

Intermec



User's Manual

**CK60 Handheld
Computer with
Windows CE**

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Throughout this manual, trademarked names may be used. Rather than put a trademark (™ or ®) symbol in every occurrence of a trademarked name, we state that we are using the names only in an editorial fashion, and to the benefit of the trademark owner, with no intention of infringement.

There are U.S. and foreign patents pending.

Bluetooth is a trademark of Bluetooth SIG, Inc., U.S.A.

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Contents

Before You Begin

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

Safety Summary

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.

Do not repair or adjust alone

Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid

Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation

Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized equipment

Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Safety Icons

This section explains how to identify and understand dangers, warnings, cautions, and notes that are in this manual. You may also see icons that tell you when to follow ESD procedures and when to take special precautions for handling optical parts...



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.

Avertissement: Un avertissement vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour éviter l'occurrence de mort ou de blessures graves aux personnes manipulant l'équipement.



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.

Attention: Une précaution vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour empêcher l'endommagement ou la destruction de l'équipement, ou l'altération ou la perte de données.



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.

Services	Description	In the USA and Canada call 1-800-755-5505 and choose this option
Factory Repair and On-site Repair	Request a return authorization number for authorized service center repair, or request an on-site repair technician.	1
Technical Support	Get technical support on your Intermec product.	2
Service Contract Status	Inquire about an existing contract, renew a contract, or ask invoicing questions.	3
Schedule Site Surveys or Installations	Schedule a site survey, or request product/system installation.	4
Ordering Products	Talk to sales administration, place an order, or check the status of your order.	5

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

Who Should Read this Manual

This manual provides information on CK60 features, and how to install, configure, operate, maintain, and troubleshoot the CK60 Computer.

Related Documents

This table contains a list of related Intermec documents and part numbers. The Intermec web site at www.intermec.com contains our documents that you can download in PDF format. To order printed versions of the Intermec manuals, contact your local Intermec representative or distributor.

Document Title	Part Number
<i>CK60 Handheld Computer Quick Start Guide</i>	962-054-115
<i>Intermec Computer Command Reference Manual</i>	073529
<i>TE 2000 VT/ANSI Terminal Emulation Programmer's Guide</i>	977-055-005
<i>TE 2000 5250 Terminal Emulation Programmer's Guide</i>	977-055-004
<i>TE 2000 3270 Terminal Emulation Programmer's Guide</i>	977-055-003

Patent Information

This product is protected by one or more of the following patents: 4,882,476; 4,894,523; 4,953,113; 4,961,043; 4,970,379; 4,988,852; 5,019,699; 5,021,642; 5,038,024; 5,081,343; 5,095,197; 5,144,119; 5,144,121; 5,182,441; 5,187,355; 5,187,356; 5,195,183; 5,195,183; 5,195,183; 5,216,233; 5,216,550; 5,218,191; 5,227,614; 5,233,172; 5,241,488; 5,243,602; 5,258,606; 5,278,487; 5,288,985; 5,308,966; 5,322,991; 5,331,136; 5,331,580; 5,342,210; 5,349,678; 5,359,185; 5,371,858; 5,373,478; 5,389,770; 5,397,885; 5,410,141; 5,414,251; 5,416,463; 5,442,167; 5,464,972; 5,468,947; 5,468,950; 5,477,044; 5,486,689; 5,488,575; 5,500,516; 5,502,297; 5,504,367; 5,508,599; 5,514,858; 5,530,619; 5,534,684; 5,536,924; 5,539,191; 5,541,419; 5,548,108; 5,550,362; 5,550,364; 5,565,669; 5,567,925; 5,568,645; 5,572,007; 5,576,529; 5,592,512; 5,594,230; 5,598,007; 5,608,578; 5,616,909; 5,619,027; 5,627,360; 5,640,001; 5,657,317; 5,659,431; 5,671,436; 5,672,860; 5,684,290; 5,719,678; 5,729,003; 5,742,041; 5,761,219; 5,764,798; 5,777,308; 5,777,309; 5,777,310; 5,786,583; 5,793,604; 5,798,509; 5,798,513; 5,804,805; 5,805,807; 5,811,776; 5,811,777; 5,818,027; 5,821,523; 5,828,052; 5,831,819; 5,834,749; 5,834,753; 5,837,987; 5,841,121; 5,842,070; 5,844,222; 5,854,478; 5,862,267; 5,869,840; 5,873,070; 5,877,486; 5,878,395; 5,883,492; 5,883,493; 5,886,338; 5,889,386; 5,895,906; 5,898,162; 5,902,987; 5,902,988; 5,912,452; 5,923,022; 5,936,224; 5,949,056; 5,969,321; 5,969,326; 5,969,328; 5,979,768; 5,986,435; 5,987,192; 5,992,750; 6,003,775; 6,012,640; 6,016,960; 6,018,597; 6,024,289; 6,034,379; 6,036,093; 6,039,252; 6,064,763; 6,075,340; 6,095,422; 6,097,839; 6,102,289; 6,102,295; 6,109,528; 6,119,941; 6,128,414; 6,138,915; 6,149,061; 6,149,063; 6,152,370; 6,155,490; 6,158,661; 6,164,542; 6,164,545; 6,173,893; 6,195,053; 6,234,393; 6,234,395; 6,244,512; 6,249,008; 6,328,214; 6,330,975; 6,345,765; 6,356,949; 6,367,699; 6,375,075; 6,375,076; 6,431,451; 6,435,411; 6,484,944; 6,488,209; 6,497,368; 6,532,152; 6,538,413; 6,539,422; 6,621,942; 6,641,046; 6,681,994; 6,687,403; 6,688,523; 6,732,930; Des. 417445

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

1 Using the CK60 Handheld Computer

This chapter introduces the CK60 Handheld Computer, developed by Intermec Technologies Corporation to enhance wireless connectivity needs and contains hardware and software configuration information to assist you in making the most out of your CK60 Computer.

- Learning Software Build Versions (page 3)
- Resetting Your CK60 Computer (page 3)
- Scanning Bar Codes (page 4)
- Using the Ambient Light Sensor (page 5)
- Using the Battery (page 6)
- Using the Keypad (page 8)
- Using the Screen (page 12)
- Using the Speakers (page 13)
- Using the Status Lights (page 14)
- Using the Secure Digital Card (page 15)

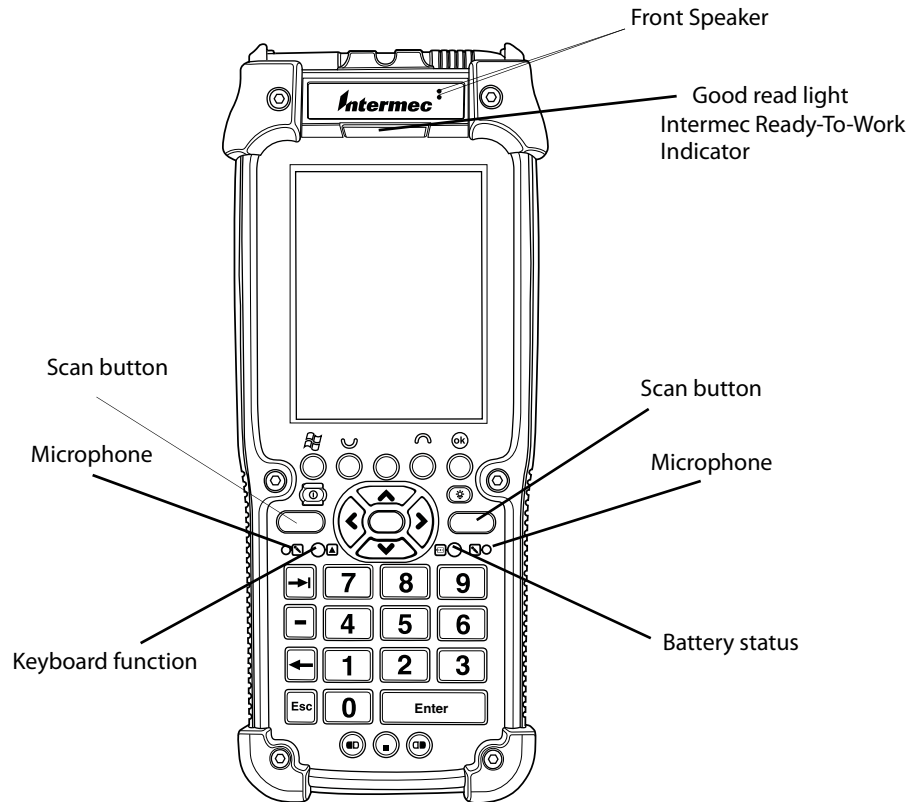


Note: Desktop icons and control panel applet icons are shown to the left. Any place that **Start** is mentioned, tap the following Windows icon in the bottom, left corner of your CK60 desktop.



Introducing the CK60 Handheld Computer

The Intermec CK60 Handheld Computer is an ergonomically designed handheld computer built on the Microsoft® Windows® CE operating system. It is a lightweight, easy-to-use, reliable computer that runs client/server applications, terminal emulation applications, as well as browser-based applications.



The CK60 Computer is available with the following:

- Ethernet
- 802.11b/g radio
- Bluetooth - *Bluetooth is a trademark owned by Bluetooth SIG, Inc., USA
- 64MB or 128MB RAM/64MB Flash Memory
- Disk on Chip (128MB)
- 2D Area Imager
- EV10 Imager

Use this manual to understand how to use the features and options available on the CK60 Computer.



™ CK60 Computers with an IEEE 802.11b/g radio installed are Wi-Fi® certified for interoperability with other 802.11b/g wireless LAN devices.

Learning Software Build Versions

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, 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.



To check to see if your CK60 Computer has the latest PSM build or the latest operating system build, double-tap the **Internet Explorer** icon from the desktop, then scroll down for the latest information displayed beneath the **CK60 Version Information** title.



Resetting Your CK60 Computer

You seldom need to perform a warm-boot or a cold-boot on the CK60 Computer. The CK60 Computer currently uses the configuration currently saved in flash memory during the boot process.

In some cases where the CK60 Computer completely stops responding, an application is locked up and does not respond, when you upgrade the firm-ware, or when you reflash the CK60 Computer, it may be necessary to perform either a warm-boot or a cold-boot.

Performing a Warm-Boot on the CK60 Computer

If your charged CK60 Computer does not resume after pressing $\frac{1}{6}$, or if the computer or an application is locked up, you may need to do a warm-boot.

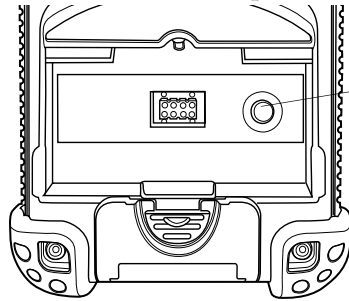
- Press and hold $\frac{1}{6}$ for ten seconds. The CK60 Computer tells you it is performing a warm-boot, then comes back up to the start screen.

Performing a Cold-Boot on the CK60 Computer

If the CK60 Computer or an application is locked up and does not respond to a warm-boot, do the following.

- 1 Release the lower clip of the hand strap.

- 2 Remove the battery pack.
- 3 Press the reset button (*shown in the following illustration*).
- 4 Reinstall the battery pack.



Press this reset button with your stylus. **Do not use force or a sharp object when pressing the reset button. You may damage the reset button.**

Scanning Bar Codes



Warning

Do not look directly into the window area or at a reflection of the laser beam while the laser is scanning. Long-term exposure to the laser beam can damage your vision.

Avertissement: Ne regardez pas directement la réflexion d'un rayon laser ou dans la fenêtre du laser lorsque celui-ci est en opération. Si vous regardez trop longtemps un rayon laser, cela peut endommager votre vue.

Use the scanner to scan and enter bar code data. The type of scanner you are using and the type of bar code you are decoding determines the way you scan the bar code. The CK60 Computer supports the scanning of 2D images. Plus, if you are using an integrated handle or a tethered scanner, the way you scan bar codes is different.

When you unpack the CK60 Computer, these bar code symbologies are enabled:

- Code39
- UPC/EAN
- PDF417 (if supported)

If you are using bar code labels that are encoded in a different symbology, you need to enable the symbology on the computer.

Scanning with the 2D Area Imager

The CK60 Computer has the 2D area imager, which provides the ability to scan 2D bar code symbologies and supports omni-directional (360°) scanning where you can position the CK60 Computer in any orientation to scan a bar code label. Using the 2D area imager is very similar to taking a picture with a digital camera.

To scan a bar code label with the 2D area imager

- 1 Press $\frac{1}{2}$ to turn on the CK60 Computer.
- 2 Point the scanner window at the bar code label and hold the CK60 Computer steady a few inches from the label.
- 3 Press the **Scan** button on the keypad or pull the trigger on a handle and center the red aiming beam over the bar code label.

The aiming beam is smaller when the imager is closer to the bar code and larger when it is further away.

When the CK60 Computer successfully reads a bar code label, you hear a high beep and the green **Good Read** light turns on briefly.

- 4 Release the **Scan** button.

Supported Devices

The CK60 Computer should connect the following scanner models: 1551, 1553, 1555; ScanPlus 1800SR, 1800ST, 1800VT; Scan Image 1470; SR1 and SG1, SF51. There are a number of different scan engines covered by these models, including RFID and XLR scan engines. Model 1555 and Scan Image 1470 are supported as input devices only; configuration of these models are accomplished by scanning labels.

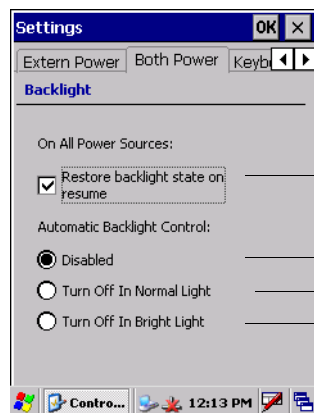
Using the Ambient Light Sensor

The ambient light sensor automatically turns off the display lighting as surrounding light increases to conserve your CK60 Computer battery power.



Backlight

As configured from the factory, the ambient light sensor is disabled. To enable the ambient light sensor and change its settings, tap **Start > Settings > Control Panel**. Double-tap the **Backlight** icon, then tap the right arrow to scroll to and tap the **Both Power** tab. Make your selections, then tap **OK** to exit this applet.



— This assumes the backlight setting once the CK60 Computer is powered on.

— This turns off the ambient light sensor.

— With this, the backlight is disabled in normal environments.

— With this, the backlight is disabled in bright environments.

Using the Battery

The CK60 Computer uses a 17.3 Watt-hour, 7.2V, replaceable Lithium-Ion (LiIon) battery. You must fully charge the main battery before you can use the CK60 Computer. When you change the battery, a backup battery (super capacity) maintains your status, memory, and real-time clock for at least 10 minutes.



Warning

The LiIon battery pack 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.

Avertissement: Le paquet de piles d'ions de lithium qui est utilisé dans cet appareil peut présenter un risque feu ou un risque chimique de brûlure s'il est maltraité. Il ne faut pas le désassembler, le réchauffer à une température plus élevée que 100°C (212°F) ou l'incinérer.



Caution

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

Attention: Si la batterie n'est pas remplacée immédiatement, des données ou applications importantes risquent d'être perdues.

Dispose of used battery packs promptly. Keep away from children. Contact your Intermec representative for replacement batteries.

Several factors determine the life of your battery such as extreme temperatures, input devices, and your usage. For example, if you use a tethered scanner every day, you need to replace your battery more often than someone who uses an internal scanner.

The CK60 Computer contains an internal super capacitor, a temporary power storage device, that protects state for up to ten minutes. This is to give you time to replace the main battery pack before state is lost. *Be sure to put the computer in a suspend mode before doing so.*

You can configure the battery power fail level 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 ten minutes at room temperature if the main battery remains in the handheld computer, using the Power control panel applet (see page 8). The state and time are lost if:

- The battery discharges beyond this level.
- The battery is removed when the computer is *not in suspend mode*.

Changing and Installing the Battery

Make sure you fully charge the LiIon battery before you install it in your CK60 Computer; and that you take at least 20 minutes to initially charge the backup battery before the backup system is fully functional.

To charge the battery

Either insert the battery into the CK60 Quad Battery Charger or place the CK60 Computer with battery installed in a CK60 Single Dock, a CK60 Single Dock with modem, or a CK60 Multidock. The battery charge time is four hours or less on any of these docks if the temperature is within the battery charging range.

You could also use a CK60 Power Adapter to keep the CK60 Computer on full power.

For maximum efficiency, store your CK60 Computer on external power with which to charge your batteries.

For more information on these accessories, see “Accessories for the CK60 Computer” on page 17.

To install the battery, insert the tabs on the bottom of the charged battery into the CK60 Computer and snap the battery into place.

Maximizing Battery Life

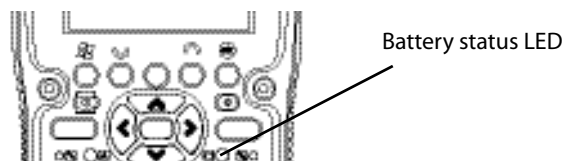
Below are things that you can do to maximize the life of your battery.

Maximizing the Life of Your Battery

When You Want To:	Do This to Save Battery Power:
Operate the CK60 Computer and the Low Battery status icon appears or the Battery light comes on.	<ol style="list-style-type: none"> 1 Press $\%0$ to turn off the CK60 Computer. 2 Remove the battery and insert another fully charged battery as quickly as possible or you may lose state. Or, you can insert the CK60 Computer into a powered quad battery pack charger.
Stop using the CK60 Computer for five minutes or longer.	<ol style="list-style-type: none"> 1 Make sure the low battery icon is not on the screen and that the Battery light is not turned on. 2 Press $\%0$ to turn off the CK60 Computer.
Store the CK60 Computer for more than a day.	<ol style="list-style-type: none"> 1 Save your state and end your computer session. 2 Press $\%0$ to turn off the CK60 Computer. 3 Insert a fully charged battery.

Checking the Battery Status

The battery status LED above your CK60 keypad, as shown in the following illustration, indicates the status of your battery. See the table on the next page to understand the meanings of the lights emitted from the LED.

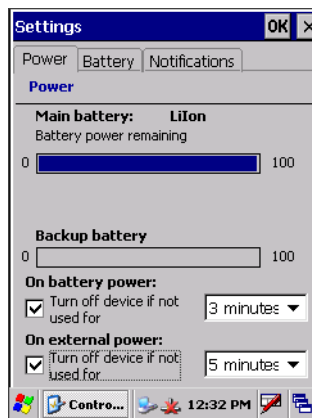


Steady Green	Battery is more than 95% charged and unit is on a charger.
Blinking Red	Battery is low.
Steady Red	Main battery is low, or if charging, remains red until your CK60 Computer reaches 95% charge status.
Steady Yellow	Your CK60 Computer is on a charging source and there is no battery pack installed. Can also mean that your CK60 Computer is out of charging range 32° to 122°F (0° to 50°C). Once your CK60 Computer gets back in range, charging resumes and the LED changes to red or green.
Steady Amber	Replace the battery pack.



Power

You can also use the Power control panel applet to view the status of this battery. Tap **Start > Settings > Control Panel**. Double-tap the **Power** icon, then tap the **Power** tab. Tap **OK** to exit this applet.



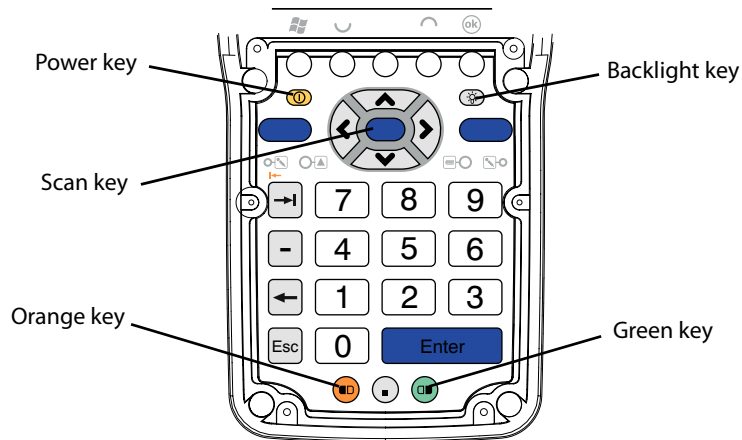
Using the Keypad

Your CK60 Computer has one of the following keypad overlay options:

- 32-key DSD large numeric
- 45-key full alphanumeric
- 58-key full alphanumeric

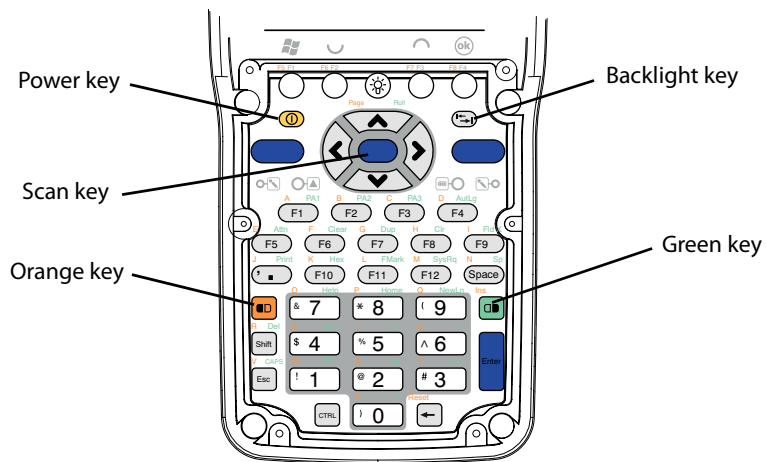
32-Key Large Numeric Keypad

The 32-key keypad is for applications that enter mainly numerical data (0-9). This keypad also lets you enter special characters by pressing color-coded key sequences.



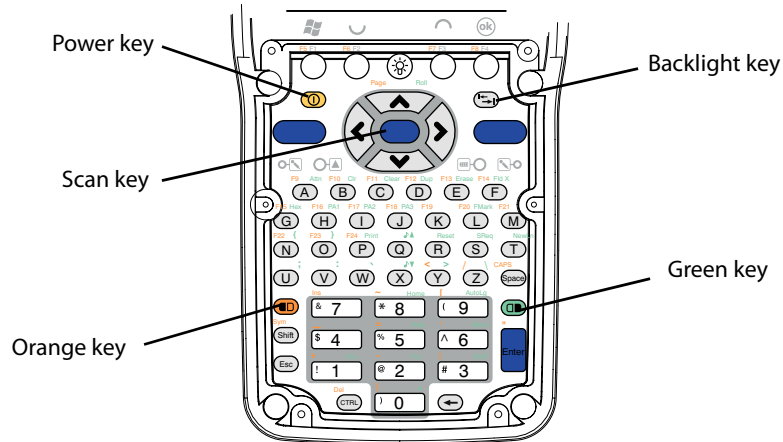
45-Key Full Alphanumeric Keypad

This keypad is for applications that enter mainly numerical data (0-9) and that may need to enter the entire alphabet. This keypad also provides shifted function keys (F1-F12) and special characters, symbols, and functions by pressing color-coded key sequences.





58-Key Full Alphanumeric Keypad

This keypad is for applications that enter mainly numeric data (0-9) and that may need to enter the entire alphabet. This keypad also provides shift function keys (F1-F24) and special characters, symbols, and functions by pressing color-coded key sequences.












Using the Color-Coded Keys

Each keypad available for the CK60 Computer provides color-coded keys to let you access additional characters, symbols, and functions printed on the keypad overlay. Once you understand how to use the color-coded keys and key sequences, you will know how to access all of the additional features printed on the keypad overlay. There are two color-coded modifier keys on the CK60 Computer: the orange  key and the green  key.

You press and release the first key, then press and release the second key to access the color-coded character or function printed above a key. Note that there are several hidden characters (such as < or >) on each CK60 keypad that require using the color-coded keys to access them.



Using the Color-Coded Keys

You Want To:	Press:	Example
Use an orange character or function printed above a key.	 key, then the key with the character or function printed above it.	Press  , then F7 to type the M character on the 45-key keypad.
Use a green character or function printed above a key.	 key, then the key with the character or function printed above it.	Press  , then Y to print the greater than symbol (>) on the 58-key keypad.
Lock the orange, green, Ctl, Alt, or Shift key to stay on.	 ,  , Ctl, A.t, or Shift key twice.	Press  twice and the applicable icon appears in the status bar with a padlock.
Unlock a green, orange, Ctl, Alt, or Shift key.	 ,  , Ctl, Alt, or Shift key once.	

Capitalizing All Characters


To type all alphanumeric characters as uppercase letters, you can enable the Caps Lock feature on the CK60 keypad.

To enable Caps Lock, press the applicable sequence:


- On the 45-key keypad, press the  key, then the Esc key.
- On the 58-key keypad, press the  key, then the Space key.


To disable Caps Lock, press the same key sequence you used to enable it.

Typing Alphabetical Characters on the 45-Key Keypad


On the 45-key keypad, press the orange  key, then the applicable key to enter letters of the alphabet when necessary.

Using the Power (⏻) Key

When you press the  key to turn off the CK60 Computer, you actually put the CK60 Computer in Suspend mode. In Suspend mode, the CK60 Computer continues to supply power to all memory, but turns off power to most hardware. This power-saving feature is to prolong battery life.

When you press the  key to turn the CK60 Computer back on, your computer resumes where it was when you turned it off.

If you are using WPA or 802.1x security, the computer may need to reauthenticate before it starts your application.

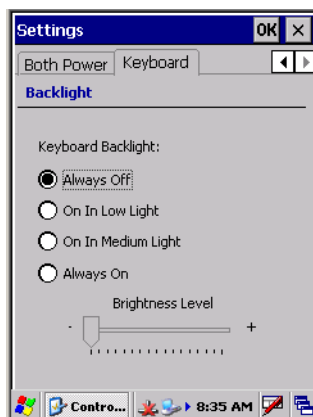
If the Battery light flashes and the CK60 does not resume after pressing , your battery may be too low to supply power. Replace the battery.

Turning on the Keypad Backlight



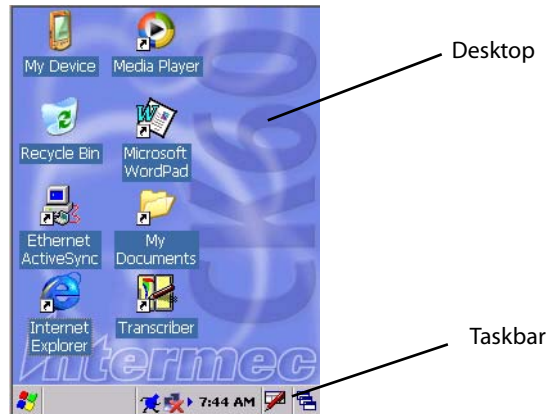
Backlight

You can configure your keypad to turn on a backlight to assist you when you are working in low lighting. To adjust the backlight for the keypad, tap **Start > Settings > Control Panel**, then double-tap the **Backlight** icon. Tap the right arrow to move to and tap the **Keyboard** tab. Make your selection, then tap **OK** to exit this applet.



Using the Screen

The CK60 Computer has a 3.8” diagonal, 240x320 pixel (QVGA) trans-reflective TFT-LCD 64K color display. The screens support Unicode characters, user-programmable fonts, and bitmap graphics. The Start screen has two distinct areas: the desktop and the taskbar. The desktop displays shortcuts to some of the applications installed on the CK60 Computer. The taskbar displays the Start menu, the time, the onscreen keyboard icon, and the desktop icon.

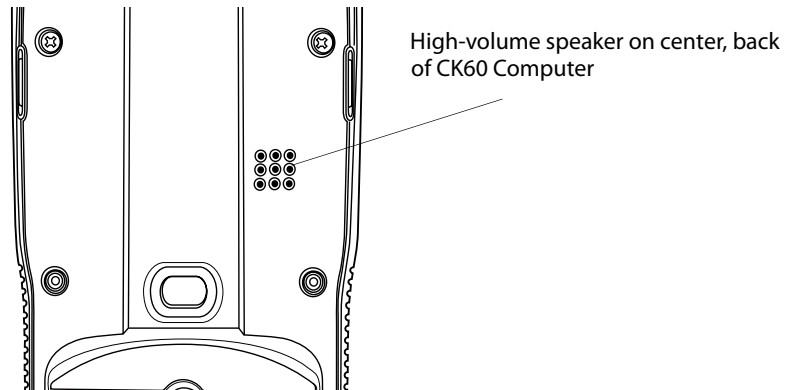


Your CK60 Computer has a stylus for selecting items and entering information. Use the stylus in place of a mouse.

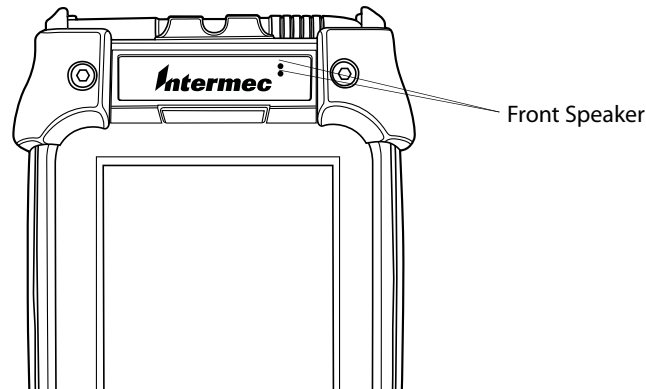
Tap	Touch the screen once with the stylus to select options, close applications, or launch menus from the taskbar.
Double-tap	Touch the screen twice with the stylus to launch applications.
Drag	Hold the stylus on the screen and drag across the screen to select text and images.
Tap and hold	Tap and hold the stylus on an icon to see a list of actions available for the item. On the pop-up menu that appears, tap the action you want to perform.

Using the Speakers

The high-volume speaker on the back of the CK60 Computer, is capable of variable volume levels. This speaker is capable of reproducing voice and WAV files, and is used primarily to convey status tones. There is a separate volume control in the Volume & Sounds control panel applet. Information on this applet is below and on the next page.



The front speaker is a full-voice range speaker of cell-phone quality with a separate volume control. See the next page for information about this 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.

Enabling the Speaker and Adjusting the Volume

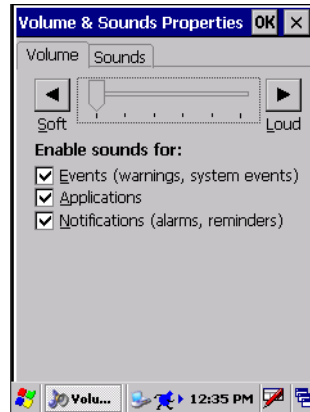


Volume & Sounds

To enable the speaker and adjust the volume:

- 1 Tap **Start** > **Settings** > **Control Panel**. Double-tap the **Volume & Sounds** icon, then tap the **Volume** tab.
- 2 Drag the slider bar to the right to the “Soft” position.

- 3 Tap OK to exit this applet.

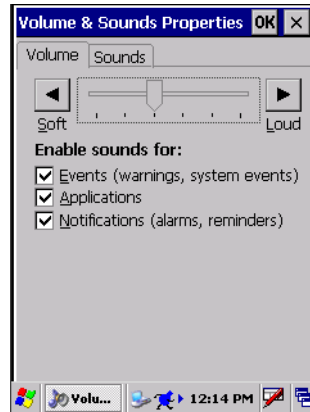


Disabling the Speaker



To disable the speaker:

- 1 Tap Start > Settings > Control Panel. Double-tap the Volume & Sounds icon, then tap the Volume tab.
- 2 Tap the Soft button to drag the slider all the way to the left.
- 3 Tap OK to exit this applet.



Using the Status Lights

The status lights on the CK60 Computer turn on to indicate the status of the battery or a successful decode of a bar code.

The battery lights and the battery screen icon work with each other to alert you to the status of your battery. If the battery light (to the right of the Scan button) comes on, check the status bar to see which battery icon appears on it. The battery may be critically low and need replacing.

The Good Read light (green) above the display indicates when the CK60 Computer successfully decodes a bar code.

Using the Secure Digital Card



Note: MultiMediaCards (MMCs) and CompactFlash (CF) storage cards are not supported in the CK60 Computer.

You can use a Secure Digital (SD) card to increase file storage and install software. The CK60 Computer currently supports SanDisk SD cards only. The SD card slot is located on the top of the CK60 Computer just above the scanner window.

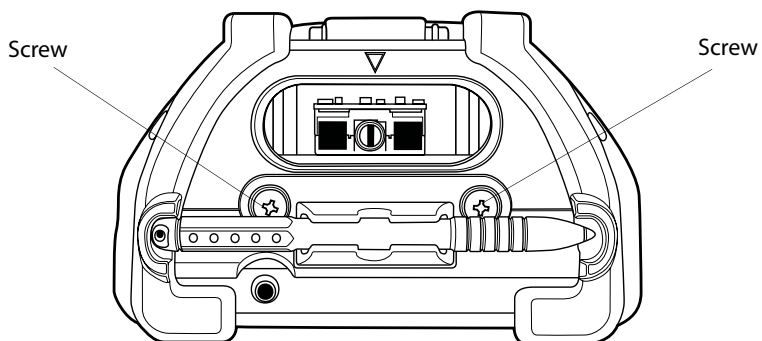


Warning

Warning: You can corrupt your SD card if you do not follow these installation and removal procedures exactly.

To insert an SD card:

- 1 Press $\frac{1}{6}$ to turn off the CK60 Computer.
- 2 Remove the two screws on the SD card slot door and remove the door (*see illustration on the next page*). Note that the screws to this door are to be torqued to 1.5 in-lbs.
- 3 Gently insert the SD card into the CK60 Computer with the printed side facing the keypad and screen side of the CK60 Computer.
- 4 Push the card into the slot until it latches in place and the steel card retainer covers the end of the SD card.
- 5 To replace the door, insert the door catch into the slot above the steel card retainer.
- 6 Replace the two screws.
- 7 Press $\frac{1}{6}$ to turn on the CK60 Computer.



To remove the SD card:

- 1 Press $\frac{1}{6}$ to turn off the CK60 Computer.
- 2 Remove the two screws on the SD card slot door and remove the door. *Note that the screws to this door are to be torqued to 1.5 in-lbs.*

- 3 Push in on the SD card until you hear it unlatch. The card should eject far enough that you can easily remove it from the CK60 Computer.

If the card does not eject easily, you can use the door catch to remove it by turn the door upside down and using the catch to pull out the SD card.

- 4 Remove the SD card from the CK60 Computer.



Warning: Before installing an SD card, inspect the gasket on the door for any damage or wear, and replace the door if any damage or wear is found.

Physical and Environmental Specifications

Use this section to locate technical information about the CK60 Computer and its available features and options.

Physical Dimensions

Length:	22.5 cm (8.87 in)
Width:	9.3 cm (3.68 in)
Depth:	5.0 cm (1.98 in) with standard case
Weight:	563 g to 852 g depending on configuration (23 oz to 30 oz)

Power Specifications

Operating:	Rechargeable 17.6 W LiIon battery pack
Backup:	Super Capacity supplies 10 minutes bridge time while replacing the main battery

Electrical Specifications

Model:	CK60
External Charge Power:	11 to 28 VDC @ 1.5 A max. (18 W max.)

Temperature and Humidity Specifications

Operating temperature:	-20° to 50°C (-4° to 122°F)
Operating humidity:	95% noncondensing
Storage temperature:	-20° to 50°C (-4° to 122°F)
Storage humidity:	95% relative humidity, noncondensing

Screen Specifications

- 240x320 pixels
- 9.7 cm (3.8 in) diagonal active area
- 5-level LED backlight control with high and low settings

Keypad Options

32-key DSD large numeric keypad

45-key large alphanumeric keypad

58-key alphanumeric keypad

Bar Code Symbolologies

Codabar, Codablock A, Codablock F, Code 11, Code 2 of 5, Code 39, Code 93, Code 128, Interleaved 2 of 5, Matrix 2 of 5, Micro PDF417, MSI, PDF417, Plessey, RSS 14, RSS Expanded, RSS Limited, Telepen, UPC/EAN

Accessories for the CK60 Computer

You can use these accessories (sold and ordered separately) with the CK60 Computer. To order accessories, contact your local Intermec representative.

CK60 Quad Battery Charger

Use the Quad Battery Charger to charge up to four batteries without having to remove them from the CK60 Computer. You can insert up to four CK60 Computers with batteries installed making it easy to remember to charge your batteries overnight. The charger also provides power to your CK60 Computers while communicating via Ethernet.

CK60 Ethernet Multidock

Use the CK60 Ethernet Multidock to hold up to four CK60 Computers with a batteries installed. The multidock charges the batteries, provides power to the CK60 Computers, provides one Ethernet connector, and provides a serial port for each inserted CK60 Computer.

CK60 Single Dock

Use the CK60 Single Dock to hold a CK60 Computer with its battery installed. The single dock charges the battery, provides power to the CK60 Computer, provides an Ethernet connector, and provides a serial port for the inserted CK60 Computer.

CK60 Single Dock with Modem

Use the CK60 Single Dock with Modem to hold a CK60 Computer with its battery installed. The single dock charges the battery, provides power to the CK60 Computer, provides an Ethernet connector, and provides a serial port for the inserted CK60 Computer.

CK60 Holster and Belt

Use the holster and belt to carry your CK60 Computer while not using it. The holster and belt support either right- or left-handed use and you can use it to carry a CK60 Computer with or without a handle. You can only use this with a CK60 Computer that has either the 1D linear imager or the 2D imager.

CK60 Handstrap

The removable and adjustable handstrap make it easy for you to hold and use the CK60 Computer without tiring your hand.

CK60 Power Adapter, USB Adapter, and Snap-On Adapters


Provides power to all of the docks and chargers.

2 Windows CE

This chapter introduces Microsoft® Windows® CE 5.0. While using your CK60 Handheld Computer, keep this key point in mind:

Tap **Start** on the task bar, located at the bottom, left corner of the screen, to quickly move to programs, files, and settings. Use the task bar at the bottom of the screen to perform tasks in programs. The task bar includes menus, buttons, and the onscreen keyboard.



Note: Desktop icons and control panel applet icons are shown to the left. Any place that **Start** is mentioned, tap the following Windows icon in the bottom, left corner of your CK60 desktop. 

This chapter describes your CK60 Computer Windows CE applications, and explains how to connect your CK60 Computer to a PC, a network, or the Internet. Below is a guide to assist you in using your CK60 Computer.

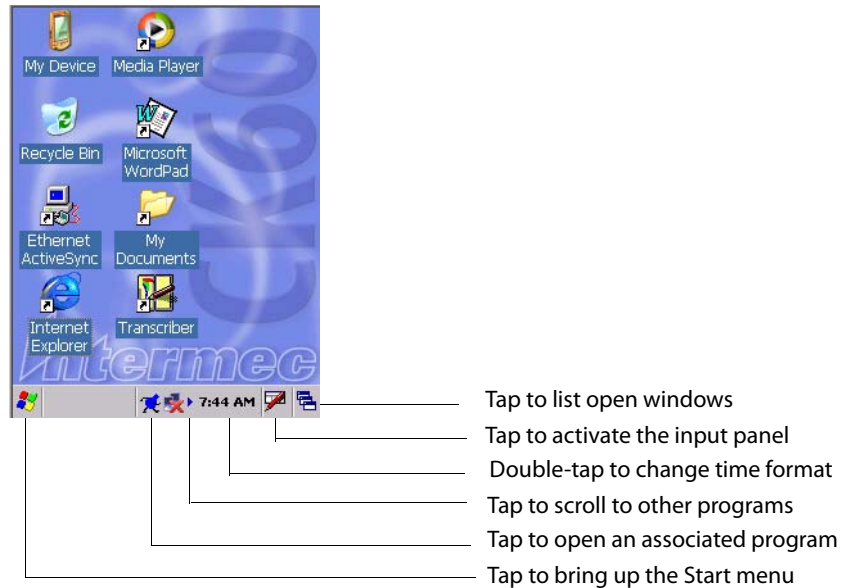
For information on:	See this source:
Programs on your handheld computer.	This chapter.
Connecting to and synchronizing with a PC.	The Quick Start Guide or <i>ActiveSync Help</i> on your PC.
Last-minute updates, detailed technical information.	Read Me files in the Microsoft ActiveSync folder on the PC.
Up-to-date information on Windows CE device.	www.microsoft.com/windows/embedded/ce.net/default.asp

Basic Skills

Learning to use your CK60 Computer is easy. This section describes the basic concepts of using and customizing your CK60 Computer.

Desktop Screen

When you turn on your CK60 Computer for the first time each day, you see the **Desktop** screen.



To customize what is displayed on the Desktop screen, including the background image, tap **Start > Settings > Control Panel**, then double-tap the **Display** icon.

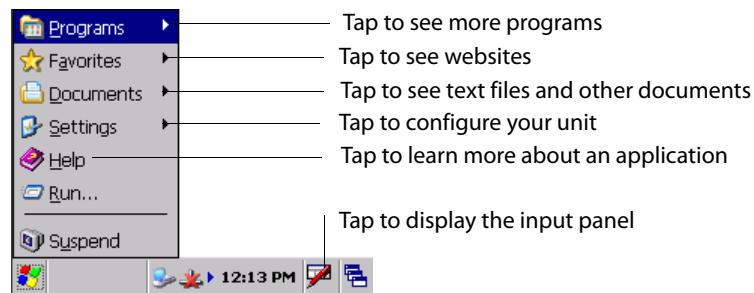
Status icons display information such as low batteries or when the CK60 Computer is connected to a PC or to the Internet. You can tap an icon to open the associated setting or program.

Programs

You can switch from one program to another by selecting it from the **Start** menu. To access some programs, tap **Start > Programs**, and then the program name.

Start Menu and Task Bar

The Start Menu is located at the bottom of the screen. It displays the active program, and allows you to switch to programs and close screens.



The task bar, which displays the current time, is at the bottom of the screen. The task bar includes menu names, buttons, and the **Input Panel** icon. Use this task bar to perform tasks in programs.

Notifications

Your device can notify you in any of the following notification types:

- A message box appears on the screen.
- A sound, which you can specify, is played.
- A light flashes on your CK60 Computer.

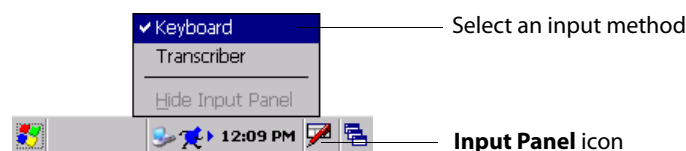
Entering Information

You can enter information on your CK60 Computer in several ways, depending on the type of device you have and the program you are using:

Typing	Using the input panel, enter typed text into the CK60 Computer. You can do this by tapping keys on the onscreen keyboard or by using handwriting recognition software.
Writing	Using the stylus, write directly on the screen.
Drawing	Using the stylus, draw directly on the screen.

Use the input panel to enter information in any program on your CK60 Computer. You can either type using the onscreen keyboard or write using **Transcriber** (described on page 22). The characters appear as typed text.

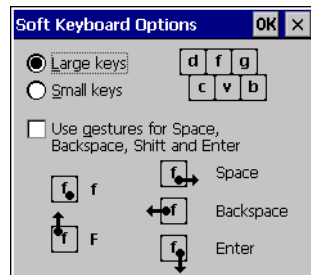
To show the input panel, tap the **Input Panel** icon, then tap **Keyboard**. To hide the input panel, tap the **Keyboard** icon, then tap **Hide Input Panel**.



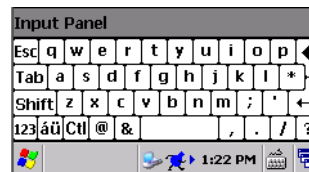


Large Keys Versus Small Keys on Keyboard

The default setting for the keyboard is with small keys. If you want to use larger keys, tap **Start** > **Settings** > **Control Panel**, then double-tap the **Input Panel** icon. Tap **Options**, then select **Large keys**. Tap **OK**, then **OK** again to close the Input Panel properties. Below are the keyboards.



Keyboard with small keys



Keyboard with large keys

Typing With the Onscreen Keyboard

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

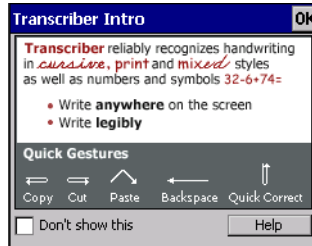
- To type lowercase letters, tap the keys with the stylus.
- To type a single uppercase letter or symbol, tap the **Shift** key. To tap multiple uppercase letters or symbols, tap the **CAP** key. *Note that the CAP key only appears when the keyboard is set to small keys. See previous page for information about the keys.*
- 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, drag the stylus to the left across at least two keys.
- To insert a carriage return, tap and hold the stylus on the keyboard and drag down.

Using Transcriber

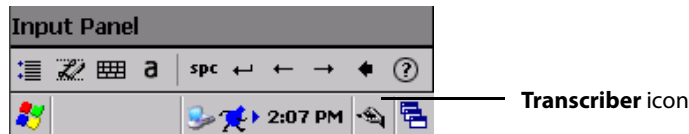
With Transcriber, you can write on the screen with the stylus just as you would on paper. You can write a sentence or more of information, then pause and let Transcriber change written characters to typed characters.



For specific instructions on using Transcriber, double-tap the **Transcriber** shortcut on the desktop screen or tap the **Transcriber** option in the Input Panel menu, then tap **Help**. Tap **OK** to close the Transcriber Intro box.



To enable the Transcriber, tap the **Input Panel** icon on the task bar, select **Transcriber**, tap **OK** to close the Transcriber Intro, select an option, then write anywhere on the screen for the input to appear in the active window. Tap the **Transcriber** icon, then select **Hide Input Panel**, to disable.



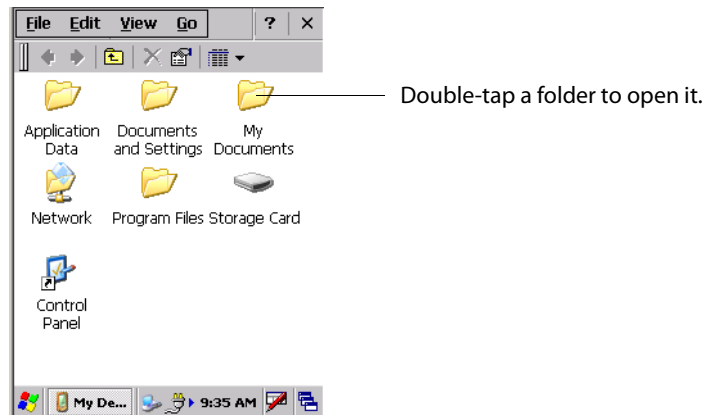
Selecting Typed Text

If you want to edit or format typed text, you must select it first by dragging the stylus across the text.

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.

Finding and Organizing Information

You can use the Windows Explorer to find files on your CK60 Computer and to organize these files into folders. Tap **Start > Programs > Windows Explorer**.



Customizing Your CK60 Computer

You can customize your CK60 Computer by adjusting settings and installing additional software.

Programs added to your CK60 Computer at the factory are stored in ROM (Read Only Memory). You cannot remove this software, and you cannot accidentally lose ROM contents.

You can install any program created for your CK60 Computer, as long as your CK60 Computer has enough memory. The most popular place to find software for your CK60 Computer is on the Windows CE web site.

Adding Programs Using Microsoft ActiveSync

Install software developed for the CK60 Computer onto your PC before installing the same software onto your CK60 Computer. Once installation is complete, tap **Start > Programs**, then the program icon to switch to it.



- 1 Determine your CK60 Computer and processor type so that you know which version of the software to install. Tap **Start > Settings > Control Panel**, then double-tap the **System** icon. Note the processor information on the **General** tab beneath the **Computer** heading.



- 2 Download the program to your PC (or insert the CD or disk that contains the program into your PC). You may see a single *.EXE or *.ZIP file, a SETUP.EXE file, or several files for different CK60 Computer types and processors. Be sure to select the program designed for the Windows CE and your CK60 Computer processor type.
- 3 Read any installation instructions, Read Me files, or documentation that comes with the program. Many programs provide instructions.
- 4 Connect the CK60 Computer and PC, then 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 CK60 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 CK60 Computer. If you cannot find any installation instructions for the program in the Read Me file or documentation, use Microsoft ActiveSync Explore to copy the program file to the “My Computer\Program Files” folder on your CK60 Computer.

Adding a Program Directly from the Internet

Install the appropriate software for your CK60 Computer on your PC before installing it on your CK60 Computer. Once installation is complete, tap **Start > Programs**, then the program icon to switch to it.



System

- 1 Determine your CK60 Computer and processor type so that you know which version of the software to install. Tap **Start > Settings > Control Panel**, then double-tap the **System** icon. Note the processor information on the **General** tab beneath the **Computer** heading.



- 2 Download the program to your CK60 Computer straight from the Internet using Internet Explorer. You may see a single *.EXE or *.ZIP file, a SETUP.EXE file, or several versions of files for different CK60 Computer types and processors. Be sure to select the program designed for the Windows CE and your CK60 Computer processor type.
- 3 Read any installation instructions, Read Me files, or documentation that comes with the program. Many programs provide instructions.
- 4 Tap the file, such as *.EXE file to start the installation wizard. Follow the directions on the screen.

Adding a Program to the Start Menu

You can either use Windows Explorer on the CK60 Computer to move the program to the “\My Computer\Windows\Start Menu” folder, or use Microsoft ActiveSync on the PC to create a shortcut to the program and place the shortcut in the “\My Computer\Windows\Start Menu” folder.

Using Windows Explorer on the CK60 Computer

Tap **Start** > **Programs** > **Windows Explorer**, and locate the program. Tap and hold the program and tap **Cut** on the pop-up menu. Open the “\My Computer\Windows\Start Menu” 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 Windows Explorer, see “Finding and Organizing Information” on page 23.

Using Microsoft ActiveSync on the PC

Use the Explore in Microsoft ActiveSync to explore your CK60 Computer files and locate the program. Right-click the program, and then click **Create Shortcut**. Move the shortcut to the “\My Computer\Windows\Start Menu” folder. The shortcut now appears on the **Start** menu. For more information, see *ActiveSync Help*.

Removing Programs



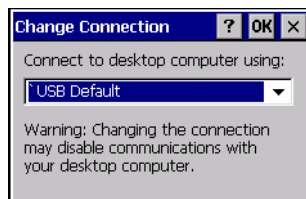
Tap **Start** > **Settings** > **Control Panel**, then double-tap the **Remove Programs** icon.

If the program does not appear in the list of installed programs, use Windows Explorer on your CK60 Computer to locate the program, tap and hold the program, and then tap **Delete** on the pop-up menu.

Microsoft ActiveSync



Tap **Start** > **Settings** > **Control Panel**, then double-tap the **PC Connection** icon. Tap **Change Connection**, then select the baud rate from the list.



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

<http://msdn.microsoft.com/embedded/downloads/ce/default.aspx>

With Microsoft ActiveSync, you can back up and restore your CK60 Computer data, and copy files between your CK60 Computer and your PC.

Install Microsoft ActiveSync on the desktop of your PC from the following URL. For more information, on installing Microsoft ActiveSync, see your Quick Start card. ActiveSync is already installed on your CK60 Computer.

<http://msdn.microsoft.com/downloads/>

After installation is complete, the ActiveSync Setup Wizard helps you connect your CK60 Computer to your PC or set up a partnership so you can browse for or move data between your CK60 Computer and your PC.

Disconnect the CK60 Computer from your PC and you are ready to go!



Note: While ActiveSync does synchronize files between your PC and your CK60 Computer, the Windows CE operating system does not include Calendar, Contacts, Tasks, Inbox, Channels, and Pocket Access applications.

IConnect



The IConnect application displays information about the Ethernet adapter and tests for connectivity. To access this application, tap the **IConnect** icon in your system tray. Two options will appear in a pop-up menu, to either open and or exit the application.

*Note that once you exit the IConnect application, select **Start > Run**, enter “IConnect.exe” in the **Open** field, then tap **OK**. The IConnect icon then reappears in the system tray.*

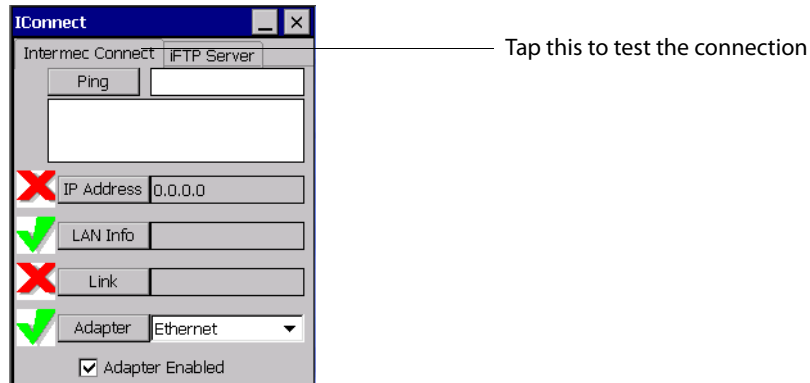


Internet Connection

Tap **Open IConnect** to access the IConnect application.

Ethernet Connections

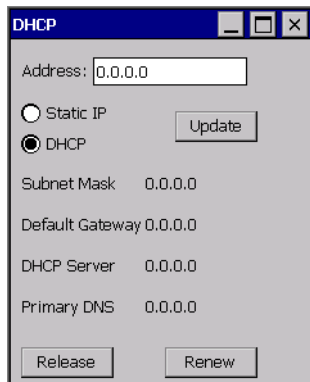
The following information applies to CK60 Computers using Ethernet:



IP Address

The **IP Address** row is for the current IP address. If the address is valid, a green check mark appears to the left and the field contains the address. If invalid, a red X is shown to the left. Tap **IP Address** to configure the IP settings for the CK60 Computer and view other IP-related addresses.

The DHCP dialog contains information about the current IP address. You can enter an IP address, check either **Static IP** or **DHCP**, then tap **Update** to commit these changes. Tap **Release** or **Renew** near the bottom to either release or renew changes to the DHCP address.



LAN Info

Tap **LAN Info** to access diagnostic pages.

Link

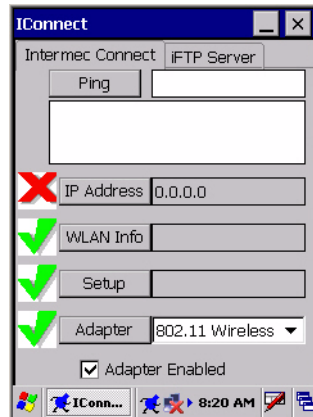
This row displays the current link speed if valid. A green check mark appears to the left if the Ethernet cable is attached to the CK60 Computer. A red X appears if the Ethernet cable is detached.

Adapter

This row lists the current network adapter. To change to a different adapter, tap the drop-down arrow, select a different adapter, then check **Adapter Enabled** below the drop-down list. To unload the current adapter, clear (uncheck) **Adapter Enabled**.

For 802.11b/g Connections

The following information applies to CK60 Computers using 802.11 Wireless:



IP Address

The **IP Address** row is for the current IP address. If the address is valid, a green check mark appears to the left and the field contains the address. If invalid, a red X is shown to the left. Tap **IP Address** to configure the IP settings for the CK60 Computer and view other IP-related addresses.

The DHCP dialog contains information about the current IP address. You can enter an IP address, check either **Static IP** or **DHCP**, then tap **Update** to commit these changes. Tap **Release** or **Renew** near the bottom to either release or renew changes to the DHCP address.

WLAN Info

Tap **WLAN Info** to access diagnostic pages.

Setup

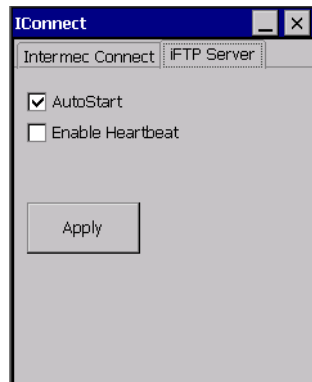
Tap **Setup** to configure the 802.11b/g SSID and security settings. See “Configuring Security” on page 64 for more information.

Adapter

This row lists the current network adapter. To change to a different adapter, tap the drop-down arrow, select a different adapter, then check **Adapter Enabled** below the drop-down list. To unload the current adapter, clear (uncheck) **Adapter Enabled**.

iFTP Server

Tap the **iFTP Server** tab to set up the FTP Server on the CK60 Computer. Check or uncheck either option, tap **Apply** to change FTP Server settings.



Getting Connected

You can set up connections to the Internet and corporate network at work to do such activities as browsing the Internet, sending and receiving e-mail and instant messages, and synchronizing information using Microsoft ActiveSync.

Connections can be made using a wired or wireless network. Once connected to the Internet or to the network at your company or organization where you work, you can view web pages by using Internet Explorer. The communication software for creating an ISP connection is already installed on your CK60 Computer. Your service provider may provide the software needed to install other services, such as paging and fax services.

Connecting to an Internet Service Provider

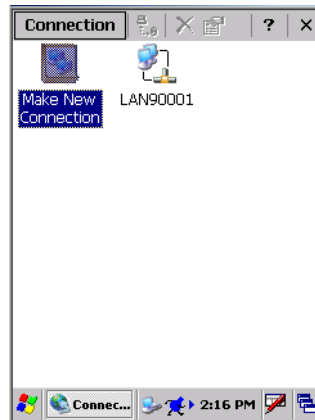
You can connect to your ISP and use the connection to view web pages. Get the following information from your ISP. Some ISPs require information in front of the user name, such as “MSN/username.”

- ISP dial-up access telephone number
- User name
- Password

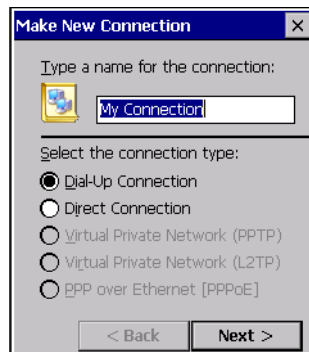


To view additional information for any screen in the wizard or while changing settings, tap **Help** in the upper-right corner.

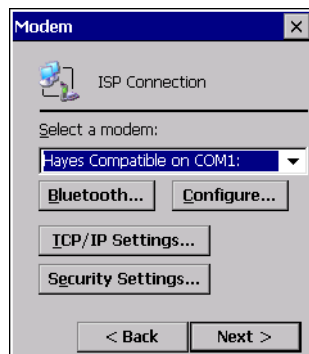
- 1 Tap **Start > Settings > Network and Dial-up Connections**, then double-tap **Make New Connection**.



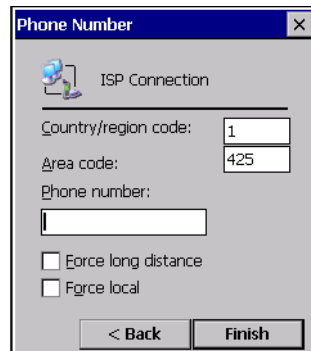
- 2 Enter a name for the connection, such as “My Connection,” then press **Next**.



- 3 In the **Select a modem** list, select “Hayes Compatible on COM1.” Tap **Next** to continue.



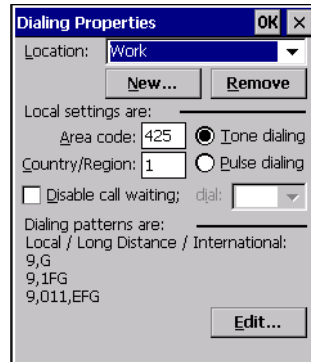
- 4 Enter the phone number, then tap **Finish**.



- 5 Double-tap the new **ISP Connection** icon, then enter the user name, password, and domain (if provided by an ISP or your network administrator).

- 6 Tap **Dial Properties**, then specify your current location from the drop-down list.

Specify your current phone type. If your phone type is pulse dialing, select **Pulse dialing**. If your type is tone dialing (as most phone lines are), then select **Tone dialing**. Tap **OK** to close the Dialing Properties page. These settings apply to all connections.



- 7 To start the connection, start visiting web sites by using Internet Explorer. See “Internet Explorer” on page 34 for information.

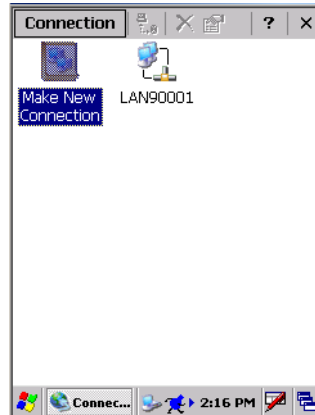
Direct Connection

A direct 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 server.

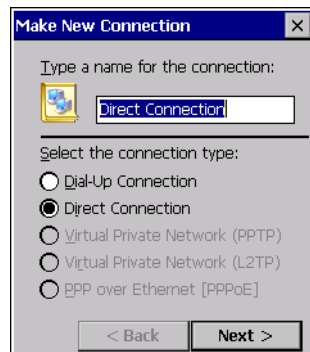


To view additional information for any screen in the wizard or while changing settings, tap **Help** in the upper-right corner.

- 1 Tap **Start > Settings > Network and Dial-up Connections**, then double-tap **Make New Connection**.



- 2 Enter a name for the connection, such as “Direct Connection.” Select **Direct Connection**, then tap **Next** to continue.



- 3 Select a device through which a connection is made from the **Select a device** drop-down list, tap **Configure** to adjust the port settings, tap **OK** to return to the Device screen, then tap **Finish**.



Direct
Connection

- 4 Insert the necessary equipment into the device, then double-tap the new **Direct Connection** icon to connect to the host.
- 5 Use a desired program to automatically begin connecting. For example, switch to Internet Explorer and browse to a web page.

Ending a Connection

To disconnect, either detach your device when connected via cable or cradle, or switch off the connection when connected via a wireless network.

Internet Explorer

Use Microsoft Internet Explorer to view web sites. To do this, create the connection first via an ISP or network, as described in “Getting Connected” on page 30.

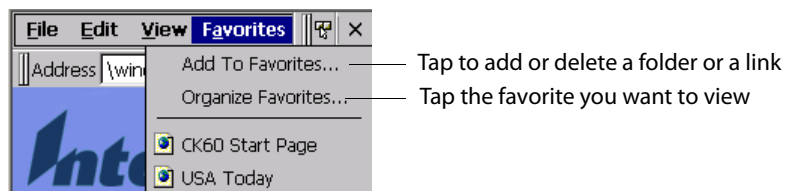
When connected to an ISP or network, you can also download files and programs from the Internet

To switch to Internet Explorer on your CK60 Computer, double-tap the Internet Explorer icon on your desktop.



Viewing Mobile Favorites and Channels

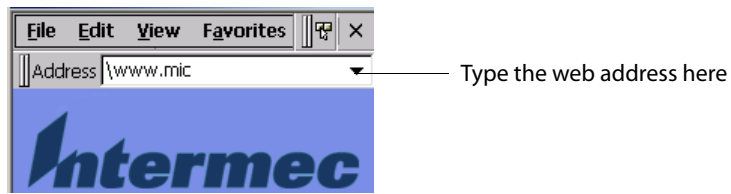
- 1 Tap Favorites from the tool menu to display your list of favorites.
- 2 Tap the page you want to view.



Browsing the Internet

- 1 Set up a connection to your ISP or corporate network using information as described in “Getting Connected” on page 30.
- 2 To connect and start browsing, do one of the following:
 - Tap Favorites from the toolbar, and then tap the favorite to view.

- In the **Address** bar that appears at the top of the screen, enter the web address you want to visit using the input panel, then tap the **[Enter]** key on the panel to go to that web site.



- Tap the drop-down arrow to select from previously entered addresses.



Note: To add a favorite link while using the CK60 Computer, go to the page you want to add, then select **Favorites > Add to Favorites**.

3 Configuring the CK60 Computer

Use this chapter to understand how to install applications onto your CK60 Series Handheld Computer and how to configure the CK60 Computer to communicate in your network. In this chapter are these sections:

- Developing Applications for the CK60 Computer (page 38)
- Packaging Applications for the CK60 Computer (page 39)
- Installing Applications on the CK60 Computer (page 40)
- Converting Older Computer Applications to CK60 Applications (page 38)
- Configuring CK60 Parameters (page 49)
- Configuring the CK60 Computer for Your Network (page 53)
- Configuring the SF51 Scanner (page 61)
- Configuring Security (page 64)
- Using Configuration Parameters (page 90)
- Using Reader Commands (page 91)



Note: Desktop icons and control panel applet icons are shown to the left. Any place that **Start** is mentioned, tap the following Windows icon in the bottom, left corner of your CK60 desktop.



Developing Applications for the CK60 Computer

CK60 Computers run applications programmed in Microsoft Embedded Visual C++. Use this section to understand what you need to:

- Develop a new application for the CK60 Computer.
- Convert an application from an older computer to a CK60 application.

Use the Intermec SDK to develop new applications to run on the CK60 Computer. The Intermec SDK is a library of C++ language functions you can use to create applications for the CK60 Computer.

See the SDK online user's manual for help developing your application. The *Intermec CK60 SDK User's Manual* contains hardware and software requirements, all of the functions that are supported by the CK60 Computer, and how to use these functions.

The SDK is part of the Intermec Developer's Library (IDL), which is available on the *Intermec Developer's Library CD* or as a download from the Intermec web site at www.intermec.com.

You need these hardware and software components to use the Intermec SDK:

- Pentium PC, 400 MHz or higher
- Windows 2000 (Service Pack 2 or later) or Windows XP (Home, Professional, or Server)
- For native C++ development, Microsoft eMbedded Visual C++ version 4.0
- For Windows CD 5.0, eVC 4.0 SP4 is required
- 128 MB RAM (196 MB recommended)
- 360 MB hard drive space for minimum installation (720 MB for complete)
- CD-ROM drive compatible with multimedia PC specification
- VGA or higher-resolution monitor (Super VGA recommended)
- Microsoft Mouse or compatible pointing device

Converting Older Computer Applications to CK60 Applications

If you have an existing application that you would like to run on the CK60 Computer, you can use the PSK to convert that application. The Intermec PSK is a set of libraries and tools that you use to convert your existing C applications into C++ applications for use on the CK60 Computer.

As you migrate from another computer to a CK60 Computer, you need to consider when converting other computer applications to run on the CK60 Computer, most APIs should work without changes, with the exception that arrow and tab keys may be reversed from other computers. Keyboard

remapping is available on the CK60 Computer should you need to map these keys like that of the other computer.

You need these hardware and software components to use the PSK:

- a PC with at least 1MB of free disk space running Microsoft Windows 2000 or Windows XP
- Microsoft eMbedded Visual C++ version 4.0 with Service Pack 2
- Intermec SDK and development tools
- Intermec PSK, which contains these files and utilities:
 - PSK functions library
 - Header files
 - Example files

The PSK is part of the Intermec Developer's Library (IDL), which is available on the *Intermec Developer's Library CD* or as a download from the Intermec web site at www.intermec.com.

Packaging Applications for the CK60 Computer

Use any of these methods to package applications for installation:

- You could package an application as a cabinet (CAB) file. *Recommended*
- For simple applications, the application itself may be the file to deliver.
- It could be a directory structure that contains the application, supporting files like ActiveX controls, DLLs, images, sound files, and data files.

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

- In the basic CK60 Computer, there are two built-in storage options: the Object Store and the Flash File Store. The Object Store is a Disk on Chip (DOC) Flash that looks like a disk. The Flash File Store 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 Flash File Store region.
- If the optional Secure Digital (SD) storage card is in the system, then consider this card the primary location to place applications installation files. The "\Storage Card" folder represents the SD card.
- Use the small non-volatile 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.

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. Intermec recommends using CAB files to install your applications. The CK60 Computer uses standard Windows CE CAB files and does not install third-party CAB files.

For the CK60 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 CK60 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 the AUTOCAB method to extract all files when a cold-boot is performed on the CK60 Computer. This method is on the *Intermec Developer’s Library CD*, see its *Software Tools User’s Manual* for information.

Installing Applications on the CK60 Computer

You can use either the Microsoft ActiveSync application or SD storage cards to install applications on the CK60 Computer.

Installing Applications Using Microsoft ActiveSync

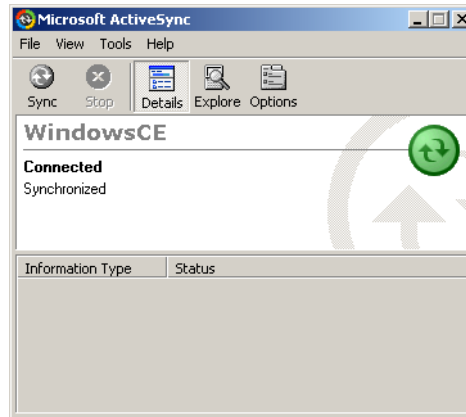
You can use Microsoft ActiveSync to establish a connection between your PC and the CK60 Computer. Microsoft ActiveSync transfers files, synchronizes files, performs remote debugging, and other device management activities.

See Chapter 2, “Windows CE” for information about the Microsoft ActiveSync application as provided by Microsoft Corporation.

This can be a serial, a USB, or an 802.11b/g Microsoft ActiveSync connection. Files can be copied using Windows Explorer on a PC or a laptop computer. This is usually good when updating a few CK60 Computers.

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

- 1 Connect the CK60 Computer to a PC using a USB or serial cable. You may have to detach, then reattach the cable to “wake” the connection.
- 2 Wait for a “Connected” message to appear in the Microsoft ActiveSync application to signal a connection to the CK60 Computer. If necessary, select **File > Get Connected** to initiate a connection or detach, then reattach the USB or serial cable.



- 3 Click **Explore** to access the “Mobile Device” folder on your unit.
- 4 From your PC, select **Start > Windows Explorer**, then browse the “C:\Intermec\CK60 Mgmt Tools\CabFiles” path for any CAB files needed for your CK60 Computer. Select the appropriate file, right-click the file for a pop-up menu, then select **Copy**.
- 5 Within the “Mobile Device” folder, go to the folder where you want the files located on the CK60 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 CK60 Computer. When the computer reboots, wait for the LED on the top left of your keypad to stop blinking. Tap **Start > Programs > Windows Explorer** to locate the newly copied executable files, then tap these files to activate their utilities.

Installing Applications Using a Secure Digital Card

If you have an SD card for your CK60 Computer, this is the best place for you to install applications.

- 1 If you are using an SD card reader, suspend the CK60 Computer, remove its SD card, and place it in the reader. For help, see “Using the Secure Digital Card” on page 15.
- 2 Copy your application file to the SD card. If you are using Microsoft ActiveSync to copy the files to the SD card, place the application in the “\Storage Card” folder on the CK60 Computer.
- 3 If using an SD card reader, insert the SD card back into the CK60.
- 4 Navigate to the “\Storage Card” folder and run your application. After your application is installed, you can run it from the Programs menu.

Launching Your Application Automatically



Note: This describes the system component startup for Intermec provided components only. It does not describe the bootstrap loader process. It only describes the component installation process provided by Windows CE. It is assumed that you understand the Microsoft CE startup procedures and are familiar with how Microsoft components start up.

You can configure the various media used in the Windows CE system with a folder name and can change the media in the registry of the system. Many of the startup components rely on folder names to locate information files, applications, or other related data.

The registry keys used by FolderCopy and other startup components to retrieve the folder names are as follows:

Flash File Store

```
[HKLM\Drivers\BuiltIn\FIshDrv]
"FolderName"="Flash File Store"
```

SD Card (Storage Card)

```
[HKLM\System\StorageManager\Profiles\SDMemory]
"Folder"="Storage Card"
```

Disk On Chip

```
[HKLM\System\StorageManager\Profiles\TRUEFFS_DOC]
"Folder"="DiskOnChip"
```

During normal Windows CE system startup, there are Intermec-specific and non-Intermec components that require an orderly start to properly function. These non-Intermec components may also need to start themselves so the Windows CE device can function properly. Since there are possible configurations that come from using one or more optional built-in peripheral devices, the platform components starting on the next page are required to manage startup.

PreShell

PreShell (PRESHELL.EXE) is launched prior to the Microsoft Shell and must execute a SignalStartup call before the Microsoft Shell launches.

PreShell searches the “\Flash File Store\2577” directory for an executable of the same name. If one exists, that application is launched. This application can do what a customer desires prior to launching the Microsoft Shell. This feature allows end customers to make their own application the shell of the system. If desired, do not exit the custom shell nor call SignalStarted.

PostShell

PostShell (POSTSHELL.EXE) can launch an application after the Microsoft Shell has launched. There are utility applications that exist that can take advantage of “hooking” the startup for maintenance, for example.

PostShell searches the “\Flash File Store\2577” directory for an executable of the same name. If one exists, that application is launched instead. This application can do what a customer desires and is launched after the Microsoft Shell starts initialization. The Microsoft Shell does not require complete initialization before this application begins and that may cause some application or system issues. These issues are expected and are considered normal for those developing PostShell applications. The application must test if the APIs it requires are available.

RunAutoRun

System components are installed and configured during the power up process from a single starting point. RunAutoRun (RUNAUTORUN.EXE), built into the operating system image and located in the “\Windows\Startup” folder, checks for AutoExec (AUTOEXEC.EXE) in a “\2577” folder on a mounted volume in this order:

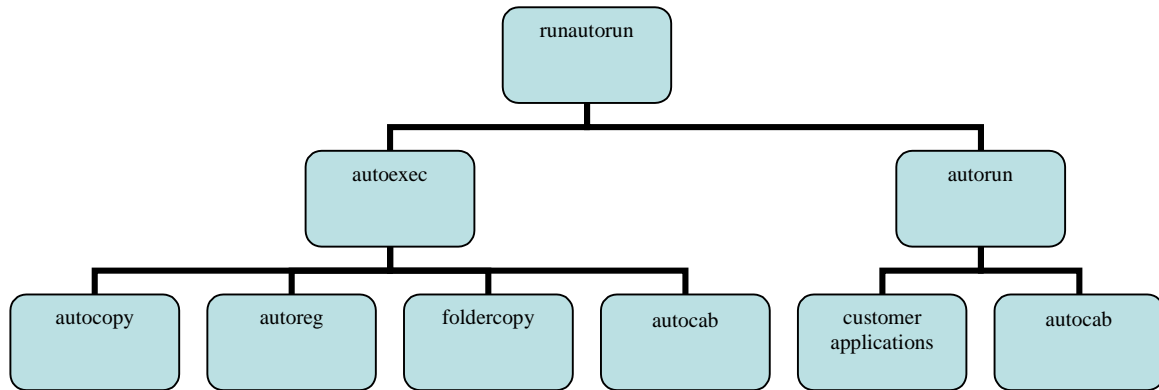
- Secure Digital (SD)
- Object Store - may be non-volatile storage or RAM
- Disk on Chip - may map as Object Store
- Flash File Store - may map as Object Store. This is the default location for the AutoExec program in Intermec systems. Intermec system applications are started from this folder. The ordering of mounted volumes overrides this feature.

The folder names used for the mounted volumes above are retrieved from the registry to maintain coherence with the naming of the mounted volumes on the platform. These folder names are not hard-coded. If AutoExec is present in the “\2577” folder on any of these media, it executes the program only on the first media it is found on and no other.

AutoExec is reserved for Intermec use to configure Intermec-specific applications. It launches the CAB installer, AutoCab (AUTOCAB.EXE), to install platform cab files to the system, such as Intermec Data Collection.

When the AUTOEXEC.EXE process completes, Run Autorun then checks for the existence of AutoRun (AUTORUN.EXE) and executes this program from the first media it is found on. This order is the same as what is used by AutoExec.

AutoRun is reserved for customer use to configure application launch sequences. It launches the CAB installer, AutoCab, as well as any customer programs that added to the AUTOUSER.DAT file and is described on the next page. The hierarchy of these files is shown below.



AutoExec

AutoExec (AUTOEXEC.EXE) automates operations such as pausing, launching processes, or signaling, and is configured through the AutoExec data file (AUTOEXEC.DAT). This script file must be in the same directory as the program itself.



Note: Intermec considers the usage of the AutoExec data file as “Intermec Private.” AutoExec installs Intermec applications such as Data Collection, Security Supplicants, Intermec Management, control panels, and shortcuts from components found in the Flash File System. Do not modify the AutoExec data file. Instead, use the AutoRun program to add software components.

Usage:

```
AutoExec [-%[W]] [-E=["X"]] [-F=["Y"]] [-LOG=] [-W=[Z]]
```

-%	Passes an ID to use in a call to SignalStarted. This argument is useful only during system startup that relies on a SignalStarted to call. W is an integer value.
-E	Passes a signal event name to use when autoexec completes. X is a string value.
-F	Overrides the data file to use. This must be a fully qualified name. Default is “autoexec.dat” in the same location as the AUTOEXEC.EXE program. Y is a string value.
-LOG	Set to any value logs activity to AUTOEXEC.TXT (in the same location as the AUTOEXEC.EXE program). Default is disabled.
-W	Pauses the autoexec process by calling sleep for the number of seconds specified by Z. Z is an integer value.

The return code from the process uses the standard error codes defined in WINERROR.H.

Keywords that AutoExec supports are:

QUIET	Enables user notification when an error occurs.
LOGGING	Enables logging to a trace file.
SIGNAL	Enables the specified named event and is immediately signaled. Useful for notifying other components of the current status.
CALL	Opens another .DAT file to process. After the called file is completed, this file is resumed.
RUN	Runs a program with a <i>SW_SHOWNORMAL</i> attribute. Autoexec does not wait for the child process to exit.
LOAD	Runs a program with a <i>SW_HIDE</i> attribute. Autoexec waits for 60 seconds for the child process to exit or <i>EXECWAIT</i> seconds if set.
EXEC	Runs the specified program. AutoExec waits 60 seconds for the child process to exit or <i>EXECWAIT</i> seconds if set.
EXECWAIT	Changes the default EXEC wait time from 60 seconds to the number of seconds specified. There is a maximum 10-minute limit imposed.
WAIT	Forces a sleep for the specified number of seconds to occur.
WAITFOR	Forces a sleep until the named event is signaled.

Examples of keyword usage are as follows:

```
; Allow message pop up if an error occurs.
QUIET 0

; Log any debug output to a trace file.
LOGGING 1

; Perform a SetEvent on the event name "autoexec_started".
SIGNAL "autoexec_started"

; Include this child data file, childexec.dat.
CALL "\childexec.dat"

; Use autcopy to copy the audio control panel from flash file store to the
windows directory. Wait for up to 60 seconds for it to exit.
EXEC "\Flash File Store\2577\autocopy.exe" -S"\Flash File Store\System\CPLAudio.cpl" -D"\Windows\CPLAudio.cpl"

; Change the default EXEC wait time to 90 seconds.
EXECWAIT 90

; Suspend processing any commands for 10 seconds.
WAIT 10

; Suspend processing any commands until event called MyEventName is signaled.
WAITFOR "MyEventName"
```

AutoRun

AutoRun (AUTORUN.EXE) automates operations such as launching other processes and is configured through the AutoRun data file (AUTORUN.DAT). This script file must be in the same directory as the program itself.

AutoRun supports the following script commands in AUTOUSER.DAT and AUTORUN.DAT.



Note: If you need to add steps at boot time, add them to AUTOUSER.DAT, not to AUTORUN.DAT. AUTORUN.DAT is provided by Intermec and is subject to change. AUTOUSER.DAT is the designated place for the end user to add steps to the boot time process.

EXEC	Launches a specified program, waits for it to complete (up to 10 minutes).
CALL	Processes a specified file of commands and returns.
CHAIN	Processes a specified file of commands and does not return.
RUN	Loads a specified program and executes it.
LOAD	Loads a specified program and executes it.

AutoRun handles quoted file names for the first parameter which allows you to specify path names or file names that contain white space. Note that only one set of quotes per command is supported.

AUTORUN.DAT entry examples:

RUN	"Flash File Store\Apps\some.exe" arg1, arg2, arg3
CALL	"Flash File Store\2577\usercmds.dat"

AutoCopy

AutoCopy (AUTOCOPY.EXE) copies or moves files from one location to another. It has no user interface and is configured through command line arguments. It has support for the following parameters, in no particular order:

Usage:

```
AutoCopy [-D["W"]] [-L["X"]] [-M[D]] [-Q[Y]] [-S["Z"]]
```

-D	Indicates the destination file name and must be fully qualified. W is a string value.
-L	Indicates a fully qualified file name for logging to enable. Default is disabled. X is a string value.
-M	Moves file to a destination rather than copies the file. Default value is disabled. D is an integer value. D=1 indicates enabled, 0 is disabled.
-Q	Indicates if a message box should appear when an error occurs. Default is disabled. Y is an integer value.
-S	Indicates a source file name and must be fully qualified. Z is a string value.

The return code from the process uses the standard error codes defined in WINERROR.H.

Example:

```
; use AutoCopy to copy the control panel from flash file store to windows.
autocopy.exe -S"\Flash File Store\System\Audio.cpl" -D"\Windows\Audio.cpl"

; use AutoCopy to move the control panel from flash file store to windows.
autocopy.exe -M1 -S"\Flash File Store\System\Audio.cpl" -D"\Windows\Audio.cpl"
```

AutoReg

The AutoReg (AUTOREG.EXE) component adds registry information to the Windows CE registry. It has no user interface and is configured through command line arguments.

Usage:

```
AutoReg [-D] [-HKey] [-Q] "filename"
```

-D	Deletes the registry file after successfully loading it. This allows for systems that have hives implemented.
-H	Saves the registry path, and all child entries, to the specific .REG registry file.
-Q	Indicates whether a message box should appear when a fatal error occurs.
filename	Fully qualified file name to read from or write to, encased in double quotes to support spaces in paths or file names. See examples below.

The return code from the process uses the standard error codes defined in WINERROR.H.

Example:

```
; use AutoReg to install this registry information.
autoreg.exe "\Flash File Store\install.reg"

; use AutoReg to install this registry information. Delete the file afterwards.
autoreg.exe -D "\Flash File Store\install.reg"

; use AutoReg to extract registry information to a file.
autoreg.exe -HHKEY_LOCAL_MACHINE\Software\Intermec\Version "\version.reg"
```

The format of the input file, in this example, is the standard registry format which should ease the creation of the input file since there are many publicly available utilities to generate a registry file besides Notepad. One example of a tool is the Microsoft Remote Registry Editor.

AutoCab

AutoCab (AUTOCAB.EXE) extracts files, registry settings, and shortcuts from Windows CE cabinet (.CAB) files. The Windows CE startup sequence invokes AutoCab as a part of AutoExec and AutoRun. During the Windows CE startup sequence, AutoCab processes all CAB files in the "\CabFiles" directory relative to the current location of Autocab, unless the location is overridden by command line arguments. AutoCab can run as a stand-alone program to install a CAB file or a directory of CAB files.

AutoCab only installs the CAB file if it was not installed before by AutoCab. To track the installation of a CAB file, AutoCab marks the CAB file with the System attribute. This attribute is ignored if the device is performing a cold-boot on a non-persistent file system.

AutoCab preserves the CAB file after installation if the ReadOnly attribute is set. If not set, the CAB file is deleted automatically after installation.

Usage:

AutoCab [-ChkRst=][-File=][-Force][-Log=][-Move=][-Quiet=][-Show=][-Signal=]

Command line switches are described below.

-ChkRst=	Set to 1 to configure AutoCab to check for the Reset flag after all CAB files are installed. This file is created by CAB files that want a warm reset after installation. Default is 0 (do not check for flag).
-File=	Specifies the CAB files to extract. Note that the specified files need not end with the .CAB extension.
-Force	Forces the specified CAB files to extract regardless of whether it was previously extracted.
-Log=	Set to 1 to create a log file in the same folder that AutoCab is running. Useful for debugging CAB installation. Default is 0 (disabled).
-Move=	Set to 1 to force source CAB file deletion, even when read-only bit set on file. Default is 0 (disabled).
-Quiet=	Set to 0 to allow AutoCab to display user message box on errors. Useful for debugging CAB installation. Default is 1 (keep quiet).
-Show=	Set to 0 to prevent showing any installation progress interfaces. Also prevents user from canceling installation. Set to 1 to show normal installation. Set to 2 to show Intermec installation progress interface (user can see what is installing but cannot cancel it). Default is 1 (show normal).
-Signal=	Set to string name of signal to use at the completion of CAB installation before a reboot occurs (if enabled). AutoCab uses WaitForSingleObject on this name. Default is disabled.

If <PathName> references a single CAB file, that file is processed. If <PathName> references a directory, all the .CAB files in that directory is processed. If <PathName> is a wild card pattern, all files matching that pattern is processed, If <PathName> is omitted, InstallCab processes all the .CAB files in directory “\CabFiles.”

Example:

```
; Install all cab files in the \Flash File Store\XYZ directory, regardless.
AutoCab -FILE="\Flash File Store\XYZ\*.cab" -FORCE

; Install only one cab file, use Intermec cab installation display
AutoCab -FILE="\myCab\app.cab" =show=2
```

Customizing How Applications Load on the CK60 Computer

If you have several processes that you need running in a specific order as the CK60 Computer turns on, you can use the AutoRun system to customize the way applications load. For compatibility with other Intermec computers, you can place a copy of AUTORUN.EXE in the same folder as your AUTORUN.DAT file but it is not required.

To create and install the AUTORUN.DAT file on your CK60 Computer

- 1 On the CK60 Computer, create a folder called “2577.”
- 2 On your desktop, open the Notepad application.
- 3 Write commands for AUTORUN.DAT using these supported script commands:

Script Command	Description
EXEC	Launches a specified program and waits up to 10 minutes for it to complete.
CALL	Processes a specified file of commands, returns. When you use the CALL command, the execution of the current file pauses while a new file that follows the same set of commands executes. Once the new file completes executing, AutoRun.exe continues processing the current file.
CHAIN	Processes a specified file of commands and does not return. This command calls another file that follows the same set of commands and stops processing the current file.
RUN	Loads a specified program and executes it. Specifies the show window attribute so that the user interface is visible when the application launches.
LOAD	Loads a specified program and executes it. Specifies the hide window attribute so the user interface is hidden initially.

- 4 Save this Notepad file as AUTORUN.DAT.
- 5 Copy the AUTORUN.DAT file to the “\2577” folder on your CK60 Computer.

During every boot, the system scans for AUTORUN.DAT in the “\2577” folder.

Here is a sample AUTORUN.DAT file that runs a dialer application and connects to a VPN:

```
EXEC "\\Program Files\My Dialer\Dialer.exe" 348-2600
EXEC "\\Program Files\My VPN\Connect.exe" MyDomain
```

Configuring CK60 Parameters

You can configure many parameters on the CK60 Computer, such as the bar code symbologies it decodes or the network settings. These characteristics are controlled by configuration parameters. The values you set for these configuration parameters determine how the computer operates. Use configuration commands to configure the CK60 Computer.

Configuring with the Setup Assistant

When first setting up the CK60 Computer, use the Setup Assistant to set or enable basic network parameters and connect your CK60 Computer to the network.

The Setup Assistant guides you through setting the following basic network parameters:

- Date and time (including time zone)
- SSID (Network name)
- DHCP server or IP address, subnet mask, and default router
- Primary and secondary DNS or WINS addresses
- Device name

To set other parameters, use the Intermec Settings control panel applet or another configuration method. The Setup Assistant runs on the CK60 Computer the first time you turn on the computer.

After the Setup Assistant is complete, the CK60 Computer should communicate with the network. A network connection icon appears in the taskbar.

Synchronizing the CK60 Computer System Time with a Time Server

It is important that the time on all of your CK60 Computers be synchronized with a network time server to ensure real-time communications and updates. Network time servers acquire Coordinated Universal Time (UTC) from an outside source such as the U.S. Naval Observatory (USNO). The CK60 Computer uses Simple Network Time Protocol (SNTP) to synchronize with a network time server.

The default reference time server is the USNO (tock.usno.navy.mil). To synchronize the time on your CK60 with this time server, you must have a valid connection to the Internet. You can also synchronize the CK60 Computer system time with a corporate network server within your firewall that is SNTP-capable. To use an internal corporate network server, you need to set the command name in the registry.

Configuring the CK60 Computer through the Network

You can change the configuration parameters of the CK60 Computer by sending commands through a host computer or through the network. If you are using a network, you can configure one or more CK60 Computers at a time. You can remotely configure the wireless or Ethernet CK60 Computer by sending a command from an application on the host computer.

Note that you cannot set all parameters through the network. You can only set those commands that have a syntax in the Command Reference Manual.



Note: You can continue running an application on the CK60 Computer while configuring it from the host computer.

Configuring the CK60 Computer in a TCP/IP Direct Connect Network

You can use the host computer to configure a wireless or Ethernet CK60 Computer in your TCP/IP network. To send and receive configuration data, you need to write a host application that can communicate with the

CK60 Computer directly through an access point or through the Ethernet network. Use the TMF protocol to send and receive transactions between the host application and the CK60 Computer.

To set up the host computer, verify that you can communicate with the CK60 Computer.

To set up the application, prepare and write a host application that can communicate with the Intermec Application Server and send transactions to and receive transactions from the CK60 Computer in this format:

TMF field	commands
-----------	----------

where:

<i>TMF field</i>	is a 2-byte field containing one of these values:
CG	Configuration Get request sent from the host application.
Cg	Configuration Get response sent from the CK60 Computer to the host computer.
CS	Configuration Set request sent from the host application.
Cs	Configuration Set response sent from the CK60 Computer to the host computer.
<i>commands</i>	are the reader and configuration commands that you want to set on the CK60 Computer or the current value you want to retrieve from the CK60 Computer. To save configuration changes in flash memory, send the reader command . +1 as the last command. for a list of all commands, see the <i>Command Reference Manual</i> .

Example

In the host application, you want to get the current values of two configuration commands from the CK60 Computer. Send the CG\$+NABV transaction from the host application



Note: The transaction header is not shown in this example. You do not need a transaction header for a host application in a TCP/IP network, but you do for a UDP Plus network.

where:

CG	is a TMF Configuration Get request.
\$+	is the Change Configuration reader command.
BV	is the Beeper Volume configuration command.

The CK60 returns the CgS+Bv4 transaction to the host application, where:

Cg	is a TMF Configuration Get response.
\$+	is the Change Configuration reader command.
BV4	means the Beeper Volume configuration command is currently set to a value of 4, which is a very high beeper volume.

Configuring the CK60 Computer in a UDP Plus Network

You can use the host computer to configure a CK60 Computer in your wireless or Ethernet network. To send and receive configuration data or files, you need to write a host application that can communicate with an Intermecc Application Server (formerly Gateway or DCS 30X).

For help, see the appropriate Gateway or DCS 30X User's Manual. Use the Terminal Message Format (TMF) protocol to send and receive transactions between the host application and the CK60 Computer.

To set up the Intermecc Application Server, configure a peer-to-peer destination name for the host application. Create a transaction ID, \$NGCFGRSP, that routes to this destination name. The Intermecc Application Server uses the transaction ID to route responses from the CK60 Computer back to the host application. \$NGCFGRSP is a special transaction ID that the server uses to forward configuration response data from a CK60.

All configuration responses are routed with the \$NGCFGRSP transaction ID. The Intermecc Application Server cannot track multiple applications sending reader or configuration commands. If you have two host applications sending reader or configuration commands, they must both be configured to receive the \$NGCFGRSP transactions, and therefore both receive all responses from all CK60 Computers.

To set up the host computer, verify that the host computer can communicate with the Intermecc Application Server.

To set up the application, prepare and write a host application that can communicate with the Intermecc Application Server and send transactions to and receive transactions from the CK60 Computer in this format. *For an example of the host application transaction, see page 51.*

transaction header	TMF field	commands
--------------------	-----------	----------

where:

<i>transaction header</i>	is a 96-byte field with message number, date, time, source application ID, destinations application ID, transaction ID, and other information. Set the system message (SYS\$MSG) flag to E in the transaction header.
<i>TMF field</i>	is a 2-byte field containing one of these values:
CG	Configuration Get request sent from the host application.
Cg	Configuration Get response sent from the CK60 Computer to the host computer.
CS	Configuration Set request sent from the host application.
Cs	Configuration Set response sent from CK60 to host computer
<i>commands</i>	are the reader and configuration commands that you want to set on the CK60 Computer or the current value you want to retrieve from the CK60 Computer. To save configuration changes in flash memory, send the reader command . +1 as the last command. See the <i>Command Reference Manual</i> for a list of supported commands.

Configuring the CK60 Computer for Your Network

The CK60 Computer is a versatile handheld computer that you can add to your wired or wireless data collection network. You can connect your CK60 Computer to your network using:

- Serial communications
- 802.11b/g radio communications
- Ethernet communications
- Bluetooth™ radio communications

Configuring Serial Communications

The CK60 Computer has a serial port to transfer data to and receive data from another device via RS-232 communications. You can also insert the CK60 Computer into a communications dock to transmit data to and receive data from a host computer or PC using RS-232 communications. The serial cable and the communications dock are sold separately. For more information on accessories, see page 17.

To use serial communications with your CK60 Computer, connect the CK60 Computer to the serial port of another device, by:

- connecting the CK60 Serial Port to the serial port of the other device using the 26-pin to DB9-pin serial cable adapter and a female-to-female null modem RS-232 cable;
- connecting the CK60 Dock to the serial port of the other device using a DB9-pin to DB9-pin serial adapter cable, then insert the CK60 Computer into the dock; or
- connecting a USB cable between the USB connector in the back of the CK60 Dock and your desktop 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.

Attention: Assurez-vous que la distance entre tous les éléments avec antennes soit d'au moins 30 centimètres (un pied) avant de faire la connexion avec l'alimentation électrique, faute de quoi vous risquez d'endommager votre installation.

The wireless CK60 Computer has an internal 802.11b/g radio to transfer data using wireless communications. This section of the manual assumes that 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 CK60 Computer supports these network protocols:

- TCP/IP
- UDP Plus

The next sections explain the parameters you need to configure for the CK60 Computer to work in your wireless network.

Configuring the Network Parameters for a TCP/IP Network

In a TCP/IP network, the CK60 Computer communicates with a host computer directly using TCP/IP. The access point acts as a bridge to allow communications between the wired network and the wireless network.

To use wireless communications in a TCP/IP network, configure the Network Name (SSID), Host IP Address, IP Settings (if not using DHCP), and Network Port parameters on each CK60 Computer in the network.

Configuring the Network Parameters for a UDP Plus Network

In a UDP Plus network, the CK60 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 the wired network and the wireless network.

To use wireless communications in a UDP Plus network, configure the Network Name (SSID), Controller IP Address, IP Settings (if not using DHCP), and Network Port parameters on each CK60 in the network.

Configuring Ethernet Communications

You can use the CK60 Computer directly in an Ethernet network if you have ordered the Ethernet option on your CK60 Computer and you insert it into a CK60 Dock. The communications dock as an Ethernet connector that makes it possible for the CK60 Computer to communicate with your Ethernet network.

To use the CK60 Computer in an Ethernet network, configure the Network Name (SSID), Host IP Address, IP Settings (if not using DHCP), and Network Port parameters on each CK60 Computer in the network. If required for your network, set the Primary and Secondary DNS Server and Primary and Secondary WINS Server parameters on each CK60 Computer in the network.

Configuring Bluetooth Radio Communications

“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 offers wireless access to LANs, the mobile phone network, and the internet for a host of home appliances and portable hand-held devices located up to 100m (328ft) apart (in a line of sight environment).

Local Bluetooth

The Local Bluetooth control panel applet displays the device name, the device address, enables or disables Bluetooth communications, and sets discoverable and connectable settings. This also provides a versions screen for various Bluetooth items in the system.

Use this applet to enable Bluetooth communications before you configure radio communications.

- 1 Select **Start > Settings > Control Panel**, then double-tap the **Local Bluetooth** icon.
- 2 Tap the top button to **On**, then tap **OK** to close the applet.



Local Bluetooth



Tap this to "On"

Device Name	Provides the "friendly" name of your CK60 Computer.
Device Address	Universally unique and cannot be changed - read-only.
Discoverable	Check this to ensure your CK60 is discoverable to other Bluetooth devices. The default is for the CK60 Computer to be undiscoverable as it does not offer any incoming services out of the box.
Connectable	Check this to allow other Bluetooth devices to connect to your CK60 Computer. The default is for the CK60 Computer to be unconnectable as it does not offer any incoming services out of the box.
Class of Device	This sets how a CK60 appears to other devices during a device discovery. The default is "0x920100" which specifies that the CK60 is capable of services of information, object transfer, and networking.

Wireless Printing

The Wireless Printing control panel applet separates the task of wireless printing from other Bluetooth management items not relevant to this task.

Wireless Printing has a concept of the "current wireless printer." This printer is the one to which the CK60 Computer makes a connection when the wireless printing COM port is opened. If there is no current wireless printer, there is no wireless printing COM port. Registration and deregistration of this COM port is controlled by BTCC. Use the Wireless Printing control panel applet to handle the COM port registration. Customer soft-

ware or other test applications can also use this applet to manage the COM port registration and deregistration.

The current wireless printer is stored in the registry and is registered and deregistered on Bluetooth stack load/unload. If the current wireless printer changes, the existing wireless printing COM port is deregistered, and the new one is registered instead. The registered COM port is stored in the registry as the “WPort.”

For more information on using Bluetooth communications, see the *Wireless Printing Development Guide* available on the *Intermec Developer’s Library CD* or the Intermec web site at www.intermec.com.

Use any of the following methods to set the wireless printer:

- Use a Bluetooth device discovery to locate the remote device (page 56)
- Manually enter the remote Bluetooth Device Address (page 57)
- Use the Bluetooth Device Manager to choose from previously discovered printers (page 58)

To do a Bluetooth device discovery:

You can set your wireless printer via a Bluetooth Device Discovery, which takes about half a minute to locate all Bluetooth devices in your range.



Wireless
Printing

- 1 Select **Start > Settings > Control Panel**, then double-tap the **Wireless Printing** icon.
- 2 Select **Device Discovery**, then tap **Acquire Printer** to initiate the device discovery.



- 3 Momentarily, Bluetooth devices discovered within range appear. If your preferred printer is in the list, select to highlight the printer, then tap **OK**. If you do not see your preferred device, make sure this device is powered on and set to discovery, then tap **Device Discovery** again.

Click **Cancel** to return to the first screen without making changes.



To enter the remote device address, if you know the Bluetooth Device Address of the printer you want to use, you do the following to avoid Device Discovery and perform a manual setup.



Wireless Printing

- 1 Select **Start > Settings > Control Panel**, then double-tap the **Wireless Printing** icon.
- 2 Select **Manual**, then tap **Acquire Printer** to go to the Manual Set dialog.



- 3 Type the address of your device in the field, then click **OK**. Tap **Cancel** to return to the first screen without making changes.



When you set your printer manually, your device does not receive the printer name. Therefore, “-unknown-” is displayed under Device Name unless you enter the correct value in to the registry in some other way.

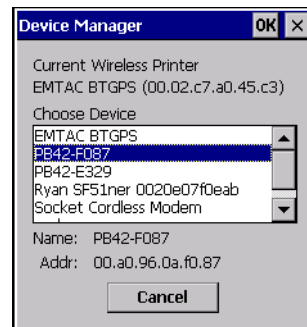
To choose from previously discovered printers, do the following to select from a list of previously discovered printers:



- 1 Select **Start > Settings > Control Panel**, then double-tap the **Wireless Printing** icon.
- 2 Select **Device Manager**, then tap **Acquire Printer** to go to the list of previously discovered printers.



- 3 Select to highlight the printer of choice, then tap **OK**. Tap **Cancel** to return to the first screen without making changes.

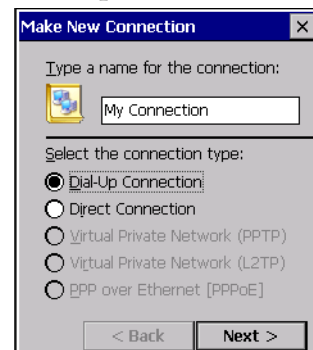


Bluetooth DUN

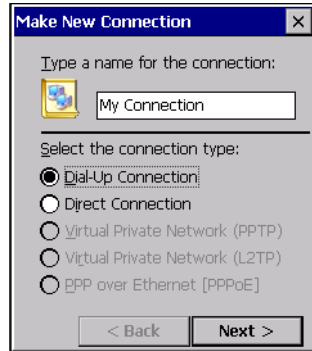
Do the following to enable Bluetooth DUN on the CK60 Computer:



- 1 Select **Start > Settings > Control Panel**, then double-tap the **Network and Dial-up Connections** icon.
- 2 Double-tap **Make New Connection**, type your connection name, check **Dial-Up Connection**, then tap **Next** to continue.



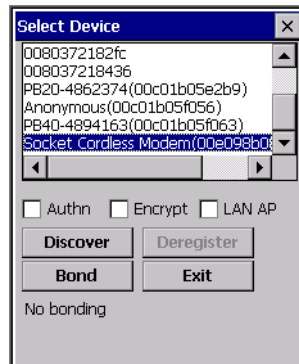
- 3 Select “Bluetooth” from the Select a modem drop-down list, then tap **Bluetooth** to access the Add Bluetooth Modem dialog.



- 4 Tap **Discover** to discover and link to a Bluetooth modem or to a Bluetooth-enabled mobile phone.



- 5 When prompted, enter the passkey in the Authentication Request dialog. *The default passkey should be listed in the user manual for your peripheral device.*
- 6 Select your device from the list of discovered devices, then tap **Bond**.



On successful bonding, notification appears at the bottom of the dialog, such as in the following illustration.



- 7 Tap **Exit** to complete the discovery and bonding of your device, tap **Next**, enter the phone number for your connection, then tap **Finish** to close the dialog.



- 8 Double-tap your connection icon, enter your dial-up networking account information in the **User Name** and **Password** fields, then tap **Connect** to establish a connection.



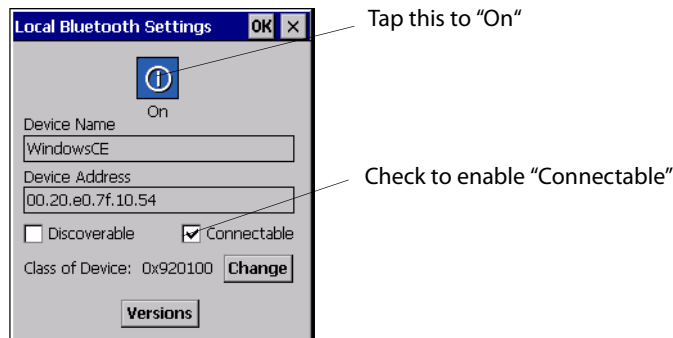
Configuring the SF51 Scanner

The following information pertains to configuring the SF51 Scanner to work with your CK60 Computer. These instructions assume you have the EasySet application installed on your desktop or laptop. The EasySet application is available from the Intermec Data Capture web site, contact your Intermec representative for information about this application.

Enabling Bluetooth

Bluetooth is required for the SF51 Scanner. On the CK60 Computer, use the Local Bluetooth control panel applet to enable Bluetooth communications before you configure the SF51 Scanner.

- 1 Select **Start > Settings > Control Panel**, then double-tap the **Local Bluetooth** icon.
- 2 Tap the top button to **On**, check **Connectable**, then take note of the device address. You will need this address to create your SF51 Connection Labels. Instructions start on the next page.



- 3 Tap **OK** to close the applet.

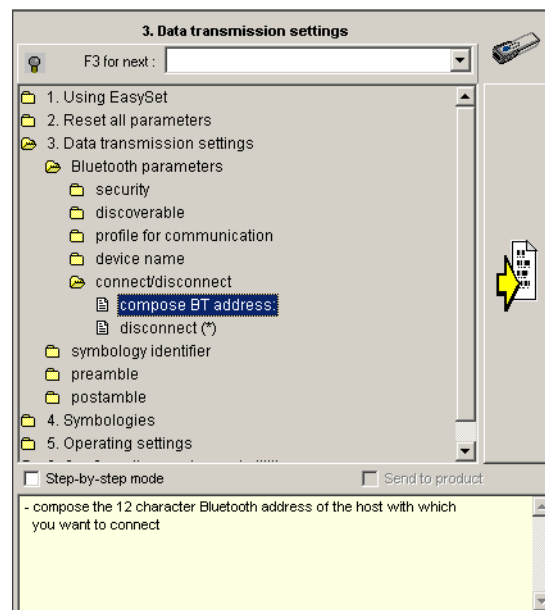
Creating an SF51 Connection Label

To initiate a connection from the SF51 Scanner, use your EasySet application to create an SF51 connection label with the CK60 Bluetooth address. The device address is listed in the Local Bluetooth control panel applet on your CK60 Computer, like the illustration shown on the previous page.

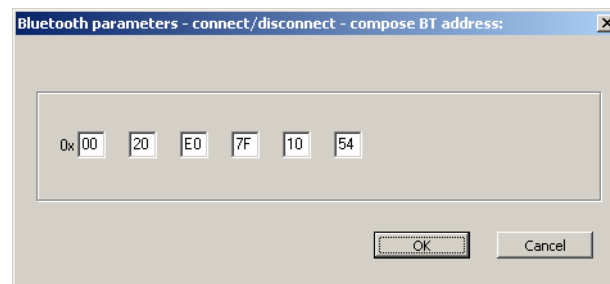


1 On your desktop or laptop, double-click the EasySet icon to activate the EasySet application if you have not already done so.

2 In the left side of the EasySet application, double-click **Data transmission settings** > **Bluetooth parameters** > **connect/disconnect** > **compose BT address**.



3 Enter the Bluetooth address assigned to your CK60 Computer (shown in your Local Bluetooth control panel applet), then click **OK** to close this dialog.

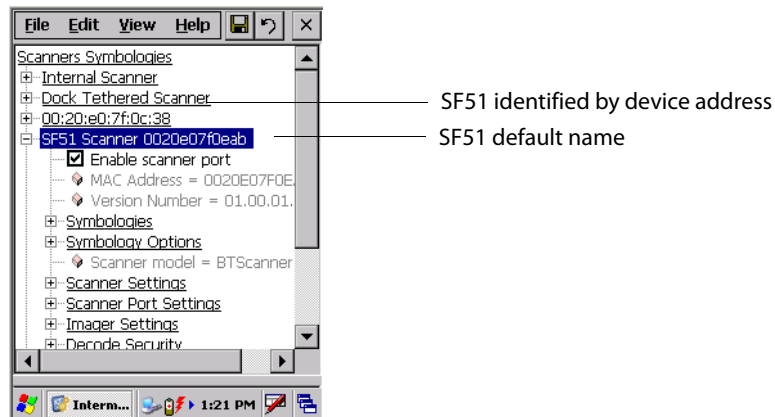


- The connection label for the SF51 Scanner appears to the right in the EasySet application, similar to the following. Scan the label once, then confirm the blue light on end of the SF51 Scanner starts blinking, which means it is trying to connect. When connected, the blue light assumes a steady blue, then SF51 data gets wedged through the keyboard interface.



Viewing SF51 Scanner Information from Your CK60 Computer

Note that in the CK60 Computer, the Intermec Settings control panel applet can display up to seven separate SF51 connections. The following illustration shows two such connections under the **Scanners, Symbologies** option.



In this applet, tap **Scanners, Symbologies**, then tap (+) to expand the **SF51 Scanner** connections to view MAC addresses, firmware version numbers, and whether each scanner is connected to the CK60 Computer. When you clear (uncheck) **Enable scanner port**, the SF51 Scanner is disconnected from the CK60 Computer. Check **Enable scanner port** again to reconnect.

If you want to rename these connections to descriptions more suitable for your situation, press the stylus on each **SF51 Scanner** connection for a pop-up menu, then select **Rename**. Enter the new description, then tap **ok** to save your entry.

When the SF51 Scanner is connected, configuration changes take effect immediately. When the SF51 Scanner is not connected, configuration changes take effect once the SF51 Scanner is reconnected.

Configuring Security

Use the next sections to understand how to configure each type of security on your wireless CK60 Computer. If you choose not to use security, see “Using Configuration Parameters” on page 90 for help.

If you are using 802.1x security, this sections also assumes that your authentication server and access points are properly configured.

Loading Certificates

If you choose to use Transport Layer Security (TLS) with WPA or 802.1x security, you need to have a unique client certificate on the CK60 Computer and a trusted root certificate authority (CA) certificate. If you choose to use PEAP, you need to load a root CA certificate. You can use a third-party CA to issue unique client certificates and a root certificate.



If your CA is on your WLAN, select **Start > Settings > Control Panel**, then double-tap the **Certificates** icon to access the Certificate control panel applet and obtain the certificates.



Note: Do not perform a cold-boot on the CK60 Computer. This resets the time and date.

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 CK60 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 exist in the same area without infringement.

Intermec Technologies 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 as you configure your wireless network:

AES (Advanced Encryption Standard)	A block cipher, a type of symmetric key cipher that uses groups of bits of a fixed length - called blocks. A symmetric key cipher is a cipher that uses the same key for both encryption and decryption.
CKIP (Cisco Key Integrity Protocol)	This is Cisco's version of the TKIP protocol, compatible with Cisco Aironet 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 your network.
TKIP (Temporal Key Integrity Protocol)	This protocol is part of the IEEE 802.11i 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: <ul style="list-style-type: none"> • No Installation Vector (IV) reuse protection • Weak keys • No protection against message replay • No detection of message tampering • No key updates
WEP (Wired Equivalent Privacy) encryption	With preconfigured WEP, both the client CK60 Computer and access point are assigned the same key, which can encrypt all data between the two devices. WEP keys also authenticate the CK60 Computer to the access point - unless the CK60 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. WiFi Alliance security standard is designed to work with existing 802.11 products and to offer forward compatibility with 802.11i.
WPA2 (Wi-Fi Protected Access)	Second generation of WPA security. Like WPA, WPA2 provides enterprise and home Wi-Fi users with a high level of assurance that their data remains protected and that only authorized users can access their wireless networks. WPA2 is based on the final IEEE 802.11i amendment to the 802.11 standard ratified in June 2004. WPA2 uses the Advanced Encryption Standard (AES) for data encryption and is eligible for FIPS (Federal Information Processing Standards) 140-2 compliance.

Configuring Your Wireless Network



To start 802.11b/g communications on the CK60 Computer, tap **Start > Settings > Control Panel**, then double-tap the **Wireless Network** icon 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.

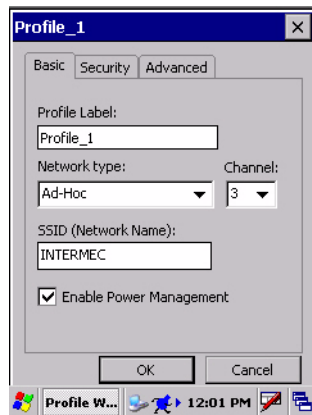
Profile	Tap the drop-down list to choose between four different profiles assigned to this unit, then tap Edit Select Profile , make the changes needed for this profile (starting on the next page), then tap OK to return to the Profiles page.
Enable Microsoft's Wireless Zero Config	Check this box to enable Microsoft's Wireless Zero Config application. This effectively disables the Intermec software solution for 802.11b/g, including configuration via the Wireless Network control panel applet.



Basic

Use the Basic page to set the network type, name, and manage battery power for this profile. Tap **ok** or **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 one or more participants.
Channel	If you select “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 four methods are available if you have purchased the security package. Contact your Intermec representative for information.*

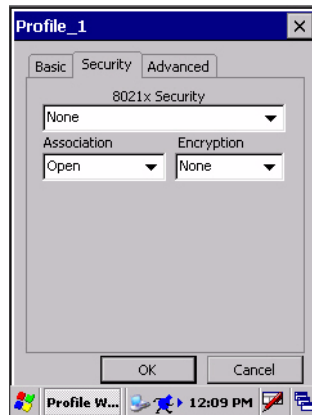
- None (*next page*)
- PEAP (*page 70*)
- TLS (*page 75*)
- TTLS (*page 79*)
- LEAP (*page 383*)

None

Use “None” to disable 802.11b/g Security and enable WEP encryption.

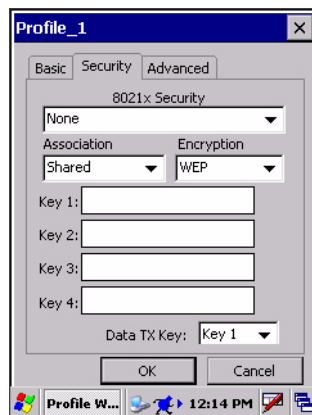
To Disable 802.1x Security

- 1 Set **8021x Security** as “None.”
- 2 Set **Association** to “Open.”
- 3 Set **Encryption** to “None.”



To Enable WEP Encryption

- 1 Set **8021x Security** as “None.”
- 2 Set **Association** to either “Open” if WEP keys are not required; or “Shared” when WEP keys are required for association.
- 3 Set **Encryption** to “WEP.” See page 65 for information about WEP encryption.
- 4 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.



To Enable WPA Encryption Using a Preshared Key

- 1 Set **8021x Security** as “None.”
- 2 Set **Association** to “WPA.” See page 65 for information about WPA encryption.
- 3 Skip **Encryption** as it is automatically set to “TKIP.” See page 65 for more information about TKIP.
- 4 Enter the temporal key as ASCII (12345) in the **Pre-Shared Key** field.



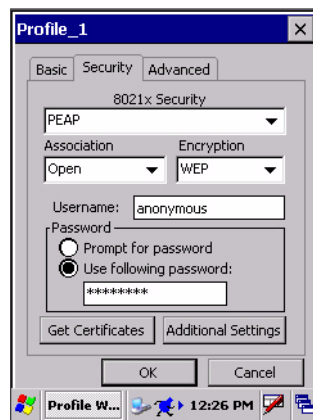
PEAP (Protected EAP)

This protocol is suitable for performing secure authentication against Windows domains and directory services. It is comparable to EAP-TTLS (see page 65), 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,” “WPA2,” or “Network EAP” as an association mode.

To Enable PEAP with an Open Association

- 1 Set **8021x Security** as “PEAP.”
- 2 Set **Association** to “Open.”
- 3 Skip **Encryption** as it is automatically set to “WEP.” See page 65 for more information about WEP.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner PEAP authentication and set options for server certificate validation and trust. See page 74 for more information.



To Enable PEAP with WPA Encryption

- 1 Set **8021x Security** as “PEAP.”
- 2 Set **Association** to “WPA.” See page 65 for information about WPA encryption.
- 3 Skip **Encryption** as it is automatically set to “TKIP.” See page 65 for more information about TKIP.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner PEAP authentication and set options for server certificate validation and trust. See page 74 for more information.



To Enable PEAP with WPA2 Encryption

- 1 Set **8021x Security** as “PEAP.”
- 2 Set **Association** to “WPA2.” See page 65 for information about WPA2 encryption.
- 3 Select **Encryption** to either “TKIP” or “AES.” See page 65 for more information about TKIP and page 65 for more information about AES.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner PEAP authentication and set options for server certificate validation and trust. See page 74 for more information.



To Enable PEAP with Network EAP

- 1 Set **8021x Security** as “PEAP.”
- 2 Set **Association** to “Network EAP.” See page 65 for information about EAP.
- 3 Select **Encryption** to either “WEP” or “CKIP.” See page 65 for more information about WEP and page 65 for more information about CKIP.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner PEAP authentication and set options for server certificate validation and trust. See page 74 for more information.



Additional PEAP Settings

- 1 Select an authentication method from the **Inner PEAP Authentication** drop-down list.

EAP/MS-CHAP-V2	Authenticates against a Windows Domain Controller 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 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.*
- 4 Click **X** to return to the Security page.

The screenshot shows a dialog box titled "Additional PEAP Settings" with a close button (X) in the top right corner. Inside the dialog, there is a section for "Inner PEAP Authentication" with a dropdown menu currently showing "EAP/MS-CHAP-V2". Below this is a section for "Certificate Settings" which contains an unchecked checkbox labeled "Validate Server Certificate". At the bottom of the "Certificate Settings" section, there are two empty text input fields labeled "Common Name 1:" and "Common Name 2:".

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 select “Open,” “WPA,” “WPA2,” or “Network EAP” as an association mode.

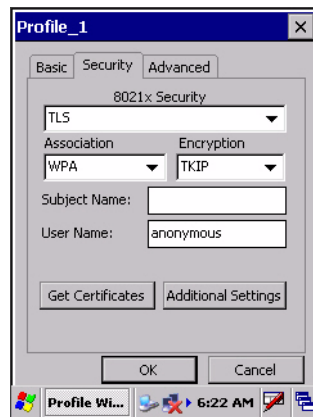
To Enable TLS with an Open Association

- 1 Set **8021x Security** as “TLS.”
- 2 Set **Association** to “Open.”
- 3 Skip **Encryption** as it is automatically set to “WEP.” See page 65 for information about WEP encryption.
- 4 Enter your unique **Subject Name** and **User Name** to use this protocol.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to set options for server certificate validation and trust. See page 78 for more information.



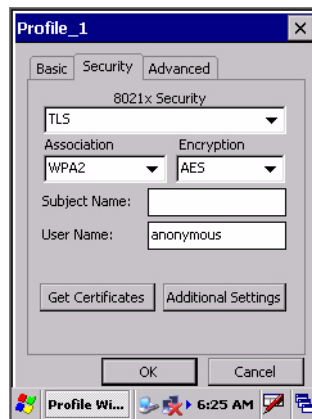
To Enable TLS with WPA Encryption

- 1 Set **8021x Security** as “TLS.”
- 2 Set **Association** to “WPA.” See page 65 for information about WPA encryption.
- 3 Skip **Encryption** as it is automatically set to “TKIP.” See page 65 for more information about TKIP.
- 4 Enter your unique **Subject Name** and **User Name** as credentials for this profile.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to set options for server certificate validation and trust. See page 78 for more information.



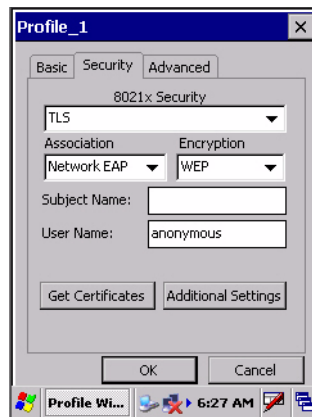
To Enable TLS with WPA2 Encryption

- 1 Set **8021x Security** as “TLS.”
- 2 Set **Association** to “WPA2.” See page 65 for information about WPA2 encryption.
- 3 Select **Encryption** to either “TKIP” or “AES.” See page 65 for more information about TKIP and page 65 for more information about AES.
- 4 Enter your unique **Subject Name** and **User Name** as credentials for this profile.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to set options for server certificate validation and trust. See page 78 for more information.



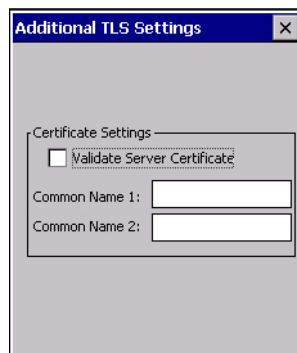
To Enable TLS with Network EAP

- 1 Set **8021x Security** as “TLS.”
- 2 Set **Association** to “Network EAP.” See page 65 for information about EAP.
- 3 Select **Encryption** to either “WEP” or “CKIP.” See page 65 for more information about WEP and page 65 for more information about CKIP.
- 4 Enter your unique **Subject Name** and **User Name** as credentials for this profile.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to set options for server certificate validation and trust. See page 78 for more information.



Additional TLS 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 **X** to return to the Security page.



TTLS (EAP-Tunneled TLS)

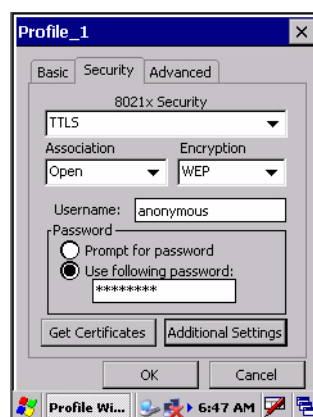
This protocol provides authentication like EAP-TLS (see page 75) but does not require certificates for every user. Instead, authentication servers are issued certificates. User authentication is done using a password or other credentials that are transported in a securely encrypted “tunnel” established 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 TTLS Settings.

Use “TTLS” to configure the use of EAP-TTLS as an authentication protocol, and select “Open,” “WPA,” “WPA2,” or “Network EAP” as an association mode.

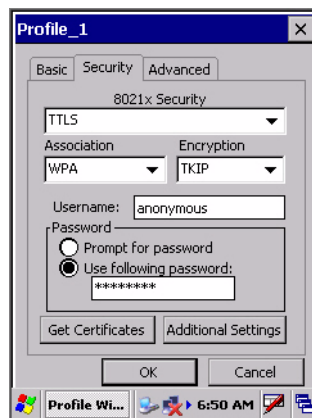
To Enable TTLS with an Open Association (default configuration)

- 1 Set **8021x Security** as “TTLS.”
- 2 Set **Association** to “Open.”
- 3 Skip **Encryption** as it is automatically set to “WEP.” See page 65 for information about WEP encryption.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner TTLS authentication and an inner EAP, and set options for server certificate validation and trust. See page 83 for more information.



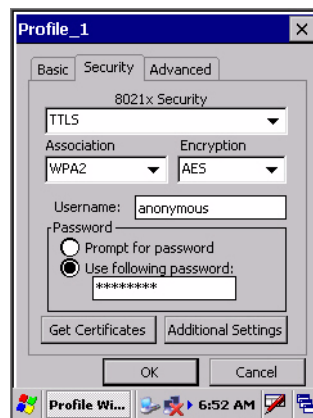
To Enable TTLS with WPA Encryption

- 1 Set **8021x Security** as “TTLS.”
- 2 Set **Association** to “WPA.” See page 65 for information about WPA encryption.
- 3 Skip **Encryption** as it is automatically set to “TKIP.” See page 65 for more information about TKIP.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner TTLS authentication and an inner EAP, and set options for server certificate validation and trust. See page 83 for more information.



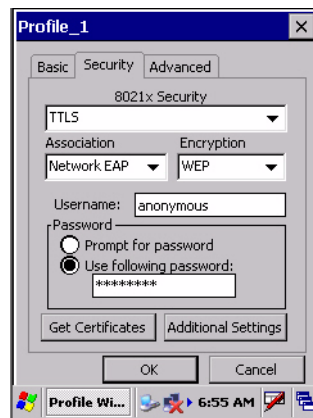
To Enable TTLS with WPA2 Encryption

- 1 Set **8021x Security** as “TTLS.”
- 2 Set **Association** to “WPA2.” See page 65 for information about WPA2 encryption.
- 3 Select **Encryption** to either “TKIP” or “AES.” See page 65 for more information about TKIP and page 65 for more information about AES.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner TTLS authentication and an inner EAP, and set options for server certificate validation and trust. See page 83 for more information.



To Enable TTLS with Network EAP

- 1 Set **8021x Security** as “TTLS.”
- 2 Set **Association** to “Network EAP.” See page 65 for information about EAP.
- 3 Select **Encryption** to either “WEP” or “CKIP.” See page 65 for more information about WEP and page 65 for more information about CKIP.
- 4 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.
- 5 Tap **Get Certificates** to obtain or import server certificates. See page 84 for more information.
- 6 Tap **Additional Settings** to assign an inner TTLS authentication and an inner EAP, and set options for server certificate validation and trust. See page 83 for more information.



Additional TTLS Settings

- 1 Select an authentication method 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. <i>You cannot use this if authenticating against a Windows NT Domain or Active Directory.</i>
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 65 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.
- 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 X to return to the Security page.

The screenshot shows a dialog box titled "Additional TTLS Settings". It contains several sections:

- Inner TTLS Authentication:** A dropdown menu currently showing "EAP".
- Inner EAP:** A dropdown menu currently showing "EAP/Token Card".
- Certificate Settings:** A section with a checkbox labeled "Validate Server Certificate" which is currently unchecked. Below it are two text input fields labeled "Common Name 1:" and "Common Name 2:", both of which are empty.
- Anonymous EAP-TTLS Name:** A text input field containing the word "anonymous".

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 CK60 Computer.

Root Certificates

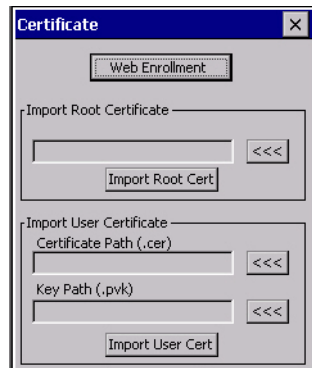
- 1 Tap the <<< button next to the **Import Root Certificate** field to select the root certificate (DER-encoded .CER file) to import.
- 2 Click **Import Root Cert** to install the selected certificate.

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 **X** to return to the Security page.



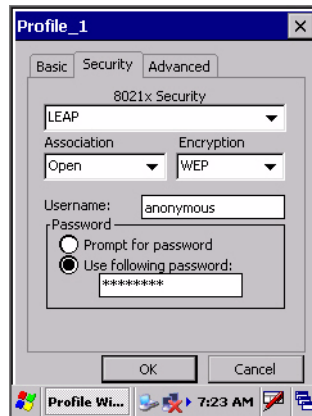
LEAP (Cisco Lightweight EAP)

LEAP is the Cisco Lightweight version of EAP. See page 65 for information about EAP.

Use “LEAP” to configure the use of LEAP as an authentication protocol, select “Open,” “WPA,” “WPA2,” or “Network EAP” as an association mode, or assign “Network EAP.” *Note that this defaults to the Network EAP.*

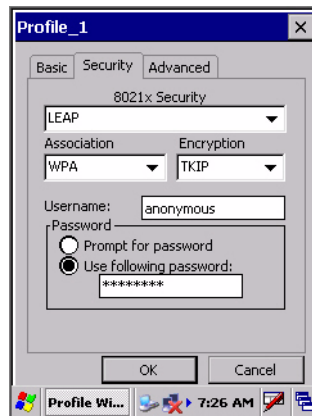
To Enable LEAP with an Open Association

- 1 Set **8021x Security** as “LEAP.”
- 2 Set **Association** to “Open.”
- 3 Skip **Encryption** as it is automatically set to “WEP.” See page 65 for more information about WEP.
- 4 Enter your unique **User Name** to use this protocol.
- 5 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.



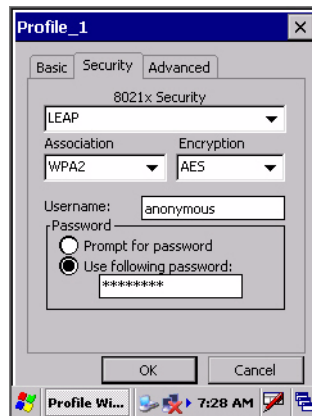
To Enable LEAP with WPA Encryption

- 1 Set **8021x Security** as “LEAP.”
- 2 Set **Association** to “WPA.” See page 65 for information about WPA encryption.
- 3 Skip **Encryption** as it is automatically set to “TKIP.” See page 65 for more information about TKIP.
- 4 Enter your unique **User Name** to use this protocol.
- 5 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.



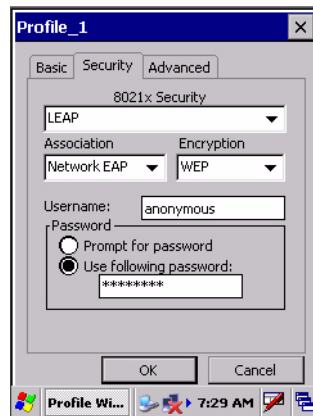
To Enable LEAP with WPA2 Encryption

- 1 Set **8021x Security** as “LEAP.”
- 2 Set **Association** to “WPA2.” See page 65 for information about WPA2 encryption.
- 3 Select **Encryption** to either “TKIP” or “AES.” See page 65 for more information about TKIP and page 65 for more information about AES.
- 4 Enter your unique **User Name** to use this protocol.
- 5 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 “PEAP.”
- 2 Set **Association** to “Network EAP.” See page 65 for information about EAP.
- 3 Select **Encryption** to either “WEP” or “CKIP.” See page 65 for more information about WEP and page 65 for more information about CKIP.
- 4 Enter your unique **User Name** to use this protocol.
- 5 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.



Advanced

Use this page to configure additional settings for this profile. Tap X to return to the Profiles page.

- **Detect Rogue APs:**

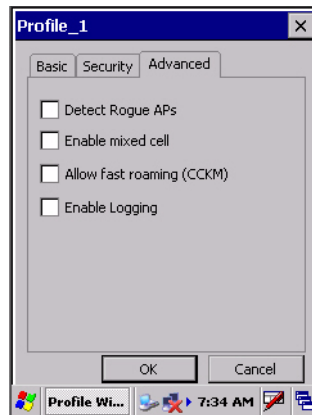
Wireless NICs and APs associate based on the SSID configured for the NIC. Given an SSID, the BSSID with the strongest signal is often chosen for association. After association, 802.1x authentication may occur and during authentication credentials to uniquely identify a user - these are passed between the NIC and the AP.

The base 802.1x technology does not protect the network from “rogue APs.” These can mimic a legitimate AP 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 APs. Once a rouge AP is detected, your CK60 Computer no longer associates with that AP until you perform a warm boot.

Clear this box to solve AP connection problems that result when an AP gets put on the rogue AP 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.



Using Configuration Parameters

A configuration parameter changes the way the CK60 Computer operates, such as configuring a parameter to have the CK60 Computer emit a very loud beep in a noisy environment. Use any of these methods to execute configuration parameters:

Scan EasySet bar code labels:

You can use the EasySet application from Intermec Technologies Corporation to print configuration labels. Scan the labels to change the imager configuration and data transfer settings. For more information, see the EasySet online help.

Send Reader Commands through the Network or from an Application

You can configure parameters by sending the following reader commands through the network or from an application. See “Using Reader Commands” on page 91 for more information.

Reader Command	Description	Options (Syntax Data for Reader Commands)
Audio Volume	Changes the volume of all audio signals	0 - Off 1 - Low 2 - Medium (<i>default</i>) 3 - High 4 - Very high
Automatic Shutoff	Sets the length of time the CK60 Computer remains on when there is no activity. When you turn on the CK60 Computer, it either resumes exactly where it was when you turned in off or boots and restarts your application.	1 - 1 minute 2 - 2 minutes 3 - 3 minutes (<i>default</i>) 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.	0 - Disable 10 - 10 seconds 30 - 30 seconds 60 - 1 minute (<i>default</i>) 120 - 2 minutes 180 - 3 minutes 240 - 4 minutes 300 - 5 minutes
Date/Time	Sets the current date and time.	Date Year - 0000-9999 (<i>1999</i>) Month - 1-12 (<i>6</i>) Day - 1-31 (<i>1</i>) Time Hour - 0-23 (<i>0</i>) Minute - 0-59 (<i>00</i>) Second - 0-59 (<i>00</i>)

Using Reader Commands

After the CK60 Computer is connected to your network, you can send the CK60 Computer a reader command from an application to perform a task, such as changing the time and date. Some reader commands temporarily override the configuration settings and others change these settings.

Change Configuration

The Change Configuration command must precede any configuration command. If you enter a valid string, the CK60 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 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 can be changed in this way. *See each command for information on respective acceptable “data” values.*

Command	Syntax
Audio Volume	BVdata
Automatic Shutoff	EZdata
Backlight Timeout	BFdata
Virtual Wedge Grid	AFdata
Postamble	AEdata
Preamble	ADdata

Example 1

To change the Beep Volume to Off, you can send this string to the CK60 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`

where:

- `$+` 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 CK60 Computer. The default date and time is *June 1, 1999 at 12:00 AM*.

From the network, send the following:

/+ yyyymmddhhmmss

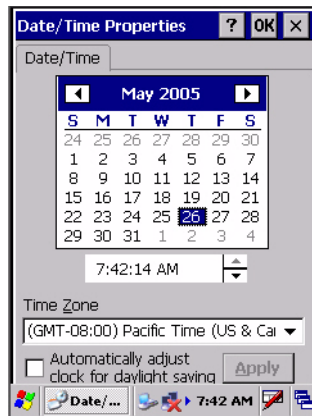
where acceptable values for the date are:

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



Date/Time

You can also set the time and date by using the **Date/Time** control panel applet. Tap **Start > Settings > Control Panel**, then double-tap the **Date/Time** icon to configure the time and date.



4 Maintaining the CK60 Computer

Use this chapter to upgrade the operating system, run diagnostics, solve problems you may encounter, and perform routine maintenance on your CK60 Handheld Computer:



Note: Desktop icons and control panel applet icons are shown to the left. Any place that **Start** is mentioned, tap the following Windows icon in the bottom, left corner of your CK60 desktop.



Upgrading the Operating System on your CK60 Computer

You can use the *Intermec Recovery Tools CD* to reinstall or upgrade the operating system software on the CK60 Computer. For more information, contact your Intermec representative for more information about this CD.

When you upgrade the operating system, you erase the current configuration and replace it with the new default configuration. You will need to reset the network parameters on the CK60 Computer to reestablish communications with other devices in the network. In other words, if you upgrade the operating system and the default registry from the operating system has changed, the registry is rolled back to the new default.

Running Diagnostics on Your CK60 Computer

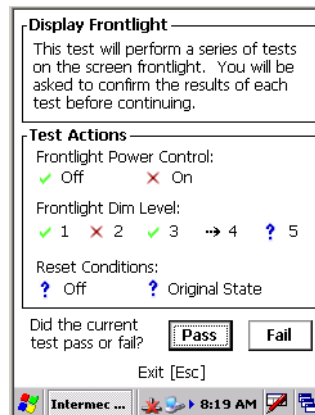


Use the Intermec Diagnostics control panel applet on the CK60 Computer to analyze firmware problems and view system information. Tap **Start > Settings > Control Panel**, then double-tap the **Intermec Diagnostics** icon to access these tests and information. Select the appropriate test, then tap **Start Test** to begin. Press **Esc** to exit any of the tests.

Frontlight Test

Use this test to ensure that your frontlight functions properly. It turns the frontlight on and off and sets brightness levels.

This test performs a series of tests on the screen frontlight. Tap either **Pass** or **Fail** to confirm the results of each test before continuing. A green check mark indicates a pass; a red “X” indicates a fail. The dashed arrow indicates the action being tested.



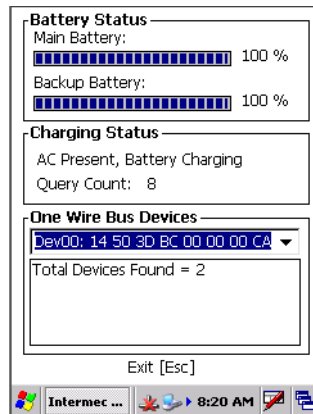
Battery Information

Use this test to view information about the battery voltage, charge levels, and AC line detection. The test would take less than a minute.

The **Main Battery** section displays the percentage of battery power remaining in the battery. You can continue using the battery until the CK60 Computer indicates that the battery is low; the battery light turns on and the low battery icon appears in the status bar.

The **Backup Battery** section indicates the percentage of battery power remaining in the backup battery (super capacity). The main battery charges the backup battery.

You can also use this screen to see the current volts and charging status.

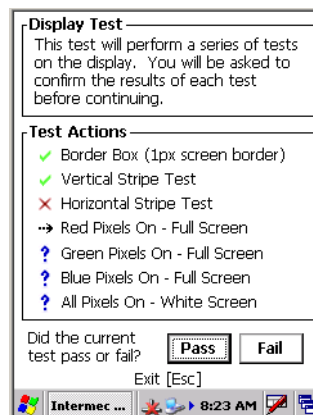


Display Test

Use this test to check for display accuracy and ensure the physical display is mounted properly and is visible. This test runs until you either press a key or tap the display.

This test performs a series of tests on the display. An explanation of what to expect is given before you press **ACTION (Enter)** to begin the test. When done testing an action, press **Esc** to end the test, then tap either **Pass** or **Fail** to confirm the results of the test before continuing to the next test.

A green check mark indicates a pass; a red “X” indicates a fail; the dashed arrow indicates the action being tested.

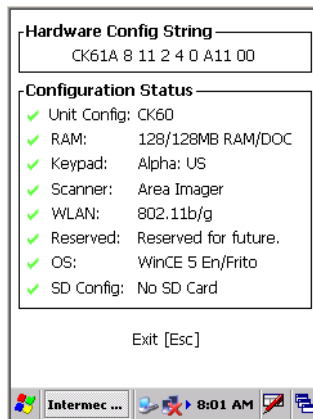


Hardware Configuration

Use this test to read the hardware configuration and display it onscreen.

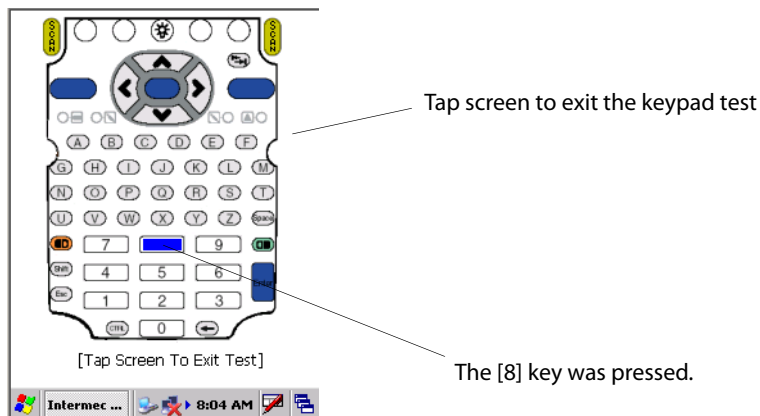
The hardware configuration table shows important information about your CK60 Computer, such as the serial number, configuration number, model, software options, and scanner type. Share this information with your Intermec representative when consulting about hardware and software that may be installed at the factory.

A green check mark indicates a pass; a blue question mark indicates information is not available; and a red “X” indicates inaccurate information.



Keyboard (Keypad) Test

Use this test to test the functionality of all the keys on your installed keypad. This test runs continuously until you tap the screen to exit. *Note that you do not test /o key, or you will suspend the CK60 Computer.* Press a key on the keypad for the screen to cover the same key with a block of color -- note the [8] key was pressed in the following illustration.

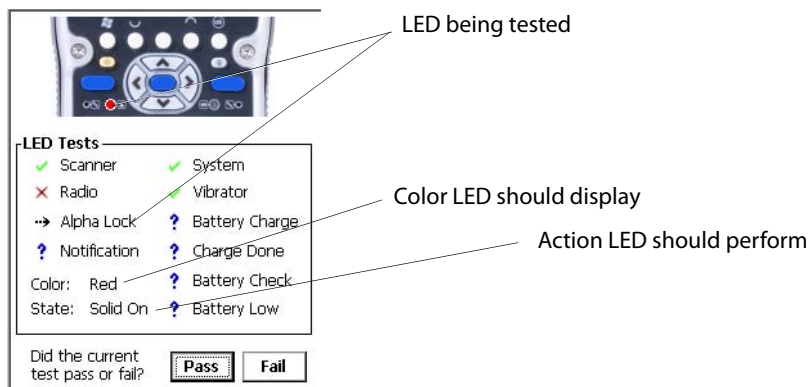


LED Test

Use this test to light each LED on the CK60 Computer to ensure each is working properly. This test continuously turns the LEDs on the CK60 Computer on until you press **Esc** to exit. There are multiple LED tests, tap **OK** on each test to go through the sequence, then tap either **Pass** or **Fail** to confirm the results of the test before continuing to the next test.

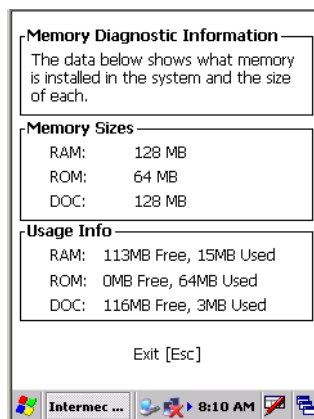
The top portion of the display shows the area of the CK60 Computer being tested. The **Color** and **State** descriptions in the left column indicate what you should expect with each LED feature being tested.

A green check mark indicates a pass; a blue question mark indicates information is not available or the feature was not tested; a red "X" indicates inaccurate information; a dashed arrow indicates the feature being tested.



Memory Information

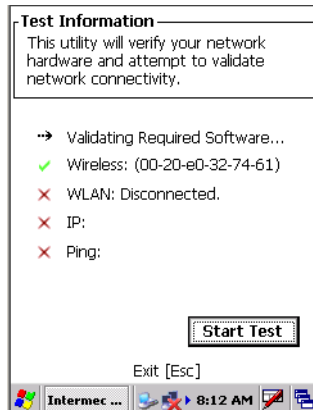
This displays the RAM, ROM, and Disk on Chip (DOC) memory installed in the CK60 Computer and the size of each. Press **Esc** to exit.



Networking Test

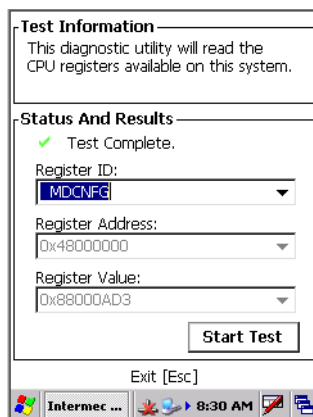
This test validates each required level of network connectivity. Tap **Start Test** to begin the validation. Press **Esc** to exit.

A green check mark indicates a validation; a blue question mark indicates the feature was not tested; a red “X” indicates the validation failed; a dashed arrow indicates the feature being tested.



Read CPU Registers

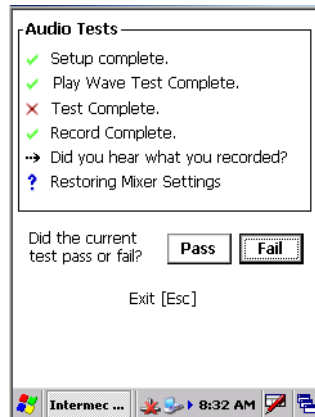
Use this to read the CPU registers available in your CK60 Computer, then create a log file listing the registers. Tap **Start Test** to read the CPU registers, then select any of the registers from the **Register ID** drop-down list to view its register address and register value. Press **Esc** to exit.



Sound Test

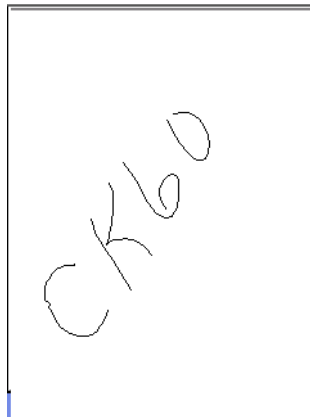
Use this to cycle through a frequency table, record audio through the microphone, and play back the recorded audio. Tap **Start Test** to begin the series, then tap either **Pass** or **Fail** to confirm the results of the test before continuing to the next test.

A green check mark indicates a pass; a blue question mark indicates the feature was not tested; a red “X” indicates the validation failed; a dashed arrow indicates the feature being tested.



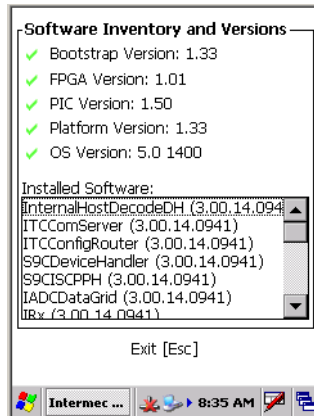
Touch Screen Test

Use this test to ensure your touchscreen works properly. Draw anywhere on the screen with your stylus, press **Esc** to exit.



Software Inventory

Use this test to get the latest version information of your critical software components. Press Esc to exit.



Troubleshooting Your CK60 Computer

If you have any problems using the CK60 Computer, look at the following for possible solutions:

- Problems While Operating the CK60 Computer (page 101)
- Problems While Configuring the CK60 Computer (page 102)
- Problems While Configuring 802.1x Security (page 102)
- Problems with Wireless Connectivity (page 104)
- Problems Transmitting Data through the Serial Port (page 105)
- Problems While Scanning Bar Codes (page 105)

If you send the CK60 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 device.

Problems While Operating the CK60 Computer

Problem	Solution
<p>You press $\frac{1}{2}$ to turn on the CK60 Computer and nothing happens.</p>	<ul style="list-style-type: none"> • Make sure the backlight is on by pressing $\frac{1}{2}$. • Make sure you have a charged battery installed correctly. For help, see “Using the Battery” on page 6. • The battery may be discharged. Replace the battery with a spare charged battery, or charge the battery and try again. • Perform a warm-boot.
<p>The Battery status LED is on.</p>	<ul style="list-style-type: none"> • If the battery status LED is a steady green, the battery is more than 95% charged and unit is on a charger. • If the battery status LED is blinking red, then the battery is low. The speed of the blinking increases as the battery power gets increasingly lower. • If the battery status LED is a steady red, the main battery is low, or if charging, then the LED remains red until the CK60 Computer reaches 95% charge status. • If the battery status LED is a steady yellow, then the CK60 Computer is on a charging source and there is no battery pack installed. This can also mean that the CK60 Computer is out of charging range 32° to 122°F (0° to 50°C). Once the CK60 Computer gets back in range, charging resumes and the LED changes to red or green. • If the battery status LED is a steady amber, then replace the battery pack.
<p>The CK60 Computer appears to be locked up and you cannot enter data.</p>	<ul style="list-style-type: none"> • Press $\frac{1}{2}$ to turn off the CK60 Computer, then press $\frac{1}{2}$ again to turn on the CK60 Computer. • Press and hold $\frac{1}{2}$ for ten seconds to warm-boot the CK60 Computer. • Perform a cold-boot on the CK60 Computer. For help, see “Resetting Your CK60 Computer” on page 3. • Try reloading the firmware. For help, see “Upgrading the Operating System on your CK60 Computer” on page 94. • If the CK60 Computer will not boot or reset, contact your local Intermec representative for help.

Problems While Configuring the CK60 Computer

Problem	Solution
You scan a configuration command, such as Beeper Volume, and you hear three low beeps.	If you are working in the Intermec Settings control panel applet, you cannot scan configuration commands. Exit the applet to scan configuration commands.
You scan or enter an option for the Scanner Model configuration command and you hear three low beeps.	You may have scanned or entered a Scanner Model command that does not apply to the type of scanner that you have installed. Try scanning or entering the Scanner Model command again and select an option for the type of device you are using.
You cannot type a character on the keypad or you can only type uppercase or lowercase letters.	You may have accidentally locked a modifier key on the keypad. Check the CK60 Computer status bar to see if it contains an icon with a locked symbol. Press the necessary key sequence to unlock the key. For help, see “Using the Keypad” on page 8.

Problems While Configuring 802.1x Security

If you have trouble configuring the computer for 802.1x security, check these problems and possible solutions.

Problems While Configuring 802.1x Security

Problem	Solution
The CK60 Computer indicates that it is authenticated, but it does not communicate with the host.	Make sure that the CK60 IP address, host IP address, subnet mask, and default router are properly configured for your network. Note: Do not perform a cold-boot on the CK60 Computer. Doing so resets the time and date. You must also update the time and date for the Certificate of Authority.
The CK60 Computer does not appear to be authenticating and a network connection icon does not appear on the status bar.	The CK60 Computer may not be communicating with your access point. Make sure the network name on the CK60 Computer is the same as the network name (SSID) of the access point with which you are trying to communicate. 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.

Problems While Configuring 802.1x Security (continued)

Problem	Solution
A network connection icon appears in the status bar, but then disappears.	<p>The CK60 Computer may not be communicating with the access point that you want it to communicate with. Make sure that the network name on the CK60 Computer is the same as the network name of the access point with which you are trying to communicate. The default network name is “INTERMEC.”</p> <p>The access point with which you are trying to communicate may not be communicating with the server. Make sure your access point is turned on, properly configured, and has 802.1x security enabled.</p>
The CK60 Computer indicates that it is not authenticated.	<p>Make sure that:</p> <ul style="list-style-type: none"> • The Users Name and Password parameters on your CK60 Computer match the user name and password on your authentication server. You may need to reenter the password on both your CK60 Computer and the authentication server. • On your authentication server, the user and group are allowed and the group policy is allowed to log into the server. For help, see the documentation that shipped with 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 reenter the IP address and secret key on both your access point and authentication server. • The authentication server software is running on the server PC.
You are setting up multiple access points in a network, with different SSIDs, and the connection fails.	The CK60 Computer does not save WEP key values when you change the SSID. Reenter the WEP key value after you change the SSID and select Apply Network Settings from the 802.11 Radio menu. You should now be able to connect to the different access points.
You receive a message saying “The server certificate has expired or your system date is incorrect” after you perform a cold-boot on the CK60 Computer.	The date and time on the CK60 Computer are not saved when a cold-boot is performed. You need to reenter the date and time and then select Apply Network Settings from the 802.11 Radio menu.

Problems with Wireless Connectivity

Problem	Solution
<p>When you turn on the CK60 Computer after it was suspended for a while (10-15 minutes or longer), it can no longer send or receive messages over the network.</p>	<p>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 “KeepAlive” message (if possible) from the host so that the TCP session is maintained while a CK60 Computer is suspended.</p>
<p>The No Network Connection icon appears on the status bar. The CK60 Computer is not communicating with the access point.</p>	<p>The CK60 Computer is not connected to the access point. Make sure the access point is turned on and operating. You may also be using the CK60 Computer out of range of an access point. Try moving closer to an access point to reestablish communications.</p> <p>Make sure the CK60 Computer is configured correctly for your network. The radio parameters on the CK60 Computer must match the values set for all access points with which the CK60 Computer may communicate. For help, see “Configuring 802.11b/g Radio Communications” on page 53.</p> <p>If you have an 802.11b radio, the radio initialization process may have failed. Try resetting the CK60 Computer. See “Resetting Your CK60 Computer” on page 3.</p> <p>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.</p>
<p>The CK60 Computer is connected to the Intermec Application Server or host computer and you move to a new site to collect data. The Network Connection icon was visible, but is now replaced with the No Network Connection icon.</p>	<p>You may have gone out of range of an access point. Try moving closer to an access point or to a different location to reestablish 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.</p>
<p>The Network Connection icon is in the status bar, but you cannot establish a terminal emulation session with the host computer.</p>	<p>There may be a problem with the host computer, a problem with the connection between the Intermec Application Server and the host computer, or a problem with the connection between the access point and the host computer. Check with your network administrator to make sure the host is running and allowing users to login to the system.</p>
<p>The Network Connection icon is in the status bar, but the host computer is not receiving any data from the CK60 Computer.</p>	<p>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.</p> <p>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.</p>

Problems Transmitting Data through the Serial Port

If you are having problems sending or receiving data through the integrated serial port on the CK60 Computer, check these possible problems:

- Make sure the CK60 Computer is connected to the PC, host computer, or RS-232 serial device using the appropriate cable adapter and null modem cable.
- If the CK60 Computer is in a communications dock, make sure that the communications dock is connected to the serial device using the appropriate cable.

For more information on using the serial port, see “Configuring Serial Communications” on page 53.

Problems While Scanning Bar Codes

Problem	Solution
<p>You cannot see a red beam of light from the scanner when you press the Scan button and aim the scanner at a bar code label.</p>	<p>There are two possible problems:</p> <ul style="list-style-type: none"> • 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. <p>You can test the effective range of the scanner. Move within 2 feet of a wall and test the scanner. You need to be within the scanning range to scan bar code labels. For help scanning bar codes, see “Scanning Bar Codes” on page 4.</p>
<p>When you release the Scan button or handle trigger, the Good Read light does not turn off.</p>	<p>The Good Read light will remain on if you configure the CK60 Computer to use continuous/edge triggering. If you configure the CK60 Computer for level triggering and the Good Read light remains on, there may be a problem. Press the Scan button or pull the trigger again without scanning a bar code label. If the light is still on, contact your local Intermec representative.</p>

Problems While Scanning Bar Codes (continued)

Problem	Solution
<p>The input device attached to the CK60 Computer does not appear to work well or read bar code labels very quickly.</p>	<p>Try setting the Scanner Model command to the specific input device you have attached. Check the bar code symbologies you have enabled on the CK60 Computer. Enable only the symbologies that you are using.</p>
<p>The scanner will not read the bar code label.</p>	<p>Make sure you aim the scanner beam so it crosses the entire bar code label in one pass.</p> <p>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.</p> <p>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.</p> <p>Make sure the bar code symbology you are scanning is enabled. Use the Intermec Settings control panel applet to check the symbologies. On the Scanners, Symbologies option, expand the Symbologies option beneath each of the devices listed (scanner, virtual wedge) to see what symbologies has a check mark. If there is no check mark, then the bar code symbology is disabled. Check the symbology to enable it, then try scanning the bar code label again.</p> <p>Make sure that the application you are running on the CK60 Computer is expecting input from a bar code. You may need to type this information instead of scanning it.</p>
<p>The scanner does not read the bar code labels quickly, or the scanning beam seems to be faint or obscured.</p>	<p>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.</p>
<p>You scan a valid bar code label to enter data for your application. The data decoded by the scan module does not match the data encoded in the bar code label.</p>	<p>The CK60 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.</p> <p>To operate the CK60 Computer quickly and efficiently, you should enable only the bar code symbologies that you are going to scan.</p>

Problems While Scanning Bar Codes (continued)

Problem	Solution
You receive a message reading “Scanner Communication Failure” when trying to connect a 1551E or 1553 decoded scanner.	Make sure that: <ul style="list-style-type: none"> • You are using the correct cable. • The scanner cable is attached correctly. When you attach the scanner to the port, it should emit a single power up beep. • Try enabling the port state using the Intermecc Settings control panel applet. • Try upgrading the scanner firmware. • Select ASCII as the scanner model.
Your 1551E or 1553 scanner was working fine, but after changing the port setting you cannot change the configuration.	The 1551E or 1553 scanner port must be using the correct RS-232 settings to allow configuration in the Intermecc Settings control panel applet. Try disabling, then enabling the scanner port state.
Configuration settings in the Intermecc Settings applet do not match the settings on your 1551E or 1553 Scanner.	Try disabling, then enabling the scanner port state to synchronize the CK60 Computer settings with the scanner.

Cleaning the Scanner Window and CK60 Screen

To keep the CK60 Computer in good working order, you may need to clean both the scanner window and the CK60 screen.

Clean the scanner window and CK60 screen as often as needed for the environment in which you are using the CK60 Computer. To clean the CK60 Computer, use a solution of ammonia and water.



Caution

There are no user-serviceable parts inside the CK60 Computer. Opening the unit will void the warranty and may cause damage to the internal components.

Attention: Le CK60 ne contient pas de pièces réparables par l'utilisateur. Le fait d'ouvrir l'unité annule la garantie et peut endommager les pièces internes.

Press $\frac{1}{2}$ to turn off the CK60 Computer. Dip a clean towel or rag in the ammonia solution and wring out the excess. Wipe off the scanner window and screen. Do not allow any abrasive material to touch these surfaces. Wipe dry.

5 Network Support

The CK60 Series Handheld Computer automatically installs the appropriate software for radio use when the unit is powered on. It provides wireless connectivity via the Wireless Local Area Network (WLAN) using a radio option that provides up to 54 Mbps.



Note: Desktop icons and control panel applet icons are shown to the left. Any place that **Start** is mentioned, tap the following Windows icon in the bottom, left corner of your CK60 desktop.



Ethernet Communications



Tap **Start > Settings > Network and Dial-up Connections**, then double-tap the LAN90001 connection icon to access and configure its properties.

'Built-In Ethernet (10Mbps...)' OK X

IP Address | Name Servers

An IP address can be automatically assigned to this computer.

Obtain an IP address via DHCP

Specify an IP address

IP Address: [. . .]

Subnet Mask: [. . .]

Default Gateway: [. . .]

IP Address

'Built-In Ethernet (10Mbps...)' OK X

IP Address | Name Servers

Name server addresses

Primary DNS: [. . .]

Secondary DNS: [. . .]

Primary WINS: [. . .]

Secondary WINS: [. . .]

Name Servers

Wireless 802.11 Communications



Tap **Start > Settings > Network and Dial-up Connections**, then double-tap the PRISMA021 connection icon to access and configure its properties.

'Conexant PRISM Wireless ...' OK X

IP Address | Name Servers

An IP address can be automatically assigned to this computer.

Obtain an IP address via DHCP

Specify an IP address

IP Address: [. . .]

Subnet Mask: [. . .]

Default Gateway: [. . .]

IP Address

'Conexant PRISM Wireless ...' OK X

IP Address | Name Servers

Name server addresses

Primary DNS: [. . .]

Secondary DNS: [. . .]

Primary WINS: [. . .]

Secondary WINS: [. . .]

Name Servers



To configure wireless 802.11 communications on the CK60 Computer, tap **Start > Settings > Control Panel**, then double-tap the **Wireless Network** icon to access the Profile Wizard for the 802.11b/g radio module. Go to Chapter 3 “Configuring the CK60 Computer” for configuration information.

AutoIP/DHCP

Automatic Private IP Addressing (AutoIP) is enabled by default in Windows CE. To remain compatible with other versions of Windows CE, enable this setting. You can configure the registry settings in the following to set the required AutoIP/DHCP behavior:

```
HKEY_LOCAL_MACHINE\Comm\PRISMNDS1\TcpIp
```

Other registry keys that can modify the behavior of AutoIP are as follows. You can find the appropriate settings and behavior of each of the AutoInterval, AutoIP, AutoMask, AutoSeed, and AutoSubnet 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.

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: Use DhcpRetryDialogue and DhcpMaxRetry registry settings to extend the number of attempts that a DHCP client makes to get a DHCP address.



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



6 Bar Code Symbolologies

This appendix contains a brief explanation of some of the bar code symbolologies that the CK60 Handheld Computer decodes and explains some of the general characteristics and uses of these bar code types.

The CK60 Computer recognizes a number of the most widely used bar code symbolologies. With bar code symbolologies, like languages, there are many different types. A bar code symbology provides the required flexibility for a particular inventory tracking system.

A symbology may be for particular industries, such as food and beverage, automotive, railroad, or aircraft. Some of these industries have established their own bar code symbology because other symbolologies did not meet their needs.

Without going into great detail on the bar code structure, note that no two products use the same bar code. Each product gets a unique bar code.

Industries that use a particular type of bar code symbology have formed regulating committees or are members of national institutes that issue and keep track of bar codes. This ensures that each organization that contributes to a particular industry conforms to its standard. Without some form of governing body, bar coding would not work.

Codabar

Codabar was for retail price-labeling systems. Today it is widely accepted by libraries, medical industries, and photo finishing services.

Codabar is a discrete, self-checking code with each character represented by a stand-alone group of four bars and three intervening spaces.

Four different start or stop characters get defined and designated “a”, “b”, “c”, and “d”. These start and stop characters are constructed using one wide bar and two wide spaces. A complete Codabar symbol begins with one of the start or stop characters followed by some number of data characters and ending in one of the start or stop characters. It may also contain optional check digit before each stop character.

Any of the start or stop characters may be used on either end of the symbol. It is possible to use the 16 unique start or stop combinations to identify label type or other information.

Since Codabar is variable-length, discrete, and self-checking, it is a versatile symbology. The width of space between characters is not critical and may vary significantly within the same symbol. The character set consists of “0” through “9”, “-”, “\$”, “:”, “/”, “.”, and “+”.

The specific dimensions for bars and spaces in Codabar optimize performance of certain early printing and reading equipment. Codabar has 18 different dimensions for bar and space widths. So many different dimensions often result in labels printed out of specification and cause Codabar printing equipment to be more expensive.

Codablock

Codablock is a stacked symbology from ICS Identcode-Systeme. It was invented by Heinrich Oehlmann and was originally a stack of Code 39 symbols.

Each Codablock symbol contains from 1 to 22 rows. The number of characters per row is a function of the x-dimension of the symbol. In other words, each row can contain a variable amount of characters. Each symbol has a start and stop bar group that extends the height of the symbol. Each row has a two character row indicator, and the last row of the symbol has an optional check digit. The symbol printing program must calculate not only the number of rows needed as in the other stack symbolologies, but also calculate the number of characters per row and the print density necessary to best fit the data into the Codablock symbol.

The code is a continuous, variable-length symbology that can encode the Code 39 character set (10 digits, 26 letters, space, 6 symbols) and is as dense as a Code 39 symbol at a given print density. For example, the maximum data density is 56 alphanumeric characters per square inch with a symbol using an x-dimension of about 7.5 mils and a bar ratio of 2 to 1.

Codablock A

Enables or disables decoding of Codablock A symbology. Codablock A is a 2D bar code that is an extension of Code 39.

Codablock F

The current version is Codablock F which is basically a stack of Code 128 symbols. A Codablock F symbol consists of between 2 and 44 rows, each up to a maximum of 62 symbol characters wide. Each row can be read by a standard code 128 reader and contains additional overhead information relating to row numbering and symbol size to enable the decoded output from each row to be re-assembled to reproduce the complete message in the right sequence.

The advantage of this code is that it can be read by moving beam laser scanners with very little modification. Codablock was adopted by German blood banks for the identification of blood.

Code 11

Code 11 satisfies the requirements for a very high density, discrete numeric bar code. The name Code 11 derives from 11 different data characters that can be represented, in addition to a start or stop character.

The character set includes the 10 digits and the dash symbol. Each character is represented by a stand-alone group of three bars and two intervening spaces. Although Code 11 is discrete, it is not self-checking. A single printing defect can transpose one character into another valid character. One or two check digits obtain data security.

The specifications for Code 11 suggest that this code should have a narrow element width of 7.5 mils. This results in an information density of 15 characters per inch.

Code 39

Code 39 (C39) is the most widely used symbology among the industrial bar codes. Most major companies, trade associations, and the federal government find this code to fit their needs. The main feature of this symbology is the ability to encode messages using the full alphanumeric character set, seven special characters, and ASCII characters.

Programming for this symbology can be for any length that the application requires. The application program for the CK60 Computer handles symbology at least one character but no more than 32 characters in length.

When programming the computer for Code 39, it is important to set the symbology limit as close as possible (minimum and maximum bar code lengths being scanned). Doing so keeps the computer bar code processing time to a minimum and conserves battery power.

Bar code readers can respond to Uniform Symbology Specification symbols in non-standard ways for particular applications. These methods are not for general applications, because of the extra programming required. Code 39 Full ASCII is one example of a symbology feature or operating mode, and is defined as part of the symbology specification. This mode can be used for general applications or any open system applications.

Code 39 Full ASCII Mode

If the bar code reader is programmed for the task, the entire ASCII character set (128 characters) could be coded using two character sequences: a symbol (“\$”, “.”, “%”, “/”) followed by a letter of the alphabet.

Concatenated Code 39

If the first data character of a symbol is a space, the reader may be programmed to append the information contained in the remainder of the symbol to a storage buffer. This operation continues for all successive symbols that contain a leading space, with messages being added to the end of previously stored ones. When a message is read which does not contain a leading space, the contents are appended to the buffer, the entire buffer is transmitted, and the buffer is cleared.

Code 93

The introduction of Code 93 provided a higher density alphanumeric symbology designed to supplement Code 39. The set of data characters in Code 93 is identical with that offered with Code 39. Each character consists of nine modules arranged into three bars and three spaces.

Code 93 uses 48 of the 56 possible combinations. One of these characters, represented by a square, is reserved for a start or stop character, four are used for control characters, and the remaining 43 data characters coincide with the Code 39 character set. An additional single module termination bar after the stop character concludes the final space.

Code 93 is a variable length, continuous code that is not self-checking. Bar and spaces widths may be one, two, three, or four modules wide. Its structure uses edge-to-similar-edge decoding. This makes the bar code immune to uniform ink spread, which allows liberal bar width tolerances.

Code 93 uses two check characters. Its supporters believe this makes it the highest density alphanumeric bar code. The dual check digit scheme provides for high data integrity. All substitution errors in a single character are detected for any message length.

Code 128

Code 128 (C128) is one of the newest symbolologies used by the retail and manufacturing industries. It responds to the need for a compact alphanumeric bar code symbol that could encode complex product identification.

The fundamental requirement called for a symbology capable of being printed by existing data processing printers (primarily dot-matrix printers) that produce daily, work-in-progress, job, and product traceability documents. The ability to print identification messages between 10 and 32 characters long, on existing forms and labels deemed an important requirement.

Code 128 uniquely addresses this need as the most compact, complete, alphanumeric symbology available.

Additionally, the Code 128 design with geometric features, improves scanner read performance, does self-checking, and provides data message management function codes.

Code 128 encodes the complete set of 128 ASCII characters without adding extra symbol elements. Code 128 contains a variable-length symbology and the ability to link one message to another for composite message transmission. Code 128, being a double-density field, provides two numeric values in a single character.

Code 128 follows the general bar code format of start code, data, check digit, stop code, and quiet code. An absolute minimum bar or space dimension of nine mils (0.010 inch minimum nominal \pm 0.001 inch tolerance) must be maintained.

Characters in Code 128 consist of three bars and three spaces so that the total character set includes three start characters and a stop character.

UCC/EAN-128 Shipping Container Labeling is a versatile tool that can ease movement of products and information. The Shipping Container Labeling bar code can take any form and usually has meaning only within the company or facility where applied.

Because this *random* data can get mistaken later for an industry standard code format, the UCC and EAN chose a symbology uniquely identified from these other bar codes. This standard is for maximum flexibility, to handle the diversity of distribution in global markets by cost efficiency.

The UCC/EAN-128 Container Labeling specification calls for a FUNC1 to immediately follow the bar code's start character. FUNC1 also follows any variable-length application field. The specification also calls for the computer to send "JC1" for the first FUNC1. The specification requires that the computer send a "<GS>" (hex 1D) for subsequent FUNC1 codes in the bar code.

Because "<GS>" is not compatible with computer emulation data streams, the Uniform Code Council has been asked to change the specification. This change is made to send the same three character sequence "JC1" to identify the embedded FUNC1 codes.

This implementation should provide for clean application coding by identifying the same sequences for the same scanned codes. If the communication of bar code types is enabled, the Shipping Container Label codes precede with a "J". These strings will appear on the computer display. The application may have to allow for strings longer than 48 characters (maximum

length indicated in the specification). Actual length variance depends on the number of variable-length data fields. Allowing for 60 characters should be sufficient. Within the Code 128 specification, the computer can link bar codes together. If this is to happen, allow for more characters (computer limit is 100 characters).

The Application Identifier Standard, that is part of the UCC/EAN Shipping Label concept, complements, rather than replaces, other UCC/EAN standards. Most UCC/EAN standards primarily identify products.

Several industries expressed the need to standardize more than product identification. The UCC/EAN Code 128 Application Identifier Standard supplies this tool. The standard adds versatility for inter-enterprise exchanges of perishability dating, lot and batch identification, units of use measure, location codes, and several other information attributes.

For more detailed information on Code 128 UCC/EAN Shipping Label bar code and Application Identifier Standard, refer to the UCC/EAN-128 Application Identifier Standard specification.

Data Matrix

Data Matrix is a high density 2D matrix code that can store a large amount of information. It has excellent error correction abilities and is mostly used for marking and tracking parts.

Data Matrix can store from 1 to about 2000 characters. The symbol is square and can range from 0.001 inch per side up to 14 inches per side. As an example of density, 500 numeric-only characters can encode in a 1-inch square using a 24-pin dot matrix printer.

Data Matrix encodes product and serial number information on electrical rating plates; marks surgical instruments in Japan; identifies lenses, circuit boards, and other items during manufacturing.

EAN (European Article Numbering)

EAN symbology is similar to UPC symbology, except that it contains 13 characters and uses the first two to identify countries.

The EAN symbology is used in the retail environment throughout most of Europe. Though similar to UPC symbology, these are not interchangeable.

EAN/UCC (Uniform Code Council) Composite

This component is not a stand-alone symbology. It is a 2D symbol designed to act as a component of existing and new EAN/UCC System linear symbols. This is not designed to carry EAN.UCC System keys (these are carried by the host linear symbol), however, it can carry any of the system's Application Identifiers. This symbology family is identified to provide encodation of item attribute data in a confined space.

Interleaved 2 of 5 (I 2 of 5)

I 2 of 5 (Interleaved 2 of 5 Code) is an all-numeric symbology, widely used for warehouse and heavy industrial applications. Its use has been particularly prevalent in the automobile industry. The I 2 of 5 symbology can be placed on smaller labels than what the standard UPC symbology requires.

I 2 of 5 also provides a little more flexibility on the type of material it can print on. Interleaved 2 of 5 Code has its name because of the way the bar code is configured.

I 2 of 5 bars and spaces both carry information. The bars represent the odd number position digits, while spaces represent the even number position digits. The two characters are interleaved as one. Messages encoded with this symbology have to use an even number of characters since two numeric characters always get interleaved together.

Matrix 2 of 5

Matrix 2 of 5 is a derivative of Code 11 and is a linear bar code limited to ten digits and a start/stop character. Discrete but not self-checking. Matrix 2 of 5 is used with a single Modulo 10 check digit. Compared with Code 11 (using two check digits) and the other industrial symbologies, Matrix 2 of 5 is somewhat more subject to substitution errors and offers no particular advantage.

MaxiCode

MaxiCode is a fixed-size code which holds up to 93 data characters. The symbol is composed of a central bulls-eye locator and offset rows of hexagonal elements; the overall dimensions of the symbol are approximately 1.11 x 1.054 inches. Each element measures 0.035 x 0.041 inches.

Created by United Parcel Service, the MaxiCode symbol is for quick automated scanning of packages on high-speed conveyor lines (special cameras can read a MaxiCode on a carton travelling at up to 500 feet per minute).

Micro PDF417

Micro PDF417 is derived from PDF417. The code has a limited set of symbol sizes and a fixed level of error correction for each symbol size. Module dimensions are user-specified so that the symbol may be printed with a variety of printers. The symbology allows up to 150 bytes, 250 alphanumeric characters, or 366 numeric digits to be stored. This is done by specifying one of three compaction modes: data, text or numeric. Text Compaction mode permits all printable ASCII characters to be encoded (values 32 to 126 inclusive) as well as selected control characters. Byte Compaction mode permits all 256 possible 8-bit byte values to encode. This includes all ASCII characters value 0 to 127 inclusive and provides for

international character set support. Micro PDF417 is designed for applications where the symbol must be smaller than PDF417 will allow.

MSI Code (Variant of Plessey)

The MSI Plessey bar code is a variant of the Plessey bar code. It is a pulse-width modulated non-self checking code, and is used primarily in store shelf labeling. Each character consists of eight elements, four bars and four spaces. The character set includes the digits 0 through 9. A Modulo 10 checksum is appended to the end of the code. For start and stop checks, MSI employs a single bit pair of 1 as a start symbol and a single bit pair of 0 as a stop symbol. MSI reverses the 1-2-4-8 BCD pattern for bit pair weighting to 8-6-2-1.

PDF417

The PDF417 symbology is a stacked 2D symbology that allows you to scan across rows of code. Each row consists of start/stop characters, row identifiers, and symbol characters, which consist of four bars and four spaces each and contain the actual data. This symbology uses error correction symbol characters appended at the end to recover loss of data.

PDF417 stores up to 1800 printable ASCII characters or 1100 binary characters per symbol. The symbol is rectangular; the shape of the symbol is adjusted to some extent by setting the width and allowing the height to grow with the data. It is also possible to break large amounts of data into several PDF417 symbols which are logically linked. There is no theoretical limit on the amount of data that can store in a group of PDF417 symbols.

The capacity of PDF417 can be helpful in applications where the data must travel with the labeled item, where a host database is not always available for quick look-up. PDF417 is used for hazardous materials labeling; storing technical specifications, and calibration data on electronic instruments; encoding fingerprints and photographs on drivers' licenses.

The maximum data density is determined by the smallest elements which can be reliably printed and scanned. Using the smallest recommended element size of 0.0075 inch wide and 0.010 inch high, the maximum data density in the binary mode is 686 bytes per square inch (106.2 bytes per square centimeter). In the printable ASCII mode the density is 1144 characters per square inch (177.2 characters per square centimeter).

Plessey

Plessey finds its origin in the pulse width modulated (PWM) code developed in England. It is widely used for shelf markings in grocery stores. Pulse width modulated codes represent each bit of information by a bar and space pair. A zero bit consists of a narrow bar followed by a wide space, while a one bit consists of a wide bar followed by a narrow space. It is

mainly a numeric symbology (0-9) with six extra characters available for assigning any symbol or letter desired.

Plessey codes employ a variety of check characters and a polynomial-based Cyclic Redundancy Check (CRC). For start and stop characters, Plessey employs a 1101 and previously used a 0101.

This symbology is very limited about what information can be encoded. It is not considered for new applications.

QR Code (Quick Response Code)

QR Code is a 2D matrix symbology containing dark and light square data modules. It has position detection patterns on three of its four corners and features direct encodation of the Japanese Kana-Kanji character set. A 2D imaging device such as a CCD camera is necessary to scan the symbology. QR Code is designed with selectable levels of error correction. It supports industry standard escape sequences to define international code pages and special encodation schemes. QR Code is used for small item marking applications using a wide variety of printing and marking technologies. This document includes descriptions of the character encodation, symbol structure, reference decode algorithm, and symbol quality measurements for QR Code.

RSS (Reduced Space Symbology)

The EAN.UCC RSS family has three linear symbologies to use with the EAN.UCC system. Usage is restricted and subject to compliance with the EAN International/UCC rules and registration procedures.

RSS 14

RSS 14 encodes the full 14-digit EAN.UCC item identification in a linear symbol scanned omnidirectionally by suitably programmed POS scanners.

RSS Expanded

RSS Expanded encodes EAN.UCC item identification plus supplementary AI element strings such as weight and “best before” date in a linear symbol that can be scanned omnidirectionally by programmed POS scanners.

RSS Limited

RSS Limited encodes a 14-digit EAN.UCC item identification with Indicator digits of zero or one in a linear symbol for use on small items that is not scanned at the POS.

Telepen

Telepen was devised by George Sims, Managing Director of SB Electronic Systems Limited, in early 1972, this is the only symbology to directly represent the full ASCII character set without shift characters.

Telepen carries the double-density numeric-only mode and is very compact. The Telepen symbol is up to 8 ASCII characters or 16 digit per inch, and is easy to print. It has a fixed 3:1 ratio, with a tolerance at least 0.4x. This symbology is extremely secure, with negligible risk of misreading. It is supported by most leading manufacturers.

UPC (Universal Product Code)

The UPC (Universal Product Code) is the symbology used throughout the grocery and retail industries. This bar code symbology contains two pieces of numerical information encoded on the bar code, producer identification, and product identification information.

The UPC symbol is 12 characters long. The first character of the UPC symbol is a number system character, such as “0” for grocery items and “3” for drug- and health-related items. This symbology is for retail environments such as grocery, convenience, and general merchandise stores.

Some retail items are so small that a standard UPC bar code cannot fit on the packaging. When this occurs there is a shorter version of the UPC symbology, referred to as UPC-E. UPC-E is six characters long (eight including number system and check digit), about half of a standard UPC bar code.



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CK60 Handheld Computer with Windows CE 5.0 User's Manual



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