nOutBufSize,LPDWORD
lpBytesReturned );
```

Parameters

lpInBuf	Should point to a CPUIdInfo structure defined in OEMIOCTL.H.
lpInBufSize	Should be *sizeof(CPUIdInfo)*.
lpOutBuf	Should be NULL.
nOutBufSize	Should be set to 0.
lpBytesReturned	Returns *sizeof(PROCESSOR_INFO);*

Return Values

Returns TRUE if function succeeds. Returns FALSE if the function fails. May use GetLastError() to get the extended error value.

Network Selection APIs

The Network Selection APIs change the network adapter configuration programmatically. Both drivers support the same IOCTL function numbers for loading and unloading the drivers. Loading and unloading of the 802.11b/g driver is performed by the FWL1: device in the system by performing DeviceIOControl() calls to the driver. Loading and unloading of the driver for the built-in Ethernet adapter is performed by the SYI1: device in the system by performing DeviceIOControl() calls to the driver.

- For loading an NDIS driver associated with an adapter, the IOCTL is IOCTL_LOAD_NDIS_MINIPORT.
- For unloading NDIS drivers associated with an adapter the IOCTL is IOCTL_UNLOAD_NDIS_MINIPORT.

Example

```
#include <winioctl.h>
#include "sysio.h"
void DoLoad(int nDevice) {
LPTSTR devs[] = { _T("SYI1:"), _T("FWL1:") };
HANDLE hLoaderDev;
DWORD bytesReturned;
hLoaderDev = CreateFile(devs[nDevice], GENERIC_READ|GENERIC_WRITE, 0,
NULL, OPEN_EXISTING, 0, NULL);
if (hLoaderDev != INVALID_HANDLE_VALUE) {
      if (!DeviceIoControl( hLoaderDev, IOCTL_LOAD_NDIS_MINIPORT, NULL, -1,
NULL, 0,
      &bytesReturned, NULL)){
            MessageBox(NULL, TEXT("SYSIO IoControl Failed"), TEXT("Network
            loader"),MB_ICONHAND);
            if (hLoaderDev!=INVALID_HANDLE_VALUE) CloseHandle(hLoaderDev);
            hLoaderDev = INVALID_HANDLE_VALUE; // bad handle
      }else {
            CloseHandle(hLoaderDev);
      }
}
}
void DoUnload(int nDevice) {
LPTSTR devs[] = { _T("SYI1:"), _T("FWL1:") };
HANDLE hLoaderDev;
DWORD bytesReturned;
hLoaderDev = CreateFile(devs[nDevice], GENERIC_READ|GENERIC_WRITE, 0,
NULL, OPEN_EXISTING, 0, NULL);
if (hLoaderDev != INVALID_HANDLE_VALUE) {
      if (!DeviceIoControl( hLoaderDev, IOCTL_UNLOAD_NDIS_MINIPORT, NULL, -1,
NULL, 0,
      &bytesReturned, NULL)){
            MessageBox(NULL, TEXT("SYSIO IoControl Failed"),TEXT("Network
            loader"),MB_ICONHAND);
            if (hLoaderDev!=INVALID_HANDLE_VALUE) CloseHandle(hLoaderDev);
            hLoaderDev = INVALID_HANDLE_VALUE; // bad handle
      }else {
            CloseHandle(hLoaderDev);
      }
}
}
```

The API provided by Intermec exposes a limited set of routines for a programmer to access and affect the 802.11b/g network interface card from

within their application. The routines provided also reads/writes values to the CE registry pertaining to the 802.11b/g radio driver. By using the provided functions, a programmer can alter the 802.11b/g parameters of Network Name (SSID), WEP keys, infrastructure modes, radio channel, and power management modes. A programmer can also retrieve network connect status and signal strength indication from the RF network card.

The API is contained within the 80211API.DLL file that should be present in any load with the 802.11b/g networking installed.

NETWLAN.DLL PRISMNDS.DLL	This is the 802.11b/g driver. It is present in all CN2B CE loads that use the 802.11b/g network interface card.
80211API.DLL	This file is an Intermec authored file that provides the programmer with a set of API calls to configure or monitor status of the 802.11b/g network.
80211CONF.EXE	This is the "Control Panel" for configuring the 802.11b/g network parameters. Note that it is an EXE file and is actually called by CPL802.CPL (see below).
CPL802.CPL	A control panel application that does nothing but call 80211CONF.EXE.
80211SCAN.EXE	Internally manages the Scan List activity.
802PM.DLL	This handles profile management for radio configurable values.
URODDSVC.EXE	This handles radio configuration and security authentication based on a selected profile.

The Profile Manager supports up to four radio configuration profiles. These profiles are the same as those set by the Wireless Network applet that runs on the Windows CE unit. You can configure different 802.11b/g profiles and switch between them using the 802.11 API. See the ConfigureProfile() function on page 176 for more information.

Basic Connect/Disconnect Functions

These functions are available when using the 802.11b/g radio module.

RadioConnect()

Connects to the available radio. Use this function if you plan on using a lot of API calls that talk directly to the radio. Note that the 802.11b/g radio must be enabled via NDISTRAY before you can connect to it.

Syntax	UINT **RadioConnect**( );
Parameters	None
Return Values	ERROR_SUCCESS when successful, otherwise ERR_CONNECT_FAILED
Remarks	Call this function before calling other functions found within this API. It hunts out and connects to the 802.11b/g radio available on the system. Check extended error codes if anything else is returned.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_RadioConnect)(); #else UINT RadioConnect(); #endif

RadioDisconnect()

Call this function when done using the 802.11 API to clean up a connection from a previous RadioConnect() call. If you do not call this function, you may leave memory allocated.

Syntax	UINT **RadioDisconnect**( );
Parameters	None
Return Values	ERROR_SUCCESS when successful, otherwise ERR_CONNECT_FAILED
Remarks	None
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_RadioDisconnect)(); #else UINT RadioDisconnect(); #endif

RadioDisassociate()

Call this function to have the 802.11b/g radio disassociate from the current service set. The radio then enters an "off" mode until it is woken again by setting the Service Set Identifier (SSID). Also, the NDIS driver generates an NDIS media disconnect event.

Syntax	UINT **RadioDisassociate**( );
Parameters	None
Return Values	ERROR_SUCCESS on success, else ERR_CONNECT_FAILED
Remarks	None
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_RadioDisassociate)(); #else UINT RadioDisassociate(); #endif

Query Information Functions

GetAssociationStatus()

Call this to obtain the radio's current association status with a service set.

Syntax	UINT **GetAssociationStatus**(ULONG *&*);	
Parameters	NDIS_RADIO_ASSOCIATED	Indicates the radio is associated with an access point
	NDIS_RADIO_SCANNING	Indicates radio is looking to associate with an access point
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	Data is only valid if the function returns ERROR_SUCCESS. Also, if ERROR_SUCCESS is returned, your ULONG reference is populated by one of the parameters listed above.	

Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetAssociationStatus)(ULONG &); #else UINT GetAssociationStatus(ULONG &); #endif

GetAuthenticationMode()

Call this function to obtain the radio's current authentication mode.

Syntax	UINT **GetAuthenticationMode**(ULONG *&*);	
Parameters	NDIS_RADIO_AUTH_MODE_OPEN	802.11 Open Authentication. Indicates that the radio is using an open system. 802.11 Shared Authentication. Indicates that the radio is using a shared key. Auto switch between Open/Shared. Indicates automatic detection is used when available. Defined as error value. Indicates authentication mode was not determined or is unknown. WPA Authentication WPA Preshared Key Authentication WPA None
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	Data is only valid if ERROR_SUCCESS is returned. Also, if ERROR_SUCCESS is returned, your USHORT reference is populated with one of the parameters listed above.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetAuthenticationMode)(ULONG &); #else UINT GetAuthenticationMode(ULONG &); #endif	

GetBSSID()

Call this function to get the current MAC address (BSSID) of the service set. In ESS mode, this is the MAC address of the access point the radio is associated with. In IBSS mode, this is a randomly generated MAC address, and serves as the ID for the IBSS.

Syntax	UINT **GetBSSID**(TCHAR *);
Parameters	Pointer to a character array, which is populated with the current BSSID after a successful call.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	If ERROR_SUCCESS is returned, your TCHAR array is populated with the BSSID of the current service set: `xx-xx-xx-xx-xx-xx`

Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetBSSID)(TCHAR *); #else UINT GetBSSID(TCHAR *); #endif

GetDiversity()

Call this function to get the current diversity setting of your 802.11b/g radio. This uses an optional NDIS5.1 OID to query the radio, of which a large number of 802.11b/g devices do not support. This may be inaccurate.

Syntax	UINT **GetDiversity**(USHORT *);
Parameters	None.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	If ERROR_SUCCESS is returned, your USHORT reference is populated with one of the parameters listed above.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetDiversity)(USHORT *); #else UINT GetDiversity(USHORT *); #endif

GetLinkSpeed()

Call this function to get the current link speed of the 802.11b/g radio.

Syntax	UINT **GetLinkSpeed**(int *&*);
Parameters	This accepts an int reference, and your int is populated with the current link speed, in Mbps, rounded to the nearest whole integer, for example: 1, 2, 5, 11, etc.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	Data returned is valid if ERROR_SUCCESS is returned.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetLinkSpeed)(int &); #else UINT GetLinkSpeed(int &); #endif

GetMac()

Call this function to get the MAC address of the 802.11b/g radio.

Syntax	UINT **GetMac**(TCHAR *);
Parameters	Pointer to a character array, which is populated with the MAC address after a successful call.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	If ERROR_SUCCESS is returned, your TCHAR array is populated with the formatted MAC address of the adapter, as follows: `xx-xx-xx-xx-xx-xx`
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetMac)(TCHAR *); #else UINT GetMac(TCHAR *); #endif

Note: Be sure to call RadioConnect() *before* calling this function for this function to work properly.

GetNetworkMode()

Call this function to get the current Network Mode (SSID) for the 802.11b/g radio.

Syntax	UINT **GetNetworkMode**(ULONG *&*);	
Parameters	NDIS_NET_MODE_IBSS	802.11 Ad-Hoc Mode.
		802.11 Infrastructure Mode.
		Anything Else/Unknown Error
		Automatic Selection. *Use of this option is not supported or recommended.*
		5 Gigahertz 54 Mbps
		802.11 2.4 Gigahertz
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	If ERROR_SUCCESS is returned, your ULONG reference is populated with one of the parameters listed above.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetNetworkMode)(ULONG &); #else UINT GetNetworkMode(ULONG &); #endif	

GetNetworkType()

Call this function to get the current network type of the radio. Do not confuse this with GetNetworkMode().

Syntax	UINT **GetNetworkType**(ULONG *&*);	
Parameters	NDIS_NET_TYPE_FH	Indicates this is a frequency hopping radio.
		Indicates that this is a direct sequence radio.
		Indicates this radio is unknown or undefined.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	If ERROR_SUCCESS is returned, your ULONG reference is populated with one of the parameters listed above.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetNetworkType)(ULONG &); #else UINT GetNetworkType(ULONG &); #endif	

GetSSID()

Call this function to get the desired SSID of the 802.11b/g radio.

Syntax	UINT **GetSSID**(TCHAR *);
Parameters	Pointer to a character array, which is populated with the current SSID when successful.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	If ERROR_SUCCESS is returned, your TCHAR array is populated with the desired SSID.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetSSID)(TCHAR *); #else UINT GetSSID(TCHAR *); #endif

Note: Call RadioConnect() *before* this function for this function to work properly.

GetPowerMode()

Call this function to get the current power savings mode of the radio.

Syntax	UINT **GetPowerMode**(ULONG *&*);	
Parameters	NDIS_RADIO_POWER_MODE_CAM	Continuous Access Mode *(ie: always on)*.
		Power Saving Mode.
		Unknown power mode.
		Auto.
		Fast PSP, good savings, fast
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	If ERROR_SUCCESS is returned, your ULONG reference is populated with one of the parameters listed above.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetPowerMode)(ULONG &); #else UINT GetPowerMode(ULONG &); #endif	

Note: Do not use Automatic Switching mode at this time.

GetRSSI()

Call this function to get the current RSSI (Radio Signal Strength Indicator), in Dbm.

Syntax	UINT **GetRSSI**(ULONG &);
Parameters	References a ULONG that is populated with the current RSSI after a successful call.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	If ERROR_SUCCESS is returned, your ULONG reference contains the RSSI. Valid RSSI range is from -100 Dbm to -30 Dbm.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetRSSI)(ULONG &); #else UINT GetRSSI(ULONG &); #endif

GetTXPower()

Call this function to get the current transmit power of the radio.

Syntax	UINT **GetTXPower**(ULONG &);	
Parameters	NDIS_POWER_LEVEL_63	63 mW
		30 mW
		15 mW
		5 mW
		1 mW
		Unknown Value or Error.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	If ERROR_SUCCESS is returned, your ULONG reference is populated with the TX power in milliwatts (mW). Valid ranges are from 5 mW to 100 mW.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetTXPower)(ULONG &); #else UINT GetTXPower(ULONG &); #endif	

GetWepStatus()

Call this to get the current state of the radio's WEP and encryption levels.

Syntax	UINT **GetWepStatus**(ULONG &);	
Parameters	NDIS_ENCRYPTION_1_ENABLED	WEP enabled; TKIP, AES not enabled, and transmit key may or may not be available.
	NDIS_ENCRYPTION_DISABLED	Indicates AES, TKIP, WEP disabled, and transmit key available.
	NDIS_ENCRYPTION_NOT_SUPPORTED	Indicates WEP, TKIP, AES not supported.
	NDIS_ENCRYPTION_1_KEY_ABSENT	Indicates AES, TKIP, WEP disabled, and transmit key not available.
	NDIS_ENCRYPTION_2_ENABLED	Indicates TKIP, WEP enabled; AES not enabled, and transmit key available.
	NDIS_ENCRYPTION_2_KEY_ABSENT	Indicates no transmit keys available for TKIP, WEP, TKIP, WEP enabled; AES not enabled.
	NDIS_ENCRYPTION_3_ENABLED	Indicates AES, TKIP, WEP enabled, and transmit key available.
	NDIS_ENCRYPTION_3_KEY_ABSENT	Indicates no transmit keys available for AES, TKIP, WEP, AES, TKIP, WEP enabled.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	If ERROR_SUCCESS returned, ULONG reference is populated with a parameter listed above.	

Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetWepStatus)(ULONG &); #else UINT GetWepStatus(ULONG &); #endif

GetRadioIpAddress()

Call this function to obtain a formatted string indicating whether DHCP is enabled, and what is the current adapters IP address.

Syntax	UINT **GetRadioIpAddress**(TCHAR *);
Parameters	Pointer to a character array that contains the formatted string of the IP address and static/DHCP information.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	If ERROR_SUCCESS is returned, your TCHAR array contains a string formatted as follows: `IP: DHCP Enabled\nxxx.xxx.xxx.xxx\n` or IP: DHCP Disabled\nxxx.xxx.xxx.xxx\n
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetRadioIpAddress)(TCHAR *); #else UINT GetRadioIpAddress(TCHAR *); #endif

GetCCXStatus()

Call this to get information about the current CCX status of the adapter.

Syntax	UINT **GetCCXStatus**(ULONG *&*);	
Parameters	NDIS_NETWORK_EAP_MODE_OFF	Disable EAP mode.
		Enable EAP mode.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	If ERROR_SUCCESS is returned, your ULONG reference is populated with one of parameters listed above.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetCCXStatus)(ULONG &); #else UINT GetCCXStatus(ULONG &); #endif	

Set Information Functions

AddWep()

Call this function to add a WEP key to the radio. Call this function multiple times when adding more than one WEP key. Save the "default" key for last. For example, when adding four keys, and the second key is the default transmit key, add keys 1, 3 and 4 *before* you add key 2.

Note: Add the default transmit key *last.*

Syntax	UINT **AddWep**(ULONG, BOOL, TCHAR *);	
Parameters	ULONG	Specifies the key index to be set. Valid values are 0-3. When set to TRUE, specifies that this key is the default transmit key. Pointer to a character array that specifies the key data in either HEX (length of 10 or 26) or ASCII (length of 5 or 13). This string must be null-terminated.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	When adding WEP keys to the radio, turn off encryption before you add the keys, then turn encryption back on afterwards. Also, be sure to add the TRANSMIT KEY last.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_AddWep)(ULONG, BOOL, TCHAR *); #else UINT AddWep(ULONG, BOOL, TCHAR *); #endif	

EnableWep()

Enables or disables WEP encryption on the radio (TRUE/FALSE).

Syntax	UINT **EnableWep**(BOOL);
Parameters	Set BOOL to TRUE to enable WEP encryption, or FALSE to disable WEP encryption.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.

Remarks	Call this function with TRUE as the parameter to enable WEP encryption. Call this function with the FALSE parameter to disable WEP encryption. This call is an alias for EncryptionStatus(). See the following:
	`EnableWEP(TRUE) = EncryptionStatus(NDIS_ENCRYPTION_1_ENABLED)`
	`EnableWEP(FALSE) = EncryptionStatus(NDIS_ENCRYPTION_DISABLED)`

Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_EnableWep)(BOOL); #else UINT EnableWep(BOOL); #endif

EncryptionStatus()

Call this function to set the desired encryption status.

Syntax	UINT **EncryptionStatus**(UINT *mode*);	
Parameters	NDIS_ENCRYPTION_1_ENABLED	WEP is enabled; TKIP and AES are not enabled, and a transmit key may or may not be available. *(same as NDIS_RADIO_WEP_ENABLED)* Indicates that AES, TKIP, and WEP are disabled, and a transmit key is available. *(Same as NDIS_RADIO_WEP_DISABLED)* Indicates that encryption (WEP, TKIP, and AES) is not supported. *(Same as NDIS_RADIO_WEP_NOT_SUPPORTED)* Indicates that AES, TKIP, and WEP are disabled, and a transmit key is not available. *(Same as NDIS_RADIO_WEP_ABSENT)* Indicates that TKIP and WEP are enabled; AES is not enabled, and a transmit key is available. Indicates no transmit keys available for use by TKIP or WEP (enabled) and AES is not enabled. Indicates that AES, TKIP, and WEP are enabled, and a transmit key is available. Indicates there are no transmit keys available for use by AES, TKIP, or WEP, which are enabled.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	None.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_EncryptionStatus)(UINT mode); #else UINT EncryptionStatus(UINT mode); #endif	

SetAuthenticationMode()

Call this function to set the desired authentication mode.

Syntax	UINT **SetAuthenticationMode**(ULONG);	
Parameters	NDIS_RADIO_AUTH_MODE_OPEN	802.11 Open Authentication. Indicates that the radio is using an open system. 802.11 Shared Authentication. Indicates that the radio is using a shared key. Auto switch between Open/Shared. Indicates automatic detection is used when available. Defined as error value. Indicates the authentication mode was not determined at this time or is unknown. WPA Authentication WPA Preshared Key Authentication WPA None
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	None.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SetAuthenticationMode)(ULONG); #else UINT SetAuthenticationMode(ULONG); #endif	

SetChannel()

This function is currently not implemented. Ad-hoc networks automatically select a channel or use the already existing channel.

Syntax	UINT **SetChannel**(USHORT);
Parameters	USHORT value that should populate with the desired channel (1-14).
Return Values	None.
Remarks	None.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SetChannel)(USHORT); #else UINT SetChannel(USHORT); #endif

SetNetworkMode()

Call this function to set the desired Network Mode.

Syntax	UINT **SetNetworkMode**(ULONG);	
Parameters	NDIS_NET_MODE_IBSS	802.11 Ad-Hoc Mode.
		802.11 Infrastructure Mode.
		Anything Else/Unknown Error
		Automatic Selection. *Use of this option is not supported or recommended.*
		5 Gigahertz 54 Mbps
		802.11 2.4 Gigahertz
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	None.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SetNetworkMode)(ULONG); #else UINT SetNetworkMode(ULONG); #endif	

SetPowerMode()

Call this function to set the desired power mode.

Syntax	UINT **SetPowerMode**(ULONG *mode*);	
Parameters	NDIS_RADIO_POWER_MODE_CAM	Continuous Access Mode *(ie: always on)*.
		Power Saving Mode.
		Unknown power mode.
		Auto.
		Fast PSP, good savings, fast
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	None.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SetPowerMode)(ULONG mode); #else UINT SetPowerMode(ULONG mode); #endif	

SetSSID()

Call this function with a pointer to a null-terminated TCHAR array containing the desired SSID to set the desired SSID of the adapter.

Syntax	UINT **SetSSID**(TCHAR *);
Parameters	Pointer to a character array that contains the desired SSID. This should be null-terminated.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	If an "ANY" network is desired, pass in _T("ANY").
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SetSSID)(TCHAR *); #else UINT SetSSID(TCHAR *); #endif

SetCCXStatus()

Call this function to set the desired CCX / Network EAP status.

Syntax	UINT **SetCCXStatus**(ULONG);	
Parameters	NDIS_NETWORK_EAP_MODE_OFF	Disable Network EAP / CCX
		Enable Network EAP / CCX
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	None.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SetCCXStatus)(ULONG); #else UINT SetCCXStatus(ULONG); #endif	

SetMixedCellMode()

Call this function to set the desired mixed cell mode.

Syntax	UINT **SetMixedCellMode**(ULONG);	
Parameters	NDIS_MIXED_CELL_OFF	Disable Mixed Cell
		Enable Mixed Cell
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.	
Remarks	None.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SetMixedCellMode)(ULONG); #else UINT SetMixedCellMode(ULONG); #endif	

RemoveWep()

Call this with a key index of 0-3 to remove the WEP key at that index.

Syntax	UINT **RemoveWep**(ULONG);
Parameters	ULONG value that specifies the key index to set. Valid values are 0-3.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when fails, or ERR_CONNECT_FAILED if connection with radio fails.
Remarks	On disassociation with all BSSIDs of the current service set, WEP key is removed by the adapter.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_RemoveWEP)(ULONG); #else UINT RemoveWEP(ULONG); #endif

Helper Functions

ConfigureProfile()

If using the Intermec 802.11 Profile Management system, you can pass a specific profile name to program the API to configure the radio.

Syntax	UINT **ConfigureProfile**(TCHAR *);
Parameters	Pointer to a character array that contains the profile name. This should be null-terminated.
Return Values	ERROR_SUCCESS when successful, ERR_QUERY_FAILED when the query failed, or ERR_CONNECT_FAILED if a connection with the radio failed.
Remarks	Call this function with a pointer to a null-terminated TCHAR array that contains the name of the profile you wish to configure. This function reads profile data from the profile manager, sets that profile as the default active profile, and configures the radio appropriately. If needed, the supplicant and any other related services are automatically started and stopped.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_ConfigureProfile)(TCHAR *); #else UINT ConfigureProfile(TCHAR *); #endif

EnableZeroConfig()

This enables or disables the Wireless Zero Configuration Wizard from Microsoft. After calling this function, a warm-boot is required for the change to take effect. *Note that enabling this effectively disables all SET commands in this API.*

Syntax	UINT **EnableZeroConfig**(USHORT);	
Parameters	TRUE	Enable Wireless Zero Config
		Disable Wireless Zero Config
Return Values	ERROR_SUCCESS when successful, ERR_ZERO_CONFIG_CHANGE_FAILED when the query failed.	
Remarks	Call this function to set the desired Zero Config status.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_EnableZeroConfig)(USHORT); #else UINT EnableZeroConfig(USHORT); #endif	

isZeroConfigEnabled()

Call this function to determine whether Zero Config is currently enabled.

Syntax	UINT **isZeroConfigEnabled**( );
Parameters	None.
Return Values	TRUE if ZeroConfig is enabled, and FALSE if it is disabled.
Remarks	None.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_isZeroConfigEnabled)(); #else UINT isZeroConfigEnabled(); #endif

isSupplicantRunning()

Call this function to determine whether the security supplicant is running.

Syntax	UINT **isSupplicantRunning**( );
Parameters	None.
Return Values	TRUE if the security supplicant is running, FALSE if not running.
Remarks	None.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_isSupplicantRunning)(); #else UINT isSupplicantRunning(); #endif

StartScanList()

If a scan list is configured on the system, this causes the API to begin the process of scanning for an available network. This call can take quite a while to process *(depending upon the length of the scan list and how long it takes to find a valid network)*, you may wish to call it from a separate thread.

Syntax	UINT **StartScanList**( );
Parameters	None.
Return Values	ERROR_SUCCESS when successful.
Remarks	Call this function to start the scan list functionality of the system.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_StartScanList)(); #else UINT StartScanList(); #endif

StartSupplicant()

Call this to start the supplicant service if it is installed on the system.

Syntax	UINT **StartSupplicant**( );
Parameters	None.
Return Values	ERROR_SUCCESS when successful.
Remarks	None.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_StartSupplicant)(); #else UINT StartSupplicant(); #endif

StopSupplicant()

Call this function to stop the supplicant service.

Syntax	UINT **StopSupplicant**( );
Parameters	None.
Return Values	ERROR_SUCCESS when successful.
Remarks	None.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_StopSupplicant)(); #else UINT StopSupplicant(); #endif

isDHCPEnabled()

Call this to determine whether DHCP is enabled on the current adapter.

Syntax	UINT **isDHCPEnabled**( );
Parameters	None.
Return Values	TRUE if DHCP is enabled, FALSE if it is not.
Remarks	None.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_isDHCPEnabled)(); #else UINT isDHCPEnabled(); #endif

RenewDHCP()

Call this to force a DHCP renewal on the current network adapter.

Syntax	UINT **RenewDHCP**( );
Parameters	None.
Return Values	ERROR_SUCCESS when successful.
Remarks	You should not have to call this function.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_RenewDHCP)(); #else UINT RenewDHCP(); #endif

GetCurrentDriverName()

Call this function to populate the TCHAR array with the driver name.

Syntax	UINT **GetCurrentDriverName**(**TCHAR** *);
Parameters	Pointer to a TCHAR array which contains the name of the driver when successful.
Return Values	ERROR_SUCCESS when successful.
Remarks	This function is called with a pointer to a TCHAR array that is large enough to hold the name of the driver PLUS the null terminator.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_GetCurrentDriverName)(TCHAR *); #else UINT GetCurrentDriverName(TCHAR *); #endif

ResetRadioToSystemSave()

Call this function to force the radio to reset to the last desired active profile.

Syntax	UINT **ResetRadioToSystemSave**( );
Parameters	None.
Return Values	ERROR_SUCCESS when successful.
Remarks	None.
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_ResetRadioToSystemSave)(); #else UINT ResetRadioToSystemSave(); #endif

EnableSuppLogging()

Call this function to set the desired supplicant logging mode.

Syntax	UINT **EnableSuppLogging**(**ULONG**);	
Parameters	NDIS_SUPP_LOGGING_ON	Supplicant Logging Enabled
		Supplicant Logging Disabled
Return Values	ERROR_SUCCESS when successful.	
Remarks	None.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_EnableSuppLogging)(ULONG); #else UINT EnableSuppLogging(ULONG); #endif	

SwitchPacketDriver()

Call this function to switch between available packet drivers on the system.

Syntax	UINT **SwitchPacketDriver**(**USHORT**);	
Parameters	INTERMEC_PACKET_DRIVER	Intermec Packet Driver (ZNICZIO)
		Microsoft Packet Driver (NDISUIO)
Return Values	ERROR_SUCCESS when successful.	
Remarks	After switching to a new packet driver, perform a warm boot for changes to take effect.	
Definitions	#ifdef DYNAMIC_LOADING typedef UINT (*PFN_SwitchPacketDriver)(USHORT); #else UINT SwitchPacketDriver(USHORT); #endif	

Notifications

Use the following information to programmatically control the vibrator, to write an application to turn on the vibrator when a message is received via the WLAN radio link, and turn it off when the user hits a key.

Vibrator support is implemented in the NLED driver as a false LED. The vibrator is LED 5 and is identified with an CycleAdjust of -1. The vibrate option is only available in the notifications panel when the vibrator is present in the system.

Regarding an applications interface to NLED.DLL, LEDs must be available for use by applications. This is possible via two functions exported by the COREDLL.DLL file. To use the LED functions, declare these as extern "C" as follows:

```
extern "C" BOOL WINAPI NLEDGetDeviceInfo(UINT nInfoId,
void *pOutput);
extern "C" BOOL WINAPI NLEDSetDevice( UINT nDeviceId, void
*pInput);
```

The LEDs are enumerated for access through the data structures associated with these APIs: Notification LED (0), Alpha Lock LED (2), Scanner LED (3), or Low Battery (4).

NLEDGetDeviceInfo

Usage

#include "nled.h"

Syntax

```
BOOL NLEDGetDeviceInfo ( UINT nInfoId, void *pOutput );
```

Parameters

nInfoId	Integer specifying the information to return. These values are defined:	
		Indicates the *pOutput* buffer specifies the number of LEDs on the device.
	NLED_SUPPORTS_INFO_ID	Indicates the *pOutput* buffer specifies information about the capabilities supported by the LED.
		Indicates the *pOutput* buffer contains information about the LED current settings.
pOutput	Pointer to the buffer to which the information is returned. The buffer points to various structure types defined in "nled.h", depending on the value of *nId*, as detailed in the following table:	
		Structure in *pOutput* NLED_COUNT_INFO NLED_SUPPORTS_INFO NLED_SETTINGS_INFO

NLEDSetDevice

Usage
#include “nled.h”

Syntax
```
BOOL NLEDSetDevice ( UINT nDeviceId, void *pInput );
```

Parameters

nDeviceId	Integer specifying the device identification. The following is defined:
	Contains information about the desired LED settings.
pInput	Pointer to the buffer that contains the NLED_SETTINGS_INFO structure.

Reboot Functions

There are several methods, via Kernel I/O Control functions, that an application program can use to force the CN2B Computer to reboot.

IOCTL_HAL_REBOOT

IOCTL_HAL_REBOOT performs a warm-boot. See page 159.

IOCTL_HAL_COLDBOOT

Invoking with this forces a cold reboot, resets the CN2B Computer, reloads Windows CE as if a power-up was performed, and discards the contents of the Windows CE RAM-based object. See page 157.

IOCTL_HAL_WARMBOOT

This function is supported on CN2B Computers. It performs a warm boot of the system, preserving the object store. See page 156.

Remapping the Keypad

Note: Only experienced application developers should perform this function of remapping the keypad. Data within the CN2B Computer could be lost should any problems occur.

Applications have the ability to remap keys on the CN2B keypad. This allows applications to enable keys that would otherwise not be available, such as the **[F1]** function key. Also, to disable keys that should not be available, such as the alpha key because no alpha entry is required. Use caution when attempting to remap the keypad because improper remapping may cause the keypad to become unusable. This can be corrected by performing a cold-boot on the device that reloads the default keymap.

Choosing How to Change Keypad Registry Settings

There are several ways to change the keypad registry settings:

- You can use a registry editing program to change the keypad registry entries. You can run the Microsoft eMbedded Visual C++ Remote Registry Editor on your PC, using ActiveSync to connect to the CN2B Computer. Or you can download and run a third-party registry editing program on your CN2B Computer. After you make your changes, you need to perform a warm boot on the CN2B Computer for the changes to take effect. For help, see "Performing a Warm-Boot" on page 11.
- You can write an application to change the keypad registry entries. An application gives you a convenient way to customize multiple CN2B Computers. Make sure your application sets the named event *KeybdSettingsChangeEvent* after you change the registry entries for the changes to take effect.
- You can use a .CAB file to edit the registry. You can install the _ResetMePlease_.txt file in your .CAB file to force a warm boot to activate the changes.

Note that remapping the keys in this way affects the key mapping for the entire system, not just for the application that does the remapping.

Planes

There are three "planes" supported for the CN2B keypad. Keys used in more than one shift plane must be described in each plane.

Unshifted Plane

The unshifted plane contains values from the keypad when not pressed with other keys, such as the following:

	To Enter This
[1]	1
[5]	5
[9]	9

Orange Plane

The **orange** plane contains values from the keypad when a key is simultaneously pressed with the **orange** key, such as the following:

Press the Keys	To Enter This
orange [0]	Start menu
orange [6]	A4
orange [9]	PgDn

Alpha (Green) Plane

The alpha plane contains values from the keypad when the keypad has been placed in alpha mode by pressing the green **[Alpha]** key, such as:

	To Enter This
[Alpha] [1]	Caps
[Alpha] [5]	j
[Alpha] [9]	w

Locating the Registry Settings for Your Key Values

Key values for each plane are stored in the registry. All units ship with a default key mapping loaded in the registry. Applications that change the default mapping need to read the appropriate key from the registry into an array of words, modify the values required and then write the updated values back into the registry. The registry access can be done with standard Microsoft API calls, such as RegOpenKeyEx(), RegQueryValueEx(), and RegSetValueEx(). These registry keys contain the plane mappings:

- The unshifted plane mapping can be found in the registry at:
  `HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\Vkey`
- The orange plane mapping can be found in the registry at:
  `HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\VkeyGold`
- The alpha plane mapping can be found in the registry at:
  `HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\VkeyAlpha`

How Key Values Are Stored in the Registry

To know which fields to update in the registry, you must know what Scan Codes are assigned to each physical key (see page 185). The Scan Code is used at the lowest level of the system to let the keypad driver know which physical key is pressed. The keypad driver takes that scan code and looks it up in a table (a copy of the table in the registry) to determine the values to pass to the operating system.

Each registry key is just an array that describes to the keypad driver what value needs to be passed for each physical key. The key values are indexed by the scan code, this is a zero-based index. For example in the unshifted plane, the [4] key has a scan code of 0x06. This means that the seventh word under the "Vkey" registry key has the value for the [4] key. Taking a sample of the "Vkey" registry key shows the following values:

```
00,00,0B,05,02,03,C1,07,04,03,BE,00,34,00,00,00,. . .
```

The value is 34,00. The values are in reverse byte order because that is the way the processor handles data. When writing an application, nothing needs to be done to swap the bytes, as this will happen automatically when the data is read into a byte value. This is something you just need to be

aware of when looking at the registry. Knowing this, we can see that the value that the keypad driver will pass to the system is a hex 34. Looking that up on an UNICODE character chart, we see that it maps to a "4". If you wanted the key, labeled "4", to output the letter "A" instead, you would need to change the seventh word to "41" (the hexadecimal representation of "A" from the UNICODE chart), then put the key back into the registry.

Note: Do not remap scan codes 0x01, 0x41, 0x42, 0x43, or 0x44, or the CN2B Computer becomes unit unusable until a cold-boot is performed.

If you wish to disable a certain key, remap its scan code to 0x00.

Change Notification

Just changing the registry keys do not immediately change the key mappings. Signal the "ITC_KEYBOARD_CHANGE" named event using the CreateEvent() API to notify the keypad driver the registry was updated.

Advanced Keypad Remapping

It is also possible to map multiple key presses to one button and to map named system events to a button. The multiple key press option could be useful to cut down on the number of keys needed to press in a given situation or to remap which key behaves like the action key. Mapping events to a button could be useful to change which buttons will fire the scanner, control volume, and allow for suspending and resuming the device. If you need help performing one of these advanced topics please contact Intermec Technical Support.

Scan Codes

At the lowest driver level, the CN2B keypad identifies keys as scan codes. These scan codes are sent via the keypad microcontroller, and cannot be changed without modifying the keypad firmware.

Keypad Scan Codes and Registry Entries

Press this Key	Meaning	Scan Code	Registry Entry
	Reserved	0x00	
[I/O]	I/O button	0x01	
	Scanner Handle Trigger	0x100	#define VK_SCAN3
	Scanner Left	0x03	Fkeycode9
	Scanner Right	0x05	Fkeycode10
[4]	4/GHI/A2	0x06	Fkeycode17

Keypad Scan Codes and Registry Entries (continued)

Press this Key	Meaning	Scan Code	Registry Entry
	None	0x07	
	Left arrow/Back Tab	0x08	Fkeycode2
	None	0x09	
[BkSp]	BkSp// (forward slash)	0x0A	Fkeycode2
orange	**orange** key	0x0B	Fkeycode3
	None	0x0C	
[Esc]	Esc/– (minus sign)	0x0D	Fkeycode20
[v]	Down arrow	0x0E	Fkeycode8
[1]	1/Caps	0x0F	Fkeycode23
[7]	7/PQRS/PgUp	0x10	Fkeycode27
[Alpha]	[Alpha] key	0x11	Fkeycode24
	None	0x12	
[^]	Up arrow/Volume increase	0x13	Fkeycode7
⇥	Right arrow/Tab	0x14	Fkeycode5
[2]	2/ABC	0x15	Fkeycode7
[8]	8/TUV/* (asterisk)	0x16	Fkeycode8
[0]	0/Win	0x17	Fkeycode26
[5]	5/JKL/A3	0x18	Fkeycode16
	None	0x19	
[Action]	Action/+ (plus symbol)	0x1A	
[3]	3/DEF/backlight	0x1B	Fkeycode21
[9]	9/WXYZ/PgDn	0x1C	Fkeycode25
[ENTER]	Enter/@ (at symbol)	0x1D	Fkeycode6
[6]	6/MNO/A4	0x1E	Fkeycode18
	None	0x1F-0x40	
	Charge Detect	0x41	
	LCD frontlight	0x42	
	Ambient light	0x42	

Keypad Scan Codes and Registry Entries (continued)

Press this Key	Meaning	Scan Code	Registry Entry
	Threshold crossed	0x42	
	Headset detected	0x43	
	Keypad Backlight	0x44	
	Ambient Light	0x44	
	Threshold Crossed	0x44	

Understanding Keypad Attributes

The keypad attributes are as follows.

- "OrangeObeyClear" = dword:0
- "OrangeOneShot" = dword:1
- "GreenObeyClear" = dword:0
- "GreenOneShot" = dword:0
- "MultimapTimeout" = dword:258 *(see next section for a description)*

When you press the Orange key or Green key, a timer starts and will turn Orange or Green mode off after three seconds. To force Orange or Green mode to stay active after the timer has expired (which is also called "locking" the mode) you must set *ObeyClear to 0.

When you press a key in Orange or Green mode, the orange or green function for that key is produced and Orange or Green mode is turned off. To force Orange or Green mode to stay active after a key has been pressed (which is also called "locking" the mode) you must set *OneShot to 0.

Creating Multiple Key Definitions

In the case of multiple key definitions, the first byte is the number of possible keys (in words) that key physical key can cycle between. The second byte must be 0x80 (this is what makes it a multi-key definition). The values following should be two bytes for each possible key.

Multiple key definitions can also be used for FkeyCode and FkeyMeta mappings. In multi-key mode, only one VK code can be emitted by the key.

MultimapTimeout is the number of milliseconds you have to press the key again before the current selection is emitted. The default is 258, which equals 600ms (0.6 seconds).

To understand MultimapTimeout, consider the numeric keypad. When you press the Green key and the **[2]** key, you have selected the "a" character. You have 0.6 seconds to press the **[2]** key again for "b." If you do

not press a key within 0.6 seconds, the “a” is emitted. If you press another key within 0.6 seconds, the timeout is cancelled, the “a” is emitted, and you have 0.6 seconds to press the second key again to select a different letter.

Sample Registry Settings

This section lists sample keypad registry settings for the numeric keypad and the scroll keypad.

Numeric Keypad Registry Settings

```
[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\FKEYS\27]
"FkeyCode2" = hex:08,00
"FkeyCode3" = hex:04,01; to enter Orange mode
"FkeyCode5" = hex:09,00
"FkeyCode6" = hex:0D,00
"FkeyCode7" = hex:32,00
"FkeyCode8" = hex:38,00
"FkeyCode10" = hex:01,01
"FkeyCode11" = hex:02,01

"FkeyCode16" = hex:35,00; to emit the number 5
"FkeyCode17" = hex:34,00
"FkeyCode18" = hex:36,00
"FkeyCode20" = hex:1B,00
"FkeyCode21" = hex:33,00
"FkeyCode22" = hex:6E,00
"FkeyCode23" = hex:31,00
"FkeyCode24" = hex:05,01
"FkeyCode25" = hex:39,00
"FkeyCode26" = hex:30,00
"FkeyCode27" = hex:37,00

"FkeyMeta5" = hex:10,00,09,00; to emit Shift-Tab (back tab)
"FkeyMeta23" = hex:5B,00,C1,00; to launch APP 1
"FkeyMeta24" = hex:BD,00

"FkeyAlpha2" = hex:20,00
"FkeyAlpha7" = hex:03,80,41,00,42,00,43,00
"FkeyAlpha8" = hex:03,80,54,00,55,00,56,00
"FkeyAlpha16" = hex:03,80,4A,00,4B,00,4C,00
"FkeyAlpha17" = hex:03,80,47,00,48,00,49,00
"FkeyAlpha18" = hex:03,80,4D,00,4E,00,4F,00
"FkeyAlpha20" = hex:14,00

"FkeyAlpha21" = hex:03,80,44,00,45,00,46,00
"FkeyAlpha23" = hex:BD,00
"FkeyAlpha25" = hex:04,80,57,00,58,00,59,00,5A,00
"FkeyAlpha26" = hex:12,00
"FkeyAlpha27" = hex:04,80,50,00,51,00,52,00,53,00
```

Scroll Keypad Registry Settings

```
[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\KEYBD\FKEYS\9\0]
;"FkeyCode1" = hex:5B,00,C1,00
"FkeyCode1" = hex:70,00
"FkeyCode2" = hex:25,00
"FkeyCode3" = hex:04,01
;"FkeyCode4" = hex:5B,00,C2,00
"FkeyCode4" = hex:71,00
"FkeyCode5" = hex:27,00
```

```
"FkeyCode6" = hex:0D,00
"FkeyCode7" = hex:26,00
"FkeyCode8" = hex:28,00
"FkeyCode9" = hex:00,01
"FkeyCode10" = hex:01,01
"FkeyCode11" = hex:02,01

;"FKeyMeta1" = hex:5B,00,C3,00
"FKeyMeta1" = hex:72,00
"FKeyMeta2" = hex:25,00
;"FKeyMeta3" = hex:5B,00,C5,00
"FKeyMeta3" = hex:74,00
;"FKeyMeta4" = hex:5B,00,C4,00
"FKeyMeta4" = hex:73,00
"FKeyMeta5" = hex:27,00
"FKeyMeta6" = hex:1B,00
"FKeyMeta7" = hex:03,01
"FKeyMeta8" = hex:06,01


"OrangeObeyClear" = dword:1
"OrangeOneShot" = dword:1
```

A Configurable Settings

www.intermec.com This appendix contains information about the Intermec Settings, Utilities, and Wireless Network applets that may be on the CN2B Mobile Computer. Information about using reader commands and configuration bar codes to configure some of your settings is also in this appendix.

Note: Information about the settings you can configure with the Intermec Settings applet is described in the *Intermec Computer Command Reference Manual* (P/N: 073529). The online manual is available from the Intermec web site at **www.intermec.com**.

Configuration Parameters

A configuration parameter changes the way the CN2B Computer operates, such as configuring a parameter to have the CN2B Computer emit a very loud beep in a noisy environment. Use either of the following methods to execute configuration parameters:

- Send parameters from an SNMP management station. See "SNMP Configuration on the Mobile Computer" on page 108.
- Scan EasySet bar codes. You can use the EasySet bar code creation software from Intermec to print configuration labels. Scan the labels to change the scanner configuration and data transfer settings.

  Use the Intermec EasySet software to print configuration labels you can scan to change your configuration settings. For more information, see the EasySet online help. EasySet is available from the Intermec Data Capture web site.

Menus of available parameters for each group are listed. Use the scroll bars to go through the list. Expand each menu (+) to view its parameter settings. Tap a parameter to select, or expand a parameter to view its subparameters.

Note that each parameter or subparameter is shown with its default setting or current setting in (< >) brackets. Tap a parameter or subparameter to select that parameter, then do any of the following to change its setting: Tap **Apply** to apply any changes.

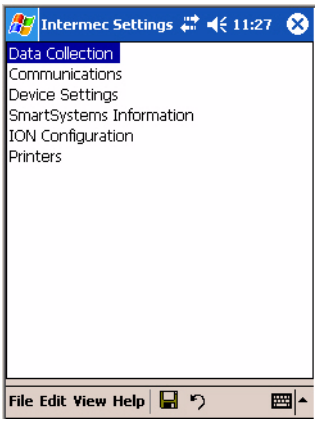
- Typing a new value in an entry field.
- Choosing a new value from the drop-down list.
- Selecting a different option. The selected option contains a bullet.
- Tap **Defaults**, then **Apply** to restore factory-default settings. Tap **Yes** when you are prompted to verify this action.
- Tap **Refresh** to discard changes and start again. Tap **Yes** when you are prompted to verify this action.

Intermec Settings Applet

You may have the Intermec Settings applet. Information about the settings you can configure with this applet is described in the *Intermec Computer Command Reference Manual*. The online manual is available from the Intermec web site at **www.intermec.com**.

See the Data Collection Resource Kit in the Intermec Developer Library (IDL) for information about data collection functions. The IDL is available as a download from the Intermec web site at **www.intermec.com/idl**. Contact your Intermec representative for more information.

To access the settings from the CN2B Computer, tap **Start** > **Settings** > the **System** tab > **Intermec Settings** to access its applet.



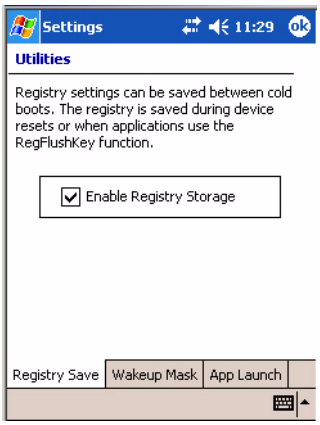
Utilities Applet

The Utilities applet examines and modifies settings and operational modes of specific hardware and software on the CN2B Computer, including the registry storage, wakeup mask, and application launch keys.

Registry Save

From the CN2B Computer, tap **Start** > **Settings** > the **System** tab > **Utilities** > the **Registry Save** tab to access the Registry Save page.

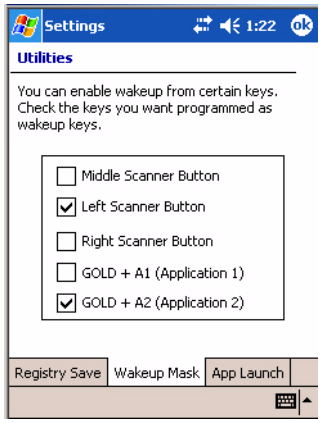
For Windows Mobile 2003, the only medium available for saving the registry is the Flash File System (PSM). Registry data is stored in the "\Flash_File_Store\Registry" path. Check **Enable Registry Storage** to enable this function.



Wakeup Mask

From the CN2B Computer, tap **Start** > **Settings** > the **System** tab > **Utilities** > the **Wakeup Mask** tab to access the Wakeup Mask page.

This page programs three scanner buttons and the **A1** and **A2** application keys to be "wakeup" or resume keys. That is, to prompt the CN2B Computer to "wake up" or resume activity after going to "sleep" as a result of being inactive after a length of time. This information remains between warm and cold boots. Check the appropriate box, then tap **ok** to apply.



Based on the setting, do the following to "wake up" the CN2B Computer.

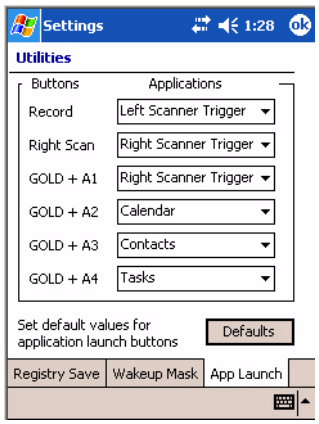
Middle Scanner Button	Squeeze the button on the Scan Handle
Left Scanner Button	Squeeze the left scanner button
Right Scanner Button	Squeeze the right scanner button
GOLD + A1 (Application 1)	Press **orange [period]**
GOLD + A2 (Application 2)	Press **orange [4]**

App Launch

From the CN2B Computer, tap **Start** > **Settings** > the **System** tab > **Utilities** > the **App Launch** tab to access the Application Launch page.

This page programs or maps two scanner buttons and four application keys to start up to six applications. *Note that the left scanner button also acts as the record button.*

For CN2B Computers with an imager,
default mappings are shown in the following illustration.



For CN2B Computers without an imager,
the default maps the Record, Calendar, Contacts, and Tasks applications the top four and the A3 and A4 buttons are "unassigned."

Note: Record, Calendar, Contacts, and Tasks are Pocket PC applications. See **Chapter 2, "Windows Mobile 2003"** for information.

- To assign an application to a button, select an application from the applicable drop-down list box.
- To assign a new application, select the "Add new application" option, which brings up an Open File dialog and browse Secure Digital storage cards for new applications.
- To disable or unmap a currently mapped application from a corresponding button, select "unassigned" from the applicable drop-down list.
- Tap **Defaults** in the lower right corner to restore defaults.

Note: You cannot map an application to more than one button. Should you assign the same application to two buttons, a verification prompt appears after the second button to confirm whether you want to remap the application. If you tap **Yes**, the applet changes the first button to "unassigned" and maps the application to the second button.

Note: All changes are activated immediate upon selection.

Wireless Network Applet

Note: See **Chapter 4, "Network Support"** for information about the 802.11b/g radio module.

About the Wireless Network

Your wireless adapter (network interface card) connects to wireless networks of two types: infrastructure networks and ad-hoc networks.

- Infrastructure networks get you onto your corporate network and the internet. Your CN2B Computer establishes a wireless connection to an access point, which links you to the rest of the network. When you connect to a network via an access point, you are using the 802.11b/g infrastructure mode.
- Ad-hoc networks are private networks shared between two or more clients, even with no access point.

Each wireless network is assigned a name (or Service Set Identifier — SSID) to allow multiple networks to coexist in the same area without infringement.

Intermec recommends using security measures with wireless networks to prevent unauthorized access to your network and to ensure your privacy of transmitted data. The following are required elements for secure networks:

- Authentication by both the network and the user
- Authentication is cryptographically protected
- Transmitted data

There are many schemes available for implementing these features.

Terminology

Below are terms you may encounter when configuring wireless networks:

- **CKIP** (Cisco Key Integrity Protocol)
  This is Cisco's version of the TKIP protocol, compatible with Cisco Airnet products.
- **EAP** (Extensible Authentication Protocol)
  802.11b/g uses this protocol to perform authentication. This is not necessarily an authentication mechanism, but is a common framework for transporting actual authentication protocols. Intermec provides a number of EAP protocols for you to choose the best for the network.
- **TKIP** (Temporal Key Integrity Protocol)
  This protocol is part of the IEEE 802.11b/g encryption standard for wireless LANs., which provides per-packet key mixing, a message integrity check and a re-keying mechanism, thus overcoming most of the weak points of WEP. This encryption is more difficult to crack than the standard WEP. Weak points of WEP include:
  - No Installation Vector (IV) reuse protection
  - Weak keys or no key updates
  - No protection against message replay
  - No detection of message tampering

- **WEP** (Wired Equivalent Privacy) **encryption**
  With preconfigured WEP, both the client CN2B Computer and access point are assigned the same key, which can encrypt all data between the two devices. WEP keys also authenticate the CN2B Computer to the access point — unless the CN2B Computer can prove it knows the WEP key, it is not allowed onto the network.

  WEP keys are only needed if they are expected by your clients. There are two types available: 64-bit (5-character strings, 12345) (default) and 128-bit (13-character strings, 1234567890123). Enter these as either ASCII (12345) or Hex (0x3132333435).

- **WPA** (Wi-Fi Protected Access)
  This is an enhanced version of WEP that does not rely on a static, shared key. It encompasses a number of security enhancements over WEP, including improved data encryption via TKIP and 802.11b/g authentication with EAP.

Configuring Your Wireless Network

To start 802.11b/g communications on the CN2B Computer, tap **Start** > **Settings** > the **System** tab > **Wireless Network** to access the Profile Wizard for the 802.11b/g radio module.

A profile contains all the information necessary to authenticate you to the network, such as login name, password or certificate, and protocols by which you are authenticated.

You can have up to four profiles for different networks. For example, you may have different login names or passwords on different networks, or you may use a password on one network, and a certificate on another.

Use the Profiles page to select and configure between the networking environments assigned to this 802.11b/g radio.

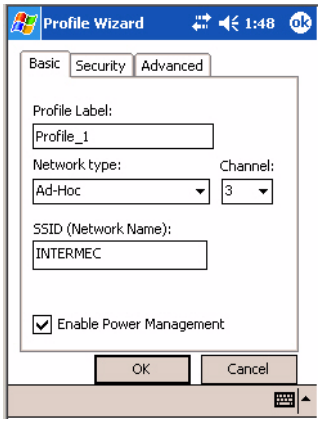
- **Profile**:
  Tap the drop-down list to choose between four different profiles assigned to this unit, then tap **Edit Select Profile**, make the changes *(starting on the next page)*, then tap **OK** to return to the Profiles page.

- **Enable Microsoft's Wireless Zero Config**
  Check this box to enable Microsoft's Wireless Zero Config application. This effectively disables the Intermec software solution for 802.11b/g, including configuration via the Wireless Network applet.

Basic

Use the Basic page to set the network type, name, and manage battery power for this profile. Tap **ok** to return to the Profiles page.

- **Profile Label**:
  Enter a unique name for your profile.
- **Network type**:
  Tap the drop-down list to select either "Infrastructure" if your network uses access points to provide connectivity to the corporate network or internet; or "Ad-Hoc" to set up a private network with participants.
- **Channel**:
  If you selected "Ad-Hoc" for the network type, select the channel on which you are communicating with others in your network. There are up to 11 channels available.
- **SSID (Network Name)**:
  This assumes the profile name *unless another name is entered in this field*. If you want to connect to the next available network or are not familiar with the network name, enter "ANY" in this field. Consult your LAN administrator for network names.
- **Enable Power Management**:
  Check this box to conserve battery power (default), or clear this box to disable this feature.



Security

The following are available from the **8021x Security** drop-down list. *Note that the last five methods are available if you have purchased the security package. Contact your Intermec representative for information.*

- None *(next paragraph)*
- PEAP *(page 200)*

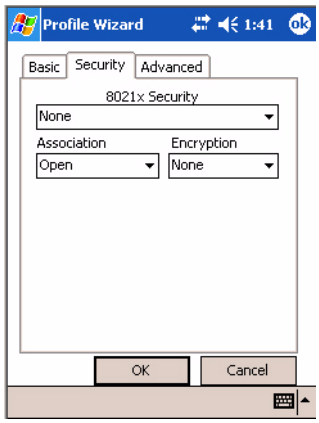
- TLS *(page 202)*
- TTLS *(page 204)*
- LEAP *(page 208)*
- EAP-FAST (page 209)

None

Use "None" to disable 802.11b/g Security and enable WEP encryption.

To Disable 802.1x Security

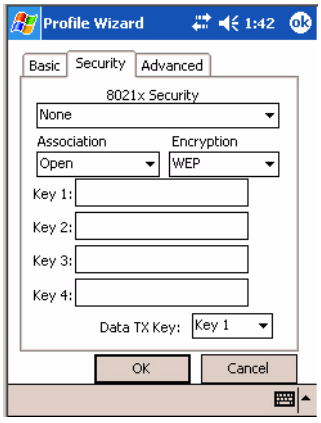
Set **8021x Security** as "None," **Association** to "Open," and **Encryption** to "None."



To Enable WEP Encryption

1 Set **8021x Security** as "None," **Association** to either "Open" if WEP keys are not required; or "Shared" when WEP keys are required for association, and **Encryption** to "WEP" (page 197).

2 If you had set **Association** to "Shared," then select a data transmission key from the **Data TX Key** drop-down list near the bottom of this screen, then enter the encryption key for that data transmission in the appropriate **Key #** field.



PEAP (Protected EAP)

This protocol is suitable for performing secure authentication against Windows domains and directory services. It is comparable to EAP-TTLS (see page 18), both in its method of operation and its security, though not as flexible. This does not support the range of inside-the-tunnel authentication methods supported by EAP-TTLS. Microsoft and Cisco both support this protocol.

Use "PEAP" to configure the use of PEAP as an authentication protocol and to select "Open," "WPA," or "Network EAP" as an association mode.

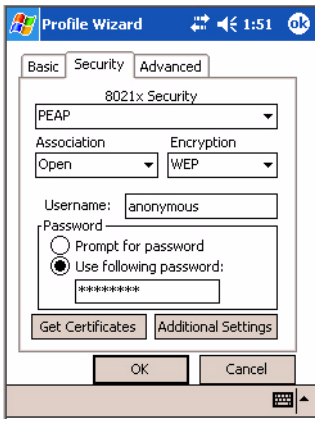
To Enable PEAP with an Open Association

1 Set **8021x Security** as "PEAP" and **Association** to "Open."

2 Enter your unique user name and password to use this protocol. Select **Prompt for password** to have the user enter this password each time to access the protocol; or leave **Use following password** as selected to automatically use the protocol without entering a password.

3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to assign an inner PEAP authentication and set options for server certificate validation and trust (page 202).



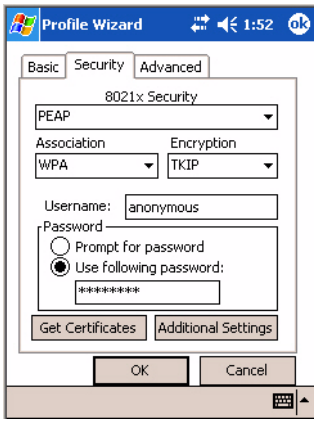
To Enable PEAP with WPA Encryption

1 Set **8021x Security** as "PEAP" and **Association** to "WPA" (page 197).

2 Enter your unique user name and password to use this protocol. Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

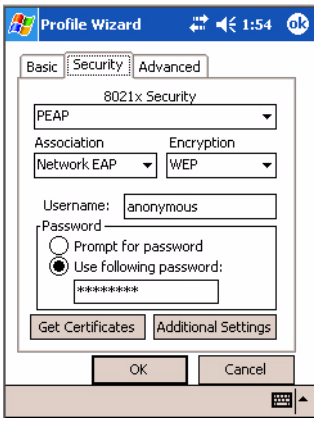
3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to assign an inner PEAP authentication and set options for server certificate validation and trust (page 202).



To Enable PEAP with Network EAP

1. Set **8021x Security** as "PEAP," **Association** to "Network EAP" (page 196), and **Encryption** to either "WEP" (page 196) or "CKIP" (page 197).
2. Enter your unique user name and password to use this protocol. Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.
3. Tap **Get Certificates** to obtain or import server certificates (page 207).
4. Tap **Additional Settings** to assign an inner PEAP authentication and set options for server certificate validation and trust (page 202).



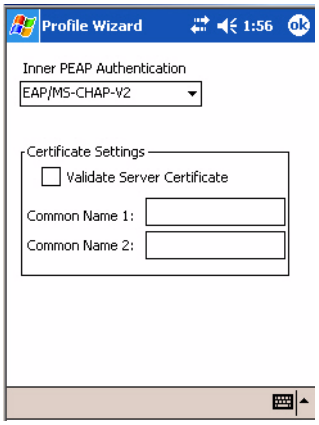
Additional Settings

1 Select an authentication method from the **Inner PEAP Authentication** drop-down list.

- **EAP/MS-CHAP-V2**
  Authenticates against a Windows Domain Controllre and other non-Windows user databases. This is Microsoft's implementation of PEAP.
- **EAP/Token Card**
  Use with token cards. The password value entered is never cached. This is Cisco's implementation of PEAP.
- **EAP/MD5-Challenge**
  Message Digest 5. A secure hashing authentication algorithm.

2 Check **Validate Server Certificate** to verify the identity of the authentication server based on its certificate when using TTLS or PEAP.

3 Enter the **Common Names** of trusted servers. *Note that if these fields are left blank, the server certificate trust validation is not performed or required.* Click **ok** to return to the Security page.



TLS (EAP-TLS)

EAP-TLS is a protocol that is based on the TLS (Transport Layer Security) protocol widely used to secure web sites. This requires both the user and authentication server have certificates for mutual authentication. While cryptically strong, this requires corporations that deploy this to maintain a certificate infrastructure for all their users.

Use "TLS" to configure the use of EAP-TLS as an authentication protocol, and to select "Open," "WPA," or "Network EAP" as an association mode.

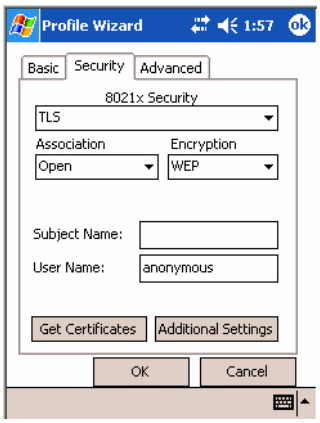
To Enable TLS with an Open Association

1 Set **8021x Security** as "TLS," and **Association** to "Open." Skip **Encryption** as it is automatically set to "WEP" (page 197).

2 Enter your unique **Subject Name** and **User Name** to use this protocol.

3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to set options for server certificate validation and trust (page 204).



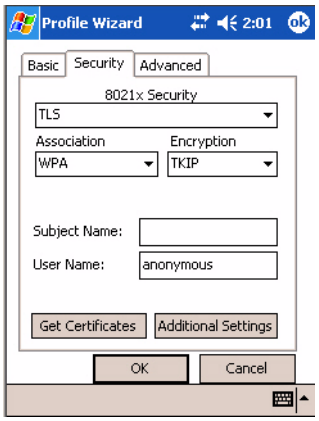
To Enable TLS with WPA Encryption

1 Set **8021x Security** as "TLS" and **Association** to "WPA" (page 197).

2 Enter a unique **Subject Name** and **User Name** as credentials.

3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to set options for server certificate validation and trust (page 204).



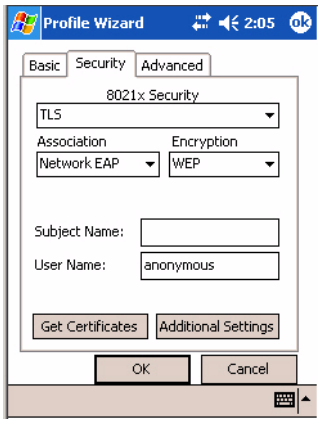
To Enable TLS with Network EAP

1 Set **8021x Security** as "TLS," **Association** to "Network EAP" (page 196), and **Encryption** to either "WEP" (page 197) or "CKIP" (page 196).

2 Enter a unique **Subject Name** and **User Name** as credentials.

3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to assign an inner TLS authentication and set options for server certificate validation and trust (page 204).

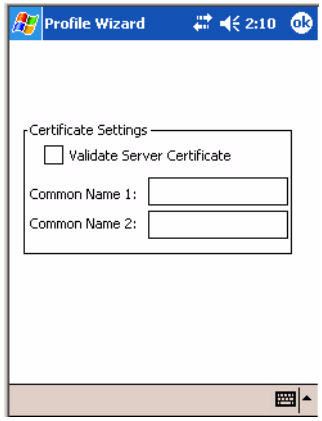


Additional Settings

1 Check **Validate Server Certificate** to verify the identity of the authentication server based on its certificate when using TLS.

2 Enter the **Common Names** of trusted servers. *Note that if these fields are left blank, the server certificate trust validation is not performed or required.*

3 Click **ok** to return to the Security page.



TTLS (EAP-Tunneled TLS)

This protocol provides authentication like EAP-TLS (see page 202) but does not require certificates for every user. Instead, authentication servers are issued certificates. User authentication is done using a password or other credentials that are transported in a securely encrypted "tunnel" established using server certificates.

EAP-TTLS works by creating a secure, encrypted tunnel through which you present your credentials to the authentication server. Thus, inside EAP-TTLS there is another *inner authentication protocol* that you must configure via Additional Settings.

Use "TTLS" to configure the use of EAP-TTLS as an authentication protocol, and select "Open," "WPA," or "Network EAP" as an association mode.

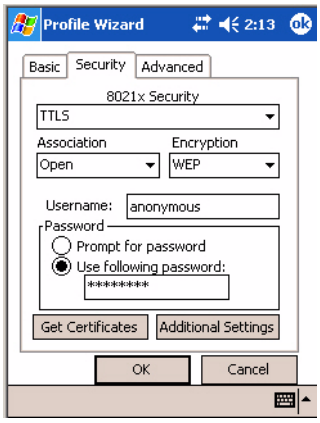
To Enable TTLS with an Open Association (default configuration)

1 Set **8021x Security** as "TTLS" and **Association** to "Open."

2 Enter your unique user name and password to use this protocol. Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to assign an inner TTLS authentication and an inner EAP, and set options for server certificate validation (page 206).



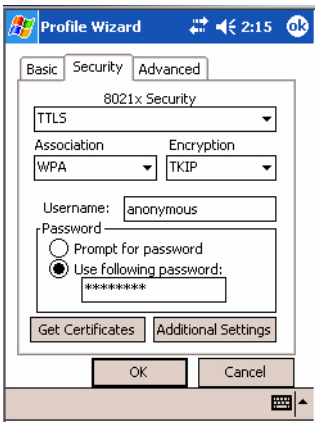
To Enable TTLS with WPA Encryption

1 Set **8021x Security** as "TTLS" and **Association** to "WPA" (page 197).

2 Enter your unique user name and password to use this protocol. Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to assign an inner TTLS authentication and an inner EAP, and set options for server certificate validation (page 206).



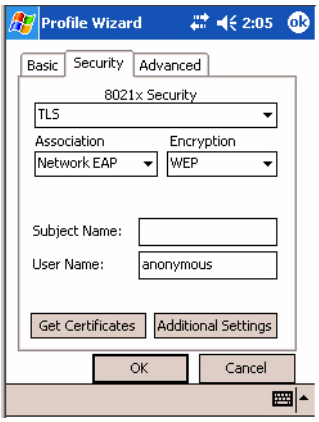
To Enable TTLS with Network EAP

1 Set **8021x Security** as "TTLS" and **Association** to "Network EAP" (page 196), and **Encryption** to either "WEP" (page 197) or "CKIP" (page 196).

2 Enter your unique user name and password to use this protocol. Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

3 Tap **Get Certificates** to obtain or import server certificates (page 207).

4 Tap **Additional Settings** to assign an inner TTLS authentication and set options for server certificate validation and trust (page 206).



Additional Settings

1 Select an authentication protocol from the **Inner TTLS Authentication** drop-down list:

- **PAP** (Password Authentication Protocol)
  A simple authentication protocol that sends security information in the clear.
- **CHAP** (Challenge Handshake Authentication Protocol)
  Use of Radius to authenticate a terminal without sending security data in the clear. Authenticates against non-Windows user databases. *You cannot use this if authenticating against a Windows NT Domain or Active Directory.*
- **MS-CHAP, MS-CHAP-V2**
  Authenticates against a Windows Domain Controller and other non-Windows user databases.
- **PAP/Token Card**
  Use with token cards. The password value entered is never cached.
- **EAP** (Extensible Authentication Protocol)
  See page 196 for information about EAP.

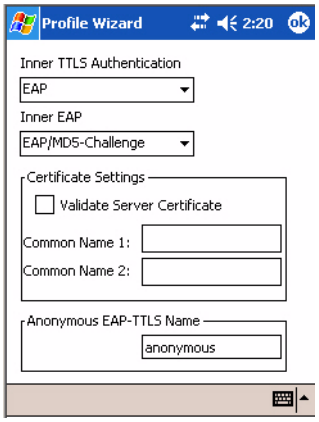
2 If you select "EAP" for the inner authentication protocol, then select an inner EAP protocol from the **Inner EAP** drop-down list.

3 Enter the **Common Names** of trusted servers. *Note that if these fields are left blank, the server certificate trust validation is not performed or required.*

4 Check **Validate Server Certificate** to verify the identity of the authentication server based on its certificate when using TTLS, PEAP, and TLS.

5 Enter the **Anonymous EAP-TTLS Name** as assigned for public usage. Use of this outer identity protects your login name or identity.

6 Click **ok** to return to the Security page.



To Get Certificates

Certificates are pieces of cryptographic data that guarantee a public key is associated with a private key. They contain a public key and the entity name that owns the key. Each certificate is issued by a certificate authority.

Use this page to import a certificate onto the CN2B Computer.

Root Certificates

1 Tap the <<< button next to the **Import Root Certificate** field to select the root certificate (DER-encoded .CER file) to import.

2 Click **Import Root Cert** to install the selected certificate.

User Certificate

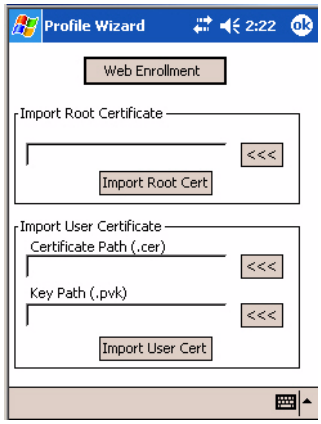
1 Tap the <<< button next to the **Certificate Path** field to select the user certificate (DER-encoded .CER file without the private key) to import.

2 Tap the <<< button next to the **Key Path** field to select the private key (.PVK file) which corresponds to the user certificate chosen in step 1.

3 Tap **Import User Cert** to install the selected certificate.

Web Enrollment

Tap **Web Enrollment** to obtain a user certificate over the network from an IAS Server. Tap **ok** to return to the Security page.



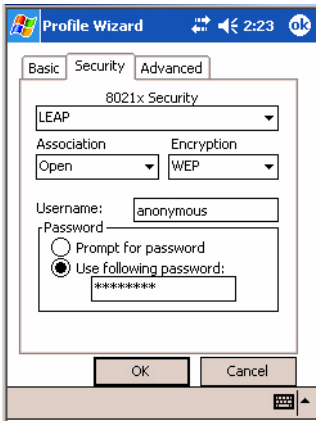
LEAP (Cisco Lightweight EAP)

LEAP is the Cisco Lightweight version of EAP. See page 196 for information about EAP.

Use "LEAP" to configure the use of LEAP as an authentication protocol, select "Open," "WPA," or "Network EAP" as an association mode, or assign Network EAP. *Note that this defaults to the Network EAP.*

To Enable LEAP with an Open Association

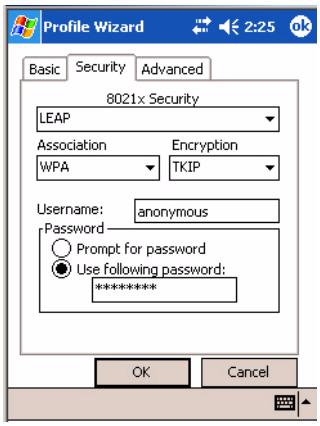
1. Set **8021x Security** as "LEAP" and **Association** to "Open."
2. Enter your unique **User Name** to use this protocol.
3. Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.



To Enable LEAP with WPA Encryption

1. Set **8021x Security** as "LEAP" and **Association** to "WPA" (page 197).
2. Enter your unique **User Name** to use this protocol.

3 Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

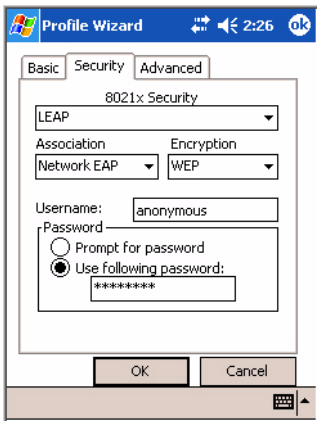


To Enable LEAP with Network EAP

1 Set **8021x Security** as "LEAP," **Association** to "Network EAP" (page 196) and **Encryption** to either "WEP" (page 197) or "CKIP" (page 196).

2 Enter your unique **User Name** to use this protocol.

3 Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.



EAP-FAST (EAP-Flexible Authentication via Secured Tunnel)

The EAP-FAST protocol is a client-server security architecture that encrypts EAP transactions with a TLS tunnel. While similar to PEAP, it differs significantly as EAP-FAST tunnel establishment is based on strong secrets unique to users. These secrets are called Protected Access Credentials (PACs), which CiscoSecure ACS generates using a master key known only to CiscoSecure ACS. Because handshakes based upon shared secrets are intrinsically faster than handshakes based upon PKI, EAP-FAST is the significantly faster of the two solutions that provide encrypted EAP transactions. No certificate management is required to implement EAP-FAST.

Use "EAP-FAST" to configure the use of EAP-FAST as an authentication protocol, select "Open," "WPA," "Network EAP" as an association mode.

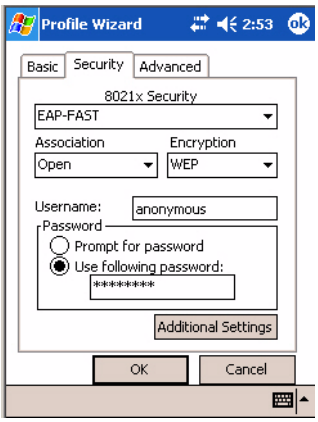
To Enable EAP-FAST with an Open Association

1 Set **8021x Security** as "EAP-FAST" and **Association** to "Open."

2 Enter your unique **User Name** to use this protocol.

3 Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

4 Tap **Additional Settings** to set options for PAC management and assign an anonymous EAP-FAST name (page 212).



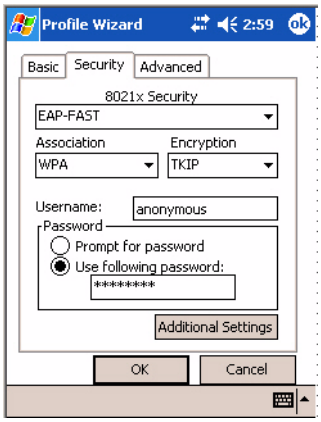
To Enable EAP-FAST with WPA Encryption

1 Set **8021x Security** as "EAP-FAST" and **Association** to "WPA" (page 197).

2 Enter your unique **User Name** to use this protocol.

3 Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

4 Tap **Additional Settings** to set options for PAC management and assign an anonymous EAP-FAST name (page 212).



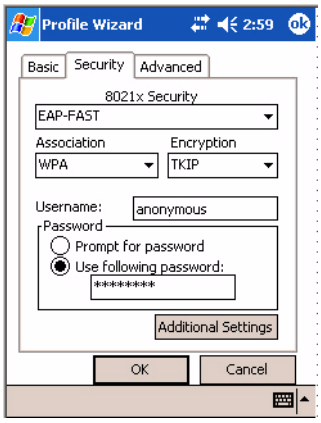
To Enable EAP-FAST with WPA Encryption

1 Set **8021x Security** as "EAP-FAST" and **Association** to "WPA2" (page 197).

2 Enter your unique **User Name** to use this protocol.

3 Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

4 Tap **Additional Settings** to set options for PAC management and assign an anonymous EAP-FAST name (page 212).



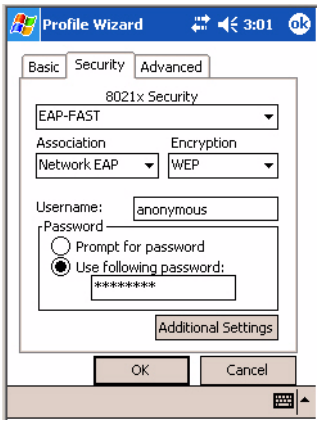
To Enable EAP-FAST with Network EAP

1 Set **8021x Security** as "EAP-FAST," **Association** to "Network EAP" (page 196), and **Encryption** to either "WEP" (page 197) or "CKIP" (page 196).

2 Enter your unique **User Name** to use this protocol.

3 Select **Prompt for password** to have the user enter this password each time to access the protocol, or leave **Use following password** as selected to automatically use the protocol without entering a password.

4 Tap **Additional Settings** to set options for PAC management and assign an anonymous EAP-FAST name. See below for more information.



Additional Settings

1 Tap **PAC Manager** to view the PAC files currently installed on your CN2B Computer. Tap **ok** to return to the Additional Settings screen.

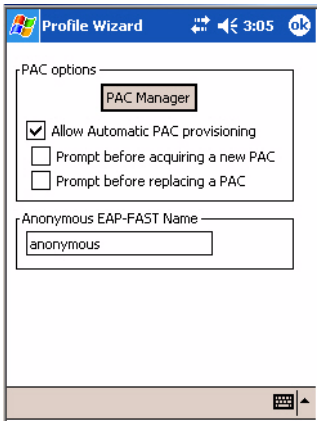
2 If you already have a PAC on your CN2B Computer, clear **Allow Automatic PAC provisioning** to avoid receiving additional PACs from the server.

3 If **Allow Automatic PAC provisioning** is checked, you can check:

- **Prompt before acquiring a new PAC** for notification of any incoming PACs.
- **Prompt before replacing a PAC** for notification whether to replace a current PAC with an incoming PAC.

4 Enter the **Anonymous EAP-FAST Name** as assigned for public usage. This outer identity protects your login name or identity.

5 Click **ok** to return to the Security page.



Advanced

Use this page to configure additional settings for this profile. Tap **ok** to return to the Profiles page.

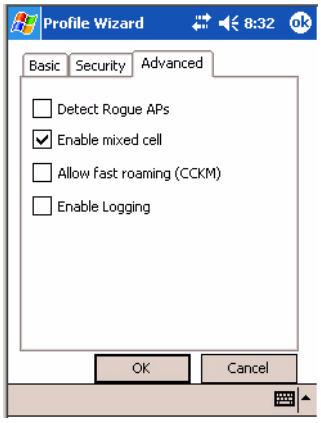
- **Detect Rogue APs** (Access Points):
  Wireless NICs and access points associate based on the SSID configured for the NIC. Given an SSID, the BSSID with the strongest signal is often chosen for association. After association, 802.1x authentication may occur and during authentication credentials to uniquely identify a user — these are passed between the NIC and the access point.

  The base 802.1x technology does not protect the network from "rogue APs." These can mimic a legitimate access point to authentication protocols and user credentials. This provides illegal users ways to mimic legitimate users and steal network resources and compromise security.

  Check this box to detect and report client behavior suspected of being rogue access points. Once detected, your CN2B Computer no longer associates with that access point until you perform a warm-boot.

Clear this box to solve access point connection problems that result when an access point gets put on the rogue access point list due to inadvertant failed authentications and *not* because it is a *real* rouge.

- **Enable mixed cell**:
  Mixed cell is a profile-dependent setting. If enabled, you can connect to mixed cell without using WEP, then you can query the cell to determine whether you can use encryption.
- **Allow fast roaming (CCKM)**:
  When using a wireless LAN that uses Cisco Access Points, a LEAP-enabled client device can roam from one access point to another without involving the authentication (RADIUS) server. If enabled, Cisco Centralized Key Management (CCKM), an access point configured to provide Wireless Domain Services (WDS) takes the place of the RADIUS server (caching credentials of an initial authentication with the RADIUS server) and authenticates the client without perceptible delay in voice or other time-sensitive applications.
- **Enable Logging**:
  Check this box to log what activity incurs for this profile.



Other Configurable Parameters

Configure the following parameters by sending reader commands through the network or from an application. See next page for information.

	Description	Option
Audio Volume	Changes the volume of all audio signals.	0 - Off 1 - Very quiet 2 - Quiet 3 - Normal (default) 4 - Loud 5 - Very loud
Automatic Shutoff	Sets the length of time the CN2B Computer remains on with no activity. When you turn on the CN2B Computer, it either resumes exactly where it was when you turned it off or boots and restarts your application.	1 - 1 minute 2 - 2 minutes 3 - 3 minutes (default) 4 - 4 minutes 5 - 5 minutes
Backlight Timeout	Sets the length of time that the display backlight remains on. If you set a longer timeout value, you use the battery power at a faster rate.	10 - 10 seconds 30 - 30 seconds 60 - 1 minute (default) 120 - 2 minutes 180 - 3 minutes 240 - 4 minutes 300 - 5 minutes
Date/Time	Sets the current date and time.	Date Year - 0000–9999 *(1999)* Month - 1–12 *(6)* Day - 1–31 *(1)* Time Hour - 0–23 *(0)* Minute - 0–59 *(00)* Second - 0–59 *(00)*
Key Clicks	Enables or disables the keypad clicks. The CN2B Computer emits a click each time you press a key or decode a row of a two-dimensional symbology.	0 - Disable clicks 1 - Enable soft key clicks 2 - Enable loud key clicks (default)

Using Reader Commands

After the CN2B Computer is connected to your network, you can send the CN2B Computer a reader command from an application to perform a task, such as changing the time and date. Some reader commands temporarily override configuration settings and some change the configuration settings.

Change Configuration

The Change Configuration command must precede any configuration command. If you enter a valid string, the CN2B Computer configuration is modified and the computer emits a high beep. To send the Change Configuration command through the network, use the `$+ [command]` syntax where *command* is the two-letter command syntax for the configuration command followed by the value to be set for that command.

You can also make changes to several different commands by using the `$+ [command]...[command n]` syntax. There are seven configuration command settings that you can change in this way. *See each command for information on respective acceptable "data" values.*

	Syntax
Audio Volume	BV*data*
Automatic Shutoff	EZ*data*
Backlight Timeout	DF*data*
Key Clicks	KC*data*
Virtual Wedge Grid	AF*data*
Virtual Wedge Postamble	AE*data*
Virtual Wedge Preamble	AD*data*

Example 1

To change the Beep Volume to Off, you can send this string to the CN2B Computer through the network: `$+BV0`
where:

`$+`	Indicates Change Configuration.
`BV`	Specifies the Audio Volume parameter.
`0`	Specifies a value of Off.

Example 2

To change the Beep Volume to Very Quiet and the Virtual Wedge Grid to 123: `$+BV1AF123`:

`$+`	Indicates Change Configuration
`BV1`	Specifies Audio Volume, set to Very Quiet (1)
`AF123`	Specifies Virtual Wedge Grid, set to a value of 123.

Set Time and Date

This command sets the date and time on the CN2B Computer. The default date and time is *June 1, 1999 at 12:00 AM*.

From the network, send the following:

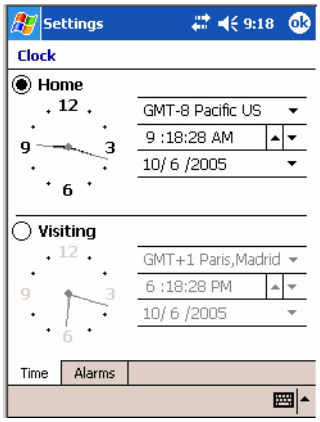
```
/+ yyyymmddhhmmss
```

where acceptable values for the date are:

`yyyy`	0000-9999	Year
`mm`	01-12	Month of the year
`dd`	01-31	Day of the month
`hh`	00-23	Hour
`mm`	00-59	Minutes
`ss`	00-59	Seconds


Clock

You can also set the time and date by using the Clock applet in the Settings menu. Tap **Start** > **Settings** > the **System** tab > the **Clock** icon.



Configuration Bar Codes

You can change some settings on your CN2B Computer by scanning the following Code 39 bar code labels.

Note: When you use a bar code creation utility to make a scannable bar code label, the utility probably adds opening and closing asterisks automatically. Asterisks are included here for translation purposes.

Audio Volume

Note: The Audio Volume parameter information is on page 214.

Turn Audio Off

$+BV0

Set Audio Volume to very quiet

$+VB1

Set Audio Volume to quiet

$+BV2

Set Audio Volume to normal *(default)*

$+BV3

Set Audio Volume to loud

$+BV4

Set Audio Volume to very loud

$+BV5

Automatic Shutoff

Note: The Automatic Shutoff parameter information is on **page 214**.

Set Automatic Shutoff to 1 minute

$+EZ1

Set Automatic Shutoff to 2 minutes

$+EZ2

Set Automatic Shutoff to 3 minutes *(default)*

$+EZ3

Set Automatic Shutoff to 4 minutes

$+EZ4

Set Automatic Shutoff to 5 minutes

$+EZ5

Backlight Timeout

Note: The Backlight Timeout parameter information is on page 214.

Backlight Timeout 10 seconds

$+DF10

Backlight Timeout 30 seconds

$+DF30

Backlight Timeout 1 minute *(default)*

$+DF60

Backlight Timeout 2 minutes

$+DF120

Backlight Timeout 3 minutes

$+DF180

Backlight Timeout 4 minutes

$+DF240

Backlight Timeout 5 minutes

$+DF300

Key Clicks

Note: The Key Clicks parameter information is on page 214.

Disable key clicks

$+KC0

Enable soft key clicks

$+KC1

Enable loud key clicks *(default)*

$+KC2

Virtual Wedge Grid, Preamble, Postamble

The following parameters are user-configurable strings. Refer to a full ASCII chart for more information.

Grid

For Virtual Wedge Grid, the first part of the bar code would be the following, which can include a string of up to 240 characters.

*$+AF

Preamble

For Virtual Wedge Preamble, the first part of the bar code would be below, followed by a string of up to 31 characters *(no <NUL>)* and an asterisk.

*$+AD

Postamble

For Virtual Wedge Postamble, the first part of the bar code would be below, followed by a string of up to 31 characters *(no <NUL>)* and an asterisk.

*$+AE

B Troubleshooting the CN2B Computer

Use this appendix to solve problems you may encounter while using the CN2B Mobile Computer.

Problems and Solutions

These tables offer solutions to the problems you may encounter.

Problems While Operating the CN2B Computer

	Solution
You press **Power** to turn on the CN2B and nothing happens.	Try these possible solutions in order: **1** Make sure the battery door is installed correctly and completely closed. **2** Make sure you have a charged battery installed correctly. **3** The battery may be discharged. Replace the battery with a spare charged battery, or charge the battery and try again. **4** Perform a warm-boot on the CN2B Computer.
You press **Power** to turn off the CN2B and nothing happens.	To turn off (or suspend) the CN2B Compuyter, hold the **Power** key for 2 or 3 seconds, then release it. If the CN2B Computer is processing data, it may not turn off when you press **Power**. Wait until the CN2B Computer finishes processing. If the CN2B Computer appears to be locked up, perform a warm-boot on the CN2B Computer. If the CN2B Computer does not respond to a warm-boot, perform a cold-boot.
The CN2B Computer is not responding to the stylus.	Press and hold the **Power** key for 2 to 3 seconds, then release it to turn off the CN2B Computer. Press **Power** again to turn on the CN2B Computer.
You place the CN2B Computer in the communications dock, and the Battery light turns on and is orange.	• The temperature may not be within the charging range. Make sure that the temperature is from 0°C to 40°C (32°F to 104°F). • The battery may be damaged. Replace the battery.
The CN2B Computer appears locked up and you cannot enter data.	Try these possible solutions in order: **1** Wait at least 10 seconds and try again. If the CN2B Computer is still connecting to the Intermec Application Server or the host, it ignores any input from the keypad or scanner. **2** Press and hold the **Power** key for 2 to 3 seconds, and then release it to turn off the CN2B Computer. Press **Power** again to turn on the CN2B Computer. **3** Perform a warm-boot on the CN2B Computer. **4** Perform a cold-boot on the CN2B Computer. **5** Try reloading the firmware. **6** If the CN2B Computer does not boot or reset, contact your local Intermec service representative for help.

Problems While Configuring Security

	Solution
The CN2B Computer does not appear to be authenticating.	The CN2B Computer may not be communicating with your access point. Make sure the network name on the CN2B Computer is the same as the network name (SSID) of the access point that you are trying to communicate with. The default network name is "INTERMEC." The 802.1x security network may not be active. Make sure that the server software is properly loaded and configured on the server PC. For help, see the documentation that shipped with your server software. The access point that you are trying to communicate with may not be communicating with the server. Make sure your access point is turned on, properly configured, and has 802.1x security enabled.
The CN2B Computer indicates that it is not authenticated.	Make sure that: • The User Name and Password parameters on your CN2B Computer match the user name and password on your authentication server. You may need to re-enter the password on both your CN2B Computer and the authentication server. • On your authentication server, the user and group are allowed and the group policy is allowed to log in to the server. For help, see the documentation for your authentication server software. • The IP address and secret key for your access point must match the IP address and secret key on your authentication server. You may need to re-enter the IP address and secret key on both your access point and authentication server. • The authentication server software is running on the server PC.
The CN2B Computer indicates that it is authenticated, but it does not communicate with the host.	Make sure that the CN2B IP address, host IP address, subnet mask, and default router are properly configured for your network.
You are setting up multiple access points in a network, with different SSIDs, and the connection fails.	The CN2B Computer does not save WEP key values when you change the SSID. Re-enter the WEP key value after you change the SSID and save your changes. You should now be able to connect to the different access points.

Problems with Wireless Connectivity

Problem	Solution
A **Network Connection** icon appears on the status bar, but the host computer is not receiving any data from the CN2B Computer.	In a UDP Plus network, there may be a problem with the connection between the Intermec Application Server and the host computer. Check with your network administrator or see the user's manual for the Intermec Application Server. In a TCP/IP network, there may be a problem with the connection between the access point and the host computer. Check with your network administrator or use your access point user's manual.
When you turn on the CN2B Computer after it was suspended for a while (10-15 minutes or longer), it can no longer send or receive messages over the network.	The CN2B Computer may not recognize the network card. Turn off the CN2B Computer, and then turn it on again. The host may have deactivated or lost your current terminal emulation session. In a TCP/IP direct connect network, you need to turn off the "Keep Alive" message (if possible) from the host so that the TCP session is maintained while a CN2B Computer is suspended.

Problems with Wireless Connectivity (continued)

Problem	Solution
The CN2B Computer is connected to the Intermec Application Server or host computer and you move to a new site to collect data. A Network Connection icon was visible but now the no network connection icon is visible.	You may have gone out of range of an access point. Try moving closer to an access point or to a different location to re-establish communications. Once you are in range again, the network connection icon appears again. Any data you collected while out of range is transmitted over the network.

The no network connection icon appears on the status bar.#	The no network connection icon appears in three situations:
	• The CN2B Computer may not have an IP address. You must configure an IP address for the CN2B Computer or make sure that DHCP assigned an address. Use Intermec Settings and select the radio tab to make sure an IP address is assigned.
	• The CN2B Computer may not be connected to the access point. Try these possible solutions in order:
	  • Make sure the access point is turned on and operating.
	  • Make sure you are not using the CN2B Computer out of range of an access point. Try moving closer to an access point to re-establish communications.
	  • Make sure the CN2B Computer is configured correctly for your network. The radio parameters on the CN2B Computer must match the values set for all access points the CN2B Computer may communicate with.
	  • If you have an 802.11b/g radio, the radio initialization process may have failed. Try resetting the CN2B Computer.
	• If you have tried these possible solutions and the no network connection icon still appears, you may have a defective radio card. For help, contact your local Intermec representative.

Problems While Scanning Bar Codes

Problem	Solution
You cannot see a red beam of light from the scanner when you press the **Scan** button or one of the **Side Scan** buttons and aim the scanner at a bar code label.	There are three possible problems: • You may be too far away from the bar code label. Try moving closer to the bar code label and scan it again. • You may be scanning the bar code label "straight on." Change the scanning angle and try again. • The PSM files may not be correctly installed. You can test the effective range of the scanner. Move within 61 cm (2 ft) of a wall and test the scanner. You need to be within the scanning range to scan bar code labels.
When you release the **Scan** button or **Side Scan** button, the Good Read light does not turn off.	The Good Read light remains on if you configure the CN2B Computer to use continuous/edge triggering. If you configure the CN2B Computer for level triggering and the Good Read light remains on, there may be a problem. Press the **Scan** button or one of the **Side Scan** buttons again without scanning a bar code label. If the light is still on, contact your local Intermec service representative.

Problems While Scanning Bar Codes (continued)

Problem	Solution
The scanner will not read the bar code label.	Make sure you aim the scanner beam so it crosses the entire bar code label in one pass. The angle you are scanning the bar code label may not be working well, or you may be scanning the label "straight on." Try scanning the bar code label again, but vary the scanning angle. The bar code label print quality may be poor or unreadable. To check the quality of the bar code label, try scanning a bar code label that you know will scan. Compare the two bar code labels to see if the bar code quality is too low. You may need to replace the label that you cannot scan. Make sure the bar code symbology you are scanning is enabled. Use Intermec Settings to check the symbologies. If your bar code symbology is disabled, enable it and then try scanning the bar code label again. ***Note:*** *If you restored the CN2B Computer to factory default settings, some of the symbologies may be disabled. Make sure that the application you are running on the computer is expecting input from a bar code. You may need to use the input panel to enter this information instead of scanning it.*
The scanner does not read the bar code labels quickly, or the scanning beam seems faint or obscured.	The scanner window may be dirty. Clean the window with a solution of ammonia and water. Wipe dry. Do not allow abrasive material to touch the window.
You scan a valid bar code label to enter data for your application. The data decoded by the CN2B Computer does not match the data encoded in the bar code label.	The computer may have decoded the bar code label in a symbology other than the label's actual symbology. Try scanning the bar code label again. Make sure you scan the entire label. To operate the computer quickly and efficiently, you should only enable the bar code symbologies that you are going to scan.

Sending the CN2B Computer to Intermec for Service

If you send the CN2B Computer in for service, it is your responsibility to save the computer data and configuration. Intermec is responsible only for ensuring that the keypad and other hardware features match the original configuration when repairing or replacing your computer.

For help understanding your warranty and finding help, see **"Global Services and Support" on page xv**.

You may be asked for the version of the operating system running on your CN2B Computer. For help finding this information, see **"Software Build Version" on page 12**.

Cleaning the Scanner Window and the Touch Screen

To keep the computer in good working order, you may need to clean the scanner window and touch screen with a solution of ammonia and water.

You can clean the scanner window and the touch screen as often as needed for the environment in which you are using the computer. You can help keep the touch screen clean by using the stylus, instead of your fingertip, to tap the screen.

There are no user-serviceable parts inside the CN2B Computer. Opening the unit voids the warranty and may cause damage to the internal components.

To clean the scanner window and touch screen

1. Press and hold the **Power** key for 2 to 3 seconds, and then release it to turn off the CN2B Computer.
2. Dip a clean towel or rag in the ammonia solution and wring out the excess. Wipe off the scanner window and touch screen. Do not allow any abrasive material to touch these surfaces.
3. Wipe dry.

To clean the scanner window

- You can use the Screen Cleaner Kit (P/N: 346-065-101) to clean the scanner window.

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CN2B Mobile Computer User's Manual

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