SOKKIA

SHC2500

Operator's Manual

SHC2500
Operator's Manual

Part Number 7010-0950
Rev A

©Copyright Topcon Positioning Systems, Inc.
August, 2009

All contents in this manual are copyrighted by Topcon. All rights reserved. The information contained herein may not be used, accessed, copied, stored, displayed, sold, modified, published, distributed, or otherwise reproduced without express written consent from Topcon.

Topcon only sells GPS products into Precision Markets.
Please go to www.topcongps.com for detailed market information.

Table of Contents

Preface vii
Terms and Conditions vii
Manual Conventions x

Chapter 1
Introduction 1-1
Getting Acquainted 1-1
General Features of the SHC2500 1-2
Front Panel Components/Indicators for the SHC2500 1-4
Illuminators, Camera, and Lasers for the SHC2500 . 1-5
Configuration Options for the SHC2500 1-6
Accessories for the SHC2500 1-6

Chapter 2
Operating the SHC2500 2-1
Front Panel Components 2-2
On/Off Button Operations 2-2
Performing a Cold Boot for the SHC2500 2-2
Placing the SHC2500 in Suspend Mode 2-2
Using the Rechargeable Battery 2-3
Checking the Battery Status 2-4
Charging the Batteries 2-4
Replacing the Batteries 2-5
Power Management 2-6
Data Entry Using the Keypad 2-7
Data Entry Using the CE Keyboard 2-8
Data Entry Using the Transcriber 2-8
Using the Integrated Camera 2-9
Power Status Icons 2-9
Connection Status Icons 2-10
The Start Menu 2-10

Miscellaneous Tools 2-10

Chapter 3
Control Panel Functions 3-1
The Taskbar and Start Menu Settings 3-9

Chapter 4
Configuring the SHC2500 4-1
Creating an ActiveSync® Connection 4-1
USB Connection 4-1
Making a Connection with ActiveSync 4-2
Using ActiveSync 4-3
Connecting to a Mail Server 4-5

Chapter 5
Troubleshooting 5-1
Obtaining Technical Support 5-3
Phone 5-3
E-mail 5-3
Website 5-5

Appendix A
Specifications A-1
SHC2500 Specifications A-1
General Specifications A-1

Appendix B
Regulatory Information B-1
FCC Compliance B-1
Community of Europe Compliance B-2
Canadian Emission Labeling Requirements B-2
Canadian Radio Frequency Emissions Statement B-3
FCC Class A B-3
CISPR 22 (EN 55022) Class A B-4
Canadian Regulatory Information (Canada Only) B-5
Declaration of Conformity for CE Mark B-6
EU Representative: B-6
WEEE Directive B-7

EMC and Radiocommunications Compliance
Labeling Using the C-Tick Mark B-8

Appendix C
Safety Warnings C-1
General Warnings C-1
Battery Pack Warnings C-1
Usage Warnings C-3

Appendix D
Warranty Terms D-1

Notes:

Preface

Thank you for purchasing this Sokkia® product. The materials available in this Manual (the "Manual") have been prepared by Topcon Positioning Systems, Inc. ("TPS") for owners of Topcon products, and are designed to assist owners with the use of the receiver and its use is subject to these terms and conditions (the "Terms and Conditions").

Please read these Terms and Conditions carefully.

Terms and Conditions

USE This product is designed to be used by a professional. The user should have a good knowledge of the safe use of the product and implement the types of safety procedures recommended by the local government protection agency for both private use and commercial job sites.

COPYRIGHT All information contained in this Manual is the intellectual property of, and copyrighted material of TPS. All rights are reserved. Do not use, access, copy, store, display, create derivative works of, sell, modify, publish, distribute, or allow any third party access to, any graphics, content, information or data in this Manual without TPS' express written consent and may only use such information for the care and operation of your receiver. The information and data in this Manual are a valuable asset of TPS and are developed by the expenditure of considerable work, time and money, and are the result of original selection, coordination and arrangement by TPS.

TRADEMARKS GR-3™, Topcon Tools™, Topcon Link™, TopSURV™, Topcon® and Topcon Positioning Systems™ are trademarks or registered trademarks of TPS. Windows® is a registered trademark of Microsoft Corporation. The Bluetooth® word mark and logos are owned by Bluetooth SIG, Inc. and any use of such marks by Topcon Positioning Systems, Inc. is used under license. SHC2500™, Sokkia Corporation and the names of Sokkia Corporation products referenced herein are either trademarks or registered trademarks of Sokkia Corporation. Other product and company names mentioned herein may be trademarks of their respective owners.

DISCLAIMER OF WARRANTY EXCEPT FOR ANY WARRANTIES IN AN APPENDIX OR A WARRANTY CARD ACCOMPANYING THE PRODUCT, THIS MANUAL AND THE RECEIVER ARE PROVIDED "AS-IS." THERE ARE NO OTHER WARRANTIES. TPS DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE. TPS AND ITS DISTRIBUTORS SHALL NOT BE LIABLE FOR TECHNICAL OR EDITORIAL ERRORS OR OMISSIONS CONTAINED HEREIN; NOR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE FURNISHING, PERFORMANCE OR USE OF THIS MATERIAL OR THE RECEIVER. SUCH DISCLAIMED DAMAGES INCLUDE BUT ARE NOT LIMITED TO LOSS OF TIME, LOSS OR DESTRUCTION OF DATA, LOSS OF PROFIT, SAVINGS OR REVENUE, OR LOSS OF THE PRODUCT'S USE. IN ADDITION TPS IS NOT RESPONSIBLE OR LIABLE FOR DAMAGES OR COSTS INCURRED IN CONNECTION WITH OBTAINING SUBSTITUTE PRODUCTS OR SOFTWARE, CLAIMS BY OTHERS, INCONVENIENCE, OR ANY OTHER COSTS. IN ANY EVENT, TPS SHALL HAVE NO LIABILITY FOR DAMAGES OR OTHERWISE TO YOU OR ANY OTHER PERSON OR ENTITY IN EXCESS OF THE PURCHASE PRICE FOR THE RECEIVER.

LICENSE AGREEMENT Use of any computer programs or software supplied by TPS or downloaded from a TPS website (the "Software") in connection with the receiver constitutes acceptance of these Terms

and Conditions in this Manual and an agreement to abide by these Terms and Conditions. The user is granted a personal, non-exclusive, non-transferable license to use such Software under the terms stated herein and in any case only with a single receiver or single computer. You may not assign or transfer the Software or this license without the express written consent of TPS. This license is effective until terminated. You may terminate the license at any time by destroying the Software and Manual. TPS may terminate the license if you fail to comply with any of the Terms or Conditions. You agree to destroy the Software and manual upon termination of your use of the receiver. All ownership, copyright and other intellectual property rights in and to the Software belong to TPS. If these license terms are not acceptable, return any unused software and manual.

CONFIDENTIALITY This Manual, its contents and the Software (collectively, the "Confidential Information") are the confidential and proprietary information of TPS. You agree to treat TPS' Confidential Information with a degree of care no less stringent that the degree of care you would use in safeguarding your own most valuable trade secrets. Nothing in this paragraph shall restrict you from disclosing Confidential Information to your employees as may be necessary or appropriate to operate or care for the receiver. Such employees must also keep the Confidentiality Information confidential. In the event you become legally compelled to disclose any of the Confidential Information, you shall give TPS immediate notice so that it may seek a protective order or other appropriate remedy.

WEBSITE; OTHER STATEMENTS No statement contained at the TPS website (or any other website) or in any other advertisements or TPS literature or made by an employee or independent contractor of TPS modifies these Terms and Conditions (including the Software license, warranty and limitation of liability).

SAFETY Improper use of the product can lead to injury to persons or property and/or malfunction of the product. The product should only be repaired by authorized TPS warranty service centers. Users should review and heed the safety warnings in an Appendix.

MISCELLANEOUS The above Terms and Conditions may be amended, modified, superseded, or canceled, at any time by TPS. The

above Terms and Conditions will be governed by, and construed in accordance with, the laws of the State of California, without reference to conflict of laws.

Manual Conventions

This manual describes the standard features and operation of the FC-2500. Unless otherwise stated, the operational characteristics described herein correspond to factory default configurations and settings as shipped from Topcon Positioning Systems. Wherever used herein, the term SHC2500 applies to all SHC2500 models (except as noted).

It is beyond the scope of this manual to provide operating system tutorials or information about commercial or customized SHC2500 application programs and connected equipment. This information should be available in the manuals that accompany those products.

This manual uses the following conventions:

Example	Description
File ▸ Exit	Click the **File** menu, and click **Exit**.
Connection	Indicates the name of a dialog box or screen.
Frequency	Indicates a field on a dialog box or screen, or a tab within a dialog box or screen.
Enter	Press or click the button or key labeled **Enter**.

Further information to note about the configuration, maintenance, or setup of a system.

Supplementary information that can help you configure, maintain, or set up a system.

	Supplementary information that can have an affect on system operation, system performance, measurements, or personal safety.
	Notification that an action has the potential to adversely affect system operation, system performance, data integrity, or personal health.
	Notification that an action *will* result in system damage, loss of data, loss of warranty, or personal injury.
	Under no circumstances should this action be performed.

Notes:

Introduction

Getting Acquainted

The SHC2500 is a fully featured, rugged and customizable hand-held computer integrated with a color camera that also reads bar codes (Figure 1-1).

The SHC2500 comes standard with the Windows CE 5.0 operating system and an Intel PXA270 XScale processor that operates up to 624 MHz. It also has Bluetooth®, WLAN, and serial communication (RS-232 and USB).

The SHC2500 enables you to connect to the RS-1 wireless radio. To learn more about the features of the SHC2500, see “General Features of the FC-2500” on page 1-2.

Figure 1-1. SHC2500 Controller

Table 1-1 describes the front components and indicators on the SHC2500.

Table 1-1. Front Components and Indicators

Item	Component	Description
1	Camera	5.17 megapixel digital camera
2	Display	An amorphous silicon active matrix AD-TFT color display.
3	Front Panel	Contains status and modifier key indicators (see Figure 1-2 on page 1-4)
4	Keypad	55 keys with an 8+1 directional keypad

General Features of the SHC2500

Operating System The SHC2500 uses Windows CE 5.0 as its operating system. You can develop applications quickly and easily using the latest development tools and network connectivity from Microsoft, such as eMbedded Visual C++ 4.0, Visual Studio 2005, and ActiveSync.

Processor The SHC2500 uses an Intel PXA270 processor designed specifically for high performance, low power, portable, hand-held devices. It incorporates Intel XScale technology with on-the-fly voltage, frequency scaling, and sophisticated power management. It also complies with the ARM Architecture V5TE instruction set.

Camera The SHC2500 uses a 5 megapixel (4 megapixel processed) digital camera equipped with ultra-bright LED illuminators for photography in low-light areas, a wide, sunlight-readable display for ease of viewing regardless of available ambient light, and adjustable IR coated-glass optics for crisp clear images. There is a 5 mega pixel color CMOS imager, a true camera system, an Auto focus system and a Mechanical Shutter system. The bar-code symbology decode software system is compatible with the following: Code 39, Code 128, Straight Code 2 of 5, UPC, EAN-13, and PDF-417 (2D Code).

Illuminators and Lasers The SHC2500 comes with four LED illuminators that enable you to take pictures in low-light conditions. A pair of 635 nm red visible lasers enable you to position objects and align the SHC2500.

Display The SHC2500 features an amorphous silicon matrix AD-TFT color display. It is outdoors-readable with a diagonal screen size of 3.52" (8.9cm). The active area of the display is 71.52mm H x 53.64mm V. The pixel format is 320H x 240V (1 pixel = R+B+G dots. The touchscreen system is 4-wire resistive technology.

Keypad The SHC2500 has 55 keys plus an 8+1 directional pad. The keyboard is contstructed of sheer-proof solid hard keys.

Indicators The SHC2500 has five LED indicators that provide a number of useful functions, including the state of keypad modifier keys. An additional LED indicates the charge and low battery status and WLAN (wireless connection) and Bluetooth power status.

Sound The SHC2500 has an integrated speaker and microphone.

Rechargeable Battery Pack The SHC2500 comes with two rechargeable Lithium-Ion (Li-Ion) battery packs that provide up to 40 hours of operating time on a full charge, depending on power management and use. Each battery is a 2500mAH@7.4V, integrated "Gas Gauge" System; field replaceable. When connected to an external power source, the Internal Charging System is used.

The Lithium-Ion technology used in the SHC2500 has exceptional charge life without the "charge memory." This means partially discharged batteries or batteries connected to the charger for extended periods will not adversely affect battery life or performance.

Configuration Options The SHC2500 comes standard with one RS-232 DE-9 serial port, one RS-1 radio port, and one USB mini A/B connector. The SHC2500 also includes USB (1.1), Wireless LAN (802.11/gb) and Bluetooth (1.2/Class II) (see Figure 1-2 on page 1-4 for connector specifications.

Durability The SHC2500 case is shock-tested per MIL-STD-810F Method 516.5, Procedure IV.

Ingress Protection The SHC2500 is completely dust-tight and can withstand exposure to jets of water. It has an IP (Ingress Protection) rating of 67 as defined by IEC standard 529.

The product warranty does not cover SHC2500 devices that fail due to electrolysis.

Front Panel Components/Indicators for the SHC2500

The front panel components consist of the battery indicator light (battery status), function light, shift key light, speaker, CAPS indicator light, bluetooth connection status, and wireless connection status (Figure 1-2).

The SHC2500 has five LED indicators that provide a number of useful functions, including the state of the art keypad modifier keys. An additional LED indicates the charge and low battery status of the unit (Figure 1-2).

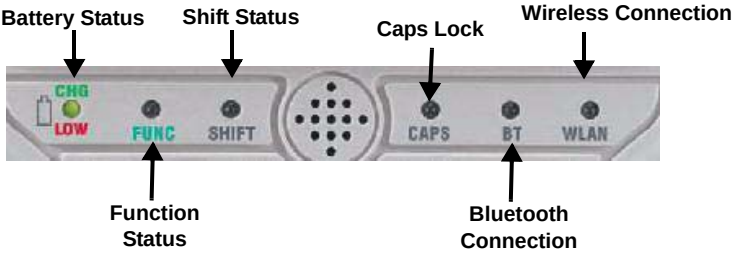


Figure 1-2. SHC2500 Modifier Keys

Table 1-2 describes the front panel components/indicators for the SHC2500.

Table 1-2. Front Panel Components

Item	Component	Description
1	Modifier LEDs	Indicates use of the FUNC, CAPS, CHG LOW (battery status), BT, SHIFT, and WLAN modifier keys

Table 1-2. Front Panel Components

Item	Component	Description
2	Battery LED	Red lights for a low battery or Green lights for a charging battery

Illuminators, Camera, and Lasers for the SHC2500

The SHC2500 comes with two LED illuminators that you can use to take pictures in low light conditions. In addition, The SHC2500 uses a pair of 635nm red visible lasers that allows you to position objects and align the SHC2500 as needed (Figure 1-3).

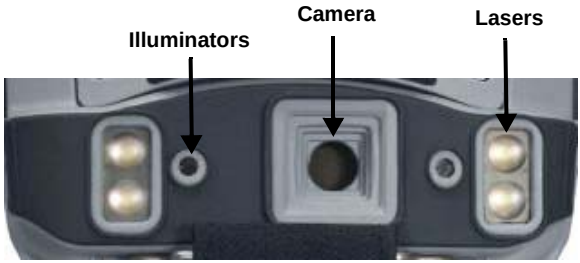


Figure 1-3. Illuminators, Camera, and Lasers

Table 1-3 describes the illuminators, camera, and lasers located on the back of the SHC2500.

Table 1-3. Camera, Illuminators, and Lasers

Item	Component	Description
1	Illuminators	Two illuminators that take pictures in low-light conditions
2	Camera	Five megapixel (4 megapixel processed) camera
3	Lasers	Two 635 nm red visible lasers that position objects and align the SHC2500

Configuration Options for the SHC2500

The SHC2500 comes standard with one RS-232 DE-9 serial port and one USB mini A/B connector. Also included is USB (1.1), Wireless LAN (802.11b) and Bluetooth (1.2) capability (Figure 1-4). See "Specifications" on page A-1 for connector specifications.

Figure 1-4. Bottom Components of the SHC2500

Table 1-4 describes the bottom components for the SHC2500.

Table 1-4. Bottom Components

Item	Component	Description
1	DE-9 RS232 Male Interface Port	Emulates standard serial pin-out connectors to connect the SHC2500 to most desktop PCs using a standard null modem cable
2	USB mini A/B Port (v 1.1 compatible)	Connects to other USB devices as either host or client

Accessories for the SHC2500

The SHC2500 package includes standard communication and power cables and accessories for configuring the SHC2500 hand-held computer and for providing a power source. Depending on the package purchased, additional accessories may also be included. Table 1-5 on page 1-7 lists the cables included with the SHC2500.

Table 1-5. SHC2500 Cables Package

Cable Description	Cable Illustration
TAD AC cable The AC cable to use with the charger cable. U.S. – p/n 60737	
Charger cable Connects to the FVC-2500 and supplies 12V 3A power to recharge the internal batteries. U.S> p/n 60736	
USB Download cable Used to connect to the PC when downloading files. U.S. – p/n 60630	
USB Flash cable Used with the USB Memory Stick to offload files. U.S. – p/n 60621	

Use of other power supplies, unless approved by Sokkia Topcon Corporation, may cause damage to the unit and void the warranty.

Notes:

Operating the SHC2500

The following describes the components shown below on the front side of the SHC2500 (Figure 2-1).

- Main Screen
- Front Panel
- Keypad

Figure 2-1. Front-Side Components of the SHC2500

Front Panel Components

For information on front panel components, see “Front Panel Components/Indicators for the FC-2500” on page 1-4 for further details.

On/Off Button Operations

The On/Off button is located at the bottom-left of the front panel and functions depending upon the state of the hand-held computer when the button is pressed and considering the length of time it is pressed. The following is a list of **On/Off** button operations:

- Cold Boot
- Suspend

Performing a Cold Boot for the SHC2500

To cold boot the SHC2500, press and hold the **On/Off** button for about 10 seconds. This action also terminates running applications and stops serial port operations.

Placing the SHC2500 in Suspend Mode

To place the SHC2500 in Suspend mode, press and release the **On/Off** button. Suspend mode allows you to suspend, but not terminate active applications. In this mode, the display turns off and the SHC2500 stops serial port operations. For battery-powered units, Suspend mode also conserves battery power.

To take the SHC2500 out of Suspend mode, press and release the **On/Off** button again. The display turns on and the device begins running any suspended application, but you must restart any serial port operations. If you attempt to use the SHC2500 before it has completely resumed operations or use it while it is entering Suspend

mode, then the device will delay three seconds before resuming or suspending.

Using the Rechargeable Battery

The SHC2500 comes with two rechargeable Lithium-Ion (Li-Ion) battery packs that provides up to 40 hours of operating time on a full charge, depending on power management settings and peripheral use.

The battery packs are shipped from the factory without power, so before using the SHC2500, fully charge the battery pack for a minimum of three hours.

The battery pack will not attain maximum capacity until it has been charged and discharged approximately four times. As a result, you may experience shorter than expected operating time on the first few uses.

Li-Ion batteries are a stable and dependable source of electrical energy, but can be sensitive to extreme temperatures. If you charge the battery pack in extreme hot or cold conditions, it will not attain a full charge until it is recharged again. As a precaution against overheating, the SHC2500 has built-in temperature sensors that suspend the charging process if the battery becomes too warm.

Because the battery pack is an electrical device, do not expose it to moisture or wet environments. If the battery becomes wet, wipe it dry, and then allow it to dry thoroughly for several hours before attempting to use or charge it.

Do not leave the battery pack in a fully discharged state for extended periods. This condition may cause one or more of the cells within the battery pack to fail. When this occurs and the battery pack is subsequently recharged, the failed cell reduces the total capacity of the battery pack, thus making the battery appear to discharge faster.

Checking the Battery Status

The CHG/LOW battery LED, indicates the current battery status as shown in Table 2-1 below.

Table 2-1. Charge/Low Battery Indicator Functions

Function	Description
CHARGE	With the power supply connected, the CHG/LOW battery LED indicates one of the following conditions: • **Nearly Charged** – charging LED indicator flashes Long Green. • **Charged** – charging LED is Solid Green.
CHG LOW	• **Batteries are low** – Battery LED flashes Red. • **Batteries are very low** – the Taskbar Icon changes to Low Indication where there is approximately 1 hour of operation remaining.
Critical Battery	*Battery LED Constant Red,* and *Taskbar Icon* changes to Exclamation Point when there is approximately 20-30 minutes of operation remaining.
Battery Door Open	Battery LED flashes Red (On, Off, or Suspend state); Charging system disabled for Safety.

Charging the Batteries

The Lithium-Ion (Li-Ion) battery pack has exceptional charge life without the "charge memory." This means partially discharged batteries or batteries connected to the charger for extended periods will not adversely affect battery life or performance.

Charge the SHC2500 away from any known or potential heat sources. Devices exposed to temperatures in excess of 110 degrees Fahrenheit during the charge cycle may experience incomplete charges and reduced operating time per charge.

To charge the Li-Ion battery pack (Figure 2-2), do the following:

1. Plug the power jack of the battery charger/power supply into the SHC2500.
2. Plug the battery charger/power supply into an available outlet and leave for approximately four hours to fully charge the batteries.

Figure 2-2. Charging the Batteries

3. Once charged, disconnect the AC power supply. The SHC2500 is ready to run exclusively on battery power.

Replacing the Batteries

There is a risk of explosion if the BT 66Q Li-Ion battery is replaced with an incorrect type. Only use the BT 66Q Li-Ion battery supplied with your device or a replacement Li-Ion battery that is supplied, recommended, or approved by Sokkia Topcon Corporation.

Remove the batteries from the SHC2500 when not using the device for extended periods. Store the batteries in a cool, dry location at normal room temperature.

To replace the battery packs (Figure 2-3 on page 2-6), do the following:

1. Turn the power off.
2. With the SHC2500 face down, unscrew the two battery door retaining screws.
3. Lift the cover up, and remove the battery pack.

4. To close the battery cover, replace the cover and tighten the screws.

Figure 2-3. Changing the Li-Ion Battery Pack for the SHC2500

Power Management

The battery-powered SHC2500 utilizes two rechargeable BT 66Q Lithium-Ion (Li-Ion) battery packs that have an average operating time of 18 hours on a full charge with power management.

The operating time is dependent on the environment, usage, and the number and type of power-drawing peripherals attached. The battery discharge rate in a full “Power Off” state is only slightly higher to the self-discharge rate of the battery itself.

Allowing the batteries to remain in a low or very low condition causes the device to enter Suspend mode. Save your work, and recharge the device as soon as possible.

To lengthen the time between charges, shorten auto-suspend time – The SHC2500 is automatically set to suspend operation to conserve battery power when you have not used the keyboard or the stylus after three minutes.

The auto-suspend time can be increased by changing the Power settings in the Control Panel:

- Tap **Start ▸ Settings ▸ Control Panel**.
- Double-click the *Power* icon in the *Control Panel*.
- On the ***Power Properties*** dialog box, click on the *Schemes* tab.
- From the *Switch state to Suspend* drop-down list, select either *After 5 minutes*, *After 10 minutes*, *After 15 minutes*, or *After 30 minutes* to auto-suspend time between battery charges.

Extended communication via the serial port, WiFi, RS-1, and Bluetooth may require large amounts of power to operate and can quickly drain the batteries.

Data Entry Using the Keypad

The joystick-style keypad (Figure 2-4 on page 2-8) has 55-keys with easy screen navigation and alphanumeric keypad entry. You can also access special keys via the **FUNC** key.

To enter data using the keypad, tap S**tart ▸ Programs ▸ Microsoft WordPad**. Using either numbers, letters, or a combination of both, enter the preferred text. Press the **CAPS** key for capital letters and the **Space** key to enter more text. To backspace, press the **Backspace** key . To begin a new line press the **Enter** arrow located in the directional circle on the SHC2500.

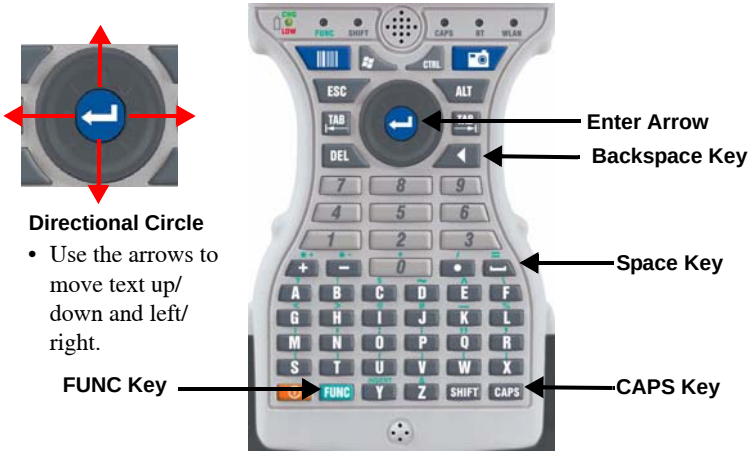


Figure 2-4. SHC2500 55-Key Keypad

Data Entry Using the CE Keyboard

To access the CE Keyboard, tap **Start** ▸ **Programs** ▸ **Tools** ▸ **CeKeys** (Figure 2-5)**.**

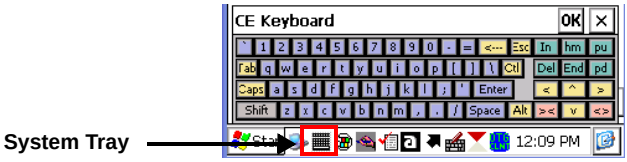


Figure 2-5. Accessing the CE Keyboard

To minimize the keyboard, click the keyboard icon that appears in the system tray.

Data Entry Using the Transcriber

Microsoft Transcriber is a handwriting recognition program that interprets pen movement across the screen as handwriting (cursive, print, or mixed) input. For more information, refer to the *Microsoft Transcriber Help* on the SHC2500 (Figure 2-6 on page 2-9).

To open Microsoft Transcriber, tap **Start ▸ Programs ▸ Tools ▸ Transcriber**.

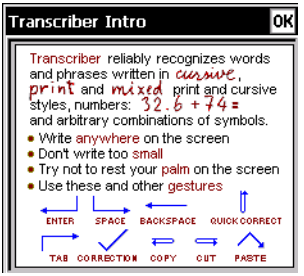


Figure 2-6. Microsoft Transcriber

Using the Integrated Camera

The SHC2500 comes with Topcon Positioning Systems' eyeWARE program pre installed, so you can take pictures and scan bar codes with the integrated camera. You can also pass data to a text field that has a focus in an application.

Power Status Icons

The SHC2500 displays power status icons (Table 2-2) in the status area to indicate power use, charging status, and low battery conditions.

Table 2-2. Power Status Icons

Icon	Description
	Main batteries are charging.
	Main batteries are low – approximately 60 minutes or less of use remaining. The CHG/LOW battery LED blinks Red once per second.
	Main batteries are very low – approximately 20 minutes or less of use remaining. The CHGELOW battery LED turns solid Red.

Connection Status Icons

The SHC2500 displays connection status icons (Table 2-3) in the status area to indicate a dial-up connection or a direct connection.

Table 2-3. Connection Status Icons

Icon	Description
	Dial-up Connection status.
	Direct Connection status

The Start Menu

Tap the *Windows* button on the control panel (top left), then press **Start** to display the start menu. By tapping one of the menu icons you can:

- Open programs that do not appear on the main screen
- View a list of Websites added to your Favorites list
- View recently accessed documents and images
- Access the Control Panel, establish connections, or configure the Taskbar and Startup menu
- View the Help menu
- Start an application using the Run command

Miscellaneous Tools

You can access the following utility programs from the Tools menu:

Screen Capture The Screen Capture program (Figure 2-7 on page 2-11) takes a picture of the current screen and saves it as a bitmap file (.bmp) to a designated location. You can set up the program to run from the system tray or by pressing a hot key.

To set up the Screen Capture program, tap **Start ▸ Programs ▸ Tools ▸ Screen Capture**. The ***ScreenCapture*** dialog box displays. Make the following selections to capture a screen on the SHC2500:

- Keyboard Hot Key – disabled
- Capture Delay (sec) – select a wait time before the Screen Capture program takes a picture (up to 9 seconds)
- Auto run in the task bar – press and enable to take a picture by tapping the *Screen Capture* icon in the System Tray

To deselect this option after making it active, tap and hold the icon until the ***ScreenCapture*** dialog box displays.

- View following capture – press and enable to view the picture immediately following the screen capture
- Reset Counter – press and enable to reset the counter to zero

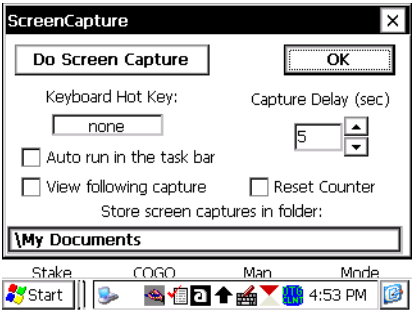


Figure 2-7. ScreenCapture Window

To change the default folder where the screen captures will be stored, press **My Documents** at the bottom of the ***ScreenCapture*** dialog box (Figure 2-7) to display the ***My Documents*** screen (Figure 2-8 on page 2-12).

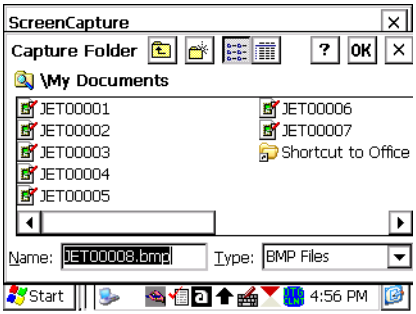


Figure 2-8. Capture Folder Dialog Box

By default, the Screen Capture program automatically assigns a number to each screen capture. The numbering scheme starts at JET00000 and increases by one after each capture.

5. To reset the picture numbering scheme to JET00000, press and enable **Reset Counter** on the ***ScreenCapture*** dialog box.

Screen captures stored in folders other than the System CF folder will be lost if you remove power from the unit.

Warm Boot Occasionally, a program may encounter an error from which it cannot recover. In this case, you can perform a Warm Boot, which reinitializes the device without affecting the contents stored in virtual memory.

To perform a warm boot do the following:

1. Tap **Start ▸ Programs ▸ Tools ▸ Warm Boot.** The **Warm Boot** confirmation window displays (Figure 2-9 on page 2-13).

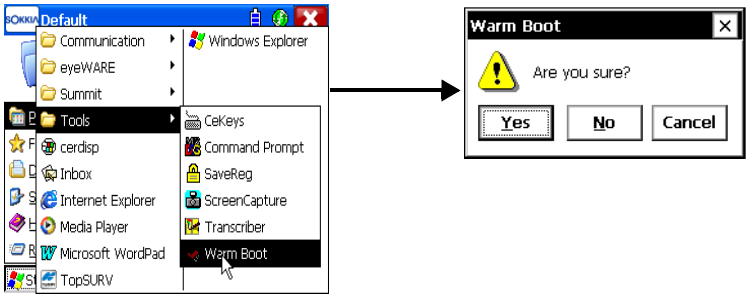


Figure 2-9. Confirmation Dialog Box

2. Press **Yes** to continue.

Manually Saving the Persistent Registry The SHC2500 internal memory consists of DRAM and Flash. Typically, any changes made to the SHC2500, including file creation, are temporarily stored in the unit's DRAM. To store the information permanently, copy the files from DRAM to internal flash memory.

Consequently, if you do not store the information to flash memory and the device loses power, all information stored in DRAM will be lost; however, when you make changes that affect the registry, such as changing settings in the Control Panel or installing software, you can permanently store registry changes without writing to flash memory by using the Persistent Registry.

The SHC2500 also stores registry information every time you perform a suspend/resume operation.

To permanently store registry information on the SHC2500:

1. Tap **Start** ▸ **Programs** ▸ **Tools** ▸ **SaveReg**. The SHC2500 begins to save the registry. After the registry is successfully saved, a message box displays.
2. Press **OK** to close the message box and return to the main screen.

Command Prompt Windows The command prompt window allows you to execute limited MS-DOS command line arguments (e.g., CD SystemCF, Run TEST.BAT, etc.).

To open the ***Command Prompt*** window:

1. Tap **Start ▸ Programs ▸ Tools ▸ Command Prompt.** The ***Command Prompt*** window displays (Figure 2-10).

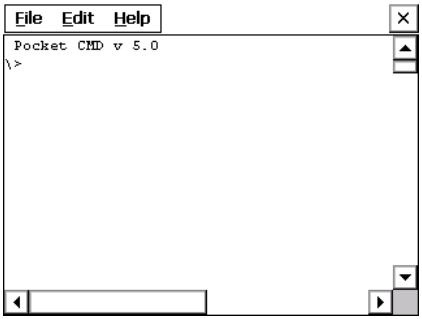


Figure 2-10. Command Prompt Window

2. Type in your command. For a list of supported commands, type **Help**, and press **Enter**.
3. To end the session, type **Exit**, and press **Enter**.

SystemCF Folder The only folder that provides non-volatile (permanent) storage is the SystemCF folder. Information stored in other folders will be lost when you remove power from the SHC2500. You can, however, have the SHC2500 automatically copy files from the SystemCF to other folders when starting up.

Notes:

Control Panel Functions

Table 3-1 describes the Control Panel functions available on the SHC2500. Tap **Start ▸ Settings ▸ Control Panel** for access to these functions.

Table 3-1. Control Panel Functions

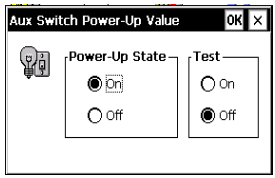
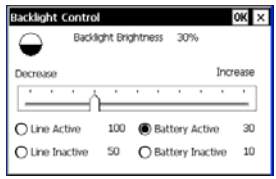
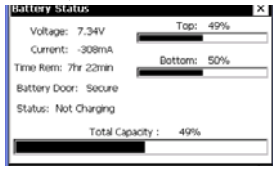
Icon	Function	Description/Menu(s)
	Aux Switch	Sets the default power state (on or off) and tests the connected devices. 
	Backlight	Adjusts the backlight setting for the following conditions: Line Active, Line Inactive, Battery Active, and Battery Inactive. 
	Battery Status	Calibrates the power status icons for proper use: Li-Ion, AC Line, or Alkaline. 

Table 3-1. Control Panel Functions (Continued)

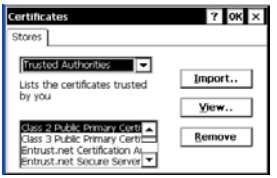
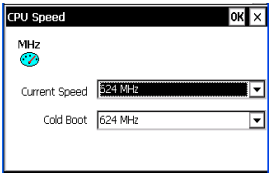
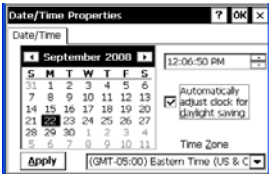
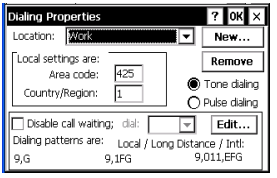
Icon	Function	Description/Menu(s)
	Certificates	Imports, displays, or removes certificates, which protects your personal information on the Internet and protects your computer from unsafe software. 
	CPU Speed	Determines the current CPU and cold boot-up speed. Allowable selections are 312 MHz and 624 MHz. 
	Date/Time	Adjusts the date, time, and time zone. 
	Dialing	Adjusts the dialing location settings and dialing patterns when using a modem. 

Table 3-1. Control Panel Functions (Continued)

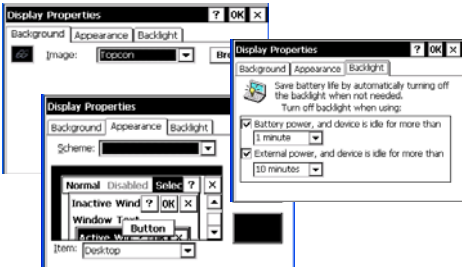
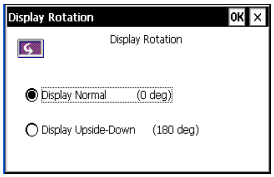
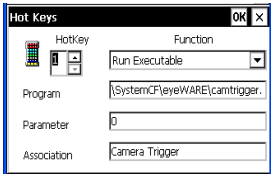
Icon	Function	Description/Menu(s)
	Display	Adjusts the backlight timeout, changes the background image, and changes the desktop color scheme. 
	Display Rotation	Rotates the screen 180 degrees (upside down). 
	Hot Keys	Assigns functionality to the device's eight programmable keys. 

Table 3-1. Control Panel Functions (Continued)

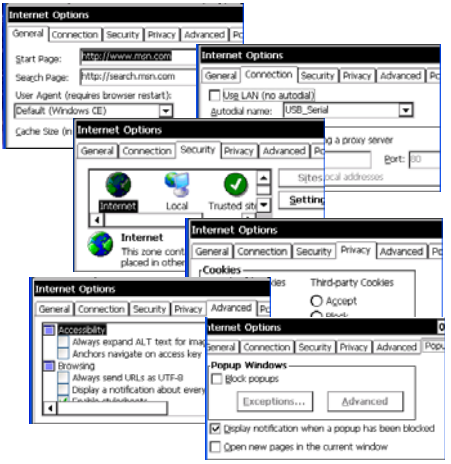
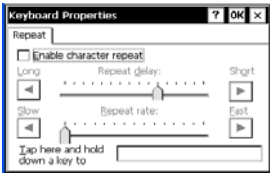
Icon	Function	Description/Menu(s)
	Internet Options	Sets up connections, security settings, and Internet-related functions. 
	Keyboard	Changes the repeat delay and repeat rate. 
	Network and Dial-up Connections	Sets up identification for remote networks.

Table 3-1. Control Panel Functions (Continued)

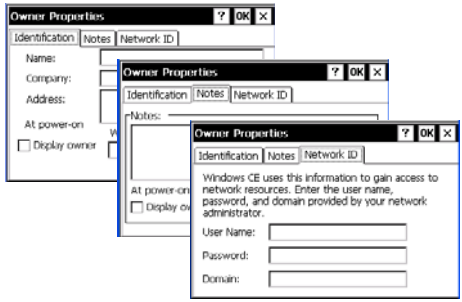
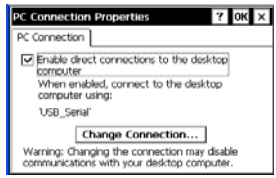
Icon	Function	Description/Menu(s)
	Owner	Allows you to enter the owner name, address, phone numbers, notes, and network ID. 
	Password	Enables password protection and password setup.
	PC Connection	Enables direct connection to a desktop computer. 

Table 3-1. Control Panel Functions (Continued)

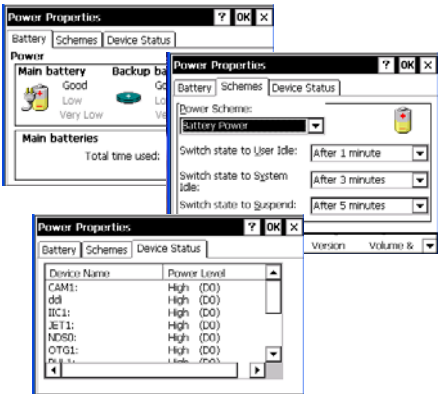
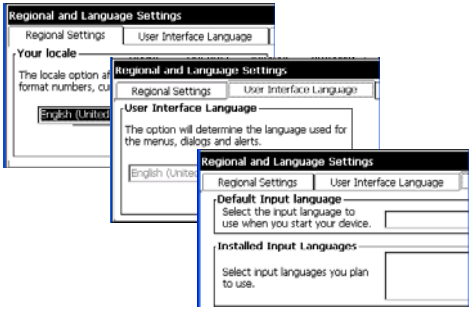
Icon	Function	Description/Menu(s)
	Power	Enables you to: • Check battery power • Set device to turn off when idle • Set up power schemes • Check the power levels of your system devices 
	Regional Settings	Changes the appearance of region-specific information, such as date, time, and currency and language used for menus, dialogs, and alerts. 

Table 3-1. Control Panel Functions (Continued)

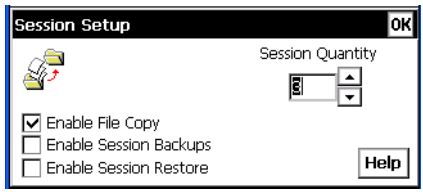
Icon	Function	Description/Menu(s)
	Remove Programs	Enables you to remove programs installed in RAM.
	Startup	Selections for: • Initial loading of files at boot-up • Backing up files at suspend • Restoring a session (set of backed up files) on the next boot-up of the device. 
	Stylus	Recalibrates the touch screen and adjusts the stylus' double-tap rate.

Table 3-1. Control Panel Functions (Continued)

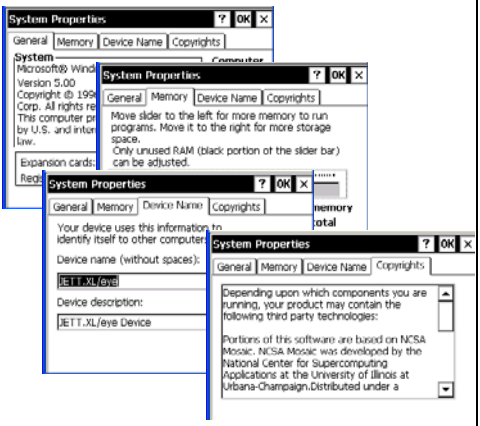
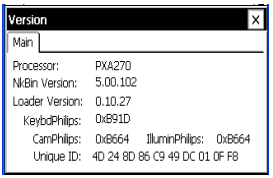
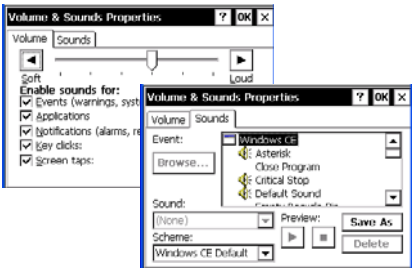
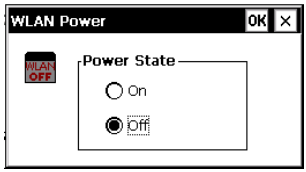
Icon	Function	Description/Menu(s)
	System	Displays system information, changes the RAM (Program/storage memory) division, and changes the device name and description. 
	Version	Displays version and configuration parameters for the SHC2500. 
	Volume & Sounds	Enable sounds for events, applications, notifications, key clicks and screen taps. 

Table 3-1. Control Panel Functions (Continued)

Icon	Function	Description/Menu(s)
	WLAN	Enables you to power on or off the wireless connection status.. 

The Taskbar and Start Menu Settings

The taskbar at the bottom of the Windows CE 5.0 desktop (Figure 3-1) displays the **Start** button, icons of programs currently running, the *Status Bar*, and the *Show Desktop* icon.

Tap **Start ▸ Settings ▸ Taskbar and Start Menu Properties** (Figure 3-1). The ***Taskbar and Start Menu Properties*** dialog box displays (Figure 3-2 on page 3-10).

The Status Bar appears on the right and by default displays small icons for the input panel, current time, power status, and network connections (Figure 3-1). Tap an icon to activate the related program.

Tap the *Show Desktop* icon to minimize active programs and re-display the desktop. Tapping the *Keyboard* icon displays the **Ce Keyboard** for data entry.

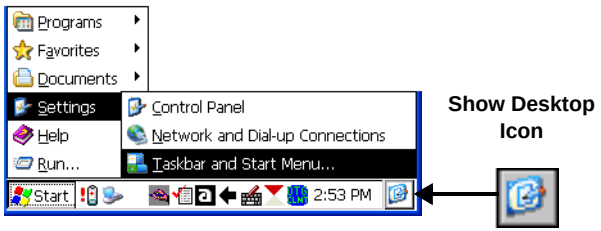


Figure 3-1. Taskbar and Start Menu Settings

On the *General* tab of the ***Taskbar and Start Menu Properties*** dialog box (Figure 3-2), do the following:

- *Always on top* – press and enable to ensure that the taskbar is always visible, even when a program displays in a full window (maximized)
- *Auto hide* – press and enable to display the taskbar only when you point to the taskbar area
- *Show Clock* – press and enable to display the time in the taskbar and to automatically set for *Daylight Savings Time*

On the *Advanced* tab of the ***Taskbar and Start Menu Properties*** dialog box, do the following, then press **OK** to save and exit the menu (Figure 3-2):

- **Clear** – press and enable to remove the contents of the documents menu
- *Expand Control Panel* – check mark this box to display the contents of the Control Panel as items on the *Control Panel* of the **Settings** menu

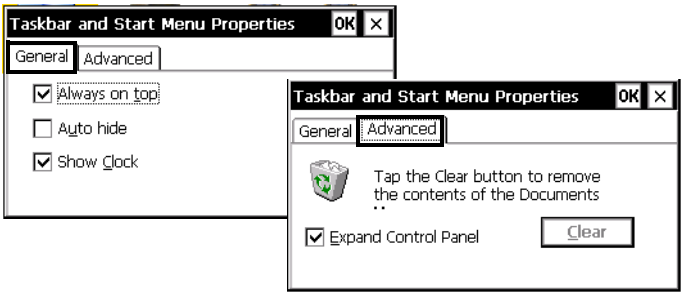


Figure 3-2. Taskbar and Start Menu Properties Dialog Box

Configuring the SHC2500

Creating an ActiveSync® Connection

ActiveSync is a desktop utility program (available as a free download from Microsoft) that allows you to synchronize certain types of information between a PC and the SHC2500. You can also use ActiveSync to transfer files and install programs on the SHC2500.

ActiveSync 4.1 supports PC sync via USB, SHC2500, or a Bluetooth connection. It does not support remote PC Sync (via WiFi or LAN).

USB Connection

By default, the SHC2500 makes an automatic ActiveSync connection and prompts you to create a partnership when you connect a USB cable between the SHC2500 and your computer.

Making a Connection with ActiveSync

If you are using an SHC2500 adapter cable, perform the following steps to make an ActiveSync connection:

1. On the SHC2500, tap **Start ▸ Settings ▸ Control Panel** (Figure 4-1). From the control panel selections, double-click on the *PC Connections* icon. The ***PC Connection Properties*** dialog box displays.
2. Check and enable the check box next to '*Enable direct connections to the desktop computer*' to connect the SHC2500 to the PC.

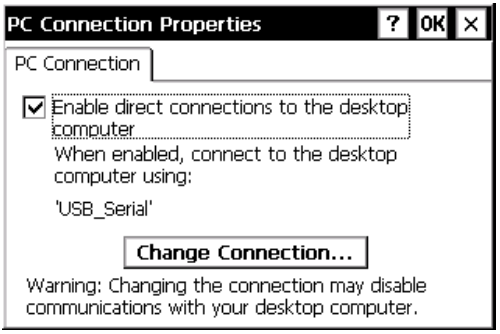


Figure 4-1. PC Connection Properties Dialog Box

3. Tap **Change Connection**. The ***Change Connection*** dialog box displays (Figure 4-2).

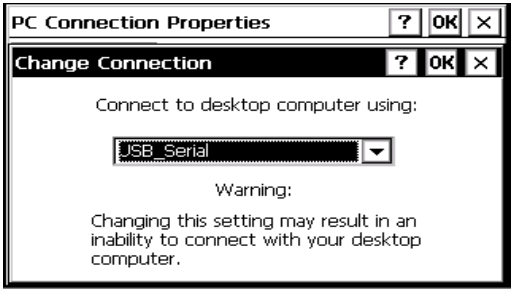


Figure 4-2. Change Connection Dialog Box

4. Select **USB_Serial** from the '*Connect to desktop computer using*' drop-down entry box, and tap **OK** to return to the ***PC Connection Properties*** dialog box.
5. Tap **OK** again to return to the ***Control Panel*** selections.
6. Close the **Control Panel** and return to the Windows CE desktop.

Using ActiveSync

ActiveSync is a desktop utility program that allows you to synchronize certain types of information between a PC and the SHC2500. To operate ActiveSync on your computer, do the following:

Plug one end of the interface cable into your computer and the other end into the SHC2500.

Start ActiveSync on the computer. The ***New Partnership*** dialog box displays (Figure 4-3). Set up a "guest" connection to perform tasks such as copying files or installing programs.

To create a guest connection during your initial setup, select **No** in the **New Partnership** wizard, and then click **Next**. The ActiveSync menu reappears. A "Connected" status displays in the ActiveSync window (Figure 4-4 on page 4-4).

Figure 4-3. Set Up a Partnership

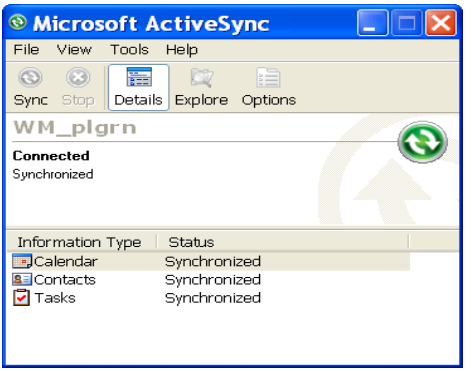


Figure 4-4. Connection Settings

7. Click **Finish** to complete the setup. ActiveSync creates a folder on your computer desktop and attempts to synchronize the item types you selected with similar items on the SHC2500. For example, if you selected Files and placed a file in the My Documents folder on the SHC2500, ActiveSync transfers it to the desktop folder on the SHC2500 (Figure 4-5).

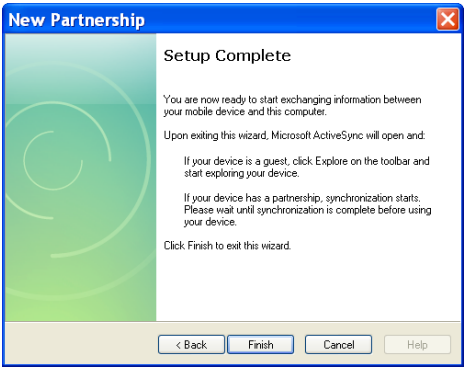


Figure 4-5. Microsoft ActiveSync

On the SHC2500, an icon indicating an ActiveSync connection appears in the system tray.

Connecting to a Mail Server

You can send and receive e-mail by connecting to a POP3 or IMAP4 server. The Inbox contains an e-mail service for each method used. For either service, you must establish a connection to your Internet service provider (ISP) or to the appropriate mail server in your local area network. In addition to creating this connection, you must also create the e-mail service.

Prior to setting up a service, you should obtain the following information from your ISP or network administrator: POP3 or IMAP4 server name, SMTP host name, password, and domain name (for network connections only).

Windows CE 5.0 does not support other mail protocols, such as AOL or services that use special authentication, such as MSN; however, you can gain access to the Internet through these services. If you use the same service to connect to different mailboxes, set up and name a different service for each connection. For additional information about the inbox, refer to Windows CE 5.0 online help.

To connect to your POP3 or IMAP4 mail server on the SHC2500:

1. Tap **Start** ▸ **Programs** ▸ **Inbox**. The **Inbox** window opens (Figure 4-6).

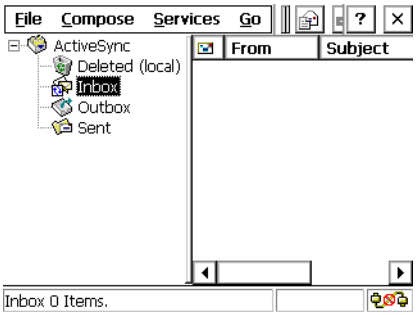


Figure 4-6. Inbox Window

2. Tap **Services** ▸ **Options**. The ***Options*** dialog box displays (Figure 4-7 on page 4-6).

3. On the **Services** tab, click **Add** (Figure 4-7). The ***Service Name*** dialog box displays (Figure 4-7). Select or enter the following information and press **OK**. The ***IMAP4 Mail Service Definition*** dialog box displays (Figure 4-8 on page 4-7).
   - Service type – select *POP3 Mail* or *IMAP4*.
   - Service name – enter a unique name for the service (once entered, you cannot change this name).

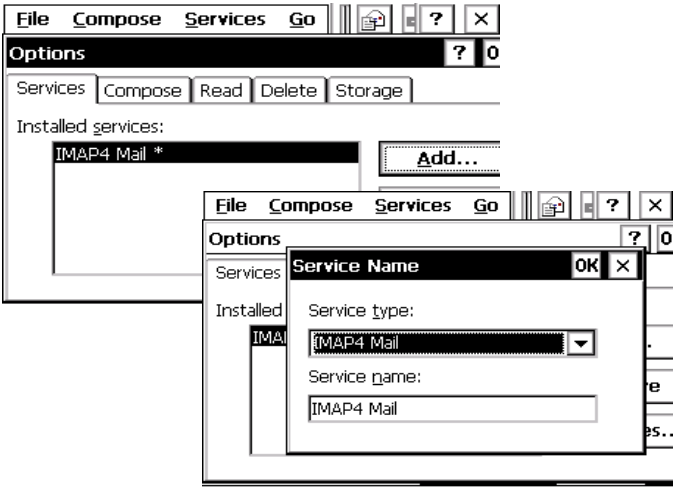


Figure 4-7. Options Dialog Box – Service Panel

4. On the *Required* panel, enter or select the following (Figure 4-8 on page 4-7):
   - Connection – select the name of the connection you created to connect to the mail server. If you are receiving e-mail through a network (Ethernet) connection, select **Network Connection**.

     If you want the **Inbox** to use your current connect, then select (none). If you have not created a connection, select **Create new connection**, double-click the **Make New Connection** icon, and follow the on-screen instructions. When finished, select the Inbox icon on the taskbar and continue setting up the Inbox.
   - Server – Enter the POP3 Host or Server (IMAP4) name of the mail server you use to receive and send messages.

- User ID – enter the user name or mailbox ID assigned to you.
- Password – enter the password you will use to access this mail account.
- Save Password – press and enable this check box if you do not want a password prompt each time you connect.

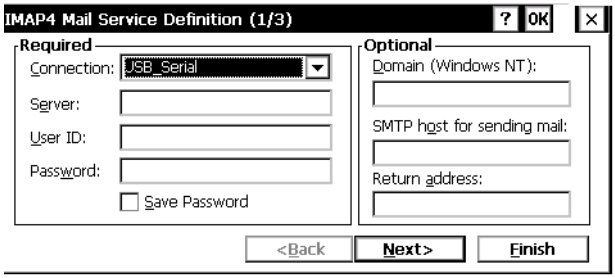


Figure 4-8. Mail Service Setup Wizard

5. On the *Optional* panel, enter the following information (Figure 4-8):
   - Domain (Windows NT) – if connecting to a network that uses Windows NT domain security, enter the Windows NT domain name.
   - SMTP host for sending mail – if your mail service uses a separate server for SMTP, enter the SMTP Host name. For IMAP4 Mail service with an ISP, the ISP must use an SMTP mail gateway.
   - Return address – enter your return e-mail address.
6. Click **Next**. The ***IMAP4 Mail General Preferences*** dialog box displays (Figure 4-9 on page 4-8). Do the following:
   - For Connection Settings – press and enable either Disconnect services after actions are performed.
   - Check for new message every – press ann enable to set a time interval to check for new messages.

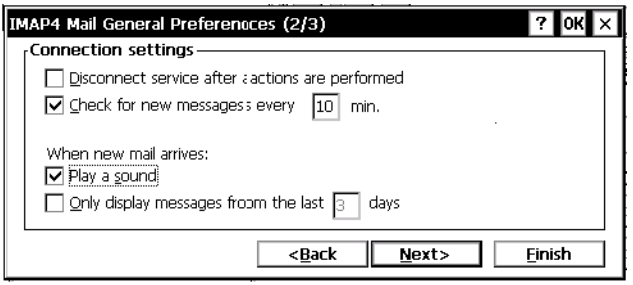


Figure 4-9. General Preferences Dialog Box

7. Select and enable any of the optional settings on this screen and click **Next** to display the second dialog box for ***Mail General Preferences*** (Figure 4-10). Select the following parameters:

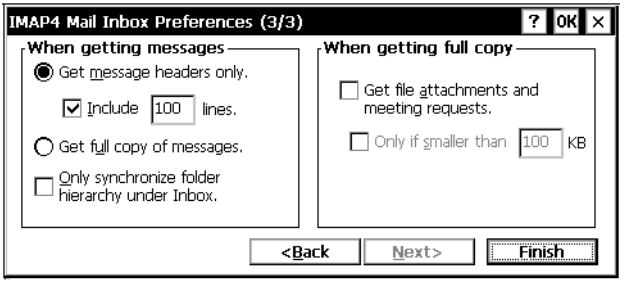


Figure 4-10. Inbox Preference Dialog Box

8. Choose any of the optional settings, and then click **Finish**. The **Mail Service Setup** wizard closes and returns to the ***Options*** dialog box (Figure 4-7 on page 4-6).

Receiving entire messages consumes storage memory.

9. Close the ***Options*** dialog box to return to the **Inbox** window (Figure 4-7 on page 4-6).

Troubleshooting

This chapter helps you diagnose and solve some common problems you may encounter with the SHC2500.

Do not attempt to repair equipment yourself. Doing so voids your warranty and may damage the hardware.

Before contacting Sokkia Topcon support, check the following:

My SHC2500 does not respond when I press the power button

- Make sure the unit is not in Suspend mode
- If the unit is operating on battery power, make sure the batteries have not discharged.
- Make sure all of the cables are properly connected:

I changed my system settings, but when I turn on the SHC2500, my settings are gone

You must save the registry after making any system or configuration changes.

I transferred files to the SHC2500 from my computer, but when I turn on the SHC2500, my transferred files are missing

- To permanently store transferred files, copy the files into internal flash memory or a compact flash card.
- Occasionally, transferred files can be hidden from view. Double-tap **My Computer**, select **View ▸ Options** and clear all boxes.

I cannot connect to the development system using ActiveSync

- Make sure you have administrator access to ActiveSync.
- Confirm the cables are properly connected.

- Make sure the serial communications configuration is correct.
- Make sure the correct COM port is available.
- In ActiveSync, make sure you are using the correct connection settings for the connection type you are using, such as USB, serial, or Ethernet.

The screen is too light or too dark

Adjust the lighting by using the Control Panel to adjust the brightness.

Tap **Start ▸ Settings ▸ Control Panel ▸ Backlight**. The ***Backlight Contro***l dialog box displays. Use the backlight control slider to increase or decrease the lighting on the main screen display.

The stylus is not responding properly

The screen is not calibrated correctly to interpret the screen taps. Recalibrate the screen.

Tap **Start ▸ Settings ▸ Control Panel ▸ Stylus**. The ***Stylus Properties*** dialog box displays. On the *Calibration* tab, press the **Recalibrate** button to recalibrate the screen.

The SHC2500 responds slowly

The device may be short of program memory or storage memory. To increase memory, tap **Start ▸ Settings ▸ Control Panel ▸ System**. The ***System Properties*** dialog box displays. On the *Memory* tab, do the following:

- Increase the amount of storage or program memory by adjusting the memory slider
- You can also delete any unnecessary files

I get little or no sound from the SHC2500

Use the Volume and Sound control in the Control Panel to adjust the volume and sound properties.

No sound is heard when I tap the touch screen or press a key

- Make sure the volume setting is high and turned on.

- Make sure the volume slider in the ***Volume and Sound*** properties dialog box in the Control Panel is set to a high level.

The SHC2500 goes into automatic Suspend mode after a short period of inactivity

- The device automatically defaults to Suspend mode after two minutes of inactivity while running on batteries and after 30 minutes of inactivity when running on AC power.
- Use Power control in the Control Panel to adjust the power management properties to.

Obtaining Technical Support

If the troubleshooting hints and tips in this Operator's Manual fail to remedy the problem, contact TPS Customer Support.

Before contacting TPS Customer support about any problems with the SHC2500 hand-held computer, see "Troubleshooting" on page 5-1 for some solutions that may fix the problem.

Phone

To contact TPS Customer Support by phone, call:

1-866-4TOPCON (1-866-486-7266)
Monday through Friday
7:00 a.m. to 5:00 p.m., Pacific time

E-mail

To contact TPS Customer Support via e-mail, use one of the following e-mail addresses (Table 5-1).

Table 5-1. Technical Support E-mail

For Questions Related To...	Use...
Hardware (receivers, antennas, firmware)	hardware@topcon.com
GPS+ and 3DMC	psg@topcon.com
OAF	options@topcon.com

Table 5-1. Technical Support E-mail (Continued)

For Questions Related To...	Use...
RTK	rtk@topcon.com
PC-CDU	pccdu@topcon.com
If in doubt...	support@topcon.com

For quick and effective support, provide a detailed description of the problem.

When e-mailing TPS customer support, provide the following information for better, faster service:

1. The receiver model and configuration settings.

   In PC-CDU, click **Help ▸ About,** and click **Save to file**. Enter a name for the file, and save it to your computer. Attach this file to the e-mail.
2. The system/hardware specifications for the computer running PC-CDU; such as operating system and version, memory and storage capacity, processor speed, and so forth.
3. The symptoms and/or error codes/messages that precede and follow the problem.
4. The activities being tried when the problem occurs. If possible, include the exact steps being taken up to when the error message or other problem occurs.
5. How regularly the problem occurs.

Generally, a customer support representative will reply within 24 hours, depending on the severity of the problem.

Website

The Topcon Positioning Systems website provides current information about Topcon's line of products. The support area of the website provides access to frequently asked questions, configuration procedures, manuals, e-mail support, and so forth.

To access the TPS website, go to www.topconpositioning.com.

Notes:

Specifications

The sections in this appendix give the features and specifications for the physical components of the SHC2500 hand-held computer.

SHC2500 Specifications

The following sections provide specifications for the SHC2500 hand-held computer and its internal components.

General Specifications

Table A-1 lists the general specifications for the SHC2500.

Table A-1. General Receiver Specifications

Physical	
Enclosure	General Electric Xenoy
Color	Dark Gray, Deep Blue and Lead Grey
Dimensions	**(Display area):** (H)10.85 in (217.6mm) x (W) 5.34 in (135.6mm) **Width (Keypad area):** 3.05 in - 4.80 in. (77.5 – 121.9mm) **Width (Active area):** 2.89 in x 2.19 in (73.4 – 55.6mm)
Weight	**(With Dual Batteries):** • 2.36 lbs **(Without Batteries):** • 30.20 oz (856.2g)

Table A-1. General Receiver Specifications (Continued)

Battery	• Battery capacity of 36 WATT-hours • 40+ hours typical operational time* • 3 hours recharge time* • Smart Battery System • Dual Lithium Ion Extended Capacity Rechargeable Batteries 5000 mAh, 7.4V *actual time may vary, based on a variety of conditions
Keypad	Keypad – 55 keys, plus an 8+1 directional pad The keyboard is constructed of sheer-proof solid hard keys.
LEDs	Five status LEDs Charge/Low battery indicator (battery-powered units)
Power	
Input voltage	Input at 12 -18 VDC, 36 WATTS. Only use the specified AC adapter.
Rechargeable Battery	• Hot-swappable • Lithium-Ion rechargeable • Smart Battery System
Voltage	7.4 volts
Capacity	5000 mAh
Battery charge	~4
Charging time	~6 hours for full charge
Memory	256MB SDRAM 2GB System Flash (30MB reserved for OS)
Display	
Type	Amorphous silicon active matrix AD-TFT color display. Outdoors readable with a diagonal screen size of 3.52” (8.9cm)
Resolution	320 x 240 pixels QVGA color 1 pixel = RGB dots

Table A-1. General Receiver Specifications (Continued)

Environment	
Operating temperature	-4°F to +122°F (-20°C to +50°C)
Storage temperature	-4°F to +158°F (-20°C to +60°C)
Charging Temperature	0 to + 40°C
Humidity	5% to 95% (non-condensing) (MIL-STD 810F Method 507.4)
Shock Resistance	4ft all faces, per MIL-STD 810F Method 516.5IV
Ruggedness	• Water immersion and Dust Protection: IP67 for ultra-rugged environments. IP67 – water-tight, IP66 – high pressure water,IP6X – dust tight, 8 hours continuous 75um particles. • Drop and Shock Protection: 26 drops 1.2m all faces, corners, and edges, per MIL-STD 810F Method 516.5 IV
I/O	
Port specifications	DE-9 RS-232C (D-Sub 9pin) serial connector Mini USB 2.0 A/B USB OTG Host and Client
CPU	
Wireless	• SDC-MFC10G Radio – Summit Data Systems™ (Wi-Fi CERTIIFIED™ for WPA-Personal, WPA-Enterprise, WPA2-Personal, and WPA2-Enterprise - Certified for Cisco Compatible Extensions Version 4 (CCX-V4)) • Bluetooth® –Version 1.2 Class II • WiFi – 802.11 b/g • Integrated Internal Antennas • Optional RS-1, 2.4 GHz SpSp Radio
Type	Marvell XScale® PXA 270 Processor
Speed	624 MHz
OS	Windows CE.NET 5.0

Table A-1. General Receiver Specifications (Continued)

Clock	Real Time clock with rechargeable Lithium backup
Camera System	
Color Image Sensor	• 5.17 megapixels color CMOS sensor – (4 megapixel processed) • Auto Focus, Shutter, Aperture, and Illumination
Resolutions (Available)	• 320x200 (HF) • 640x480 (VGA) • 2048x1944 (QSXGA) • 1280x960 (SXGA)
Bar Code Symbology	• Code 128 • Code 39 • Code 2 of 5 • EAN-13 • PDF-417 (2D Code)
Lens	High quality IR coated glass optics (polarizing lens option
Regulatory	• FCC Part 15 • CE • IC • RoHS COmpliant • WEEE • C-tick
Shutter Speeds	Up to 1/500 of a second
Focal Length	Macro 2.25 inches to infinity
Aperture	Automatic, F 2.8 or F 8.0 (software selectable)
LED	Four white LEDs, each with a luminous flux of 100 lm
Laser Focus System	Two class IIIa-type lasers that operate at 635 nm at a radiated power of 3 mW
Multimedia	
Audio	• Integrated Speaker and Microphone • Audio Bridge Circuitry

Regulatory Information

The following section contains information on this product's compliance with government regulations for use.

FCC Compliance

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Move the equipment away from the receiver.
- Plug the equipment into an outlet on a circuit different from that to which the receiver is powered.

- Consult the dealer or an experienced radio/television technician for additional suggestions.

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void your authority to operate such equipment.

Community of Europe Compliance

The product described in this manual is in compliance with the R&TTE and EMC directives from the European Community.

Canadian Emission Labeling Requirements

1. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
2. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.
3. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
4. The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website: www.hc-sc.ca/rpb.

Cet appareil numérique de la classe B respecte conform a la norme NMB-003 du Canada.

Canadian Radio Frequency Emissions Statement

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at his own expense.

To maintain compliance with the limits of a Class A digital device, Sokkia Topcon Corporation requires that you use quality interface cables when connecting to this device. During testing for certification Category 5 cables were used.

Modifications to this product not authorized by Sokkia Topcon Corporation, could void FCC approval and negate your authority to operate the product.

The user may find the following booklet prepared by the Federal Communications Commission helpful: The Interference Handbook, available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

For more information regarding the above statement, please contact Topcon Positioning Systems, Inc., 7400 National Drive, Livermore, CA 94550 USA; telephone 800-443-4567.

CISPR 22 (EN 55022) Class A

This is a class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

Canadian Regulatory Information (Canada Only)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Note that Industry Canada regulations provided, that changes or modifications not expressly approved by Sokkia Topcon Corporation could void your authority to operate this equipment.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe B respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

- **Canada RSS-210/CNR210** (RF Remote Controller)

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

This Class B digital apparatus complies with Canada RSS-210.

Cet appareil numerique de la classe B est conforme a la norme CNR-210 du Canada.

The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Declaration of Conformity for CE Mark

We, at Topcon Corporation, declare EC conformity for the following product:

Brand	Topcon
Model/Type	SHC2500 & RS-1 Radio
Model Numbers	60727 & 60434
Manufacturer's Name	Two Technologies, Inc.
Manufacturer's Address	419 Sargon Way Horsham, Pennsylvania 19066 United States of America

The SHC2500 Mobile Computer satisfies all the technical regulations applicable to the following directives:

- EMC per R&TTE Directive (1999/5/EEC)

  EN 301 489-17 V1.2.1:2006

  EN 55022:1998
- Radio Systems per R&TTE Directive: EN 300 328 V1.7.1:2002-08
- Low Voltage Directive (2006/95/EC)

  N60950-1:2006 Safety of Information Technology Equipment

  EN60825-1:1994 Safety of laser products

EU Representative:

Name	Topcon Europe Positioning B.V.
Address	Esse Baan 11, 2908 LJ Capelle a/d Ijssel, The Netherland
Country	The Netherlands
Telephone	+31-10-4585077
FAX	+31-10-4585045

WEEE Directive

The following information is for EU-member states only:

The use of the symbol below indicates that this product may not be treated as household waste. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about the take-back and recycling of this product, please contact your supplier where you purchased the product or consult.

WEEE Directive

This symbol is applicable to EU members states only.

Following information is only for EU-member states:
The use of the symbol indicates that this product may not be treated as household waste. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about the take-back and recycling of this product, please contact your supplier where you purchased the product or consult.

EU Battery Directive

This symbol is applicable to EU members states only.

Battery users must not dispose of batteries as unsorted general waste, but treat properly.

TOPCON CORPORATION

EMC and Radiocommunications Compliance Labeling Using the C-Tick Mark

The use of the C-Tick logo below and the company ID (N13813) indicates that this product complies with the Australian Communications and Media Authority's EMC (electromagnetic compatibility) and Radiocommunication standards. The compliance label also establishes a traceable link between the equipment and the manufacturer, importer, or the agent responsible for compliance and for placing it on the Australian market.

The C-Tick mark is a certification trademark registered to the ACA (Australian Communications Authority) in Australia under the 1995 Trade Marks Act and to RSM (Radio Spectrum Managment) Group in New Zealand under section 47 of the NZ Trade Marks Act.

The mark is only to be used in accordance with conditions laid down by the ACA and RSM.

Safety Warnings

General Warnings

To comply with RF exposure requirements, maintain at least 25cm between the user and the radio modem.

Battery Pack Warnings

Never attempt to open the casing of the detachable batteries! Lithium-Ion batteries can be dangerous if mishandled!

Do not incinerate or heat battery pack above 212 degrees Fahrenheit (100 degrees celsius). Excessive heat can cause serious damage and possible explosion.

Tampering with the batteries by end users or non-factory authorized technicians will void the battery's warranty.

- Do not attempt to open the battery pack or to replace it.
- Do not disassemble the battery pack.
- Do not charge in conditions different than specified.
- Do not use a battery charger other than the one specified by Topcon.
- Do not short circuit.
- Do not crush or modify.

This product contains a CR Lithium Battery which contains Perchlorate Material – special handling may apply.

See http://www.dtsc.ca.gov/hazardouswaste/perchlorate/

Note: This is applicable to California, USA only.

Usage Warnings

Handling the cord on this product, or cords associated with accessories sold with this product, exposes you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm. ***Wash hands after handling.***

If this product has been dropped, altered, transported or shipped without proper packaging, or otherwise treated without care, erroneous measurements may occur.

The owner should periodically test this product to ensure it provides accurate measurements.

Inform TPS immediately if this product does not function properly.

Only allow authorized TPS warranty service centers to service or repair this product.

Notes:

Warranty Terms

TPS (Topcon Positioning Systems) laser and electronic positioning equipment are guaranteed against defective material and workmanship under normal use and application consistent with this Manual. The equipment is guaranteed for the period indicated, on the warranty card accompanying the product, starting from the date that the product is sold to the original purchaser by TPS' Authorized Dealers.[1]

During the warranty period, TPS will, at its option, repair or replace this product at no additional charge. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. This limited warranty does not include service to repair damage to the product resulting from an accident, disaster, misuses, abuse or modification of the product.

Warranty service may be obtained from an authorized TPS warranty service dealer. If this product is delivered by mail, purchaser agrees to insure the product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location and to use the original shipping container or equivalent. A letter should accompany the package furnishing a description of the problem and/or defect.

The purchaser's sole remedy shall be replacement as provided above. In no event shall TPS be liable for any damages or other claim including any claim for lost profits, lost savings or other incidental or consequential damages arising out of the use of, or inability to use, the product.

1. The warranty against defects in a Topcon battery, charger, or cable is 90 days.

Notes:

SOKKIA

ISO 9001:2000
FM 68448

Sokkia® SHC2500 Operator's Manual
P/N: 7010-0950 Rev A 08/09
©2009 Topcon Corporation All rights reserved. No unauthorized duplication.