

SPECTRA PRECISION®

RANGER™ 3 DATA COLLECTOR GETTING STARTED GUIDE



Contents

Welcome	1
Device Hardware.....	2
Unit Setup	4
Working with the Unit and the Battery	8
Status indicators	13
Settings on your Unit	14
Communication.....	17
Connecting to a PC	17
Working with Bluetooth.....	19
Working with Wi-Fi (Wireless Lan, WLAN or 802.11).....	21
Working with the Camera	23
Working with the Barcode Scanner	26
Working with the GPS	27
Working with the Wireless WAN	29
Troubleshooting	33
Caring for your Unit.....	34
Environmental Considerations	35
Environmental Specifications	36
Hardware Specifications	36
Regulatory Information.....	37
Declaration of Conformity	38
Safe Use of your Unit.....	39
Appendix A	42
Using SatViewer	42

Welcome

Congratulations on your purchase of the most powerful and advanced handheld computer available on the market today. Its rugged design allows you to work in harsh outdoor environments. You can operate your unit in blazing heat, subzero cold, driving rain or dusty job sites – places you could not take a consumer-grade handheld computer.

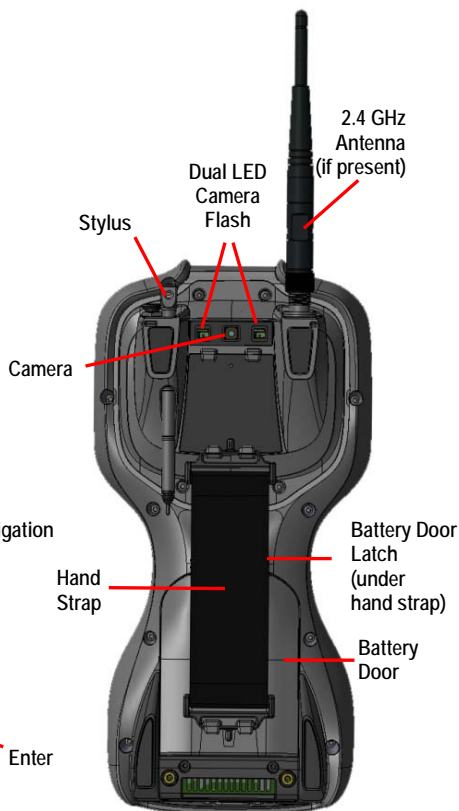
NOTE: Not all the features discussed in this manual will apply to every unit, as some of the features are offered as options. If the feature described does not apply to your unit, please disregard that section.

Device Hardware

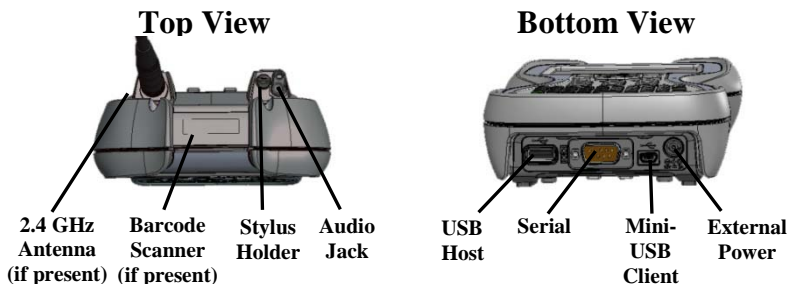
Front View



Back View

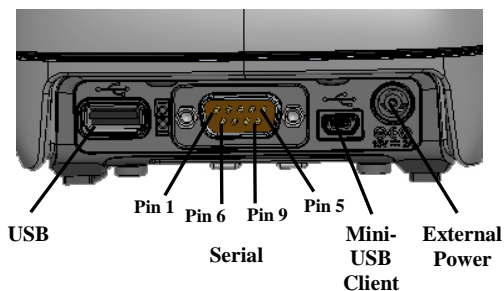


NOTE: Some features are offered as options and may not apply to your unit. Be sure to read the warranty and safety information in this manual prior to using your unit.



I/O

The I/O has a mini-USB client (to connect to Microsoft Windows Mobile Device Center, used on Microsoft Windows Vista[®] and Windows 7[®], or connect to Microsoft ActiveSync[®], used on Microsoft Windows XP[®]), a USB host port (to connect to USB client devices) and a DB9 RS-232 connector (for use with serial devices).



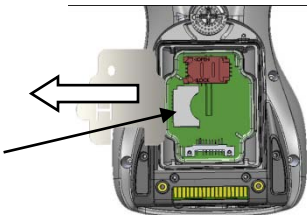
NOTE: COM1 is always reserved in software for the 9-pin port.

Many USB peripheral devices supported by personal computers (Microsoft Windows XP, Microsoft Vista, Microsoft Windows 7, etc.) are **not** supported by this unit. Mass storage devices (e.g. memory drives) and USB Human Interface Devices (HID) (e.g. keyboards) are supported. Before purchasing a USB peripheral, check with the manufacturer to ensure that it will operate with one of these natively supported USB classes. Some devices have no applicability in Windows Mobile. For example, mice do not make sense to use with your unit because it is designed to be touchscreen or keypad operated.

Unit Setup

1. Install the SD card (if desired)

1. Lift up the plastic regulatory label in the battery compartment.
2. Gently slide the SD card into the slot.
3. Close the plastic regulatory label.



If your unit has the WWAN option, install the GSM SIM card. See page 29 for installation instructions.

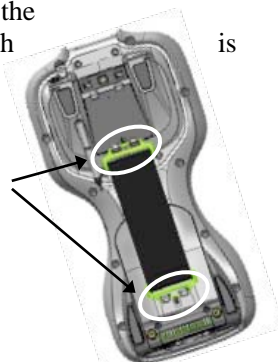
2. Install the battery

The Lithium-Ion (Li-Ion) battery with the battery cover is shipped detached from the unit. Insert the battery at the bottom of the compartment first so the connector on the battery mates with the pins in the battery compartment. Using your thumb, the flat end of the stylus or a coin, turn the latch located above the battery clockwise until tightened. As the latch turned, the battery lowers level to the case.



3. Attach the hand strap

Attach the hand strap to the back case, as shown.



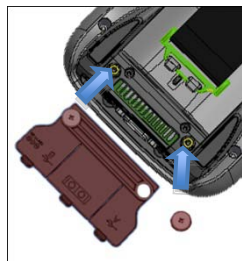
4. Attach audio port cover and stylus

Attach the tethers to the back case, as shown.



5. Attach the I/O Dust cover (optional)

While the unit is completely sealed, the dust cover protects the connectors from foreign objects.



6. Apply the screen protector

To keep the touchscreen clean and protected, apply the screen protector following the instructions provided in the screen protector package. Unprotected screens become scratched and scuffed over time. Screen protectors extend the life of the display by providing a protective and replaceable barrier between abrasive grit and the surface of the display. It is recommended to replace the screen protector every 2 months, or more often if heavily used.

Screen damage associated with not using a screen protector, not using the approved screen protector or failure to follow the instructions for installation may void the product warranty.

7. Charge the battery

IMPORTANT: Fully charge the battery at least 4 hours after installing in the unit. The battery LED (left LED) will turn green when fully charged.

The power supply that ships with your unit has four international plugs that fit almost every electrical outlet in the world. Connect the appropriate plug to the power cord and attach to the power supply. Plug into an electrical outlet and plug the barrel end of the power supply into the unit.

Warning! Be sure to only use the power supply included with your unit. Use of other adapters may void the product warranty.

8. Turning your unit on and off (resume/suspend)

The unit should boot up when the battery is installed. If not, press and release the green **Power** key on the keypad. To turn your unit off, press and release the **Power** key again.

One of the most convenient features of your unit is “suspend/resume”. There is no waiting for the unit to boot up every time it is turned on. (It does not occur on the first boot-up.)

9. Language selection

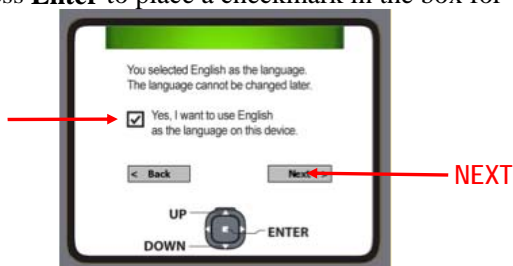
IMPORTANT: Carefully choose the correct language because all other languages are removed after this selection. Contact technical support if the wrong language was selected.

The first time the unit is turned on or if the firmware is re-loaded, you may need to select the desired language.

1. Use the up or down arrows to highlight the language desired and press **Enter** to select it. (The touchscreen is not enabled yet).



2. Use the up or down arrows to highlight the checkbox.
3. Press **Enter** to place a checkmark in the box for “Yes”.



4. Use the up or down arrows to highlight **NEXT** and press **Enter**.
5. Wait while your unit is being configured to the chosen language. It will restart when finished.

NOTE: Only Microsoft applications and messages will be translated into languages other than English. All other error messages, notifications and other applications may appear in English.

10. Align screen

When the unit first turns on, the message “Tap the screen to set up your Windows Mobile-based device” will appear.

The align screen message will display a series of targets to tap in sequence on the screen. Use the stylus to tap the targets firmly and accurately. Sometimes you need to repeat the alignment procedure more than once to provide a satisfactory alignment.

11. Password – lock (optional)

You do not have to provide a password unless you are concerned about unauthorized use. To eliminate using a password, tap **Skip**.

If you opt for password protection the password must be entered every time the unit is turned on or the **Power** key is pressed to resume operation.

WARNING: BE CERTAIN TO REMEMBER THE PASSWORD.

The only way to recover from a forgotten password is to perform a Clean Boot and you will **LOSE** all application software, licenses, settings and data on your unit. See page 12 on how to perform a Clean Boot.

12. Setup is complete

Tap the screen to start using your unit.

Working with the Unit and the Battery

Home Screen

The Home Screen is an easy way to launch your favorite programs. You can view high-level information at a glance, with notifications for Live services, e-mail and SMS/MMS.

Data Collector: Hover over the top bar of the Home Screen to access the **Wireless Manager**. This manages wireless settings like Wi-Fi, Bluetooth and Phone.

Pictures: You can select **All Photos** to open up **Pictures and Videos**. Tap **Camera** to start taking pictures.

Music: You can select your music from this menu.


Time: You can select your time zone, set the time and date to the correct values and set alarms.

Text: If you have the phone feature set up on your unit, you can send and receive text messages from this menu.

E-mail: Email can be set up and launched here.

Calendar: Appointments can be managed from here.

Favorites: Internet Explorer can be launched from here.

You can change to the classic Today Screen by tapping  **Settings / Home / Items**.

Extreme Heat

Extreme heat: The battery is designed to stop operating at or above the extreme heat of +149 °F (+65 °C). If this icon appears, the battery has overheated to +140 °F (+60 °C).






CAUTION: If the battery temperature exceeds 158 °F (70 °C) it will be disabled and will need to be replaced.

Battery Life

The Lithium-Ion (Li-Ion) battery life is dependent upon the application and operating environment. For example, estimated battery life will be approximately 34 hours with the unit turned on but idle, with the backlight on, all radios and compass off when using a new battery.

Tips for extending the battery life:

- **Display backlight:** Tap  / **Settings / System / Backlight** to minimize the amount of time the backlight stays on and dim it to only as bright as required to view the display.
- **Wi-Fi, Bluetooth, camera, or barcode scanner:** Turn off when not needed. (Camera and barcode scanner are optional devices.)
- **Flashlight:** Minimize the use of the flashlight.
- **WWAN:** Turn the phone off when not in use.
- **Cold temperatures:** Keep the unit as close to room ambient temperature (77 °F or 25 °C) as possible. If feasible, keep it inside your coat or a vehicle when not in use.
- **GPS:** Ensure that the GPS-aware applications that communicate with the GPS are closed when not in use.
- **Auto features:** Tap  / **Settings / Power / Advanced**. Specify your unit to turn off in a short time if not in use. Tap  / **Settings / Bluetooth / Wake Settings**. Turn off **Allow Bluetooth activity to turn the device on**. Bluetooth could turn on your unit, transfer data and drain the battery.
- Heavy processing by the CPU may have some impact on battery life, but is typically less significant.

Charging the battery

The battery can be charged in the unit or apart from the unit with an external battery charger (sold separately, as an accessory). Connect the plug for your country to the power cord and attach to the power supply. Plug into an electrical outlet and plug the barrel end of the power supply into the unit. The unit will be charged in about 4 hours.

A full charge is indicated by the battery indicator (left LED) turning green. The recommended temperature range for charging is between +32 °F and +104 °F (0 °C and +40 °C). If the battery temperature is outside of this range, the battery may not charge.

Warning! Be sure to only use the power supply included with your unit. Use of other adapters may void the product warranty.


Changing the battery

The unit was designed to be able to change the battery quickly without resetting it. The unit saves enough power (in Replace Battery mode) that if you swap the battery within approximately one minute, it will not trigger a reset.

WARNING: If the saved power runs out before the new battery is installed, the unit will reset. This will not impact saved data, programs or configuration, however unsaved data will be lost and the time settings may be reset.













To change a battery assembly, perform the following steps:

1. Close open applications and save data in case the battery exchange takes too long.
2. Remove the hand strap from the unit.
3. Enter the **Replace Battery** mode (so alarms will not wake up the unit while changing the battery). Hold down the Power key for about 3 seconds then release to display the power menu. Tap **Replace Battery/SIM**. See page 11.
4. Turn the latch located above the battery counterclockwise.
5. Remove the battery from the unit.
6. Quickly insert the replacement battery onto the unit.
7. Turn the latch located above the battery clockwise.
8. Replace the hand strap.
9. Turn on the unit to resume operation.


Battery power: Tap  / **Settings / Power** to see how much battery power is remaining. Tap **Advanced** to turn the display off when not in use to conserve battery power.

Notification LEDs

At the top of the unit are three LEDs that provide status information:

Left LED 	Center LED 	Right LED 
Colors: amber, green, red	Colors: amber, green, red	Colors: amber, blue, green
Battery Status:  Green: fully charged  Amber: charging  Red: battery error	OS Status (application dependent):  Red-blinking: alarm WWAN Status:  Amber-blinking: 2G connection  Green-blinking: 3G connection (if OS status alarm and WWAN is on, the red will blink faster)	Bluetooth on:  Blue-blinking Wi-Fi on:  Amber-blinking GPS on:  Green-blinking (LED will flash in a sequence if multiple features are on)

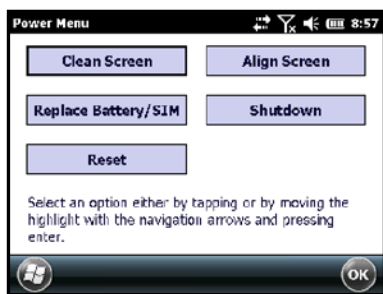
Speaker and microphone

Your unit comes with an integrated speaker and a microphone. It also has a 3.5 mm audio jack that is wired for a headset with a stereo speaker and microphone combination. To record, tap  / **Notes** (or hold down the **Fn** key and the **5** key). If you do not see the Recording toolbar, tap **Menu / View Recording Toolbar**. Tap the round **Record** symbol on the screen. The unit will record until the square **Stop** symbol is pressed. The recorded file will be saved in the Notes folder.

Power key features

The **Power** key turns the unit on and off and performs a number of additional functions.

Power menu: Hold down the **Power** key for about 3 seconds to display a countdown. Continuing to press the **Power** key will cause a reset when the countdown reaches zero. If you release the **Power** key while the countdown is proceeding, you access the following menu. Tap an option or **OK** to exit.



Clean Screen: Disables the touchscreen for cleaning. Press the enter key to re-enable the touchscreen.

Align Touchscreen: Repeats the alignment procedure.

Replace Battery/SIM: Ensures that alarms will not wake up the unit while changing the battery or accessing the SD card or the SIM under the battery.

Shutdown: Intended for long-term

storage to put the unit in its lowest power mode. Running application state and unsaved data will be lost. Internal GPS parameters will be reset to their default settings. To take the unit out of the shutdown mode, press the power key and the unit will boot up. **NOTE:** While in shutdown mode, the battery LED does not work, but if the power supply is plugged in, it will still charge.


Reset: Stops all running programs and restarts the unit. No file system data is lost, only open or unsaved files will be lost. All registry settings, control panel, personal information, GPS settings and databases are preserved.

NOTE: If the countdown or the Power menu does not appear when the power button is held down, continue to hold down the power button for at least 8 seconds to start the reset. It may take up to 10 seconds for the unit to start after the power button has been released.

Perform a Clean Boot

WARNING: Application software installed by the customer and some licenses, settings and user data will be cleared if this function is performed!




Hold down the Power key until the countdown begins and then release it to show the Power Menu described above. Tap **Reset**. Upon the appearance of the boot screen, press and hold the power key and then press the right soft key . A screen appears warning that if you continue, this operation will clear the persistent store. Follow the instructions on the screen **ONLY** if you want to completely clear your unit.

Storage memory


Unlike many handhelds that can lose data if they lose power, all your data is always stored in non-volatile persistent storage memory. Losing power will not impact **saved** data or configurations other than the real-time clock. As with any computer system, we recommend that you regularly backup your data to removable media or to a PC.

Accessing storage memory using File Explorer


File Explorer ( **File Explorer**) lets you browse the contents of folders on your unit. To easily delete, rename, or copy an item, touch and hold the item and then select the function desired.

NOTE: Unlike PC's, Windows Mobile does not support a Recycle Bin. Once a file is deleted, it cannot be recovered.

Task Manager




Closing programs still leaves them resident in RAM. Windows Mobile will close background programs to free up RAM if resources are low. To manually close programs, tap  **Task Manager**. Tap on the program and tap **End Task** or tap **Menu / End all Tasks**.

Flashlight


The dual LEDs for the camera flash can also be used as a flashlight. Tap  **Flashlight** to toggle the Flashlight on and off.

Status indicators


Following are some of the status indicators seen on your unit's display.

Icon	Description	Icon	Description
	Battery power is low		Other networks are detected. Tap to access an available network
	Battery power is very low		Wireless network connected
	Battery communication error		Active connection, but not currently synchronizing
	Battery charging		Inactive connection to computer or wireless network
	Battery level		Synchronizing
	Battery warning out of temperature range		Synchronizing error
	Instant messages received		Pending alarm
	Speaker is on		Phone is turned on and signal strength
	Speaker is off (or in mute position)		Phone is turned off. To turn it on, tap this icon
	SIM card missing		No signal
	Faulty SIM card		No service. Phone connection unavailable or network error.
	E-mail has been received		Lost signal. The unit is searching for a signal.
	Tap to view more notifications		EDGE network is available
	Data call is in progress		EDGE network connected
	Roaming mode		GPRS network available
	3G connected		GPRS network connected
			HSDPA network available

Settings on your Unit


Tap  / **Settings**. Some of the more useful settings are described below.

Lock (password)


If you want password protection from unauthorized use of your unit, tap  / **Settings** / **Lock**. The password must be entered every time you turn the unit on or resume operation.


WARNING: BE CERTAIN TO REMEMBER THE PASSWORD. The only way to recover from a forgotten password is to perform a Clean Boot. However, you will **LOSE** all application software, licenses, settings and data on your unit. For instructions on how to perform a Clean Boot, see page 12.

Buttons (keys)

Tap  / **Settings** / **Personal** / **Buttons**. Under **Program Buttons**, your favorite programs can be assigned to several of the keypad buttons. The list of assignable keys is shown on the left hand side with the program that is assigned by default on the right. To reassign a key, select the key in section 1 and change to the desired program or action from the pull-down list in section 2.

You can customize the way your Up/Down control repeats by changing the settings under the **Up/Down Control** tab.

The yellow  (function key) accesses the symbols in yellow on the keypad of the unit. Several settings can be changed under **Keyboard Options**.

Auto release: Press and release the  key to access a yellow task for one use. It then goes back to the standard function for the key.

Manual release: Press the function key to toggle it on and off.

Yellow tasks remain active until the function key is pressed again.

Disabled: The function key has to be held down while pressing any other key to access the yellow task.

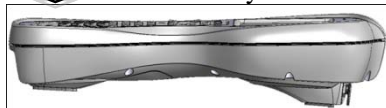
Play Sticky Key Sounds: To disable sticky key sounds, remove the check in the box.

Compass calibration

To re-calibrate the compass, tap  / **Settings / System / Compass Calibration**. Tap on Calibrate to begin.

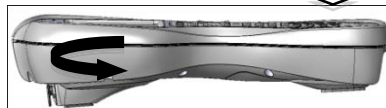
1. Hold the unit level and press the **Enter** key.

 Press Enter key.



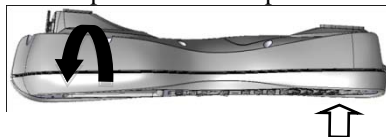
2. Rotate the unit 180 degrees (while keeping it horizontal) and press the **Enter** key again.

Rotate and press Enter key.





3. Rotate the unit upside down and press the **Enter** key again.

Rotate upside down and press Enter.




Backlight for display


Tap  / **Settings / System / Backlight**. The default for the backlight is on. Tap **Battery Power**, **External Power** and **Brightness** to change settings.

To toggle the backlight on and off, hold down the **Fn** key and the **9** key to access the  (moon). Once toggled off, the backlight will stay off until it is toggled back on. Screen taps and key presses will not cause it to turn on.


Memory

Tap  / **Settings / System / Memory** to see how much Storage memory and Program memory is available. If there is an SD card installed under the battery, tap **Storage Card** to view the available memory on the card. You can also find the large files that are using storage memory.

System information

Tap  / **Settings** / **System** / **System Information**. Firmware version, serial number, processor speed, RAM and Flash size, wireless configurations, battery and card port information can be found here.

Power

Tap  / **Settings** / **Power** to view the approximate battery power remaining. Tap the **Advanced** tab and choose the settings for automatically turning off the unit when not in use.

Communication

Your unit may offer multiple methods of communication with other devices as described below. Not all the features apply to every unit, as some of the features are offered as options. If the feature described does not apply to your unit, please disregard that section.

Connecting to a PC

Connecting your unit to a PC allows you to copy files, synchronize information, send and receive e-mail and install applications on your unit. Connectivity software is pre-installed on your handheld unit.

Microsoft Windows Vista® & Windows 7®: Microsoft Windows Mobile Device Center may be pre-installed on your PC. If it is not on your PC, go to www.microsoft.com and search for Windows Mobile Device Center to install it.
NOTE: It does not recognize the serial port and Serial ActiveSync is not supported at all. You must connect by either USB or Bluetooth.

Microsoft Windows XP® SP3 or later: Microsoft ActiveSync 4.5 or greater is required. (Microsoft Office Outlook 2000 and older is not supported.)



NOTE: If you have an earlier version on your PC, you need to upgrade to version ActiveSync 4.5 prior to connecting to your unit. Go to <http://www.microsoft.com> and search for ActiveSync.

IMPORTANT: Do not connect your unit to the USB port on the PC until **after** you install connectivity software to your PC. If you prematurely connect the unit to your PC, your PC USB drivers may get into a confused state and will not connect. If you suspect that something like this has happened, uninstall the connectivity software on your PC, reboot, and reinstall.

After the connectivity software is installed on the PC, connect the unit to the PC:

1. Connect the USB end of the synchronization cable to the PC.
2. Turn on your unit.
3. Connect the mini-USB end of the cable to your unit.

Troubleshooting connection problems

1. Confirm the unit is configured to communicate with the PC.
Tap  / **ActiveSync** / **Menu** / **Connections**. Confirm the box **Synchronize all PC's using this connection** is checked and **USB** is selected from the dropdown list.
2. If the unit is unable to connect to the PC via ActiveSync, try disabling any personal firewall software running on the PC. TCP/IP ports need to be open.
3. Reset the unit.
4. If you have more than one unit, PC and/or cable, testing different combinations of equipment can help isolate the cause of the problem.
5. If you suspect the unit may have been connected to the PC USB port before the connectivity software was installed, then uninstall, reboot the PC, and reinstall.
6. Confirm the version of connectivity software used on your PC (Microsoft ActiveSync 4.5 or greater for Windows XP or Windows Mobile Device Center for Windows 7 and Vista).
7. Tap  / **Settings** / **Connections** / **USB to PC** and change the check box **Enable advanced network functionality**.

Working with Bluetooth

All units have embedded Bluetooth capability—a short-range wireless communication technology that exchanges information (beam) over a distance of up to 30 feet (10 meters), without requiring a physical connection.

Bluetooth settings: tap  / **Settings / Bluetooth**.

Mode: To enable Bluetooth, select the check box **Turn on Bluetooth**. If you want other Bluetooth devices to find your unit, also select the check box **Make this device visible to other devices**.

Devices: Tap **Add new device** to search for other Bluetooth devices. For enhanced security, use passcodes.

COM Ports: Available only for Bluetooth-connected devices that support serial (COM) connections.


Wake Settings: *Allow Bluetooth activity to turn the device on.*

When this check box is selected, another Bluetooth device can send data and your unit will turn on and reply if necessary.

NOTE: It is recommended that your unit be configured to automatically turn off when not in use. (See the Power section on page 11.) Otherwise, another Bluetooth device could turn on your unit, transfer data and if it does not turn off again, drain the battery.


Receiving Beams: To allow the unit to receive incoming beams, navigate to the Connection Settings dialog. Choose **Beam** and check the **Receive all incoming beams** checkbox.

Creating a Bluetooth Partnership: Bluetooth partnerships are required for connections to some PC's, printers, and headphones. Configuring Bluetooth connections vary depending upon how each Bluetooth device works. Refer to all device documentation.

1. Tap  / **Settings / Bluetooth / Mode**. Ensure that both devices have Bluetooth turned on in the Mode area, are visible and within close range.
2. Tap **Devices / Add new device...** Wait a few moments while your unit searches for Bluetooth devices.
3. Tap the name of the other Bluetooth device and tap **Next**. For enhanced security, use passcodes. Enter the same passcode on the other unit.

4. Under **Advanced**, you can change the name of the other device and add additional services, if available. Tap **Save**.


Bluetooth connection with a PC


1. Ensure that your PC has connectivity software installed. See *Connecting to a PC* on page 17.
2. Set up a partnership between your unit and the PC. Refer to your PC documentation for instructions.
3. Once shown, select the PC from the Device list and tap **Next**.
4. Enter the passcode, if necessary and tap **Next**.
5. Confirm that ActiveSync service is available and place a check in the check box and tap **Finish**.
6. Tap  / **ActiveSync** / **Menu** / **Connect via Bluetooth**.

Bluetooth-enabled headphone: You can use a Bluetooth stereo A2DP headphone only. Many Bluetooth headphones will not require a passcode to pair with your unit.

Troubleshooting Bluetooth connection problems: If your unit cannot find another Bluetooth device, confirm that the device is within range (less than 30 feet / 10 meters) and no large objects obstruct the path of other Bluetooth-enabled devices. Confirm that the device is turned on and has been configured to be discoverable.

Working with Wi-Fi (Wireless Lan, WLAN or 802.11)

If your unit comes with built-in Wi-Fi capability (Wi-Fi is a trademark of the Wi-Fi Alliance), you can wirelessly transmit data to and from your unit by connecting to available access points or hot spots. To find out if you have Wi-Fi installed in your unit, tap  / **Settings / System / System Information / Wireless.**

The Wi-Fi is off by default; however the on/off state will persist after a reset. To turn the Wi-Fi on or off, go to the top of the Home Screen and tap on Wireless Manager or tap  / **Settings / Connections / Wireless Manager** and tap **Wi-Fi**. Once the Wi-Fi is turned on, it detects the wireless networks in the vicinity and gives you the option to connect to one. Turn Wi-Fi off when not in use to save battery power and possibly speed up other processes.


NOTE: If your unit is connected to a PC that is connected to the Internet, the unit will use the PC's Internet connection and Wi-Fi will not show up in the Wireless Manager screen. You may allow the simultaneous use of the PC and the Wi-Fi module by tapping the checkbox next to **Allow wireless connection on the device when connected to the desktop** under **File > Connection Settings** in the ActiveSync UI.


To change the Wi-Fi settings, tap **Menu / Wi-Fi Settings.**

1. Wi-Fi by default is disabled. Tap **Menu / Turn on Wi-Fi.**
2. Tap the network you want to connect to. The networks with three or four bars provide a better connection. Tap **OK.**
3. Tap **Connect** to begin using an open network. If the network does not require passwords, no changes are required.
4. If the network requires authentication, a Network Authentication dialog will open. For networks that require network keys, enter the network key into the dialog box and tap **Connect** to begin using the network.
5. Under **Network Adapters** tab, changes can be made to what your network card connects to and to modify adapter settings.

Advanced: You can set specific Wi-Fi settings required by some networks. Administrators can also set a password to limit access to configuration settings.

Exchange ActiveSync: Exchange ActiveSync, a component of Exchange Server, facilitates data synchronization between your unit and an Exchange server. This synchronization can occur over a network connection, allowing you to update calendars, contacts, tasks and the Inbox on your unit without directly connecting to a PC. The server must be running Exchange Server 2003 SP2 or later.

To use Exchange ActiveSync, confirm with your system administrator that an Exchange Server is available. The administrator will provide you with a login name, password, server name, and domain name. To configure Exchange ActiveSync on your unit, tap  / **ActiveSync / Menu / Add Server Source**. Enter the user name, password and domain and tap **Next**. Choose the data types you want to synchronize and tap **Finish**. Enter the server address and confirm with your administrator whether the Exchange server requires an encrypted (SSL) connection. Tap **Next**.

Troubleshooting Wi-Fi connection problems: If the unit seems to be connected to the network, but you are having difficulty using the network connection, tap  / **Settings / Connections / Wi-Fi**. The **Network Cards** window will open and allow you to confirm that the connection is appropriately configured as either a **Work** or **Internet** connection. If you are unable to connect to a network, try connecting to another network without any security, such as a Wi-Fi hotspot, to determine if the issue is the hardware or the network.


Installing additional software on your unit

Third-party software designed for Microsoft Windows Mobile® is installed by running a setup program on the PC while the unit is connected over ActiveSync or Windows Mobile Device Center®.





Some programs are CAB files that need to be transferred to your unit and executed from the unit.

Follow the setup instructions that came with your software. If prompted, perform a reset to complete the installation.

Working with the Camera

Depending upon the configuration of your unit, it may have an integrated digital camera. To find out if you have a camera installed in your unit, tap  / **Settings / System / System Information / CardPort** and see if it is listed under **Cardport Devices**.


Using the Camera:

1. From the Home Screen, tap **Pictures / All Photos** to open up **Pictures & Videos** or tap  / **Pictures & Videos**.
2. Tap on **Camera**.
3. Lightly press the  key halfway to focus the image.
4. Press until the **Enter** or the  key clicks to take a picture.
5. Press the  key or tap **OK** to close the picture preview.
(Files are saved in **File Explorer** (under **My Device**) / **My Documents / My Pictures**.)

NOTE: The camera preserves battery power by going into standby mode after 30 seconds of no camera usage. Tap the screen or press a button to resume.

Managing Pictures:

Tap the desired picture.

Send: If you are connected to the internet, press the left  key or tap **Send** to e-mail the selected picture.

Press the right  key or tap **Menu** to see the following features:

Zoom: A zoom window shows up in the lower right hand corner of the display. You can zoom in, zoom out or return to normal view (only on higher resolution pictures).

Play Slide Show: Tap the display to see the icons to pause, advance, return to the last slide, or stop the slide show.

Set as Home Background: Tap to place the selected picture as the background of the Home screen.

Beam Picture: For use to beam to another Bluetooth device.

Save: Saves the selected picture to a contact or a jpg.

Edit: Puts a selected picture into an editable mode. To rotate the picture 90 degrees, tap the left application key **Rotate**.

Press the right  key or tap **Menu** to select the following:

- **Crop:** Tap **Crop** and then drag the stylus on the screen to select the area to be cropped.
- **Auto Correct:** Automatically corrects the color in images.
- **Undo:** Takes the picture back a step.
- **Revert to Saved:** Eliminates all edits to the picture.
- **Save As:** Saves the edited file under a new file name. If you want it saved under the previous name, tap **OK**.

Properties: Tap to see photo information.

Options: Tap to make changes.

- **General:** The picture can be resized for e-mailing and the settings can be changed to rotate pictures to the right or left.
- **Slide Show:** Change settings to optimize for viewing.
- **Camera:** Change settings for saving files.
- **Video:** Change settings for audio capture and time limits.

NOTE: To create folders to manage your pictures, tap **Menu / Edit / New Folder** while in the thumbnail view. Tap **Menu / Edit / Cut** and then **Paste** to move the files to the new folder. (You can rename the folder using File Explorer.)

Camera settings:

Tap  / **Pictures & Videos / Camera**. While in the Camera mode, tap **Menu**.

Video: To put the camera into video mode, tap **Menu / Video**. (The settings for video are Brightness, Quality, White Balance, Full Screen and Options.) To take a video, use the Enter button to start and stop. To switch out of video mode, tap **Menu / Still**.

Mode: Tap **Normal**, **Timer** (for a 5 second delay), or **Burst** (takes 5 photos ~3 seconds apart; the preview window stays the same). (This setting is only available in camera mode.)

Brightness: Tap plus numbers to lighten; minus numbers to darken.

Resolution: The larger the resolution, the larger the file size.

There are 6 choices for camera mode: 320x240, 640x480 (default), 1280x1024, 1600x1200, 2048x1536 and 2592x1944.

There are 3 choices for video mode under **Quality**: 320x240, 176x144 (default) and 640x480.

Zoom: Tap the larger number to zoom in and the smaller number to zoom out. (This setting is only available in camera mode.)

White Balance: Instead of using the automatic mode, you can correct colors needed (incandescent, sunny or fluorescent).

Flash: Tap **On** when a flash is needed for taking the picture.

(This setting is only available in camera mode.)

Full Screen: Tap to make the picture or video full screen. Tap the screen to return the menus. Tap **Full Screen** again to stop this function.

Options: Tap to make changes.

- **Camera:** Change settings for saving files.

- **Video:** Change settings for audio capture and time limits.

- **General:** The picture can be resized for e-mailing and the settings can be changed to rotate pictures to the right or left.

- **Slide Show:** Change settings to optimize for viewing.

Geotagging: Settings that can be changed while using the GPS with the camera. (This setting is only available in camera mode.)

- **Geotagging:** Choose where the tagging is done:

- **Disable:** turns off Geotagging.

- **Exif Data only:** Exif data is stored in the image data only.

- **Embed Text Only:** shows the location stamp on the image.

- **Both:** Exif is stored in the image data and the location data is shown on the image.

NOTE: The GPS will continue tracking satellites if Geotagging is turned on. Either “Acquiring Satellites” or “GPS Ready” will be shown above the preview image when the viewfinder is not in standby.


- **Font:** Set the size, font, color, location and format of the image embedded location stamp.


- **GPS Power:** Determines when the GPS is turned on. The default is **Auto Power off** with a timeout of 5 minutes to conserve battery power. You can choose a timeout value of 1, 5, 10, 20, 40 or 60 minutes.

Effects: Flip/Rotate changes the direction the picture is taken and Sound settings can be muted for shutter sound and auto focus. (This setting is only available in camera mode.)

Auto Focus: Choose the **Macro** setting to change the focus and flash to take close shots; choose the **Infinite** setting to change the focus and flash to take long distance shots. (This setting is only available in camera mode.)

Working with the Barcode Scanner


Depending upon the configuration of your unit, it may have an integrated laser 1D barcode scanner. Tap  **Settings / System / System Information / CardPort** to see if Barcode Scanner is listed under the Cardport Devices. Also, barcode scanner units have a clear plastic cover at the top with a laser warning label.

If you do not have your own barcode scanner software to install, there is a basic application called ScanAgent. Tap  **ScanAgent**. If not on your unit, it may be downloaded from the web site.

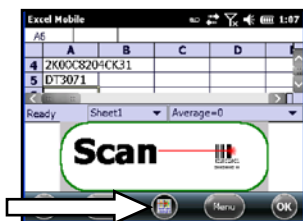
NOTE: Avoid direct viewing of the laser beam. Do not stare into the beam or point directly at eyes.

Using ScanAgent (optional on certain device offerings; may not be installed.)


There are two options for scanning into applications that use text input, such as Microsoft Excel® or Microsoft Word®:

- Press the  key.
- Use the Scanner SIP (Soft Input Panel): Tap and hold on the SIP to display options. Select **Barcode Scanner**. Tap the scan SIP on the screen to activate the scanner.

You can change the Scanner shortcut button. See page 14.



ScanAgent setup

To set up ScanAgent and test scanning, tap  **Settings / System / Scanner Setup**. Tap **Scan Now** to activate the laser and start scanning immediately. If the scan fails to decode, try moving closer or farther away from the barcode you are trying to scan. To change settings, tap **Edit Config**.

Scan Codes: Check the barcode symbologies you want to scan.


Parameters can be changed for each symbology by tapping on **Code Params** or **UPC EAN Params**. Tap **Restore Defaults**, if desired. Choosing fewer barcode symbologies results in faster scan times.

Scan Parameters: Changes can be made to the scan duration, the barcode symbology, or sounds to play when a scan starts or ends. You can also select different .WAV files for sounds.


Prefix/Suffix: You can add a prefix before the barcode or suffix after. The suffix can also be changed to send TAB or nothing instead of RETURN after the suffix.

For detailed information on these and other settings, please refer to the Software Development Kit provided on our web site.

Working with the GPS

Tap  / **Settings / System / System Information / Wireless** to see if your unit has GPS installed. COM2 is the dedicated hardware port for the built-in GPS (COM1 is dedicated to the external 9-pin). The GPS is compatible with applications that accept the NMEA position information using a default baud rate of 9600.

GPS settings:

If you are using only one GPS-aware application, these settings do not need to be changed. However, to use multiple GPS-aware applications, tap  / **Settings / System / GPS** and select the following tabs:


Access: The GPS Intermediate Driver allows multiple applications to access the GPS receiver. To manage the GPS Intermediate Driver, uncheck the check box.

Hardware: COM2 is the hardware port dedicated for the built-in GPS. Verify that COM2 is selected. The internal GPS communicates at 9600 baud by default. If it has been modified by a third-party program, adjust to match the receiver baud rate.

Programs: Programs that use GPS need to know which port to use to access GPS data. When using more than one GPS-aware application, the same GPS program port must be used in each application. Ensure that the COM port on the GPS-aware application(s) is set to the same GPS program port as shown in the Programs tab of the GPS applet. The program port must be a different port than the hardware port. By default, this is COM3. **NOTE:** Some GPS-aware applications may not communicate over GPS ports.

A-GPS: While Assisted GPS can improve time-to-first-fix, it may reduce accuracy in some situations. Uncheck the box next to **Enable Assisted GPS** and reboot your unit if you wish to disable it.

Using Assisted GPS (A-GPS)

To enable and disable A-GPS, tap  / **Settings / System / GPS / A-GPS**. If the GPS has been used in the prior 72 hours, A-GPS will retain a memory of the satellite paths. The A-GPS satellite data is stored in memory for the satellites visible in your current position. Therefore the unit can lock on the satellites quickly, in less than 20 seconds in an open sky. The expiration of the A-GPS data is also shown in this menu. Using A-GPS may reduce accuracy in some situations.

If you are unable to connect to the GPS using the default GPS settings, you can restore it to factory default settings by performing a system shutdown and leaving the unit shut down for approximately 5 minutes. See Power key features on page 11.

SatViewer

(Optional on certain device offerings; may not be installed.)

If your unit has the built-in GPS, it may have SatViewer™ installed. External GPS receivers, Bluetooth GPS receivers or other external GPS devices (including other SiRF II or SiRF III GPS receivers) are not supported and may not work correctly with SatViewer. See Appendix A for more instructions on using SatViewer.

Exiting GPS applications

Any time you exit a GPS application (such as SatViewer) it is advisable to close the port gracefully, e.g. tap **Disconnect from GPS** and exit the application. Failure to do so may leave the port open and hinder the next GPS operation

Working with the Wireless WAN

Depending upon the configuration of your unit, it may have the additional 3G wireless wide area network (WWAN) feature. After purchasing a data connection plan from your local GSM cellular provider, you can communicate from field to office, send e-mail messages and send text messages.

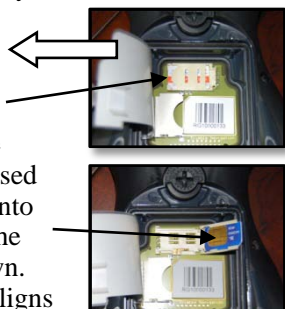
NOTE: When browsing the internet using the cellular connection, you must turn off the Wi-Fi (802.11) or the unit will default to the Wi-Fi to browse.

CAUTION:

- DO NOT use your unit while driving a moving vehicle.
- DO NOT remove the WWAN antenna unless directed by support personnel.
- When you are on a plane, in a medical facility or at a gas station where wireless communication devices are not allowed, go to **Wireless Manager** to TURN OFF all wireless communications. Simply turning the **Power** key off does not turn off these communications.

Installing (or changing) the SIM card





1. Hold down the **Power** key for about 3 seconds and release to display the power menu. Tap **Replace Battery/SIM** to ensure the alarms will not wake up the unit.
2. Remove the hand strap.
3. Turn the latch located above the battery counterclockwise.
4. Remove the battery from the unit.
5. Lift up the plastic regulatory label.
6. Slide the white SIM carriage to the unlocked position (to the right).
7. Gently open the hinged SIM carriage door, and place the SIM card (purchased from your cellular service provider) into the SIM carriage door that lifts up. The golden contacts should be facing down. Also ensure that the notched corner aligns with the angled corner on the SIM carriage.
8. Close the SIM carriage and then slide it to the locked position (to the left).



9. Close the plastic regulatory label.
10. Place the battery into the unit.
11. Turn the latch located above the battery clockwise.
12. Replace the hand strap.


Setting up the cellular data connection using CellStart

(Optional on certain device offerings; may not be installed.)

1. Tap  / **CellStart**. (You may need to tap **OK** to agree to the terms to open the program.) Under **Available Settings**, tap the **[+]** by your country to expand carriers.
2. Tap the **[+]** by the carrier you have signed up with and highlight **Typical** and tap **New**. (If using multiple configuration settings, you can tap on the primary setting and tap **Default**.)
3. Ensure the phone is turned on. Tap  / **Settings** / **Connections** / **Wireless Manager** / **Phone**.
4. Test the settings by tapping  / **Internet Explorer** and then browse to a web page. The phone will automatically start dialing when you try to open a web page.
5. If the phone will not connect, try other settings before calling the carrier technical support.
6. You can also manually change modem settings by tapping  / **Settings** / **Connections** / **Connections**.

NOTE: Once connected, G (GPRS) or E (EDGE - a faster form of GPRS) or H (HSDPA) will automatically appear in the notification bar depending on the network capabilities in that area; some service providers may only provide GPRS.


Removing cellular data settings

1. Tap  / **CellStart**.
2. Tap **Refresh** to see the current list of configurations.
3. Select the configured data setting you wish to remove.
4. Tap **Remove** and **OK**.

NOTE: After removing a default configuration, the top setting will become the new default.

To access the detailed settings for each configuration, tap **Menu** / **Open Connections Applet** to change the modem connections.

Customizing your phone

Tap  / **Settings / Personal / Phone**. The SIM card must be installed and the phone turned on to view the settings.

Sounds: Tap to make changes.

- **Phone Number:** The SIM card phone number is displayed.
- **Ring type, Ring tone and Keypad** sounds: Choose the sounds you want for text messaging notifications.

Security: A PIN can be set or changed to block unauthorized access to your data connection.

Services: This unit is data-only and dialing controls are not available. Settings can be changed for Call Barring, Caller ID, Call Forwarding, Call Waiting, Fixed Dialing and Voicemail and Text Messages.

Network: Find and set your preferred networks.


Version: View the RIL, MUX, RHA and AUD versions, as well as the manufacturer, model and revisions number of the WWAN module.

Info: Find and set your preferred networks.


- **IMEI:** The unique number that identifies the phone module that is embedded in the unit. (If you purchase a SIM card separately, the phone service provider may want your IMEI number. It is located on this screen as well as in the battery compartment.
- **IMSI and ICCID:** Unique numbers embedded on the SIM card.
- **Signal Strength, Cell ID, Location Code and Network Code** are also listed under the info tab.

Band: Leave all the settings selected unless there is a good reason to make adjustments.

Browsing the Internet

Tap  / **Internet Explorer**, and enter the address of one of your favorite web sites.

Internet Sharing

The Internet service from your unit can be shared with a computer. Tap  / **Internet Sharing**. You can connect either through USB or Bluetooth.

Using the WWAN features


NOTE: The Wireless WAN features of this unit are used only for data communication and do NOT have voice capability or the ability to send MMS messages (Multimedia Messaging Service). Voicemails left on this number can be retrieved only by using another phone, depending upon the plan you purchased from your service provider. It is recommended to request the data-only plan from your service provider and have a “voice restriction” placed on your line.


Use the **Wireless Manager** to turn on the phone and wait at least 30 seconds before using the phone. The unit may say the phone is on, but it needs to register with your service provider before it works properly. To save battery power, turn off the phone feature when not in use.

SMS messages

You can send a SMS (short message service) in exactly the same way as a normal mobile telephone. Each SMS text message can contain a maximum of 160 characters or less, depending on your service provider. To send a message from the **Home** Screen, simply hover over the bar **Text** and tap **Compose**.

Sending and receiving e-mail

E-mail setup: Tap  **E-mail**. Follow instructions to set up the e-mail service. You can synchronize with a POP Mail server, or with a Microsoft Exchange[®] server.

Sending and receiving messages: Tap  **E-mail** and select an e-mail account. Tap **New** to compose a message and tap **Send**. Input the contact information. Depending on your account settings, your unit will check for new e-mail periodically. You can force a download of new messages, by tapping **Menu / Send/Receive**.


Troubleshooting



What do I do to keep my battery from failing during a job?

Consider carrying a fully charged spare battery in the field. The unit is designed so that battery replacement can be easily done.

How do I delete files? Open File Explorer and browse to the file to be deleted. Touch and hold on the file and tap Delete from the menu that appears. Unlike PC's, Windows Mobile does not support a Recycle Bin. Once you delete a file, it cannot be recovered.

How can I see file extensions or file attributes? Windows Mobile File Explorer does not support viewing file extensions like Windows Explorer on a PC. You can connect the unit to your PC and browse from the PC to view file extensions. (Refer to Connecting to a PC on page 17 for details.) Third-party file management programs are available for Windows Mobile devices that may support a Recycle Bin, viewing file extensions and more.

How can I tell how much memory is available? Tap  / **Settings / System / Memory** to view available free storage and program memory. Tap Storage Card to view available memory on memory cards that may be installed.

How can I make the display more viewable? Tap  / **Settings / System / Backlight / Brightness** to adjust the display brightness; however, this will reduce battery life. You can also change the background theme found under  / **Settings / Home**. Confirm that you have only one screen protector in place.

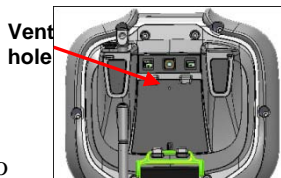
Can I use my SD device with my unit? SD (and SDHC) memory cards work as long as they are supported with Microsoft Windows Mobile 6 drivers. SDIO cards are not supported.

Can I work with Microsoft Office files in Word Mobile and Excel Mobile? Office Mobile applications are trimmed-down versions of the PC Microsoft Office applications and do not support all of the features that are supported by the PC applications. You can view simple documents and make simple changes on your unit. The Office Mobile applications are located under **Start / Office Mobile 2010**.

Can I use my USB memory stick (or mouse, keyboard, cell phone or other USB device) with my unit? You can connect peripheral devices via the USB connectors on the bottom of the unit. Check with the device manufacturer to see if the USB peripheral device is supported under Windows Mobile 6.5. Special drivers may need to be installed.

Caring for your Unit

Case vent hole: A Gore-Tex membrane is used at the vent hole to equalize the atmospheric pressure within the unit and to prevent dust, water, etc. from entering. The vent must remain clear of any obstruction. Damage to the touchscreen will occur if the vent is covered. Covering the vent with stickers and labels may void the warranty.



Cleaning the unit: Use a soft, dampened cloth with either water or a diluted mild detergent. If a mild detergent is used, ensure all soap residue is removed. Do not use any chemical cleaners and do not put the unit in the dishwasher.

Care of the touchscreen: Use only the included stylus or other devices specifically designed for use with touchscreens.

The use of ballpoint pens, nails or other sharp objects to operate the touchscreen will scratch and/or damage the unit. Keep the touchscreen clean by gently wiping the display, using a soft, dampened cloth with either clean water or glass cleaner.

Do not use abrasive cleaners directly on the display. Doing so may void your warranty. Use the screen protectors included with the unit to keep the touchscreen clean and protected, following the instructions provided on the screen protector package.

Mechanical shock: The unit is designed to resist damage for drops up to 4 ft (1.22 meters). However, you should protect the display from impact, pressure, or abrasive substances that can scratch it or crack it. The unit should not be dropped unnecessarily.

Environmental Considerations

The unit's rugged design allows you to run your applications in harsh outdoor environments. Here are some considerations that will help you get the most out of your unit when working in very wet, hot or cold conditions.

Water: This unit is designed to withstand accidental immersion. Keep the battery assembly and its connectors as dry as possible. If the battery compartment does get wet, dry off the contacts as much as possible. Removal of the back case screws could cause leakage and may void your warranty.

NOTE: Although a custom cover for the I/O ports and the audio jack are provided, these are not required to maintain the seal the unit against water. The covers are intended to keep mud, sand and other materials from blocking these ports.

Temperature range: The operational temperature range is from -22 °F to +140 °F (-30 °C to +60 °C). Although the unit is designed to be rugged, do not leave it in direct sunlight or in a vehicle in the sunlight for extended periods.

Batteries perform best at room temperature. The battery has a stable capacity as temperatures rise; however, the colder the temperature, the greater the reduction in available battery life. Under very cold conditions (-4 °F / -20 °C and below), the battery life will be shortened. To improve the battery performance in very cold conditions, consider carrying a fully charged, spare battery in a warm place (for instance, keeping them inside your coat). The unit is designed for battery replacement to be easily done.

Environmental Specifications

TEMPERATURE	Operation: -22 °F to +140 °F (-30 °C to +60 °C) Storage: -40 °F to +158 °F (-40 °C to +70 °C)
SHOCK	MIL-STD-810G, Method 503.5
HUMIDITY	MIL-STD-810G, Method 507.5
WATER	IP67, sealed against accidental immersion
DROP	MIL-STD-810G, Method 516.6, Procedure IV 26 drops @4 ft. (1.22 m) onto plywood over concrete; 6 drops @-22 °F (-30 °C), 6 drops @+140 °F (+60 °C)
SAND AND DUST	IP67, sealed against dust
VIBRATION	MIL-STD 810G Method 514.6, Procedure I & II
ALTITUDE	MIL-STD 810G, to 15,000 ft (4572 m) at a nominal temp. of +73 °F (+23 °C), Method 500.5, Procedures I, II, & III
EMI	Meets FCC class B requirements
ROHS COMPLIANT	This product complies with international RoHS regulations

Hardware Specifications

OS	Windows Mobile 6.5 Professional
CPU	Texas Instruments Sitara® AM3715 ARM® Cortex™ A8
RAM (VOLATILE)	256 MB DDR SDRAM
FLASH STORAGE	8 GB of nonvolatile NAND Flash storage
DISPLAY	640 x 480 VGA (4.2" landscape), sunlight-readable color TFT with resistive touchscreen and LED backlight
KEYPAD	Qwerty or ABCD
BATTERY LIFE	34 hours with unit on, but idle, backlight on, all radios off, compass off and using a new battery.
BATTERY CHARGING	3 hours to full charge
BATTERY CAPACITY	11.1 V, 2600 mAh, 28.9 Wh Li-Ion rechargeable pack
POWER SUPPLY	SL Power PW173KB
POWER	Input: DC 15.0 V 2.0 A
I/O PORTS	Mini-USB client, USB host, Audio Jack, Serial Port (9-pin RS-232), SDHC Memory slot, SIM slot
SOUND	Integrated sealed speaker and microphone. Audio jack is for a headset with stereo speaker and microphone
ADDITIONAL FEATURES	Color Digital Camera (5 megapixel) with Auto Focus and Flash, Laser Barcode Scanner , Digital Compass with Accelerometer
INTEGRATED WIRELESS	Integrated GPS, Wi-Fi 802.11B/G, and Bluetooth 2.0+EDR; Optional 3G GSM (pentaband HSDPA)

Regulatory Information

U.S.A.

This device complies with Part 15 of the FCC Rules. It is tested to comply with FCC standards for home or office use. 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 Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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 harmful interference to radio or television 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.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications. Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Exposure to Radio Frequency (RF) Signals

Your device contains a radio transmitter and receiver. The radiated output power is far below the international radio frequency exposure limits. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines are based on the safety standards previously set by international standards bodies:

- American National Standards Institute (ANSI) IEEE. C95.1-1992.
- National Council on Radiation Protection and Measurement (NCRP). Report 86. 1986.
- Int'l Commission on Non-Ionizing Radiation Protection (ICNIRP) 1996.
- Ministry of Health (Canada), Safety Code 6. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

Use of unauthorized or modified antennas may impair call quality and damage the phone, causing loss of performance. To assure optimal phone performance and ensure human exposure to RF energy is within the guidelines set forth in the relevant standards; always use your device only in its normal-use position. Avoiding contact with the antenna area when the phone is IN USE optimizes the antenna performance.

This device has been designed to operate with the antennas listed below, and having

a maximum gain of 3 dB. Antennas not included in this list or having a gain greater than 3 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Spectra Precision Antenna # 53009009-SPN

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.

Carrying the unit

Due to radio frequency emissions, it is unsafe to operate the radio with the unit in a holster, dangling from a lanyard, or with any method that keeps the powered unit in very close proximity to the head or torso. For safe operation, carry the unit in your hand with the antennas located at least 20 cm (~8 inches) from the head or torso. See the following illustration for the correct and incorrect way to operate the unit.



Declaration of Conformity

Europe

According to ISO / IEC Guide 22 and EN 450 14

Manufacturer's Name: Trimble Navigation Limited.

Manufacturer's Address: PO Box 947, Corvallis, OR 97339 USA

Declares, under our sole responsibility, that the product:

Product Name: Data Collector

Model Number: Ranger/TSC3

Regulatory Name: Ranger/TSC3

Product Options: ALL

Conforms to the following Product Specifications:

EN 300 328: V1.7.1:2006	EN 61000-3-2:2006
EN 301 489-1: V1.8.1:2008	EN 61000-3-3:2008
EN 301 489-17: V2.1.1:2009	EN 61000-4-2:2001
EN 301 511:V9.0.2:2003	EN 61000-4-3:2006
EN 301 489-07 V1.3.1:2005	EN 61000-4-4:2004
EN 301 489-24 V1.4.1:2007	EN 61000-4-5:2006
EN 301 908-1&2:V4.2.1:2010	EN 61000-4-6:2005
EN 55022:2006, Amendment A1:2007	EN 61000-4-11:2004
EN 55024:1998, Amendments A1:2001, A2:2003	EN 60950-1:2001
CISPR 22:2005, Amendments A1:2005, A2:2006	
R&TTE Directive 1999/5/EC	
CFR 47, Part 15, Subpart B	

Supplementary Information:

In addition, the product is battery powered and the power supply provided with this product has been certified to IEC 60950 +A1, A2, A3, A4, A11.

As manufacturer, we declare under our sole responsibility that the equipment follows the provisions of the Standards stated above.

Corvallis, OR USA

Importer of Record: Trimble European Regional Fulfillment Center,
Logistics Manager, Meerheide 45, 5521DZ Eersel, Netherlands.

CAUTION: Only approved accessories may be used with this equipment. In general, all cables must be high quality, shielded, correctly terminated and normally restricted to two meters in length. The power supply approved for this product employs special provisions to avoid radio interference and should not be altered or substituted.

Unapproved modifications or operations beyond or in conflict with these instructions for use may void authorization by the authorities to operate the equipment.

Safe Use of your Unit

Repair: Do not attempt to dismantle the unit for repair. There are no user-serviceable parts inside. For service, use the contact details listed on the cover of this manual or contact your local dealer.

Battery safety: Lithium-Ion batteries are classified by the U. S. Federal Government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries contain recyclable materials and are accepted for recycling. Dispose of used batteries in accordance with local regulations.

- 1) Do not disassemble or open, crush, bend or deform, puncture, or shred the battery assembly. There are no user-serviceable parts in the battery assembly.
- 2) Do not use battery if plastic case is cracked, compromised or punctured.
- 3) Do not attempt to separate battery from the battery door.
- 4) Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids.
- 5) Do not expose to fire, explosion, or other hazard. Do not expose to temperatures above +158 °F (+70 °C). The battery is designed to stop functioning if it reaches an unsafe temperature.
- 6) Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals. If battery contacts appear damaged, DO NOT use the battery.
- 7) Use only the battery for the system for which it was specified.
- 8) Non-approved batteries will not function in the device. Replace the battery only with another battery that has been qualified with the system per this standard, IEEE-Std-1725-200x. Improper battery use or use of an unqualified battery may present a risk of fire, explosion, leakage, or other hazard.
- 9) Only use the battery with a charging system that has been qualified with the system per this standard.
- 10) 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.

Power supply safety

Use only AC and vehicle adapters intended for the unit. Other external power sources may damage your product and void the warranty. Certification of this Class III product is only valid with the power supply - SL Power PW173KB.

- Ensure the input voltage on the adapter matches the voltage in your location. Ensure the adapter has prongs compatible with your outlets.
- The power supply is designed for **indoor use only**. Avoid using the power supply in wet areas.
- Unplug the power supply from power when not in use.
- Do not short the output connector.

Telecommunications & Internet Association (TIA) information

Hearing Aids: Some digital wireless phones may interfere with some hearing aids. In the event of such interference, you may want to consult your service provider, or call the customer service line to discuss alternatives.

Pacemakers and Other Medical Devices: The Health Industry Manufacturers Association recommends a minimum separation of six inches be maintained between a handheld wireless phone and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by and recommendations of Wireless Technology Research. Persons with pacemakers should use the ear opposite the pacemaker to minimize the potential for interference. If you have any reason to suspect that interference is taking place, turn the phone OFF immediately.

If you use any other personal medical device, consult the manufacturer of your device to determine if they are adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information.

Turn the phone OFF in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

Environmental Hazards

The product complies with international RoHS regulations.

有毒有害物质和元素

Toxic and Hazardous Substances and Elements

部件名称 Part Name	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr6+)	聚溴联苯 Poly-brominated biphenyls (PBB)	聚溴二苯醚 Poly-brominated diphenyl ethers (PBDE)	
印制电路组件 Printed Circuit Assemblies	X	0	0	0	0	0	20
显示 Display	X	0	0	0	0	0	20
键盘 Keypad	X	0	0	0	0	0	20
住房 Housing	0	0	0	0	0	0	
硬件 Hardware	0	0	0	0	0	0	

Product Period does not include these items

电池 Battery	X	0	0	0	0	0	8
交流适配器 Power supply	X	0	0	0	0	0	10
电缆 cable	0	0	0	0	0	0	
开始指南 Manual	0	0	0	0	0	0	
手带 Hand strap	0	0	0	0	0	0	
触控笔包 Stylus pkg.	0	0	0	0	0	0	
随带光盘 Companion CD	0	0	0	0	0	0	


Appendix A

Using SatViewer

(Optional on certain device offerings; may not be installed.)

If your unit has the built-in GPS, it will have SatViewer™ installed. External GPS receivers, Bluetooth GPS receivers or other external GPS devices (including other SiRF II or SiRF III GPS receivers) are not supported and may not work correctly with SatViewer. See Appendix A for more instructions on using SatViewer.

Quick Start: The following steps will allow you to quickly connect to the GPS with default settings:

1. Start SatViewer by tapping  / **SatViewer**.
2. Tap on the **GPS** tab.
3. Make sure the COM setting is set to **COM3**.
4. Tap **Connect to GPS**. The fields Lat, Lon, Spd, Az and Ht will all read “?” until SatViewer connects to the GPS and obtains a satellite fix. If you are attempting to get a satellite fix for the first time, it may take several minutes and it is recommended to position your unit outside with no overhead obstructions.
5. Tap **Sky**. Lat and Lon will change to current latitude and longitude when a satellite fix has been completed.

Welcome to SatViewer. Your on-board GPS receiver features a 20-channel SiRF III GPS receiver. The typical expected accuracy for this GPS receiver is about five to fifteen meters. It has the capability of receiving correction signals (Satellite-Based Augmentation System, SBAS) that may improve the accuracy of the GPS. However, these correction signals are not consistently available in all locations. The typical expected accuracy of the GPS receiver with the correction signals is about three to five meters in an open sky.

The GPS receiver updates its position once every second. It may take several minutes to start tracking the first time you try to use it because it needs time to update its position and download current satellite information from the GPS satellites. This process will occur faster in a location with open sky.

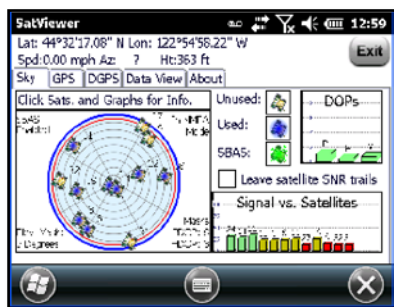
After your unit has downloaded the current satellite information, Assisted GPS (A-GPS) will retain a memory of the satellite paths up to 72 hours. Therefore the GPS can lock on the satellites quickly, in less than 20 seconds in an open sky.

SatViewer provides a way to quickly start using the GPS functionality of the unit, but it is not a stand-alone mapping, GIS or navigation program by itself. SatViewer is useful for checking the GPS configuration and enabling advanced features of your unit GPS receiver when these settings are not made available in other applications. When changing any GPS settings or other settings, it is important to wait a few moments after tapping on the desired option to allow time for your GPS receiver to implement the requested change. SatViewer communicates with the GPS receiver on your unit to compute your current position, speed, direction (azimuth) and height. This information is displayed at the top of the screen along with other information about the satellite signals. Speed and direction measurements are only useful when the GPS receiver is in motion. Standing in one position with the GPS receiver may result in inaccurate readings in direction and speed. If you are not moving, direction is reported as ? and speed is reported as "0". Height calculations from a GPS receiver are typically not very accurate. Vertical accuracy is about two to three times worse than the horizontal accuracy). Units of measurement are only displayed in U.S. feet and heights are only displayed in height above mean sea level (MSL).

The pages of the application are accessed by tapping the various tabs, which are laid out in index card format. The information in each tab is described on the following pages.

Sky Tab

Sky Plot Graphic: The Sky Plot is a graphical representation of where the satellites are positioned in the sky. The top of the circle represents north, the center is straight up, and the farthest right point is east. The outer blue circle represents the horizon and the red circle represents the elevation mask. The light gray circles radiating out from the center are the zenith angles in ten-degree increments. The lines bisecting the light gray circles divide the circle into thirty-degree azimuths.



The satellite icons are color coded to indicate if they are used, unused, or SBAS satellites. Each icon is labeled with the corresponding satellite's ID number (PRN). If **Leave satellite SNR trails** is checked, the path of the satellites are also marked by a dotted line as each satellite moves across the sky.

Status Indicators: The following four messages are displayed around the sky plot to indicate the current settings configured on other pages:

- **Corrections Disabled / SBAS Enabled:** displays if Satellite Based Augmentation System (SBAS) is enabled or disabled. When SBAS is enabled, your GPS receiver will attempt to locate, track and use correctional data supplied from an SBAS satellite in order to improve accuracy. There are a limited number of SBAS satellites available, so they may not be readily accessible in your area. This setting is configured in the **Type** field on the **DGPS** page.

***NOTE:** SBAS satellites are geosynchronous and centered over the equator. The further away from the equator the GPS unit, the less visible SBAS satellites are. The Sky Map in SatViewer will show you the position of these space vehicles relative to your position.*

- **In SiRF Bin. Mode / In NMEA Mode:** indicates which mode you are running in. Some applications may require GPS data to

be sent to the application in the form of a NMEA message, where other applications require the GPS data be sent as a SiRF Binary message. Most mapping and navigation applications can use the NMEA message. This setting is configured with the **NMEA/SiRF Binary** radio buttons on the **GPS** page.

- **Elev. Mask:** displays the current elevation mask. This is the minimum angle above the horizon that a satellite must be located before it is used and is represented on the sky plot by a red circle. This setting is useful when using the GPS in areas where there might be obstructions to the view of low flying satellites (e.g. around buildings or trees). A typical elevation mask setting is between 5 and 15 degrees to eliminate those satellites from being used to calculate a position. The purpose for this setting is to increase the accuracy of the GPS. However, by using this setting, you are reducing the total number of satellites that can be tracked and used by your GPS receiver. The idea is to eliminate those satellites that may degrade the accuracy of your GPS receiver. This is configured in the **Masks** section of the **GPS** page.
- **Masks:** Displays the current PDOP and HDOP mask values as configured in the **Masks** section of the **GPS** page. If the measured Dilution of Precision (DOP) value exceeds the value set for the corresponding mask, the resulting calculated position will be ignored. In general, as the value of the DOP decreases, the accuracy of the GPS position increases. DOP values greater than six usually indicate the GPS position data is of poor quality (due to poor satellite geometry) and the resulting positions are less accurate. **NOTE:** DOPs can not be displayed in Binary Mode, however, the DOP masks are still in effect.

Satellite Icons

- **Unused:** A GPS satellite whose signal is being received, but not being used for position calculations.
- **Used:** A GPS satellite that is being used to calculate your current position.
- **SBAS:** A Satellite Based Augmentation System (SBAS) satellite, which can be used for error corrections. (See the **DGPS** page for more information.)

Leave SNR trails: Creates a dot on the screen for all previous satellite positions that form a trail on the sky plot over time as the satellite moves across the sky.

DOPs Bar Graph: displays the various Dilution of Precision (DOP) values as explained below. DOPs are not displayed when **SiRF Binary** is selected on the **GPS** page.

- **PDOP:** displays the Position Dilution of Precision, which is a combination of HDOP, VDOP and Time Dilution of Precision. It will always be larger than HDOP and VDOP.
- **HDOP:** displays the Horizontal Dilution of Precision, which is a measure of the calculated accuracy of the solution. DOP has no units and lower numbers indicate better solution geometry. In general, the lower the DOP value, the better confidence you have in the position reading from your GPS receiver.
- **VDOP:** displays the Vertical Dilution of Precision, which is a measure of the calculated elevation.

Each DOP bar is color coded to indicate the DOP quality as follows:

Green: The DOP is less than three (best).

Yellow: The DOP is greater than three, but less than six.

Orange: The DOP is greater than or equal to six, but less than twenty.

Red: The DOP is greater than or equal to twenty (worst).

Signal vs. Satellite Bar Graph: shows all the visible satellites and their corresponding ID numbers (PRN) ranging from 1 to 32. Also, the PRN for any currently tracked SBAS satellite (ranging from 122 to 138) is displayed in this graph. Tapping any bar will also display the signal to noise ratio (SNR) value for that satellite. The color of each bar indicates the following:

Green: Good satellite signal strength. Satellite is used with an SNR greater than or equal to thirty dB.

Yellow: Fair satellite signal strength. Satellite is used with an SNR less than thirty dB.

Red: No signal or the signal strength is below the minimum allowable threshold. Satellite is not used.

GPS Tab

Connect to GPS / Disconnect from GPS: This button either tries to establish a connection with the GPS receiver chip or disconnects the connection.

COM: used to select the COM port for communication between SatViewer and your GPS receiver. Your GPS receiver port is set to COM3 and a baud rate of 9600. The default SatViewer settings shouldn't need to be changed to connect.

NOTE: Before changing COM port or baud rate settings, you must first disconnect from your GPS receiver before making the changes. After you have changed the COM settings, then you can re-attempt to connect to your GPS receiver, using the **Connect to GPS** button. When exiting SatViewer (or any other GPS application) it is good practice to tap **Disconnect from GPS** before closing the application to ensure the COM port is closed.

Enabling the Microsoft GPS driver

If you would like to connect two or more programs to your GPS receiver at the same time (such as SatViewer and a navigation program), ensure the Microsoft GPS driver is turned on:

1. Tap **Settings / System / GPS**.
2. Tap the **Access** tab.
3. Ensure there is a checkbox next to **Manage GPS automatically**. This turns on the Microsoft GPS driver. Ensure that the GPS program port is COM3 (or any other port available in the Microsoft GPS driver screen) and the GPS hardware port is COM2 with baud rate of 9600.
4. The Microsoft GPS driver will now allow multiple applications to connect to your unit's GPS receiver at the same time. Your unit's GPS receiver can be controlled with SatViewer while other applications are also using your unit's GPS receiver.
5. In SatViewer and any other program using your unit's GPS receiver, change the COM port to COM3 (or the COM port specified in Step 3 above). Both applications will connect to your unit's GPS receiver through the Microsoft GPS driver.



Restore Defaults:

When connected to your unit's GPS receiver: Tapping the **Restore Defaults** tab will result in the following settings being changed:

- GPS receiver output set to NMEA mode
- GPS status voice prompt - OFF
- Static Navigation - OFF
- Smooth Tracking - OFF
- Under Advanced
 - Elevation mask - 5
 - PDOP mask - 8
 - HDOP mask - 8

NMEA message settings are as follows:

- GGA – 1 sec
- GSA – 1 sec
- GLL – off
- VTG – 1 sec
- GSV – 1 sec
- RMC – 1 sec
- DGPS settings under the DGPS tab are set back to their defaults of Usage: Auto, Type: SBAS ON and SBAS Sat. PRN: Auto
- No change to any COM settings

Each of the above settings (except for the GPS status voice prompt) are sent and applied to your unit's GPS receiver.

When disconnected from your unit's GPS receiver: Tapping the **Restore Defaults** tab will result in the following settings:

- GPS receiver output set to NMEA mode
- GPS status voice prompt - OFF
- Static Navigation - OFF
- Smooth Tracking - OFF
- Under Advanced
 - Elevation mask - 5
 - PDOP mask - 8
 - HDOP mask - 8

NMEA message settings are as follows:

- GGA – 1 sec
- GSA – 1 sec
- GLL – off
- VTG – 1 sec
- GSV – 1 sec
- RMC – 1 sec

NMEA message settings (set to default or otherwise) will be sent to your unit's GPS receiver and applied the next time you connect to your unit's GPS receiver (with output set to NMEA).

- DGPS settings under the DGPS tab are set back to their defaults of Usage: Auto, Type: SBAS ON and SBAS Sat. PRN: Auto

Since you are **not connected** to your unit's GPS receiver, none of the above changes are actually applied to your unit's GPS receiver. To apply these settings, you will need to first connect to your unit's GPS receiver and then tap on the **Restore Defaults** button.

- If the Microsoft GPS driver is not used, the COM port gets set to COM2.
- If the Microsoft GPS driver is used, the COM port gets changed to its assigned program port. The default port is COM3.
- Baud rate is set to 9600
- Data bits are set to 8
- Flow is set to None
- Parity is set to None
- Stop bit is set to 1

To completely restore your unit's GPS receiver back to the factory settings, perform a system shut down. The system must be shut down for a minimum of 5 minutes to reset the GPS receiver. This may also be accomplished by removing the battery from the unit for a minimum of 5 minutes. For instructions on how to perform a shut down, see page 12. This procedure is beneficial when you are unable to connect your unit's GPS receiver to SatViewer due to a change in the communications settings caused by another software application and you would like to set them back to their original configuration.

NMEA / SiRF Binary: Choose this to set your unit's GPS receiver to NMEA mode or SiRF Binary mode. When in SiRF Binary mode, DOP values are not available in the Sky page. The mode you select here will also determine the format for the information that can be

viewed from the **Data View** page. Most GPS applications require that your unit's GPS receiver be set to output NMEA messages. There are some specialized GPS applications that require the SiRF Binary output mode. Please consult the documentation of your GPS application to see which output format you should use and then choose that option via this setting.

Static Navigation: This feature keeps your unit's GPS receiver from showing the normal erratic positions when standing still. When checked, small changes in your position are interpreted as GPS error and your computed position will remain unchanged. For applications where you will be mapping or navigating at walking speed or slower, it is recommended to disable this feature, so even small changes in position will be shown.

Smooth Tracking: This feature smoothes the track generated by your unit's GPS receiver. When checked, movement is smoothed mathematically to reduce the seemingly jagged movement resulting from GPS error. For unfiltered, raw GPS readings, you should leave this box unchecked. However, if you want to see a smoother overall position (e.g. while navigating), then turn this feature on via the checkbox.

NOTE: Both the **Static Navigation** and **Smooth Tracking** features modify your true GPS positions mathematically so these features should not be used when you need the most accurate GPS positions available.

Masks: These define limits that determine when a satellite will be used or not used.

- **Elevation:** This is the minimum angle above the horizon that a satellite must be located before it is used. A value of zero would essentially turn off the elevation mask. A value of ninety would mask all satellites. A typical elevation mask setting is between five and fifteen degrees to block tracking of those satellites potentially affected by multipath error due to obstructions (e.g. buildings or trees). Multipath error is error to the GPS position from the satellite signal bouncing off of objects before reaching the GPS receiver.

- **PDOP:** This is the maximum allowable Position Dilution of Precision (PDOP), which is a combination of HDOP, VDOP and Time Dilution of Precision. While exceeded, the GPS data will not be used for position calculations. This setting is advantageous when quality and reliability of your position are of concern. Typically, PDOP values of six or greater are considered “suspect” and therefore resulting positions are less reliable.
- **HDOP:** This is the maximum allowable Horizontal Dilution of Precision (PDOP), which is a measure of the geometrical quality of the solution. While exceeded, the GPS data will not be used for position calculations.

NOTE: DOPs can not be displayed in Binary Mode, however, the DOP masks are still in effect.

GPS status voice prompt: When checked, changes in GPS quality will result in an audible message indicating the change.

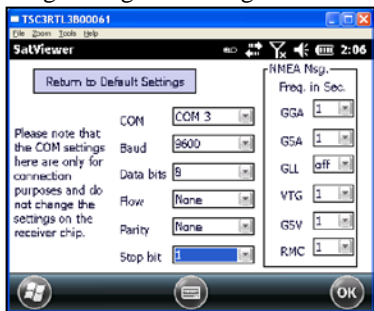
Advanced: When tapped, opens the **Advanced GPS** screen described on the following page.

Advanced GPS Page

Return to Default Settings:

When connected to your unit's GPS receiver: Tapping the **Return to Default Settings** button, the following settings are changed and applied to your unit's GPS receiver:

- Resets NMEA strings to defaults of:
 - GGA – 1 sec
 - GSA – 1 sec
 - GLL – off
 - VTG – 1 sec
 - GSV – 1 sec
 - RMC – 1 sec



NOTE: The COM settings are grayed out and cannot be changed until you disconnect from your unit's GPS receiver.

When disconnected from your unit's GPS receiver: Tapping the **Return to Default Settings** button, the following settings are changed:

- Resets NMEA strings to defaults of:
 - GGA – 1 sec
 - GSA – 1 sec
 - GLL – off
 - VTG – 1 sec
 - GSV – 1 sec
 - RMC – 1 sec

NMEA message settings (set to default or otherwise) will be sent to your unit's GPS receiver and applied the next time you connect to your unit's GPS receiver (with output set to NMEA).

- If the Microsoft GPS driver is not used, the COM port gets set to COM2.
- If the Microsoft GPS driver is used, the COM port gets changed to its assigned program port.
- Sets baud rate to 9600
- Data bits are set to 8
- Flow is set to None
- Parity is set to None
- Stop bit is set to 1

Since you are **not connected** to your unit's GPS receiver, none of the changes are actually applied to your GPS receiver.

COM: used to select the COM port for communication between SatViewer and your unit's GPS receiver. This field is also available on the **GPS** page for convenience and changing it in one location will automatically change it in the other location.

Baud: sets the speed for communications between your unit's GPS receiver and SatViewer. The baud rate of your GPS receiver is 9600 by default. Please note, if you have used another application to change the baud rate of your GPS receiver to 4800, it will take longer for your GPS receiver to respond to changes made within SatViewer. During this period, you may see menu items grayed out while SatViewer is sending the new settings to your unit's GPS receiver.

Data Bits: should match the data bit rate set in the device you are communicating with.

Flow: should match the flow control set in the device you are communicating with.

Parity: should match the parity set in the device you are communicating with.

Stop bit: should match the stop bit set in the device you are communicating with.

NMEA Msg: This section allows you to control which NMEA messages are output by your unit's GPS receiver and the rate at which they are output. The GGA NMEA message is automatically enabled by default and cannot be disabled. You may change the frequency of output for the GGA NMEA message, but you may not disable it. Other NMEA messages listed may be disabled as well as changing the frequency of output. The ability to change the frequency of output and to disable certain messages is useful when communicating at a very low baud rate to prioritize which NMEA messages are sent. Each field allows you to select a value from one to five (measured in seconds), or to select **OFF**. For example, selecting three instructs the receiver to output the corresponding NMEA message once every three seconds. Selecting **OFF** instructs the receiver to never output the corresponding message. This setting is only applicable when you need to specify your unit's GPS receiver to send out very specific NMEA messages at specific times for your GPS application. Most users will not need to change this as the

default NMEA settings will work for most GPS applications trying to display common GPS information (e.g. position, velocity, direction).

DGPS Tab

Differential GPS (DGPS)

positioning involves subtracting a combination of ranges measured to various satellites from two or more receivers measuring the same satellites simultaneously. When the signals are subtracted, the major error sources cancel each other out.



The GPS receiver used with SatViewer can provide DGPS through the Satellite Based Augmentation System (SBAS), which uses multiple ground stations and then broadcasts corrections to the end users via SBAS satellites.

Usage: configures the DGPS requirements as follows:

- **Auto:** will use DGPS when available, but continue to provide autonomous (uncorrected) positions when DGPS is not available.
- **DGPS Required:** will only provide positions when DGPS is available. Autonomous positions will not be available. When DGPS data is available, it can be applied to your GPS position to increase the accuracy of your position reading.
- **Ignored:** will not provide DGPS positions even when available.

NOTE: Due to the limited number and availability of SBAS satellites in the sky, DGPS coverage from SBAS satellites may not always be available. Therefore, it is recommended that you use the **Auto** setting where the GPS will use and apply DGPS data when available, but will continue providing positions even when DGPS is not available.

Type: allows you to select SBAS ON or SBAS OFF. (Currently SBAS is the only DGPS service available, but other DGPS systems may be available in the future.)

SBAS Sat. PRN: configures which SBAS satellite to use. Selecting **Auto** instructs the GPS receiver to automatically make the selection.

Return to Default Settings: If connected to the unit's GPS receiver, the following settings are changed and applied to your unit's GPS receiver:

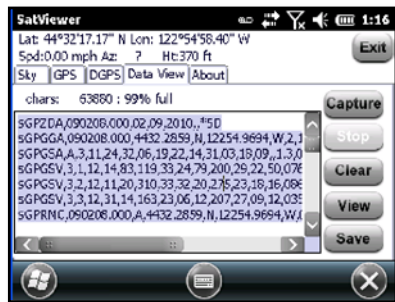
- Restores DGPS settings back to default state:
 - Usage: Auto
 - Type: SBAS ON

- SBAS Sat PRN: Auto

If disconnected from your unit's GPS receiver this button has no effect on DGPS settings.

Data View Tab

The **Data View** page allows you to capture and view the GPS data being sent to SatViewer by your unit's GPS receiver over the COM port. There are two formats for data that can be viewed from this screen depending on if you are running in NMEA or SiRF Binary mode, as configured in the **GPS** page. This feature is useful if you have a need to view or store the raw GPS messages as they come out from your unit's GPS receiver in a textual format. This feature is for advanced GPS users who need the ability to store the raw GPS information as ASCII text in one large LOG file. This feature is intended to collect up to several minutes of data. It is not intended for extended data collection sessions.



When in NMEA mode, the data displayed is simply the raw NMEA codes being sent over the COM port, which are displayed in their original ASCII format.

When in SiRF Binary mode, the data being sent over the COM port is in binary format and therefore must be converted to ASCII text before it can be displayed in a useable format. This involves converting each binary message to hexadecimal text and adding a text tag to each message that explains what type of message it is.

Chars: Lists the number of characters captured to the buffer. The maximum amount of characters that can be stored to the buffer is approximately 64,000 characters. A “% full” indicator for the used buffer is provided for your convenience.

Capture: Begins capturing the data passing over the COM port and storing it to a buffer.

Stop: Stops capturing data and outputs the contents of the buffer to the screen.

Clear: Clears the buffer and any data listed on the screen.

View: Outputs the contents of the buffer to the screen while capturing data.

Save: Opens a new screen where the contents of the **Data View** screen can be saved to a file.

NOTICE for Our European Union Customers

For product recycling instructions and more information, please go to:
www.spectraprecision.com/env.

Recycling in Europe:

To recycle WEEE (Waste Electrical and Electronic Equipment products that run on electrical power), call +31 497 53 24 30 and ask for the “WEEE Associate.”

Or

Mail a request for recycling instructions to:

Spectra Precision Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL



This product complies with international regulations for
Restriction on Hazardous Substances Directive (RoHS)



Windows Mobile:

www.microsoft.com/windowsmobile/default.aspx

Section 508 Support: Download accessibility templates for our products.
www.Trimble.com/section508

©2011, Spectra Precision. Spectra Precision and the Spectra Precision logo are trademarks of Spectra Precision, registered in the United States Patent and Trademark Office and in other countries.

Microsoft, Windows, Windows Server, Windows Vista, Windows 7, Windows Mobile, the Windows logo, Excel, Word, Outlook, and ActiveSync are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Microsoft products are licensed to OEMs by Microsoft Licensing, Inc., a wholly owned subsidiary of Microsoft Corporation.

All other brand names and trademarks are property of their respective owners.

Display images shown may vary slightly from actual display. Specifications and data subject to change.

121410

SPECTRA PRECISION
10355 Westmoor Drive, Suite #100
Westminster, CO 80021
USA
+1-720-587-4700 Phone
888-477-7516 (Toll Free in USA)
www.spectraprecision.com

