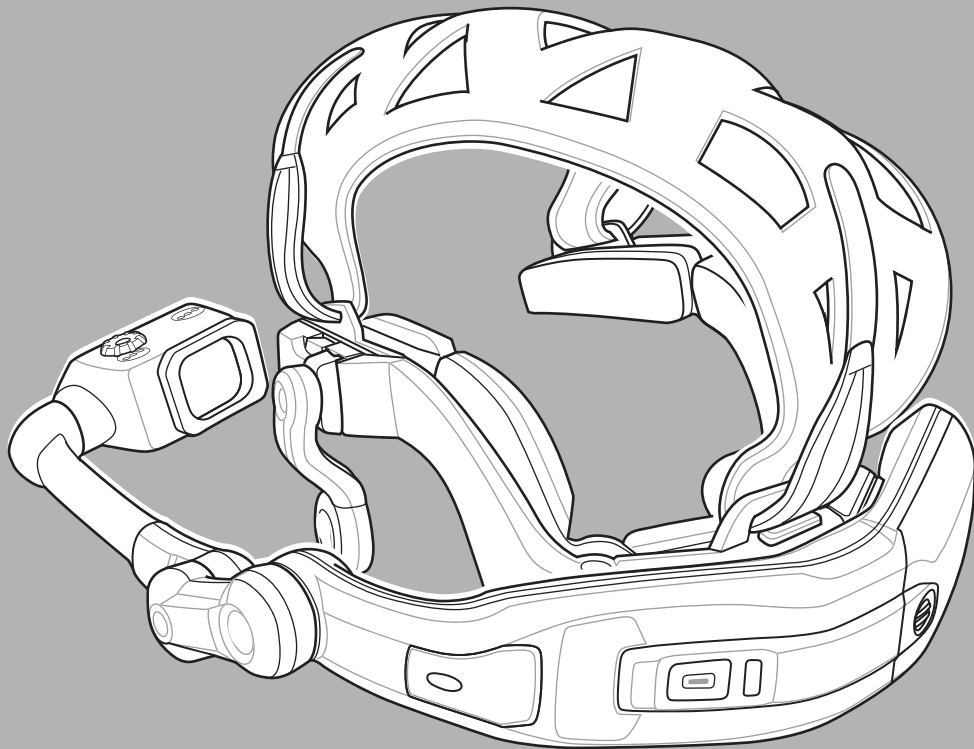


# HC1 HEADSET COMPUTER INTEGRATOR GUIDE





**HC1**

# **INTERGRATOR GUIDE**

72E-165012-02

Rev. A

April 2015

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## Revision History

Changes to the original manual are listed below:

Change	Date	Description
-01 Rev. A	7/10/13	Initial release.
-01 Rev. B	10/1/13	Update Configuration chapter.
-02 Rev. A	4/9/15	Zebra Rebranding



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# ABOUT THIS GUIDE

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## Introduction

This guide provides information about configuring the HC1 headset computer.

**NOTE**

Screens and windows pictured in this guide are samples and may differ from actual screens.

## Documentation Set

The documentation set for the HC1 is divided into guides that provide information for specific user needs.

- **HC1 Quick Reference Guide** - describes how to start using the HC1 for the first time.
- **HC1 User Guide** - describes how to use the HC1.
- **HC1 Integrator Guide** - describes how to set up the HC1 and the accessories.

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## Configurations

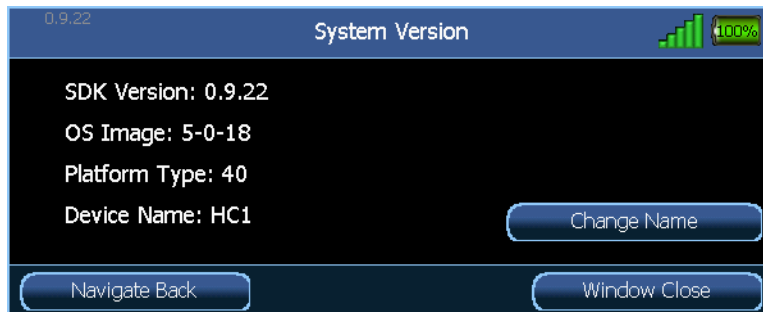
This guide covers the following configurations:

Configuration	Radios	Display	Memory	Data Capture	Operating System
HC1	WLAN: 802.11 b/g WPAN: Bluetooth v 2.1 with EDR	Color screen	512 MB RAM/ 512 MB Flash	optional camera, CS3070, RS507	Windows CE 6.0

## Software Versions

This guide covers various software configurations and references are made to operating system or software versions. To determine the software versions:

Say “My Computer” > “My Controls” > “System Version.”



## Chapter Descriptions

Topics covered in this guide are as follows:

- [Chapter 1, Application Development](#), describes requirement for developing applications for the HC1.
- [Chapter 2, Synchronization](#), provides information for copying files between the HC1 and a host computer.
- [Chapter 3, Operating System Update](#), provides procedures for updating the HC1 operating system.
- [Chapter 4, Configuration](#), provides information for configuring the HC1 software.
- [Chapter 5, Maintenance & Troubleshooting](#), includes instructions on cleaning and storing the HC1, and provides troubleshooting solutions for potential problems during HC1 operation.
- [Appendix A, Specifications](#), includes a table listing the technical specifications for the HC1.

## Notational Conventions

The following conventions are used in this document:

- The term “headset computer” refers to the Zebra HC1.
- *Italics* are used to highlight the following:
  - Chapters and sections in this and related documents
  - Dialog box, window and screen names
  - Drop-down list and list box names
  - Check box and radio button names
  - Icons on a screen.
- **Bold** text is used to highlight the following:
  - Key names on a keypad
  - Button names on a screen.
- Bullets (•) indicate:
  - Action items
  - Lists of alternatives
  - Lists of required steps that are not necessarily sequential.

- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

---

## Related Documents and Software

The following items provide more information about the HC1.

- *HC1 Quick Reference Guide*, p/n 72-165008-xx
- *HC1 User Guide*, p/n 72E-165011-xx

For the latest version of this guide and all guides, go to: <http://www.zebra.com/support>

---

## Service Information

If you have a problem with your equipment, contact Zebra Global Customer support for your region. Contact information is available at: <http://www.zebra.com/support>.

When contacting Zebra Global Customer support, please have the following information available:

- Serial number of the unit
- Model number or product name
- Software type and version number

Zebra responds to calls by email or telephone within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Global Customer Support, you may need to return your equipment for servicing and will be given specific directions. Zebra is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

If you purchased your product from a Zebra business partner, contact that business partner for support.



# CHAPTER 1      APPLICATION DEVELOPMENT

The HC1 Software Developer's Kit allows developers to write applications that take advantage of the capabilities of the HC1.

The HC1 SDK is available on the Zebra Support Central web site: <http://www.zebra.com/support>.



# CHAPTER 2      SYNCHRONIZATION

Synchronization lets the user manage information between an HC1 and a host computer so that changes made either on the HC1 or on the host computer appear in both places. Download and install synchronization software to the host computer (either Microsoft ActiveSync for Windows XP or Windows Mobile Device Center (WMDC) for Windows Vista and Windows 7) in order to use the sync feature. Visit [www.microsoft.com](http://www.microsoft.com) on the host computer for details.

The synchronization software:

- Allows working with HC1-compatible applications on the host computer. The sync software replicates data from the HC1 to view, enter, and modify data on the host computer.
- Synchronizes files between the HC1 and the host computer, converting the files to the correct format.
- Backs up the data stored on the HC1. Synchronization is a one-step procedure that ensures the data is always safe and up-to-date.
- Copies (rather than synchronizes) files between the HC1 and the host computer.
- Controls when synchronization occurs by selecting a synchronization mode. For example, synchronize continuously while the HC1 is connected to the host computer, or synchronize only on command.
- Selects the types of information to synchronize and control how much data is synchronized.

## Installing the Sync Software

To download and install either Microsoft ActiveSync (for Windows XP) or WMDC (for Windows Vista and Windows 7), visit [www.microsoft.com](http://www.microsoft.com) and follow the instructions provided.

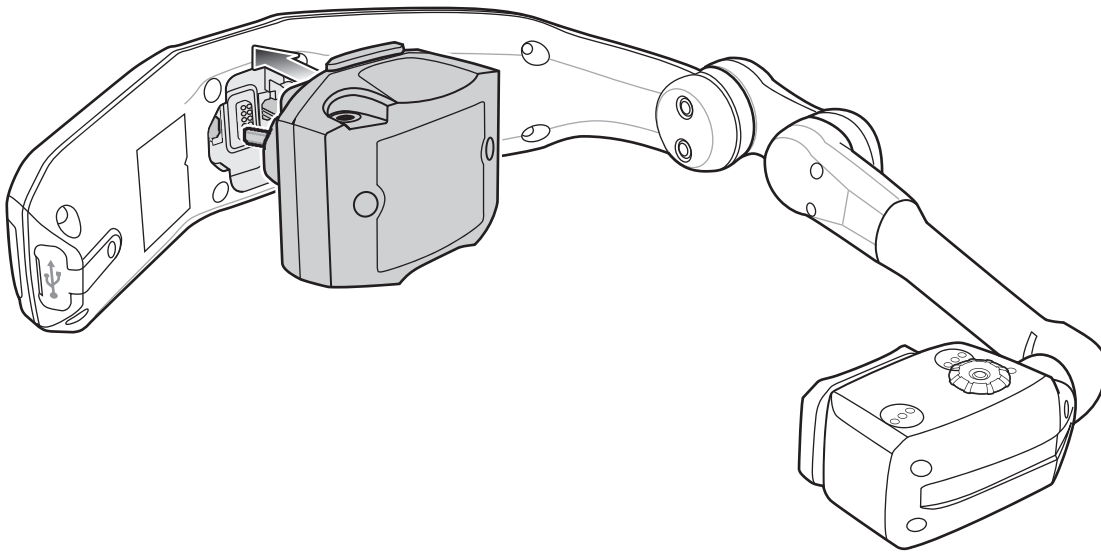
## HC1 Setup



**NOTE** Microsoft recommends installing the synchronization software on the host computer before connecting the HC1.

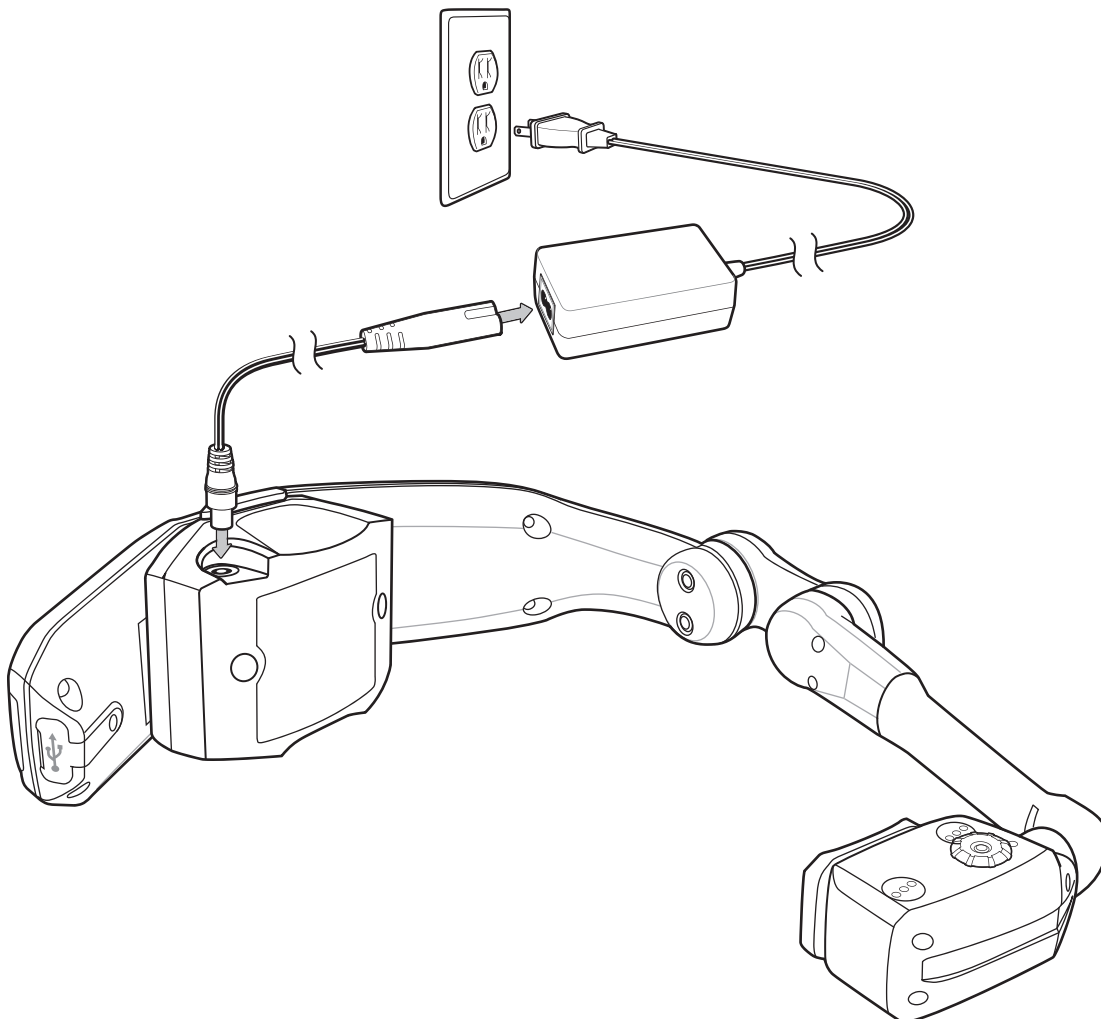
The HC1 can be set up to communicate with a USB connection. The HC1 communication settings must be set to match the communication settings used with ActiveSync or WMDC.

1. Install ActiveSync or WMDC on the host computer and setting up a partnership.
2. Connect the power module to the HC1.



**Figure 2-1** *Connect Power Module to HC1*

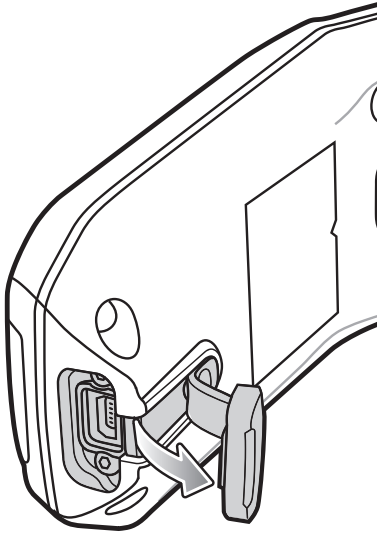
3. Connect the power supply to the power module.



**Figure 2-2** *Connect Power Supply to Power Module*

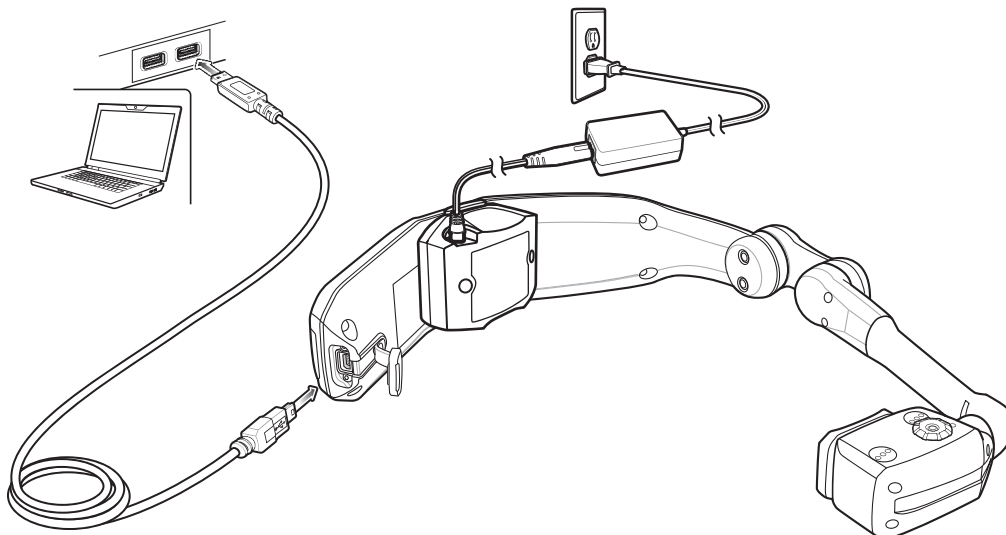


4. Lift the rubber plug covering the USB port.



**Figure 2-3** *Open USB Cover*

5. Connect the mini USB connector of the USB cable to the USB port on the HC1.
6. Connect the other end of the USB cable to the host computer.



**Figure 2-4** *Connect Host Computer to HC1*

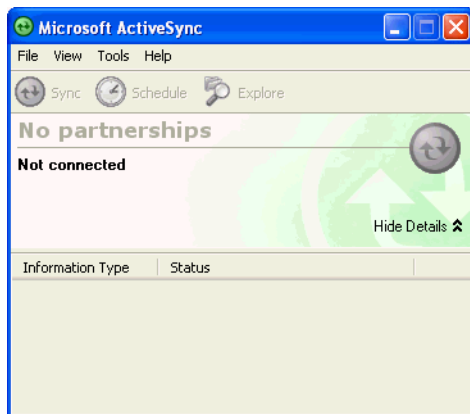
## Setting Up a Sync Connection

Set up a Sync connection using Windows XP or Windows 7.

### ActiveSync (Windows XP)

To set up a Sync connection using Windows XP:

1. Select **Start > Programs > Microsoft ActiveSync** on the host computer. The **ActiveSync Window** displays.



**Figure 2-5** ActiveSync Window



**NOTE** Assign each HC1 a unique device name. Do not try to synchronize more than one HC1 to the same name.

2. In the **ActiveSync** window, select **File > Connection Settings**. The **Connection Settings** window appears.



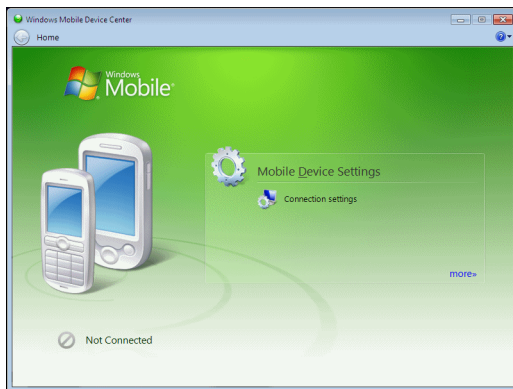
**Figure 2-6** Connection Settings Window

3. Select **Allow USB connections** check box.
4. Select the **Show status icon in taskbar** check box.
5. Select **OK** to save any changes made.

## Windows Mobile Device Center (Windows 7)

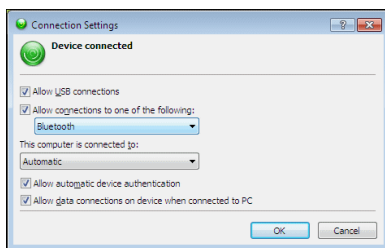
To set up a Sync connection using Windows 7:

1. Select **Start > All Programs > Windows Mobile Device Center** on the host computer.



**Figure 2-7** Windows Mobile Device Center Window

2. In the WMDC window, under **Mobile Device Settings**, click **Connection settings**.



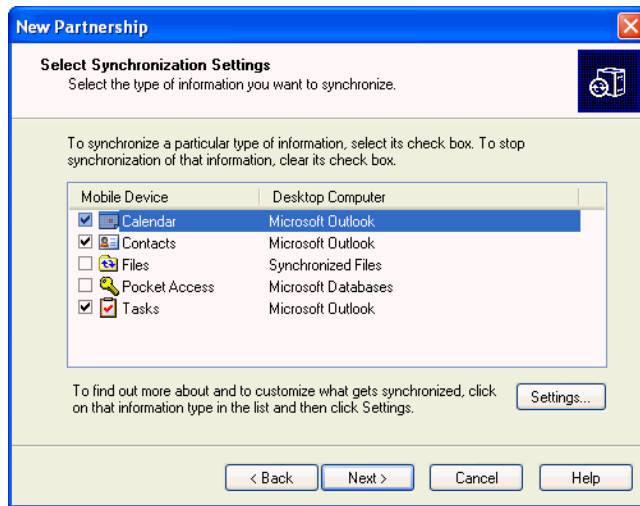
**Figure 2-8** Connection Settings Window

3. Select **Allow USB connections** and adjust any additional settings as needed.
4. Click **OK** to save your settings.

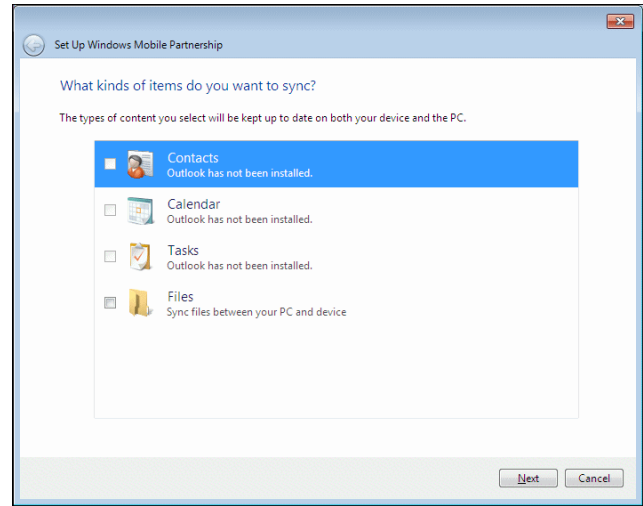
## Setting up a Partnership

To set up a partnership:

1. If the **Get Connected** window does not appear on the host computer, select **Start > All Programs > Microsoft ActiveSync**.
2. Select if you want to create synchronize with the host computer or to connect as a guest.
3. Click **Next**.



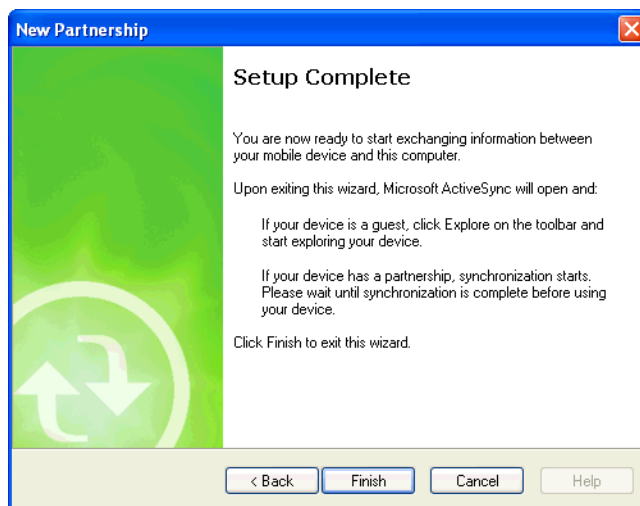
ActiveSync



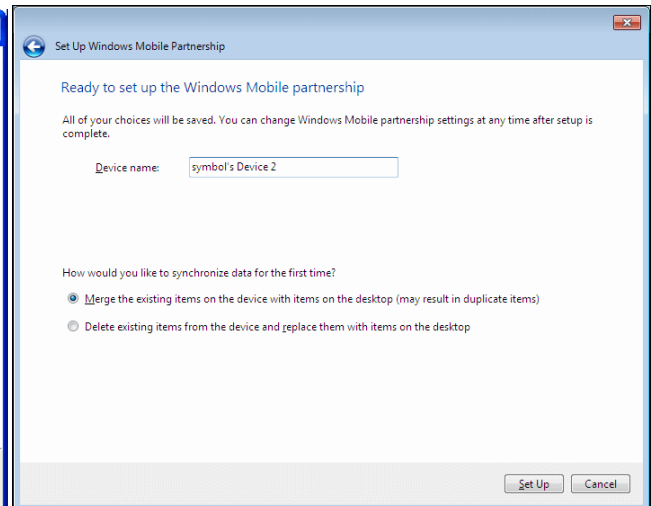
WMDC

**Figure 2-9** Select Synchronization Setting Window

4. Select the appropriate settings and click **Next**.



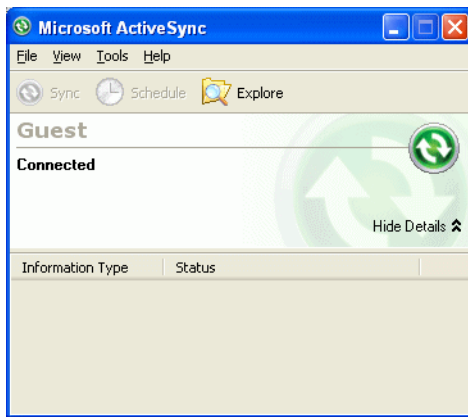
ActiveSync



WMDC

**Figure 2-10** Setup Complete Window

5. Click **Finish** or **Setup**.



ActiveSync



WMDC

**Figure 2-11** *Connected Window*

During the first synchronization, information stored on the HC1 is copied to the host computer. When the copy is complete and all data is synchronized, the HC1 can be disconnected from the host computer.

✓ **NOTE** The first synchronization operation must be performed with a local direct connection. To retain partnerships after a cold boot, capture partnership registry information in a .reg file and save it in the Flash File System.

For more information about using ActiveSync or WMDC, start the application on the host computer, then see Help.

## Copying Files from a Host Computer

Copy files to the wearable terminal using ActiveSync or by placing the wearable terminal into mass storage mode.

### ActiveSync

To copy files from a host computer to the wearable terminal:

1. Ensure that ActiveSync or WMDC is installed on the host computer and that a partnership was created. For more information see, [Setting Up a Sync Connection on page 2-3](#).
2. Connect the HC1 to the host computer using the USB cable. See [HC1 Setup on page 2-1](#) for connection information.
3. The Microsoft ActiveSync or WMDC application automatically launches.

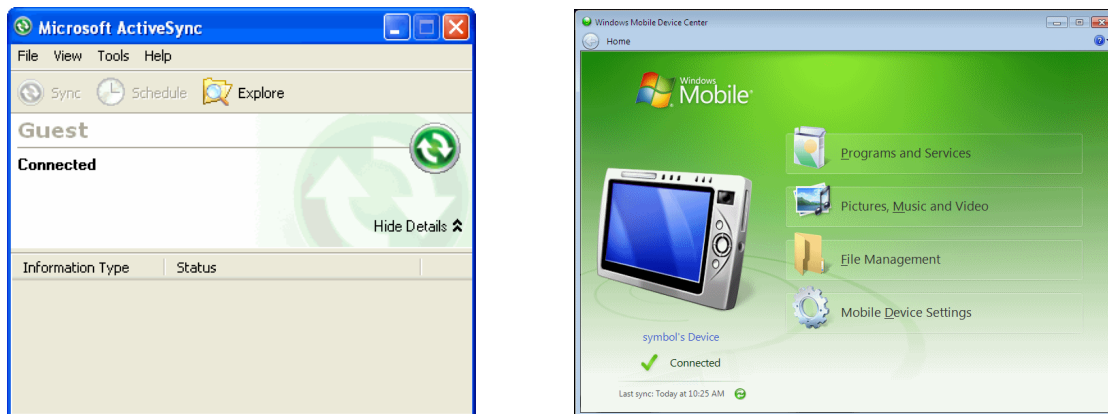


Figure 2-12 ActiveSync Connected Window

4. In ActiveSync, select *Explore* or in WMDC select **File Management** > **Browse the contents of your device**.

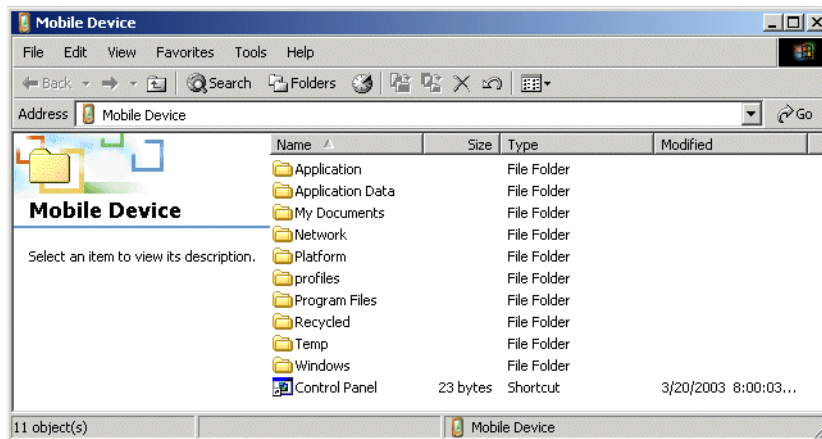


Figure 2-13 Explorer

5. Double-click the folder to expand the folder contents.

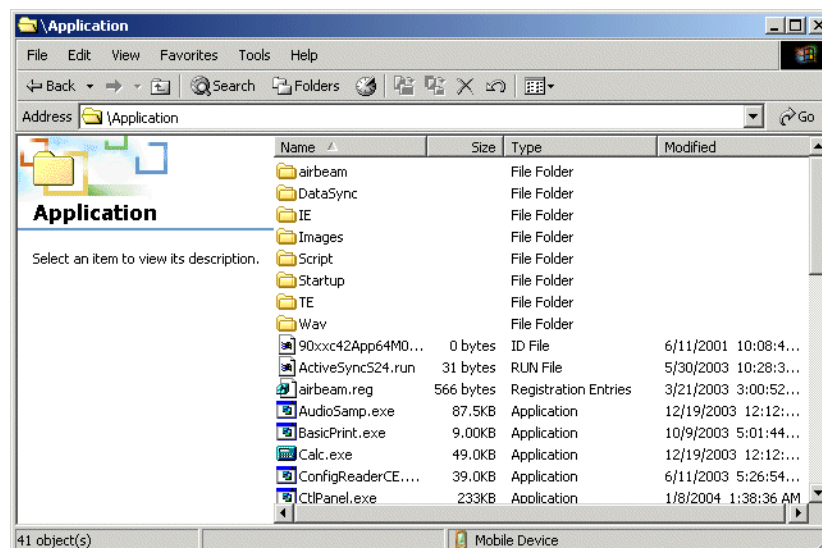


Figure 2-14 Application Folder Contents

6. Use Explorer to locate the host computer directory that contains the file to download. Tap that directory in the left pane to display its contents in the right pane.
7. Drag the desired file(s) from the host computer to the desired mobile device folder.





# CHAPTER 3      OPERATING SYSTEM UPDATE

Operating system updates are distributed as packages. Zebra distributes the update packages on the Support Central web site, <http://www.zebra.com/support>. Perform the update by using a microSD card.



**CAUTION** When performing an operating system update, all data and installed applications on the HC1 is erased. Copy all important data a host computer prior to performing an update. Re-install applications after the update.

## Downloading the Latest Operating System

To download the update package:

1. On a host computer, go to the Zebra Support Central web site; <http://www.zebra.com/support>.
2. Select *Software Downloads*.
3. Select *Mobile Computers*.
4. Select *HC1*.
5. On the HC1 Product page, select the OS update package.
6. Follow the instructions to download the package.

## Updating the Operating System Using a microSD Card

To update the HC1 operating system:



**CAUTION** Connect the HC1 to AC power before performing an OS update.

1. Install a microSD card into a host computer.
2. Copy the OS update package files to the root of the microSD card. Refer to the instructions provided with the OS update package.
3. Properly remove the microSD card from the host computer.
4. Remove the battery door.

5. Remove the battery from the HC1.
6. Using a #1 Phillips screwdriver, remove the screw securing the card cover.
7. Lift the card cover.
8. Insert the microSD card into the card slot with the contacts facing down.
9. Close the card cover.
10. Secure the card cover using a #1 Phillips screwdriver.
11. Connect the HC1 to AC power. See *Charging the HC1 on page 1-4*.
12. Install the battery.
13. Install the battery door. The HC1 turns on and detects the files on the microSD card and begins to update the operating system.
14. The upgrading screen displays during installation.
15. When complete, the Desktop or an installed application appears.



**CAUTION** The user must remove the microSD card after performing an operating system update. Failure to remove the card causes an operating system update upon a cold boot.

16. Using a #1 Phillips screwdriver, remove the screw securing the card cover.
17. Lift the card cover.
18. Remove the microSD card from the HC1.
19. Close the card cover.
20. Secure the card cover using a #1 Phillips screwdriver.
21. Disconnect the Charging Adapter.

### Updating the Operating System Using MSP

The MSP Client Software is a set of software components that come pre-installed on the HC1. The MSP Client software consists of the following components:

- The **Rapid Deployment** application provides support for MSP Staging functionality, provides support for the MSP Legacy Staging process, and provides support for backward-compatible legacy MSP 2.x Legacy Staging functionality.
- The **MSP Agent** application provides MSP Provisioning functionality and Control functionality when used with MSP 4.2 Control Edition.

Refer to the Mobility Services Platform 4.2 User's Guide, p/n 72E-100158-xx, for instructions for using the Rapid Deployment and MSP Agent clients.

# CHAPTER 4 CONFIGURATION

---

## AutoPatch File

AutoPatch allows the HC1 operating system and flash drives to be automatically patched from a microSD card at boot time. This feature is enabled each time the HC1 boots. Just after the system boots, but before control is handed to AutoExec, the AutoPatch application runs. It checks the currently inserted microSD card for a top level folder called **AutoPatch/**. If found, every file inside the folder is copied to the HC1 flash disk, preserving the folder hierarchy if one exists. The top level hierarchy inside **/Storage Card/AutoPatch/** is copied to the root of the HC1 file-system.

For example, to update a file called **readme.txt** that is in the **/Windows** directory of the HC1, place the new **readme.txt** file in the **/AutoPatch/Windows/** folder on the microSD card.

At the end of each boot sequence a log file is written by AutoPatch describing what occurred, which files it copied and the status of the operation. This log file is located at:  
**/Goldeni/Launcher/autopatch\_log.txt**.

---

## Configuring the Autoexe File

The autoexec feature controls how the system behaves at boot up. On booting the HC1, after AutoPath has been run, the operating system looks for the **autoexec.txt** file to tell it what additional steps it should perform before handing over control to the user.

The **autoexec.txt** file is located in one of two places on the HC1. However only the first file found is read and parsed.

- **/Storage Card/autoexec.txt**
- **/autoexec.txt**

If a microSD card is inserted and contains an **autoexec.txt** file, this takes precedence over the one stored in the root WinCE directory.

The file contains a list of instructions, comprising system settings and applications to launch automatically. The instructions are written in ASCII text and take the form 'action = value'.

The syntax for the **autoexec.txt** file in [Table 4-1](#). See [Autoexec.txt File Example on page 4-3](#) for an example of an **autoexec.txt** file.

**Table 4-1** *Autoexe.txt File Options*

Action	Value	Description
Orientation	0 (up) or 1 (down)	Change the default orientation of the screen on boot-up.
Brightness	1 to 100	Change the default brightness of the screen on boot-up. 1 is dark, 100 is bright.
Speaker	0 to 100	Change the default speaker volume on boot-up. 0 is mute, 100 is loudest
WiFi	0 (Disable) or 1 (Enable)	Set the state of the WIFI driver on boot-up; either enabled or disabled.
Sleep	Time in milliseconds	Sleep Time in milliseconds Sleep for 'n' milliseconds. Delay's further script processing by defined amount.
Language	Default Language	Specify the default language used by HC1 in its applications. This does not localize the underlying WinCE OS – just the Speech Recognizer and applications. If this item is not specified the system will boot to 'en_us'.
Execute_and_continue	Path to .exe file	Execute the given application and continue with autoexec script. Does not wait for application to finished running. Arguments can be supplied to the executable by listing them after a '[' character on the command line.
Execute_and_wait	Path to .exe file	Execute the given application and wait until application has terminated before continuing with autoexec script. Arguments can be supplied to the executable by listing them after a '[' character on the command line.
ActiveSync	1	Force ActiveSync connection.
Desktop	(none)	Start standard WinCE Desktop Shell.

## Autoexec.txt File Example

```
#####
##
## Golden-i Auto-Exec Script File
## Version 1.5.1 - August 2013
## (c) 2010 Kopin Corporation
##
##
## Script Description:
## # - Denotes Comment Line
## orientation = x : screen orientation, 0=up, 1= down
## brightness = x : 1 to 100 to set screen brightness
## output = x : 0 or 1 for DVI or LCD output (Golden-i Dev Boards only)
## speaker = x : 0 to 100 for speaker volume
## wifi = x: 0 for disabled, 1 for enabled
## language = xx_xx : Default Speech Recognition Language at Boot Time
## (Always defaultys to en_us unless specified here)
## Possible Values:
## en_us US English
## fr_fr French
## ge_ge German
## it_it Italian
## sp_sp Spanish##
##
## execute_and_continue = pathname
## : full or relative path to executable. Executable launched.
## Script proceeds without waiting for executable to complete.
## Arguments can be added using '|' as separator, ie. notepad.exe |
myfile.txt
##
## execute_and_wait = pathname
## : full or relative to path executable. Executable launched.
## Script waits for executable to complete before contining
## Arguments can be added using '|' as separator, ie. notepad.exe |
myfile.txt
##
## sleep = x : pause time in milliseconds
##
## activeSync = 1 : Force an activeSync connection over USB
##
## desktop = x : start the WinCE Desktop
##
## copyfiles = srcFolder: copy entire tree inside srcFolder to Golden-i root partition
##
##
## Script Files are searched for in the following order. If found the first script is found
## the second one will not be executed:
##
## \Storage Card\autoexec.txt
## \autoexec.txt
##
#####

orientation = 0
```

```
brightness = 50
```

```
execute_and_wait = \Storage Card\Goldeni\bin\winCE\GoldeniWinCE.exe
```

```
desktop
```

---

## Configuring the Home Page

The G-i Services Home Page (My Computer) screen can be configured to add or remove applications. The configuration file, `home_page.gis`, is located at: `\Golden-i\app-data\File Explorer\default_home\`.

Refer to the `README - LAUNCH SCREEN SYNTAX.txt` file, located at `\Golden-i\app-data\File Explorer\`, describes the options for modifying the `home_page.gis` file.

---

## Home Page File Example

```
#####
##
## Golden-i Launch Screen - Home Page
##
## v1.0.0
##
#####

title =
y = 0

-----Welcome Text
#Not used, commented out
#label = welcomeText
#textsize=28
#transparent=1
#textalign=1
#textcolor=150,150,150
#x=10
#y=20
#w=780
#h=60

-----Default Home Page Text

label =
textsize=18
transparent=1
textalign=1
textcolor=150,150,150
x=100
y=420
```

```
w=600
```

```
h=80
```

```
-----My Photos
```

```
button = photosButton
```

```
x = 80
```

```
y = 110
```

```
w = 150
```

```
h = 110
```

```
transparent=1
```

```
buttonImage = home_icons\my_photos_button.gif
```

```
buttonlink = \My Documents\Photos
```

```
buttonAlign=1
```

```
textSize=14
```

```
-----My Videos
```

```
button = videosButton
```

```
x = 240
```

```
y = 110
```

```
w = 150
```

```
h = 110
```

```
transparent=1
```

```
buttonImage = home_icons\my_videos_button.gif
```

```
buttonlink = \My Documents\Videos
```

```
buttonAlign=1
```

```
textSize=14
```

```
-----My Documents
```

```
button = documentsButton
```

```
x = 400
```

```
y = 110
```

```
w = 150
```

```
h = 110
```

```
transparent=1
```

```
buttonImage = home_icons\my_documents_button.gif
```

```
buttonlink = \My Documents\Documents
```

```
buttonAlign=1
```

```
textSize=14
```

```
-----My Storage Card
```

```
button = storageCardButton
```

```
x = 560
```

```
y = 110
```

```
w = 150
```

```
h = 110
```

```
transparent=1
```

```
buttonImage = home_icons\sd_card_button.gif
```



```

buttonlink = \Storage Card
buttonAlign=1
textSize=14

-----My Controls Button
button = controlsButton
x = 80
y = 270
w = 150
h = 110
transparent=1
buttonImage = home_icons\my_controls_button.gif
buttonlink = giControlPanels.exe
buttonAlign=1
textSize=14

-----My Network Controls Button
button = networkControlsButton
x = 240
y = 270
w = 150
h = 140
transparent=1
buttonImage = home_icons\my_networks_button.gif
buttonlink = giControlPanels.exe -wifi
buttonAlign=1
textSize=14

-----My Bluetooth Controls Button
button = bluetoothControlsButton
x = 400
y = 270
w = 150
h = 140
transparent=1
buttonImage = home_icons\my_bluetooth_button.gif
buttonlink = giControlPanels.exe -bluetooth
buttonAlign=1
textSize=14

-----My Telephone Controls Button
button = telephoneControlsButton
x = 560
y = 270
w = 150
h = 140
transparent=1

```

```
buttonImage = home_icons\my_phone_button.gif  
buttonlink = giControlPanels.exe -telephone  
buttonAlign=1  
textSize=14
```

---

```
#####
##
## Golden-i Launch Screen - Page Description Syntax
##
## v1.0.0
##
#####

// Add a page title and have it spoken by TTS system on page load
title = My Title

//Three graphic elements can be added: image, label and button

//Image = image name (jpg, gif or png), absolute filename or relative
image = images\skid.jpg

//Label = label text
label = The brakes are pulling to one side

//Button = button text
button = Press Me

//All components allow sizing with xywh commands
x = 20
y = 120
w = 200
h = 200

//TextSize for labels and buttons
textSize = 12

//Textcolor for labels and buttons in RGB decimal format
textColor = 255, 0 , 255

//Text labels are either single line and centered, or multiline and aligned left
multiline=1

//Buttons and labels either have a border and blue background, or can be transparent
transparent=1
```

```
//Buttons can have inset image to left of text
buttonImage = images\movie.gif
buttonImageWidth = 60
buttonImageHeight = 60

//Buttons can have a link:
//If the link ends in .jpg, .gif or .png, link will be opened with system image viewer
//If the link ends in .pdf, link will be opened with system pdf viewer
//If the link ends in .wmv, .avi, .mpeg4 or .h264, link will be opened with system movie
viewer
//If the link ends in .txt it will be parsed as a new page layout
//f the link is the phrase 'EXPERT_HELP', link will open camera viewer  and dial first
number in contacts list (see My Telephone Controls)

buttonlink = videos\Wheel Change.wmv
```

# Chapter 5 Maintenance & Troubleshooting

---

## Introduction

This chapter includes instructions on cleaning and storing the HC1, and provides troubleshooting solutions for potential problems during HC1 operation.

---

## Maintaining the HC1

For trouble-free service, observe the following tips when using the HC1:

- Although the HC1 is water and dust resistant, do not expose it to rain or moisture for an extended period of time.
- Protect the HC1 from temperature extremes. Do not leave it on the dashboard of a car on a hot day, and keep it away from heat sources.
- Use a soft lens cloth to clean the HC1. If the surface of the HC1 screen becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution.
- Periodically replace the rechargeable battery to ensure maximum battery life and product performance. Battery life depends on individual usage patterns.

---

## Battery Safety Guidelines



**WARNING!** Failure to follow these guidelines may result in fire, explosion, or other hazard.

- The area in which the units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken where the device is charged in a non commercial environment.
- Follow battery usage, storage, and charging guidelines found in this user guide.
- Improper battery use may result in a fire, explosion, or other hazard.

- To charge the mobile device battery, the battery and charger temperatures must be between +32 °F and +104 °F (0 °C and +40 °C)
- Do not use incompatible batteries and chargers. Use of an incompatible battery or charger may present a risk of fire, explosion, leakage, or other hazard. If you have any questions about the compatibility of a battery or a charger, contact Zebra support.
- Do not disassemble or open, crush, bend or deform, puncture, or shred.
- Severe impact from dropping any battery-operated device on a hard surface could cause the battery to overheat.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
- Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer.
- Battery usage by children should be supervised.
- Please follow local regulations to properly dispose of used re-chargeable batteries.
- Do not dispose of batteries in fire.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.
- If you suspect damage to your equipment or battery, contact Zebra support to arrange for inspection.

---

## Cleaning



**CAUTION** Always wear eye protection.

Read warning label on compressed air and alcohol product before using.

If you have to use any other solution for medical reasons please contact Zebra for more information.



**WARNING!** Avoid exposing this product to contact with hot oil or other flammable liquids. If such exposure occurs, unplug the device and clean the product immediately in accordance with these guidelines.

## Approved Cleanser Active Ingredients

100% of the active ingredients in any cleaner must consist of one or some combination of the following: isopropyl alcohol, bleach/sodium hypochlorite, hydrogen peroxide or mild dish soap.

## Harmful Ingredients

The following chemicals are known to damage the plastics on the HC1 and should not come in contact with the device: ammonia solutions, compounds of amines or ammonia; acetone; ketones; ethers; aromatic and chlorinated hydrocarbons; aqueous or alcoholic alkaline solutions; ethanalamine; toluene; trichloroethylene; benzene; carboic acid and TB-lysoform.

## Cleaning Instructions

Do not apply liquid directly to the HC1. Dampen a soft cloth or use pre-moistened wipes. Do not wrap the device in the cloth or wipe, but gently wipe the unit. Be careful not to let liquid pool around the display window or other places. Allow the unit to air dry before use.

## Special Cleaning Notes

Many vinyl gloves contain phthalate additives, which are often not recommended for medical use and are known to be harmful to the housing of the HC1. The HC1 should not be handled while wearing vinyl gloves containing phthalates, or before hands are washed to remove contaminant residue after gloves are removed. If products containing any of the harmful ingredients listed above are used prior to handling the HC1, such as hand sanitizer that contain ethanolamine, hands must be completely dry before handling the HC1 to prevent damage to the plastics.

## Materials Required

- Alcohol wipes
- Lens tissue
- Cotton tipped applicators
- Isopropyl alcohol
- Can of compressed air with a tube.

## Cleaning the HC1

### Housing

Using the alcohol wipes, wipe the housing including keys and in-between keys.

### Display

The display can be wiped down with the alcohol wipes, but care should be taken not to allow any pooling of liquid around the edges of the display. Immediately dry the display with a soft, non-abrasive cloth to prevent streaking.

### Connector

1. Remove the main battery from HC1. See *Replacing the Battery on page 1-17*.
2. Dip the cotton portion of the cotton tipped applicator in isopropyl alcohol.
3. Rub the cotton portion of the cotton tipped applicator back-and-forth across the connector on the bottom of the HC1. Do not leave any cotton residue on the connector.
4. Repeat at least three times.
5. Use the cotton tipped applicator dipped in alcohol to remove any grease and dirt near the connector area.
6. Use a dry cotton tipped applicator and repeat steps 4 through 6.



**CAUTION** Do not point nozzle at yourself and others, ensure the nozzle or tube is away from your face.

7. Spray compressed air on the connector area by pointing the tube/nozzle about ½ inch away from the surface.
8. Inspect the area for any grease or dirt, repeat if required.

### **Headstrap and Pads**

It may be necessary to wash the headstrap and replaceable pads when they become soiled.

Remove the headstrap and pads from the HC1. Hand wash in cold water with a mild detergent (such as Woolite®). Do not use bleach. Air dry. Do not use a dryer.

### **Cleaning Frequency**

The cleaning frequency is up to the customer's discretion due to the varied environments in which the mobile devices are used. They may be cleaned as frequently as required. However when used in dirty environments it may be advisable to periodically clean the scanner exit window to ensure optimum scanning performance.



## Troubleshooting

### HC1

**Table 5-1** Troubleshooting the HC1

Problem	Cause	Solution
HC1 does not turn on.	Battery not charged.	Charge or replace the battery.
	Battery not installed properly.	Ensure the battery is installed properly. Refer to the HC1 User Guide for more information.
	System crash.	Perform a reboot. Remove and replace the battery.
Battery did not charge.	Battery failed.	Replace battery. If the HC1 still does not operate, reboot the HC1.
	HC1 removed from power source while battery was charging.	Connect power source and begin charging. The 1950 mAh battery fully charges in less than four hours and the 4800 mAh battery fully charges in less than ten hours.
	Extreme battery temperature.	Battery does not charge if ambient temperature is below 32 °F (0 °C) or above 104 °F (40 °C).
Cannot see characters on screen.	HC1 in suspend mode.	Press the <b>Power</b> button.
Cannot see display properly.	Not using dominate eye.	Use dominate eye. Refer to the <i>HC1 User Guide</i> for more information.
During data communication, no data was transmitted, or transmitted data was incomplete.	HC1 unplugged from host computer during communication.	Reattach the cable and re-transmit.
	Incorrect cable configuration.	See the system administrator.
	Communication software was incorrectly installed or configured.	See the system administrator.
HC1 does not emit sound.	Volume setting is low or turned off.	Increase the volume. See <i>Speaker Volume on page 4-6</i> for more information.
	Speaker module not installed or not installed properly.	Remove and replace speaker module. Refer to the <i>HC1 User Guide</i> for more information.
	Optional Ear Bud not installed or not installed properly.	Remove and replace Ear Buds. Refer to the <i>HC1 User Guide</i> for more information.

**Table 5-1** *Troubleshooting the HC1 (Continued)*

Problem	Cause	Solution
HC1 goes into suspend mode.	HC1 is inactive.	The HC1 turns off after a period of inactivity. Press the Power button to resume.
	Battery is depleted.	Recharge or replace the battery.
	Overvoltage or overcurrent condition.	Replace battery. See system administrator.
	SD card cover not closed properly.	Remove and properly install the SD card cover.
	Battery door not closed properly.	Remove and properly install the battery door.
HC1 does not respond to voice commands.	Noisy environment.	Ensure that Optical Pods is positioned properly.
	Microphone holes clogged.	Ensure that dirt is not covering microphone holes.
	Voice control is disabled.	Press the programmable user button on the Firm Goods Assembly to enable voice control.
HC1 cannot connect to Bluetooth mobile device.	Out of range.	Ensure that Bluetooth device is closer than 32 feet from HC1.
	Bluetooth device not in discoverable mode.	Ensure that the Bluetooth device is in discoverable mode. Refer to the device user documentation.
	Does not have supported profiles.	Ensure that the Bluetooth device supports the profiles supported by the HC1. Refer to the <i>HC1 User Guide</i> for more information. Refer to the device user documentation.
	Not paired with Bluetooth device.	Ensure that the Bluetooth device is paired with the HC1. Refer to the <i>HC1 User Guide</i> for more information.

## Four-slot Spare Battery Charger

**Table 5-2** *Troubleshooting the Four-slot Spare Battery Charger*

Symptom	Possible Cause	Solution
Spare battery is not charging (Spare Battery Charging LED does not light).	Charger is not receiving power.	Ensure the power cable is connected securely to both the charger and to AC power.
	Spare battery is not correctly seated.	Remove and re-insert the battery into the charger, ensuring it is correctly seated.
	Spare battery was removed from charger or charger was unplugged from AC power too soon.	Ensure charger is receiving power. Ensure the spare battery is seated correctly. If a battery is fully depleted, it can take up to five hours to fully recharge a battery.
	Spare battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.



# Appendix A Specifications

## HC1 and Accessory Technical Specifications

*Table A-1* summarizes the HC1 technical specifications and intended operating environments.

**Table A-1** *HC1 Technical Specifications*

Item	Description
<b>Physical Characteristics</b>	
Dimensions	Designed to fit a wide range of users from 5th percentile female to a 95th percentile male head size
Weight (including battery)	23.6 oz/670 g with standard battery (Camera Module not included) 25.7 oz/730 g with extended life battery (Camera Module not included) Camera Module: (4.4 oz/125 g)
Display	Full Color, SVGA, Transmissive TFT (800 x 600) Micro-Display with an Adjustable Backlight; anti-scratch / anti-glare coated Field of View: 32 degrees (diagonal) Virtual image size: 15 inch
Voice Recognition	98-99% accuracy, natural language software (No learning required), supports 5 languages (English, French, Italian, German and Spanish)
Noise Cancellation	Active, ambient noise-cancellation (Dual Microphones)
Gesture Control	9-axis tracking and gesture module (accelerometer, gyroscope, and digital compass)
Communication Interface	Mini-USB Connector – USB OTG host (100mA)/client Accessory Interface Connectors – Two USB 2.0 EHCI High Speed (400 mA) (cannot be used simultaneously)

**Table A-1** HC1 Technical Specifications (Continued)

Item	Description
User Programmable Buttons:	Two
Battery	Rechargeable Lithium-ion 1950 or 4800 mAh minimum (3.7V)
Expansion Slot	User accessible microUSB slot; up to 32 GB.
Network Connections	Full-speed USB (host or client)* Bluetooth WLAN
Notification	LED (Suspend and Battery Charge Status)
Audio	User Removable Near-Ear Loudspeaker Module Built-in Dual Microphones
<b>Performance Characteristics</b>	
CPU	Texas Instruments OMAP 3730 Series Processor, 800 MHz, 3D GraphicAccelerator
Operating System	Microsoft Windows CE 6.0 Professional
Memory	512 MB RAM/512 MB Flash
<b>User Environment</b>	
Operating Temperature	-10 °C to 50 °C (-14 °F to 122 °F)
Storage Temperature	-40 °C to 70 °C (-40 °F to 158 °F) without battery
Charging Temperature	0° C to 40° C (32°F to 104°F)
Humidity	5 to 95% non-condensing
Drop Specification	4ft./1.2m to concrete across operating temperature per MIL-STD-810.
Tumble	500 0.5 m (1.6 ft.) tumbles (1000 hits).
Electrostatic Discharge (ESD)	+/-15 kV air discharge, +/- 8 kV direct discharge (Relative Humidity 50%)
Sealing	IP65
<b>Wireless LAN Data and Voice Communications</b>	
Wireless Local Area Network (WLAN) radio	IEEE® 802.11b/g
Security	WPA and WPA2 and WEP
Antenna	Internal
<b>Wireless PAN</b>	
Bluetooth	v2.1 with Enhanced Data Rate (EDR)
Supported Profiles	Discovery & Connect, HID, COM (SPP), BT PAN-Ad-hoc, BT PAN-AP, Hands-free, OBEX FTP

**Table A-1** *HC1 Technical Specifications (Continued)*

Item	Description
<b>Accessories</b>	
Camera	2MP, Wide Angle Fixed Focus, Configurable Video from 1080p (@30 fps)
Data Capture	RS507 – Hands-Free 1D/2D Imager – Cordless CS3070 – 1D Laser Scanner





# GLOSSARY

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## Numeric

- 802.11.** A group of wireless specifications developed by the Institute of Electrical and Electronics Engineers (IEEE). It specifies an over-the-air interface between a wireless client and a base station or between two wireless clients.
- 802.11a.** Operates in the 5 GHz frequency range (5.125 to 5.85 GHz) with a maximum 54Mbit/sec. signaling rate. The 5 GHz frequency band is not as crowded as the 2.4 GHz frequency because it offers significantly more radio channels than the 802.11b and is used by fewer applications. It has a shorter range than 802.11g and is not compatible with 802.11b.
- 802.11b.** Operates in the 2.4 GHz Industrial, Scientific and Measurement (ISM) band (2.4 to 2.4835 GHz) and provides signaling rates of up to 11Mbit/sec. This is a very commonly used frequency. Microwave ovens, cordless phones, medical and scientific equipment, as well as Bluetooth devices, all work within the 2.4 GHz ISM band.
- 802.11g.** Similar to 802.11b, but this standard supports signaling rates of up to 54Mbit/sec. It also operates in the heavily used 2.4 GHz ISM band but uses a different radio technology to boost overall throughput. Compatible with the 802.11b.

---

## A

- Access Point.** Provides a bridge between Ethernet wired LANs and the wireless network. Access points are the connectivity point between Ethernet wired networks and devices (laptops, hand-held computers, point-of-sale terminals) equipped with a wireless LAN adapter card.
- Ad Hoc Mode.** A wireless network framework in which devices communicate directly with one another without using an access point.
- API.** An interface by means of which one software component communicates with or controls another. Usually used to refer to services provided by one software component to another, usually via software interrupts or function calls
- Application Programming Interface.** See **API**.

**ANSI Terminal.** A display terminal that follows commands in the ANSI standard terminal language. For example, it uses escape sequences to control the cursor, clear the screen and set colors. Communications programs support the ANSI terminal mode and often default to this terminal emulation for dial-up connections to online services.

**Association.** The process of determining the viability of the wireless connection and establishing a wireless network's root and designated access points. A headset computer associates with its wireless network as soon as it is powered on or moves into range.

**Autodiscrimination.** The ability of an interface controller to determine the code type of a scanned bar code. After this determination is made, the information content is decoded.

---

## B

**Bar Code.** A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in machine-readable form. The general format of a bar code symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format. See **Symbology**.

**Bit.** Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

**Bits per Second (bps).** Bits transmitted or received.

**Bluetooth.** A low-cost, short-range radio link between two devices. Bluetooth can replace cables and can be used to create ad hoc networks and provide a standard way to connect devices.

**Bit.** Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

**bps.** See **Bits Per Second**.

**Byte.** On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory is used to store one ASCII character.

**boot or boot-up.** The process a computer goes through when it starts. During boot-up, the computer can run self-diagnostic tests and configure hardware and software.

---

## C

**CAM.** (Continuously Aware Mode) Mode in which the adapter is instructed to continually check for network activity.

**CDRH.** (Center for Devices and Radiological Health) A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.

**CDRH Class 1.** This is the lowest power CDRH laser classification. This class is considered intrinsically safe, even if all laser output were directed into the eye's pupil. There are no special operating procedures for this class.

**CDRH Class 2.** No additional software mechanisms are needed to conform to this limit. Laser operation in this class poses no danger for unintentional direct human exposure.

**CHAP.** (Challenge Handshake Authentication Protocol) A type of authentication in which the authentication agent (typically a network server) sends the client program a random value that is used only once and an ID value. Both the sender and peer share a predefined secret. The peer concatenates the random value (or nonce), the ID and the secret and calculates a one-way hash using MD5. The hash value is sent to the authenticator, which in turn builds that same string on its side, calculates the MD5 sum itself and compares the result with the value received from the peer. If the values match, the peer is authenticated.

**Character.** A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message.

**Character Set.** Those characters available for encoding in a particular bar code symbology.

**Check Digit.** A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.

**Cold Boot.** A cold boot restarts the headset computer and erases all user stored records and entries.

**COM port.** Communication port; ports are identified by number, e.g., COM1, COM2.

**Continuous Code.** A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.

**Cradle.** A cradle is used for charging the terminal battery and for communicating with a host computer, and provides a storage place for the terminal when not in use.

---

## D

**Data Communications Equipment (DCE).** A device (such as a modem) which is designed to attach directly to a DTE (Data Terminal Equipment) device.

**DCE.** See **Data Communications Equipment**.

**DCP.** See **Device Configuration Package**.

**Decode.** To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.

**Decode Algorithm.** A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.

**Decryption.** Decryption is the decoding and unscrambling of received encrypted data. Also see, **Encryption** and **Key**.

**Depth of Field.** The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.

**Device Configuration Package.** The Device Configuration Package provides flash partitions, Terminal Configuration Manager (TCM) and the associated TCM scripts. With this package hex images that represent flash partitions can be created and downloaded to the headset computer.

**DTE.** See **Data Terminal Equipment**.

---

## E

**EAN.** (European Article Number) This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

**EAP.** (Extensible Authentication Protocol) A general authentication protocol used to control network access. Many specific authentication methods work within this framework.

**EAP-PEAP.** (Extensible Authentication Protocol-Protected Extensible Authentication Protocol) A mutual authentication method that uses a combination of digital certificates and another system, such as passwords.

**EAP-TLS.** (Extensible Authentication Protocol-Transport Layer Security) A mutual authentication method that uses digital certificates.

**Encoded Area.** Total linear dimension occupied by all characters of a code pattern, including start/stop characters and data.

**Encryption.** Encoding data to prevent it from being read by unauthorized people.

**ENQ (RS-232).** ENQ software handshaking is also supported for the data sent to the host.

**EMDK.** Enterprise Mobility Developer's Kit.

**Ethernet .** An IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

**ESD.** Electro-Static Discharge

---

## F

**Flash Disk.** An additional megabyte of non-volatile memory for storing application and configuration files.

**Flash Memory.** Flash memory is nonvolatile, semi-permanent storage that can be electronically erased in the circuit and reprogrammed.

**File Transfer Protocol (FTP).** A TCP/IP application protocol governing file transfer via network or telephone lines. See **TCP/IP**.

---

## H

**Hard Reset.** See **Cold Boot**.

**Hz.** Hertz; A unit of frequency equal to one cycle per second.

**Host Computer.** A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs and network control.

---

**I**

**IEC.** International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.

**IEC (825) Class 1.** This is the lowest power IEC laser classification. Conformity is ensured through a software restriction of 120 seconds of laser operation within any 1000 second window and an automatic laser shutdown if the scanner's oscillating mirror fails.

**IEEE Address.** See **MAC Address**.

**Internet Protocol Address.** See **IP**.

**I/O Ports.** interface The connection between two devices, defined by common physical characteristics, signal characteristics, and signal meanings. Types of interfaces include RS-232 and PCMCIA.

**Input/Output Ports.** I/O ports are primarily dedicated to passing information into or out of the terminal's memory. Series 9000 headset computers include Serial and USB ports.

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

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

**IPX/SPX.** Internet Package Exchange/Sequential Packet Exchange. A communications protocol for Novell. IPX is Novell's Layer 3 protocol, similar to XNS and IP, and used in NetWare networks. SPX is Novell's version of the Xerox SPP protocol.

**IS-95.** Interim Standard 95. The EIA/TIA standard that governs the operation of CDMA cellular service. Versions include IS-95A and IS-95B. See **CDMA**.

---

**K**

**Key.** A key is the specific code used by the algorithm to encrypt or decrypt the data. Also see, **Encryption** and **Decrypting**.

---

**L**

**laser scanner.** A type of bar code reader that uses a beam of laser light.

**LASER.** (Light Amplification by Stimulated Emission of Radiation) The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.

**LCD.** See **Liquid Crystal Display**.

**LEAP.** (Lightweight Extensible Authentication Protocol) A mutual authentication method that uses a username and password system.

**LED Indicator.** A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition.

**Liquid Crystal Display (LCD).** A display that uses liquid crystal sealed between two glass plates. The crystals are excited by precise electrical charges, causing them to reflect light outside according to their bias. They use little electricity and react relatively quickly. They require external light to reflect their information to the user.

---

## M

**MC.** Mobile computer.

**MDN.** (Mobile Directory Number) The directory listing telephone number that is dialed (generally using POTS) to reach a mobile unit. The MDN is usually associated with a MIN in a cellular telephone -- in the US and Canada, the MDN and MIN are the same value for voice cellular users. International roaming considerations often result in the MDN being different from the MIN.

**MIL.** 1 mil = 1 thousandth of an inch.

**MIN.** (Mobile Identification Number) The unique account number associated with a cellular device. It is broadcast by the cellular device when accessing the cellular system.

**MS CHAP.** (Microsoft Challenge Handshake Authentication Protocol) is the Microsoft version of CHAP and is an extension to RFC 1994. Like the standard version of CHAP, MS-CHAP is used for PPP authentication; in this case, authentication occurs between a PC using Microsoft Windows NT or Microsoft Windows 95 and a Cisco router or access server acting as a network access server (NAS).

---

## N

**Nominal.** The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value.

**Nominal Size.** Standard size for a bar code symbol. Most UPC/EAN codes are used over a range of magnifications (e.g., from 0.80 to 2.00 of nominal).

**NVM.** Non-Volatile Memory.

---

## O

**ODI.** See **Open Data-Link Interface**.

**Open Data-Link Interface (ODI).** Novell's driver specification for an interface between network hardware and higher-level protocols. It supports multiple protocols on a single NIC (Network Interface Controller). It is capable of understanding and translating any network information or request sent by any other ODI-compatible protocol into something a NetWare client can understand and process.

**Open System Authentication.** Open System authentication is a null authentication algorithm.

---

## P

**PAN .** Personal area network. Using Bluetooth wireless technology, PANs enable devices to communicate wirelessly. Generally, a wireless PAN consists of a dynamic group of less than 255 devices that communicate within about a 33-foot range. Only devices within this limited area typically participate in the network.

**Parameter.** A variable that can have different values assigned to it.

**PING.** (Packet Internet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.

**Programming Mode.** The state in which a scanner is configured for parameter values. See **Scanning Mode**.

---

## Q

**Quiet Zone.** A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.

---

## R

**RAM.** Random Access Memory. Data in RAM can be accessed in random order, and quickly written and read.

**RF.** Radio Frequency.

**ROM.** Read-Only Memory. Data stored in ROM cannot be changed or removed.

**Router.** A device that connects networks and supports the required protocols for packet filtering. Routers are typically used to extend the range of cabling and to organize the topology of a network into subnets. See **Subnet**.

**RS-232.** An Electronic Industries Association (EIA) standard that defines the connector, connector pins, and signals used to transfer data serially from one device to another.

---

## S

**Scanner.** An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are:

1. Light source (laser or photoelectric cell) - illuminates a bar code.
2. Photodetector - registers the difference in reflected light (more light reflected from spaces).
3. Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.

**Scanning Mode.** The scanner is energized, programmed and ready to read a bar code.

**Scanning Sequence.** A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.

**SDK.** Software Development Kit

**Secure Sockets Layer (SSL).** SSL is a commonly-used protocol for managing the security of a message transmission on the Internet. SSL uses a program layer located between the Internet's Hypertext Transfer Protocol (HTTP) and Transport Control Protocol (TCP) layers. SSL is included as part of both the Microsoft and Netscape browsers and most Web server products. Developed by Netscape, SSL also gained the support of Microsoft and other Internet client/server developers as well and became the de facto standard until evolving into Transport Layer Security. The "sockets" part of the term refers to the sockets method of passing data back and forth between a client and a server program in a network or between program layers in the same computer. SSL uses the public-and-private key encryption system from RSA, which also includes the use of a digital certificate.

**Shared Key.** Shared Key authentication is an algorithm where both the AP and the MU share an authentication key.

**Soft Reset.** See **Warm Boot**.

**Specular Reflection.** The mirror-like direct reflection of light from a surface, which can cause difficulty decoding a bar code.

**Subnet.** A subset of nodes on a network that are serviced by the same router. See **Router**.

**Subnet Mask.** A 32-bit number used to separate the network and host sections of an IP address. A custom subnet mask subdivides an IP network into smaller subsections. The mask is a binary pattern that is matched up with the IP address to turn part of the host ID address field into a field for subnets. Default is often 255.255.255.0.

**Substrate.** A foundation material on which a substance or image is placed.

**Symbol.** A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters and check characters.

**Symbology.** The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39, PDF417, etc.).

---

## T

**TCP/IP.** (Transmission Control Protocol/Internet Protocol) A communications protocol used to internetwork dissimilar systems. This standard is the protocol of the Internet and has become the global standard for communications. TCP provides transport functions, which ensures that the total amount of bytes sent is received correctly at the other end. UDP is an alternate transport that does not guarantee delivery. It is widely used for real-time voice and video



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

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

**Terminal Emulation.** A “terminal emulation” emulates a character-based mainframe session on a remote non-mainframe terminal, including all display features, commands and function keys. The HC1 Series supports Terminal Emulations in 3270, 5250 and VT220.

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

**TKIP.** (Temporal Key Integrity Protocol) A wireless encryption protocol that periodically changes the encryption key, making it harder to decode.

**Tolerance.** Allowable deviation from the nominal bar or space width.

**Transmission Control Protocol/Internet Protocol.** See **TCP/IP**.

**TLS.** (Transport Layer Security) TLS is a protocol that ensures privacy between communicating applications and their users on the Internet. When a server and client communicate, TLS ensures that no third party may eavesdrop or tamper with any message. TLS is the successor to the Secure Sockets Layer (SSL).

**Trivial File Transfer Protocol.** See **TFTP**.

**TSR.** See **Terminate and Stay Resident**.

---

## U

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

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## U

**Visible Laser Diode (VLD).** A solid state device which produces visible laser light.

---

## W

**Warm Boot.** A warm boot restarts the headset computer by closing all running programs. All data that is not saved to flash memory is lost.

**WAP.** (Wireless Application Protocol) A set of specifications, developed by the WAP Forum, that lets developers using Wireless Markup Language build networked applications designed for handheld wireless devices. WAP was designed to work within the constraints of these devices: a limited memory and CPU size, small, monochrome screens, low bandwidth and erratic connections.

**headset computer.** In this text, headset computer refers to the HC1 wireless portable computer. It can be set up to run as a stand-alone device, or it can be set up to communicate with a network, using wireless radio technology.

**WEP.** Wired-Equivalent Privacy protocol was specified in the IEEE 802.11 standard to provide a WLAN with a minimal level of security and privacy comparable to a typical wired LAN, using data encryption.

**WPA.** Wi-Fi Protected Access is a data encryption specification for 802.11 wireless networks that replaces the weaker WEP. It improves on WEP by using dynamic keys, Extensible Authentication Protocol to secure network access, and an encryption method called Temporal Key Integrity Protocol (TKIP) to secure data transmissions.

**WPA2.** Wi-Fi Protected Access 2 is an enhanced version of WPA. It uses Advanced Encryption Standard instead of TKIP.

**WLAN.** Wireless local-area networks use radio waves instead of a cable to connect a user device, such as a headset computer, to a LAN. They provide Ethernet connections over the air and operate under the 802.11 family of specifications developed by the IEEE.

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