



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 "\SDMMC Disk" 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 the following options to get the package to the preferred location on your CN2B Computer: Microsoft ActiveSync, FTP Server (page 78), Secure Digital storage cards (page 78), or Registry (page 79).

Using Microsoft ActiveSync



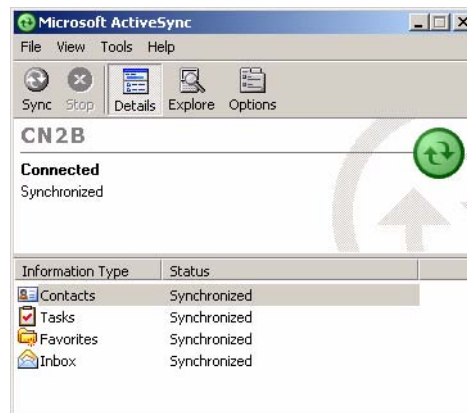
Note: These instructions assume the CN2B Management Tools were installed on your desktop.

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, InfraRed, or 802.11b/g 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 more information.

Copying a Secure Digital Storage Card

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

- 1 Suspend the CN2B Computer and remove its Secure Digital drive, which holds a Secure Digital storage card.
- 2 Using a Secure Digital Adapter card, place the Secure Digital drive in your desktop PC card drive.
- 3 Create a subdirectory on the PCMCIA Secure Digital drive in which to store your application.
- 4 Copy your application, data files, and all required DLLs and drivers to the subdirectory created on the Secure Digital drive.
- 5 Add your application to the AUTOUSER.DAT file on the “\SDMMC Disk\2577” directory with the following statement:
`RUN=\<your directory>\<yourapp.exe>`
where *your directory* is the directory on the Secure Digital storage card where the application was installed, and *yourapp.exe* is the name of your application. Finish the “RUN=” statement with a carriage return linefeed combination. There may be multiple run statements in the file.
- 6 Remove the Secure Digital card from your desktop and reinstall it into the CN2B Computer.
- 7 Warm-boot the CN2B Computer to add these files to the Secure Digital storage card.

If the AUTOUSER.DAT file is found and the “RUN=” statement is correct, the task manager launches and executes your program on startup.

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 before running the Registry Save application. Once you do, performing a warm-boot keeps 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\CabFiles” folder on the CN2B Computer, then perform a cold-boot to load this file.

Deleting the Old Registry File



File Explorer

- 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.

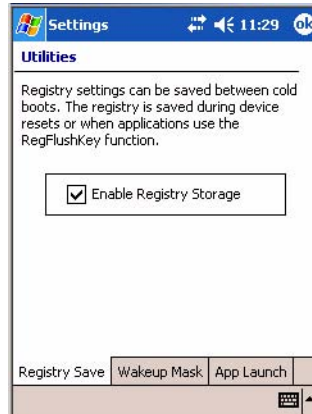


Using the RegFlush CAB File

Contact your Intermec representative about getting a copy of the REGFLUSH.CAB file.

Loading the Registry Save Application

- 1 On the CN2B Computer, tap the REGFLUSH.CAB file to load the “Registry Save” application.
- 2 Set up the CN2B Computer to your specifications using the Intermec Settings applet and other applets.
- 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**.



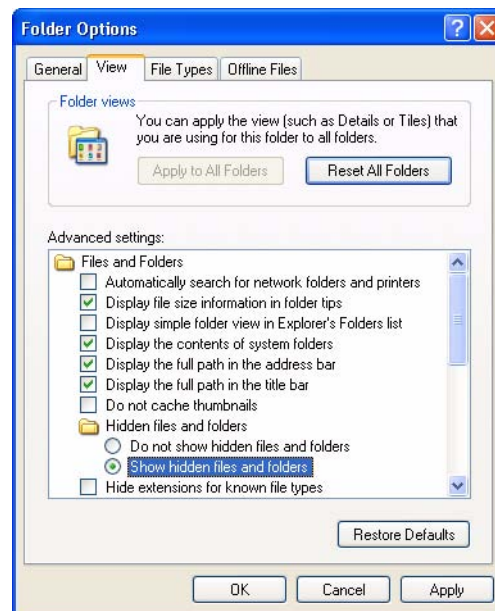
- The new registry file should be on the root of the Flash File Store folder with today's date.



Updating Other Computers in Your Network

These instructions assume you have Windows XP on your desktop.

- 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.
- On your desktop, select **Start > Settings > Control Panel**, double-click **Folder Options**, then click the **View** tab. Beneath “Hidden files and folders,” check **Show hidden files and folders**, then click **OK** to close.



- Using the Microsoft ActiveSync application on your desktop, click **Explore** to access the Flash File Store folder on your CN2B Computer and locate the “registry” file. Copy this file, then paste it in a temporary location on your desktop.

- 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 79, 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

You can use the *Intermec Recovery CD* to reinstall or update the operating system software on the CN2B Computer. For more information, contact your Intermec representative.

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 without changes. Below are a few exceptions:

- The other computer may use the “\Storage Card” folder for nonvolatile storage. You may need to change the application to store data onto the “SDMMC Disk” folder instead of the “\Storage Card” 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.
- Some WAN radio options have changed. Review the WAN radio information in Chapter 4, “Network Support” to determine if any changes are required in your application.
- Keyboard remapping is available on the CN2B Computer should you need to map these keys like that of the original computer (see page 104).
- Special Resource Kits are not needed to compile applications for the Xscale processor. Targeting the SA1110 processor creates applications that run on the CN2B Computer.

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 (page 86)
- Local Area Networks (page 92)
- Wide Area Networks (page 100)
- Remote Access (Modems) (page 101)
- Management (page 108)

Personal Area Networks

“Bluetooth” is the name given to a technology standard using short-range radio links, intended to replace the cables connecting portable and fixed electronic devices. The standard defines a uniform structure for a wide 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 also offers wireless access to LANs, the mobile phone network, and the internet for a host of home appliances and mobile computer interfaces.

Information about other Bluetooth software is in the Bluetooth Resource Kit and the *Wireless Printing Development Guide* via the Intermec Developer Library (IDL), which is available as a download from the Intermec web via www.intermec.com. Contact your Intermec representative for more information.

About the Application



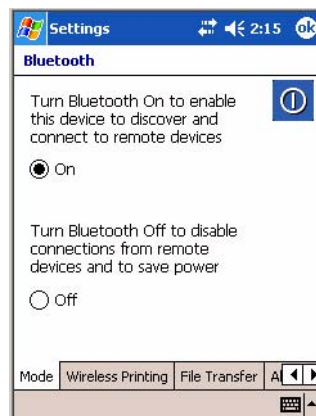
Bluetooth

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*” on the next page 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.



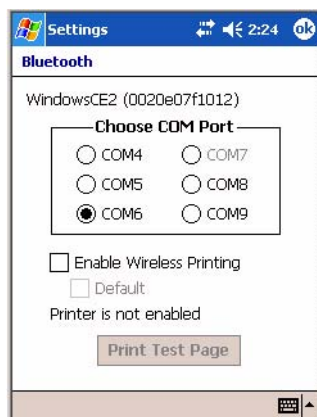
Properties

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. Check **Default** COM ports 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**.

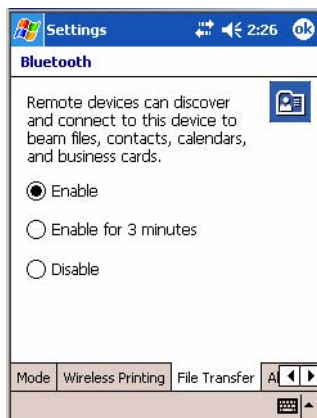
Check **Default** to set this printer to identify the assigned COM Port as the WPPort in the registry. See the *Wireless Printing Development Guide* for more details on WPPort.

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



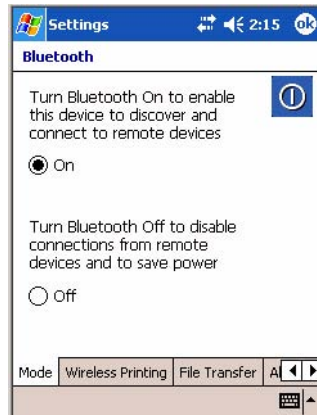
Note: While these instructions apply to many Bluetooth devices, these instructions use the Nokia 3650 for example purposes.

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

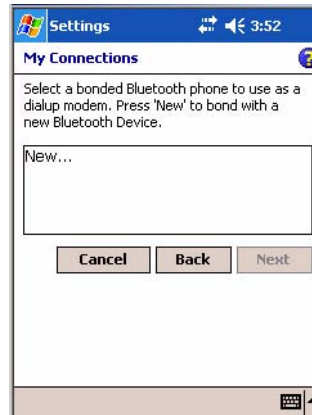
1 Tap **Start** > **Settings** > the **Connections** tab > the **Connections** icon, then tap **Add a new modem connection**.



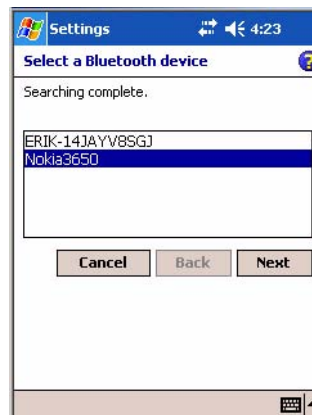
- 2 Enter a name for the connection, such as “Nokia.” In the **Select a modem** list, select “Bluetooth,” then tap **Next** to continue.



- 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.

The screenshot shows the 'Enter Device Bluetooth PIN' screen in the Settings application. The title bar says 'Settings' and the time is 4:25. The screen title is 'Enter Device Bluetooth PIN'. The text reads: 'Enter a Bluetooth PIN of your choice to bond with Nokia3650. The same PIN must be entered on both devices. Please check your device's instruction manual to learn how to answer to PIN requests.' Below this is a text input field labeled 'Device PIN:' containing four asterisks '****'. At the bottom are three buttons: 'Cancel', 'Back', and 'Next'.

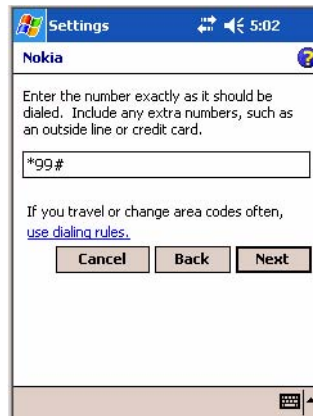
- 6 Enter a name for the device if needed, then tap **Finish**.

The screenshot shows the 'Name the Bluetooth Device' screen in the Settings application. The title bar says 'Settings' and the time is 4:54. The screen title is 'Name the Bluetooth Device'. The text reads: 'Enter a name for the bonded device.' Below this is a text input field labeled 'Name:' containing the text 'Nokia3650'. At the bottom are three buttons: 'Cancel', 'Back', and 'Finish'.

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

The screenshot shows the 'My Connections' screen in the Settings application. The title bar says 'Settings' and the time is 4:56. The screen title is 'My Connections'. The text reads: 'Select a bonded Bluetooth phone to use as a dialup modem. Press 'New' to bond with a new Bluetooth Device.' Below this is a list box containing two items: 'New...' and 'Nokia3650'. The 'Nokia3650' item is selected and highlighted in blue. At the bottom are three buttons: 'Cancel', 'Back', and 'Next'.

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

- USB communications
- 802.11b/g radio communications

Configuring USB Communications

You can place the CN2B in the modem dock (P/N: 075499) or the communications dock (P/N: 225-696-001) 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 15.

To use USB communications with your CN2B Computer

- 1 Connect the 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 communications dock.
- 4 Turn on the CN2B Computer.

Configuring 802.11b/g Radio Communications



Caution

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 195.

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 191.

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 195.

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 191.

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 system tray.

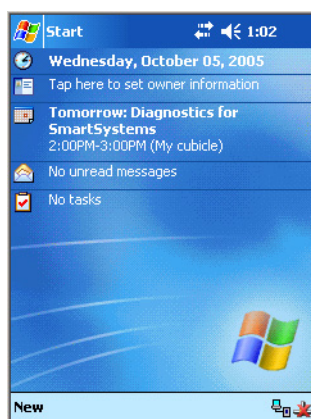
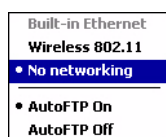


To configure wireless 802.11 communications on the CN2B Computer, tap **Start > Settings > the System tab > the Wireless Network** icon. Go to Appendix A, “Configurable Settings” for information.

No Networking



When “No networking” is selected via the NDISTRAY pop-up menu, the **disconnected** icon shown to the left appears in the system tray.



Network Selection APIs

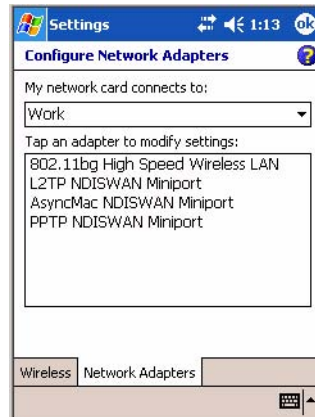
These APIs change the network adapter configuration programmatically. Both drivers support the same IOCTL function numbers for loading and unloading the drivers. Go to Chapter 7, “Programming” to see the APIs.

Network Connections



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 Technologies recommends that you use the Wireless Network applet instead as it offers more security choices and exhibit better roaming behavior. Information about the Wireless Network applet is page 194.

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.



Connections

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



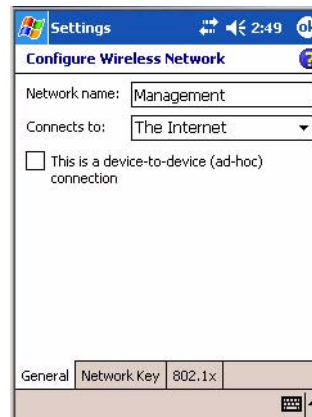
- 2 Tap the **Advanced** tab > **Network Card** > the **Wireless** tab > **Add New**.



- 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:

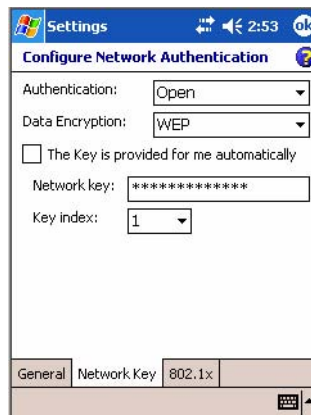
To Disable Authentication

- 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 194).

To Enable WPA Authentication

- a Set **Authentication** to “WPA.” See page 195 for information about WPA encryption.
- b Set **Data Encryption** to “WEP” or “TKIP.” See page 195 for information about WEP encryption and page 194 for TKIP encryption.

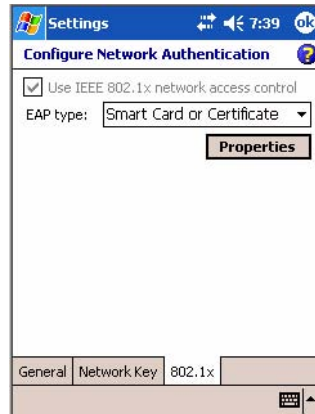


To Enable WPA Authentication Using a Preshared Key

- a Set **Authentication** to “WPA-PSK.” See page 195 for information about WPA encryption.
- b Set **Data Encryption** to “WEP” or “TKIP.” See page 195 for information about WEP encryption and page 194 for TKIP encryption.
- c Enter the new **Network key**.



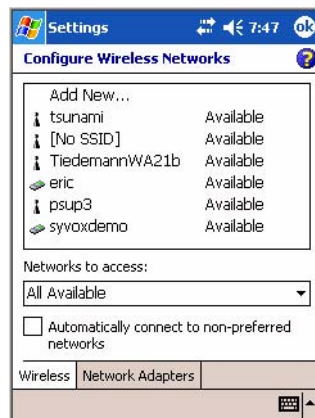
- 5 Tap the **802.1x** tab, select either “PEAP” or “Smart Card or Certificate” for the **EAP type**, then tap **Properties** to adjust its settings.



- 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 104.

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**.

Connections



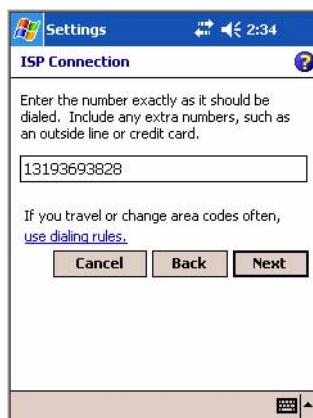
- 2 Enter a name for the connection, such as “ISP Connection.”

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.



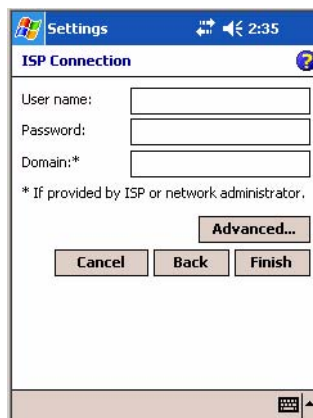
The screenshot shows the 'Settings' application with the 'Make New Connection' screen. The title bar is blue with the Windows logo, 'Settings', and a signal strength indicator. Below the title bar, the screen has a white background. The title 'Make New Connection' is in blue. Below it, there is a text input field labeled 'Enter a name for the connection:' with the text 'ISP Connection' entered. Below that is a dropdown menu labeled 'Select a modem:' with 'Hayes Compatible on COM1:' selected. At the bottom, there are three buttons: 'Cancel', 'Back', and 'Next'. A keyboard icon is visible at the bottom right of the screen.

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



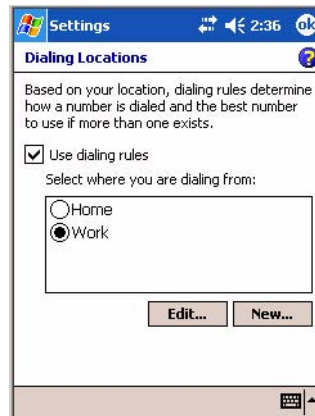
The screenshot shows the 'Settings' application with the 'ISP Connection' screen. The title bar is blue with the Windows logo, 'Settings', and a signal strength indicator. Below the title bar, the screen has a white background. The title 'ISP Connection' is in blue. Below it, there is a text input field labeled 'Enter the number exactly as it should be dialed. Include any extra numbers, such as an outside line or credit card.' with the number '13193693828' entered. Below that is a link 'If you travel or change area codes often, use dialing rules.' At the bottom, there are three buttons: 'Cancel', 'Back', and 'Next'. A keyboard icon is visible at the bottom right of the screen.

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

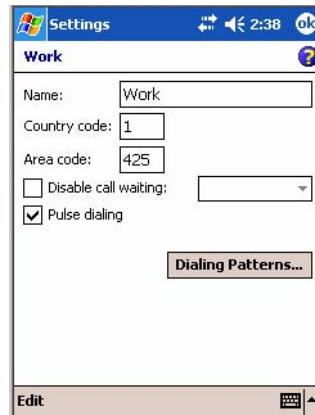


The screenshot shows the 'Settings' application with the 'ISP Connection' screen. The title bar is blue with the Windows logo, 'Settings', and a signal strength indicator. Below the title bar, the screen has a white background. The title 'ISP Connection' is in blue. Below it, there are three text input fields labeled 'User name:', 'Password:', and 'Domain:*'. Below the 'Domain:*' field is a note '* If provided by ISP or network administrator.' At the bottom, there are three buttons: 'Cancel', 'Back', and 'Finish'. A keyboard icon is visible at the bottom right of the screen.

- 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 71.
- Send and receive instant messages with MSN Messenger. For more information, see “MSN Messenger” on page 65.



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.

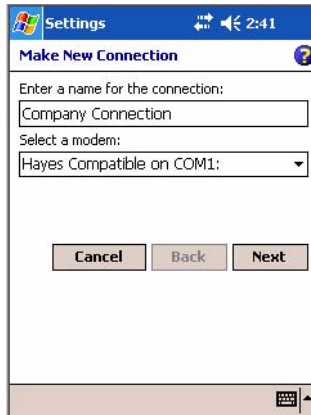


Connections

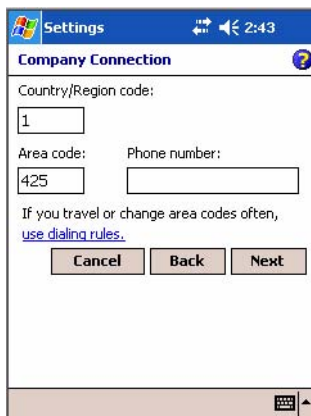
- 1 Tap **Start > Settings > the Connections tab > the Connections icon**. In My ISP, tap **Add a new modem connection**.



- 2 Enter a name for the connection, such as “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 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 your 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**.

Settings 2:44

Company Connection

User name:

Password:

Domain:*

* If provided by ISP or network administrator.

Advanced...

Cancel Back 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.



- 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.

Settings 2:31 ok

Connections

To set up or change connection information, tap one of the following links.

My ISP

[Add a new modem connection](#)

My Work Network

[Add a new modem connection](#)

[Add a new VPN server connection](#)

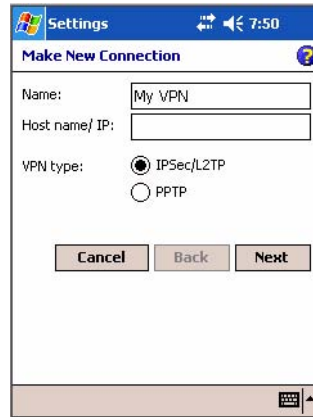
[Set up my proxy server](#)

Tasks Advanced

- 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.



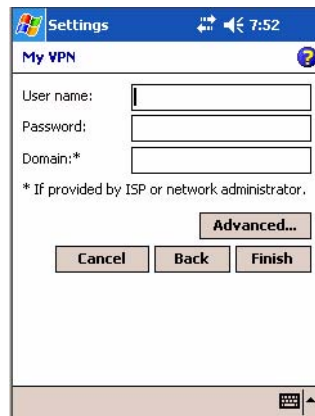
The screenshot shows the 'Settings' app with the 'Make New Connection' screen. The 'Name' field is filled with 'My VPN'. The 'Host name/ IP' field is empty. Under 'VPN type', the 'IPSec/L2TP' radio button is selected. At the bottom, there are three buttons: 'Cancel', 'Back', and 'Next'.

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



The screenshot shows the 'Settings' app with the 'My VPN' screen. Under the heading 'Authenticate IPSec/L2TP connections using:', the 'A pre-shared key' radio button is selected. Below this, there is an empty text input field. At the bottom, there are three buttons: 'Cancel', 'Back', and 'Next'.

- 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.

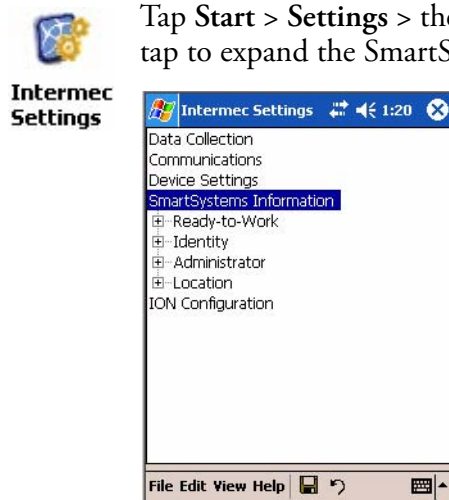
Use the Intermec Settings applet to gather, view, and update device configuration settings within the SmartSystems Foundation. Information about

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 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**, 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 Technologies provides SNMP support for MIB-II through seven read-only MIB-II (RFC1213-MIB) Object Identifiers (OIDs).



Note: You can only 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.
- **ITCTERMIAL.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 <i>ifNumber</i> = 1 and <i>ifIndex</i> = 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 <i>ifNumber</i> .
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.
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 (<i>same as CN2B IP address</i>), 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 (<i>same as ifIndex</i>).
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 (<i>same as Subnet Mask</i>).

Configuring with SNMP

The community string allows an SNMP manager to manage the CN2B Computer with a specified privilege level. The default read-only community string is “public” and “private” is the default read/write community string. See the specific configuration parameter to find its OID. To configure the CN2B Computers using SNMP:

- 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. *See Appendix A, “Configurable Settings” to learn more about these parameters.*



5 Printer Support

The CN2B Mobile Computer works with the following printers from Intermec Technologies. 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 following methods for printing using Pocket PC at this time is 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. Contact your Intermec representative for more information.
- Via wireless printing - *see the Wireless Printing Development 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 118.
- **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 any 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.



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 the methods described below, enable 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 Technologies Corporation 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. Contact your Intermec representative for more information.

Data Collection Configuration



**Intermec
Settings**

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

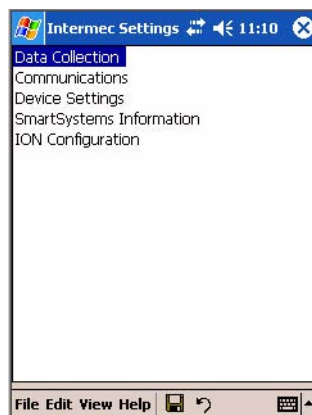
The Intermec Internal Scanner feature allows Automatic Data Collection (ADC) by accepting data from the COM1 port and wedging it into the keyboard interface. You can enable or disable this feature from the Today screen on the CN2B Computer.

Do the following before you configure your internal scanner 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.

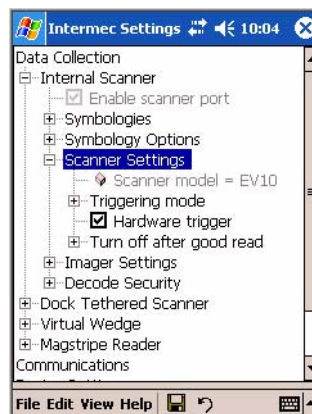


Intermec
Settings

- 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 Symbolologies

The EV10 Scanner supports these symbolologies:

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 symbolologies:

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