

Using the Windows Mobile Operating System

In this chapter:

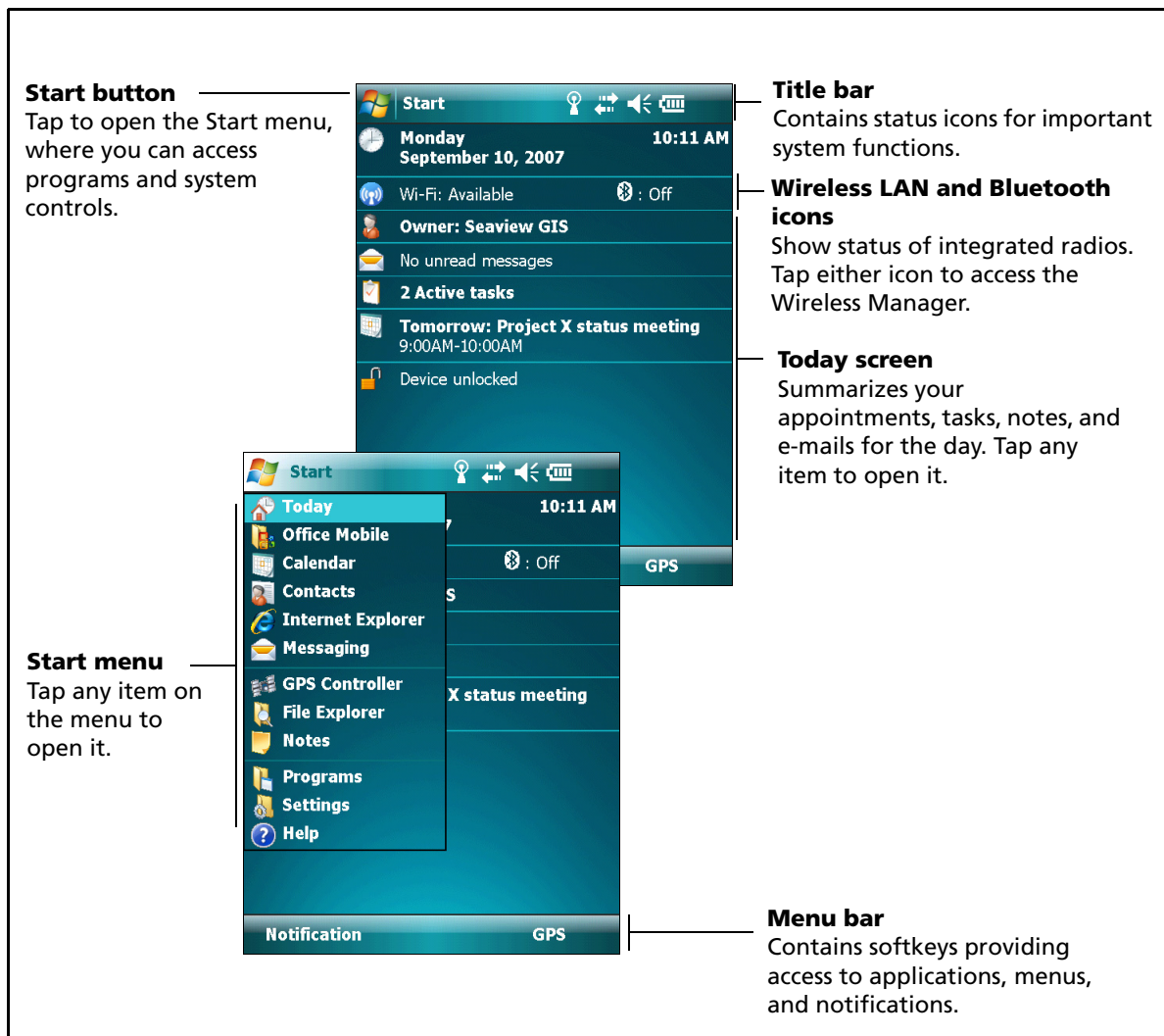
- Parts of the screen
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- Status indicators
- Pre-installed programs
- Accessing help
- Entering information
- Personalizing the handheld
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The GeoExplorer 2008 series handheld is powered by the Windows Mobile 6 Classic operating system.

This chapter describes the main features of the Windows Mobile operating system.

Parts of the screen

The main parts of the screen are shown below.















Accessing help

To access help, tap / *Help* or, if available, tap in the application window. If there is an application running, context-sensitive help for the current screen appears. To view the main Help Contents page, tap the *Contents* softkey in the menu bar.

Help files installed on the handheld work in the same way as a Web page. Tap hyperlinks to navigate around the help and use to retrace your steps. Tap *View / Contents* to return to the Contents page for the application, and tap *View / All Installed Help* to return to the main Contents page.

Status indicators













Status indicators that appear in the title bar at the top of the screen are as follows:










Icon	Tap icon to...
 Battery level	
 Low battery (20% or less remaining)	check battery level
 Battery charging/using external power	
 Speaker is on	
 Speaker is off	change volume
 Connected to ActiveSync or the Windows Mobile Device Center (WMDC) on a computer	
 Connected to a Bluetooth-enabled phone	
 Disconnected from ActiveSync or WMDC	
 Disconnected from a Bluetooth-enabled phone	configure the connection or access the Wireless Manager
 Wireless LAN radio is on	
 A wireless LAN is detected	
 Sending or receiving wireless signals	

The Wi-Fi  and Bluetooth icons  on the *Today* screen show the status of each radio. Tap the icon to access the Wireless Manager and turn on or turn off the radio.

Pre-installed programs

Programs that are pre-installed on the GeoExplorer 2008 series handheld are as follows:

Program	Function
 ActiveSync	Synchronize information between the handheld and a computer.
 Calculator	Perform basic arithmetic functions.
 Calendar	Keep track of appointments and arrange meetings.
 Contacts	Keep track of your friends and colleagues.
 Excel Mobile	From the Start menu, tap <i>Office Mobile</i> and then tap <i>Excel Mobile</i> . Use Excel Mobile to create and edit Excel spreadsheets.
 File Explorer	View and manage files.
 GPS Connector	Located in <i>Settings / Connections</i> , it allows you to configure communications between the handheld's integrated GPS receiver and external devices.
 GPS Controller	Configure and view status information for the integrated GPS receiver.
 Help	View help. If there is an application running, context-sensitive help for the current screen appears. To view the main Help Contents page, tap the Contents softkey in the menu bar
 Internet Explorer	Browse the World Wide Web.
 Messaging	Write, send, and receive e-mail messages.
 Messenger	Send instant messages using Windows Live™ Messenger.

Program	Function
 Notes	Create handwritten, typed, or recorded notes.
 Office Mobile	Provides access to these Office Mobile applications: Excel Mobile, PowerPoint Mobile, and Word Mobile.
 Pictures and Videos	Take, view, and edit pictures, or record and launch video clips.
 PowerPoint Mobile	From the Start menu, tap <i>Office Mobile</i> and then tap <i>PowerPoint Mobile</i> . Use PowerPoint® Mobile to view slide show presentations.
 Search	Search for a file or item stored on the handheld.
 Tasks	Keep track of your tasks.
 Windows Live	Access Windows Live services, including e-mail, instant messenger and Internet search.
 Windows Media	Play Windows Media® or MP3 audio and video files.
 Word Mobile	From the Start menu, tap <i>Office Mobile</i> and then tap <i>Word Mobile</i> . Use Word Mobile to create and edit Word documents.

For more information about using any of this software, refer to the Help for the software. See [Accessing help, page 36](#).

Using the stylus

Removing and replacing the stylus

To remove the stylus from its holder on the front of the handheld, press the spring on the stylus downwards and then lift the stylus forward, as shown.



To insert the stylus into its holder on the front of the handheld, insert the tip of the stylus into the lower retainer with the Trimble logo on the stylus facing out. Then press the spring on the stylus downwards and insert the top of the stylus below the top retainer.

Interacting with the handheld

To interact with the handheld, use the stylus to tap on the touch screen.

Actions you can perform with the stylus are as follows:

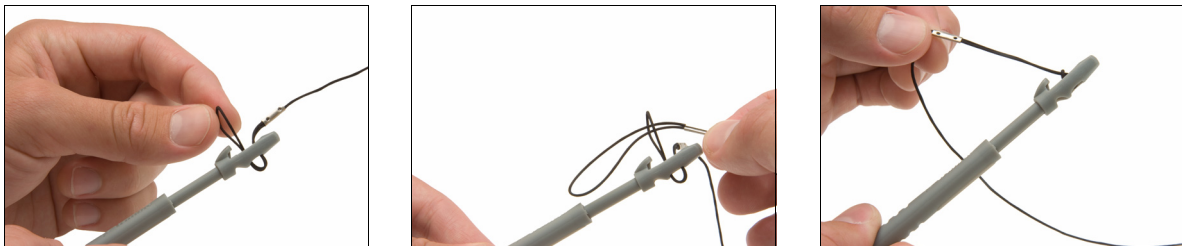
Action	Definition
Tap	Touch the screen once with the stylus to open items and select options.
Tap and hold	Tap and hold the stylus on an item to see a list of actions available for that item. On the pop-up menu that appears, tap the action you want to perform.
Drag	Hold the stylus on the screen and drag across the screen to select text and images. Drag in a list to select multiple items.

If at any time the touch screen does not respond correctly to stylus taps, realign it. For more information, see [Screen, page 47](#).

Tethering the stylus to the handheld

To attach a tether to the stylus:

1. Hold the stylus with the Trimble logo facing upwards and insert the end of the tether down through one of the two holes in the top of the stylus and then back up through the other hole.



2. Insert the other end of the tether through the loop and pull until the knot in the tether is tight.
3. Attach the tethered stylus to the handheld as described below.

To attach a tethered stylus to the handheld, feed the end of the tether through the top of the stylus retainer on the handheld and then feed the end of the stylus through the loop until the knot in the tether is tight.

Entering information

Depending on the program you are using, you can enter information in several ways, as described below:

Input method	Description
Synchronizing	Use Microsoft connection management software to exchange information between the handheld and an office computer. For more information, see Chapter 4, Connecting to an Office Computer .
Typing	Use the Keyboard input panel to enter typed text by tapping keys on the on-screen keyboard.
Writing	Use the stylus like a pen to write directly on the screen.
Recording	Create a stand-alone recording or embed a recording into a note.

Selecting an input panel

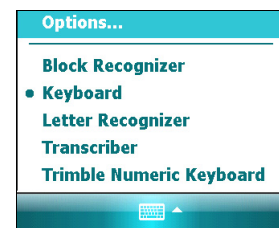
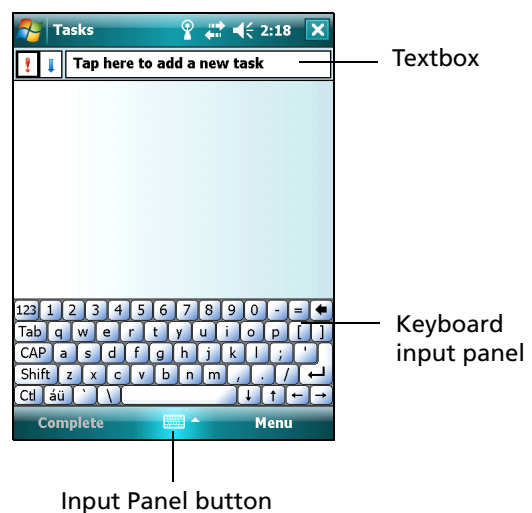
Use an input panel to type or to write on the screen.

The Input Panel button automatically appears in the menu bar of any application.


To display the currently selected input panel, tap a text box in the application, or tap the Input Panel button.



To select an input panel, tap the Input Selector arrow next to the Input Panel button and then tap the input panel you want to use:

- To use the on-screen keyboard, tap *Keyboard*.
- To write directly onto the screen and have the handwritten words and symbols converted into typed characters, tap *Letter Recognizer* or another input panel that supports writing on the screen.
- To configure options for the selected input panel, tap *Options*.



Using the on-screen keyboard

To enter characters, use the stylus to tap the keys on the keyboard. When you finish entering text in a field, tap  to accept the text you have entered and then move to the next field.

To enter special characters, tap  to display keyboards containing numbers and symbols. To switch back to the main keyboard, tap  again.

To hide the keyboard, tap the keyboard icon again.



Tip – To make the keys larger, tap the Input Selector arrow and then tap *Options*. In the *Input method* list, select Keyboard and then tap **Large Keys**.

Writing directly on screen

When you select Letter Recognizer, you can write individual letters, numbers, and punctuation in the Letter Recognizer input panel and have them converted into typed text.



Tip – For help with writing characters with Letter Recognizer, tap the question mark near the writing area.

When you select Transcriber, you can write anywhere on the screen using the stylus. The Microsoft Transcriber software converts your handwriting to text. You can use it to enter notes in a text editor such as Notes.




Transcriber has a number of tools and modes that allow you to customize how it works. These tools and modes are controlled from the Transcriber keyboard.

For more information, refer to the *Transcriber Help*.

Making a recording

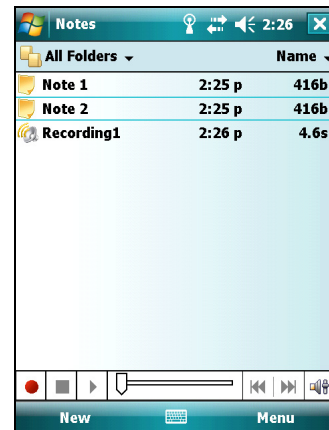
You can create a stand-alone voice note or you can add a recording to a note. Then you can work with voice notes in the same way that you work with notes.

To make a recording:


1. Tap  / *Programs / Notes*.
2. Do one of the following:
 - To create a stand-alone recording, in the screen displaying the list of notes, tap the Record button  to begin recording.
 - To add a recording to a note, create or open a note and then tap the Record button  to begin recording.




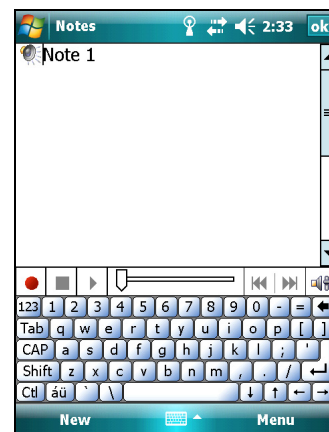
Tip – If you do not see the Recording toolbar, tap *Menu / View Recording Toolbar*.



Note – The GeoExplorer 2008 series handheld's microphone is on the front of the handheld, in the keypad area. The microphone will capture voice notes when you are holding the handheld in front of you. In noisy environments, you may need to move the handheld closer to you or to the source of the sounds you want to record.

3. When you finish recording, tap the Stop button .
 - If you are creating a stand-alone recording, an icon appears in the note list.
 - If you are recording in an open note, an icon appears in the note. Tap **OK** to return to the note list.

To play a recording, tap the recording in the note list or open the note and then tap the  icon in the note.



Personalizing the handheld

Use the controls in the *Settings* area to customize the handheld. The following examples describe controls that are available.

Buttons

Use the *Buttons* control to assign the action you want to be performed when you press the left or right application key.

By default, these keys perform the same action as the left and right softkeys in the menu bar. Alternatively, program these keys to perform a selected action.

Application buttons can be programmed to perform one of the following types of actions:

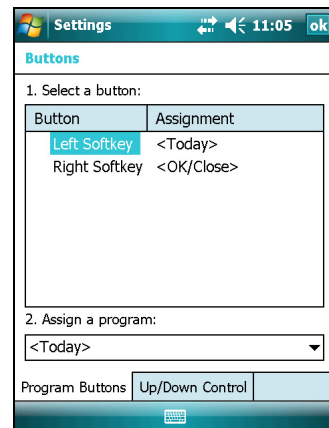
- Run a selected application, for example Messaging or Calendar.
- Act as a software button, for example an OK/Close button or a scroll button.
- View a selected screen, or part of a screen, for example return to the *Today* screen or launch the Context menu or Input panel.

To open the *Buttons* control:

- Tap  / *Settings* / *Personal* / *Buttons*.

To specify an action for the button:

1. Tap the *Program Buttons* tab.
2. Tap a button in the list to select it.
3. From the *Assign a program* drop-down list, select the action you want to occur when you press the button or tap the softkey.
4. Tap **OK**.




Today

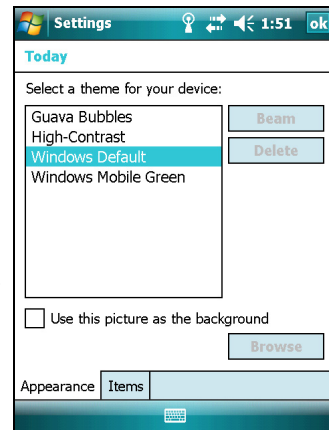
Use the *Today* control to change the display theme that controls the appearance of the *Today* screen, and to customize which items appear on the *Today* screen.

Appearance

You can use a theme to customize the background picture on the *Today* screen, the color of the title and menu bars, menus, and messages.

To change the display theme:


1. Tap  / *Settings* / *Personal* / *Today*.
2. Tap the *Appearance* tab.
3. Do one of the following:
 - To use a predefined theme, select it from the list.
 - To select the picture that you want to display in the *Today* screen background, select the *Use this picture as the background* check box. Then tap **Browse** to search for a file on the handheld.
4. Tap **OK**.

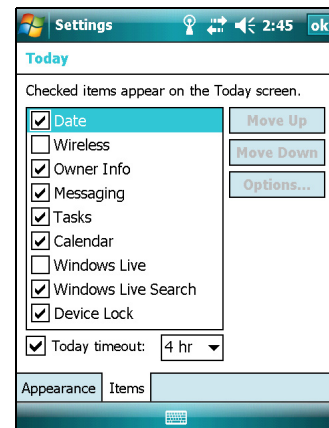


Items


You can choose the items that appear on the *Today* screen, and the order that they appear in.

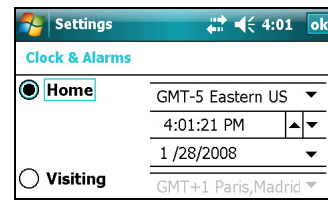
To change the items that appear on the *Today* screen:

1. Tap  / *Settings* / *Personal* / *Today*.
2. Tap the *Items* tab.
3. Select or clear the check boxes to show or hide the *Today* screen items.
4. Use the **Move Up** and **Move Down** buttons to change where the selected item appears on the *Today* screen.
5. Tap **OK**.



Set the time zone

In the *Today* screen, tap the clock icon . The *Clock Settings* screen appears. Tap the *Time* tab, select the *Home* option and then select the correct time zone.



Device lock


Use the *Device Lock* option on the *Today* screen to lock the screen and keypad while the handheld remains turned on.

To lock the device, tap *Device unlocked* in the *Today* screen. The *Today* screen shows *Device locked*, and *Unlock* appears in the left corner of the menu bar.

Once the handheld is locked, the screen and most of the keys do not respond until the handheld is unlocked. The exceptions are the **Power** key and the **Reset** button, which always respond when pressed.



Communication with external devices such as a GPS receiver, or external sensors used by GPS field software, is not interrupted by locking the handheld. This means that you can keep using the GPS field software when the handheld is locked. For example, you could lock the device so that you can safely transport it between features, while keeping the software connected to the GPS receiver so that you can continue recording GPS positions.

To unlock the device, tap the *Unlock* notification in the left corner of the *Today* screen menu bar and then tap **Unlock**.

You can help to keep your data secure by requiring a password each time the handheld is turned on. Tap  / *Settings* / *Personal* / *Lock* to set a password or to change password settings.

Power

To open the *Power* control, do one of the following:


- Tap the battery icon  in the title bar of the *Today* screen.
- Tap  / *Settings* / *System* / *Power*.

Tap the *Battery* tab to check the battery level (see [Checking the level of battery power, page 26](#)).

Tap the *Advanced* tab to set the time before the handheld turns off when idle (see [Suspend mode, page 28](#)).

Sounds and notifications

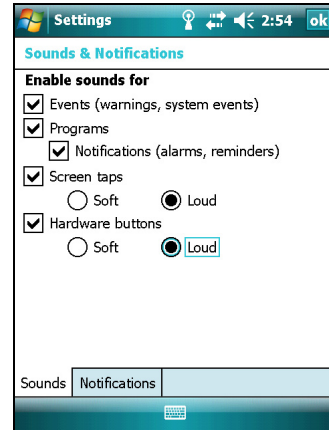
Use the *Sounds & Notifications* control to set preferences for the speaker volume and system sounds. To open the *Sounds & Notifications* control:

- Tap  / *Settings* / *Personal* / *Sounds & Notifications*.

To turn on or turn off sounds:

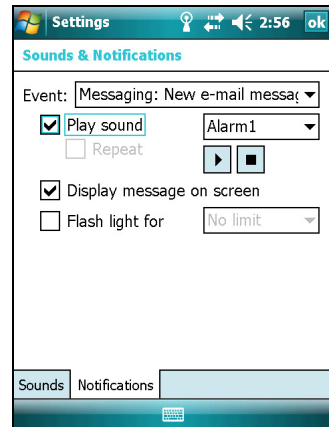
1. Tap the *Sounds* tab.
2. Select or clear the check boxes to enable or disable categories of sounds.
3. If you select the *Screen taps* or *Hardware buttons* check boxes, select the *Soft* or *Loud* option to control the volume of the sounds.
4. Tap **OK**.

You can use predefined schemes to customize sounds, or you can create your own sound schemes.




To specify a sound scheme:

1. Tap the *Notifications* tab.
2. From the *Event* drop-down list, select an event.
3. Select the type of notification you want to receive for that event.
4. Tap **OK**.



Screen

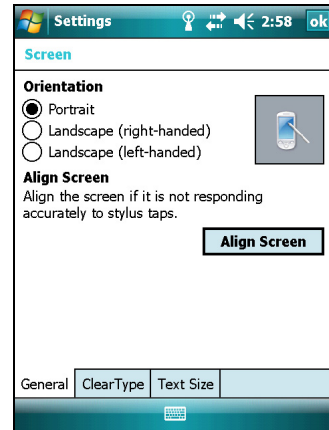
Use the *Screen* control to align the touch screen or to change the appearance of text on the screen. To open the *Screen* control:

- Tap  / *Settings* / *System* / *Screen*.

To change the screen settings:

1. Tap the *General* tab.
2. To change the orientation of the screen, select an option in the *Orientation* group.
3. To start the alignment sequence for the touch screen, tap **Align Screen**.
4. Tap **OK**.

Note – To align the screen at any time, press and hold the **Power** button for 1 second until the Power menu appears and then tap **Align Screen**.



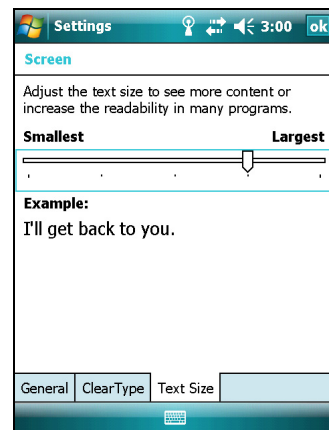
Using ClearType font smoothing can make text easier to read on the screen.

To enable ClearType:

1. Tap the *ClearType* tab and then select the *Enable ClearType* check box.
2. Tap **OK**.

To change the size of text on screen:

1. Tap the *Text Size* tab.
2. Tap and drag the slider control to the left to make text smaller, or to the right to make text larger.
The example text below the slider shows how the text will appear on screen.
3. Tap **OK**.



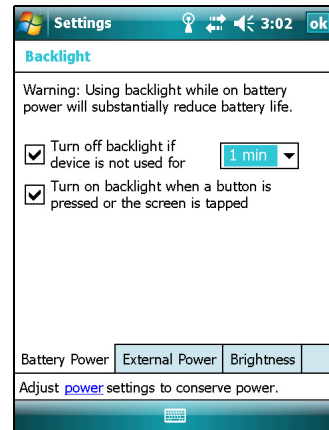
Backlight

The backlight makes the screen easier to read in low light, but uses extra power. Use the *Backlight* control to configure power-saving settings for the backlight. To open the *Backlight* control:

- Tap  / *Settings* / *System* / *Backlight*.

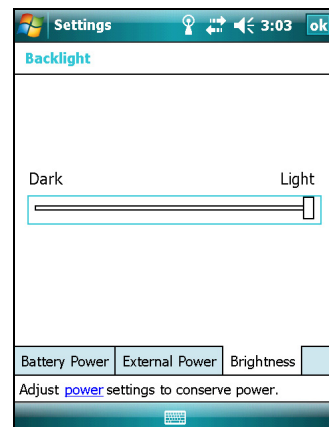
To set the backlight to automatically turn off:

1. To automatically turn off the backlight when the handheld is idle and is using **battery power**, tap the *Battery Power* tab. Select the *Turn off backlight* check box and then select a time from the drop-down list.
2. To automatically turn off the backlight when the handheld is idle and is using **external power**, tap the *External Power* tab. Select the *Turn off backlight* check box and then select a time from the drop-down list.
3. Tap **OK**.



To change the brightness:

1. Tap the *Brightness* tab.
2. Tap and drag the slider control to the left to make the backlight darker, or to the right to make the backlight brighter.
3. Tap **OK**.



Messaging

Use Messaging to send and receive e-mail messages using the GeoExplorer 2008 series handheld. Messaging is the equivalent of your e-mail Inbox.

To use e-mail, you can do one of the following:

- Synchronize e-mail messages with Microsoft Exchange or Microsoft Outlook® on an office computer.
- Send and receive e-mail messages by connecting directly to an e-mail server through an ISP or a network.

Synchronizing e-mail messages

You can synchronize e-mail messages on the handheld and the computer.



CAUTION – When you delete a message on the handheld, it is deleted from the office computer the next time you synchronize the devices.

To synchronize e-mail, you must enable Inbox synchronization in the ActiveSync software. For more information, refer to the *ActiveSync Help* on the office computer.

During synchronization:

- Messages are copied from the mail folders of Exchange or Outlook on the office computer to the Messaging folder on the handheld. By default, you will receive messages from the past 3 days only, the first 100 lines of each message, and file attachments of less than 100 KB in size.
- E-mail messages in the Outbox folder on the handheld are transferred to Exchange or Outlook, and then sent from those programs.
- E-mail messages in subfolders in other e-mail folders in Outlook are synchronized only if they were selected for synchronization in the ActiveSync software.

To send and receive e-mail for a synchronized Exchange or Outlook account, connect the handheld to the office computer. Synchronization automatically begins, and the handheld sends and receives e-mail.

Connecting directly to an e-mail server

In addition to synchronizing e-mail messages with an office computer, you can send and receive e-mail messages by connecting to an e-mail server.


Before you can send and receive e-mail, you must create an e-mail account in the Messaging software.

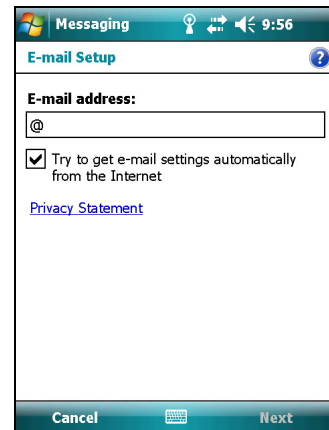
Note – You must set up an Internet connection on the handheld before you can set up and use your e-mail account. For more information, see [Connecting to a wireless LAN access point, page 82](#) or [Connecting to a Bluetooth-enabled phone for Internet access or real-time corrections \(including VRS networks\), page 88](#).

If you need to connect to different mailboxes, set up and name a different service for each connection.

Note – The Messaging software supports only the POP3 and IMAP4 protocols for incoming mail, and SMTP for outgoing mail.

To set up a mail service:

1. Tap  / *Messaging*.
2. Tap *New E-mail Account*.
3. Enter the e-mail address for your account.
4. To automatically get connection settings for your e-mail account from the Internet, select the check box.
5. Tap **Next**.
6. Follow the steps in the Setup wizard. If the connection settings are not automatically downloaded from the Internet, you must enter them using the connection details supplied by your ISP or network administrator.



Note – You cannot change the account name later.

7. Tap **Finish**.
8. Tap **OK** to download mail immediately.



Tip – To receive TerraSync data files by e-mail, edit the settings for the e-mail account you have set up. To do this, tap **Menu** and then select *Options*. In the *Accounts* tab, tap the e-mail account you want to use to receive TerraSync files. The *E-mail Setup* wizard appears. Tap **Next** until you reach the last page of the wizard. From the *Message download limit* drop-down list, select **Entire message**.

When you connect the handheld to the e-mail server, new messages are downloaded to the Messaging folder, messages in the Outbox folder are sent, and messages that have been deleted on the e-mail server are removed from the Messaging folder.

Messages received directly from an e-mail server are linked to the e-mail server rather than an office computer. When you delete a message on the handheld, it is also deleted from the e-mail server the next time you connect the handheld to the e-mail server.

You can work online or offline. When working online, you read and respond to messages while connected to the e-mail server. Messages are sent as soon as you tap **Send**, which saves space on the handheld.

When working offline, you can disconnect from the e-mail server after you download new message headers or partial messages and then decide which messages to download completely. The next time you connect, Messaging downloads the complete messages you have marked for retrieval and sends any messages that you have written.

Connecting to an Office Computer

In this chapter:

- Connection management software
- Connecting the handheld to a computer
- Managing the connection using the Windows Mobile Device Center
- Managing the connection using ActiveSync technology
- Installing software onto the handheld

Connect the GeoExplorer 2008 series handheld to an office computer to transfer information, settings, and files from one device to the other, or to install software onto the handheld.

You can connect the handheld to a computer using the USB cable or a Bluetooth wireless link.

To protect your data, Trimble recommends that you regularly copy important data to an office computer.

Connection management software

To install software onto a Windows Mobile powered device, or to copy files between the handheld and a computer, you must connect the device to an office computer. If the computer is running:

- the Windows Vista® operating system, use the Windows Mobile Device Center to manage the connection.
- the Windows® XP or 2000 operating system, use ActiveSync technology to manage the connection.

Note – You must install the Windows Mobile Device Center or ActiveSync technology onto the computer **before** you connect the handheld.

This connection management software also enables you to synchronize office applications on an office computer with the handheld.



CAUTION – The available space on the handheld is small compared to an office computer. To avoid accidentally synchronizing the handheld with a large amount of data on the office computer, Trimble recommends that you either connect to the handheld **without forming a partnership**, or that you limit the information types and amount of data that is synchronized.



CAUTION – Synchronizing data is designed to keep the same data on both the office computer and the handheld. Exercise care when resynchronizing applications after deleting data from one computer, as resynchronizing will delete the same information from the other computer.

For more information see one of the following:

- [Managing the connection using the Windows Mobile Device Center, page 56](#)
- [Managing the connection using ActiveSync technology, page 57.](#)

Installing the Windows Mobile Device Center

The Windows Vista operating system includes a basic connectivity driver for Windows Mobile powered devices. This driver allows you to transfer files from the handheld to an office computer.

To install software onto a Windows Mobile powered device, you must install Windows Mobile Device Center 6 onto an office computer.

A copy of the Windows Mobile Device Center is provided on the *GeoExplorer 2008 Series Getting Started Disc*. Alternatively, go to www.microsoft.com/windowsmobile/devicecenter.mspx to download the latest version from the Microsoft website.

Installing ActiveSync technology

A copy of ActiveSync technology is provided on the *GeoExplorer 2008 Series Getting Started Disc*. Alternatively, go to

www.microsoft.com/windowsmobile/activesync/default.aspx to download the latest version from the Microsoft website.

Connecting the handheld to a computer

To connect the GeoExplorer 2008 series handheld to a computer:

1. Make sure that the handheld and the computer are switched on.
2. Make sure you have installed the appropriate connection management software onto the computer (see [Connection management software, page 54](#)).
3. To form a connection, do one of the following:
 - Use the handheld's integrated Bluetooth radio to establish a wireless serial link to a Bluetooth-enabled computer. For more information, see [Connecting to an office computer to use ActiveSync technology, page 97](#).
 - Use a USB connection:
 - a. Connect the USB data cable to the USB port on the support module.
 - b. Connect the other end of the USB data cable to a USB port on the computer.
 - c. Place the handheld in the support module. For information about how to do this, see [Getting Started, page 21](#).

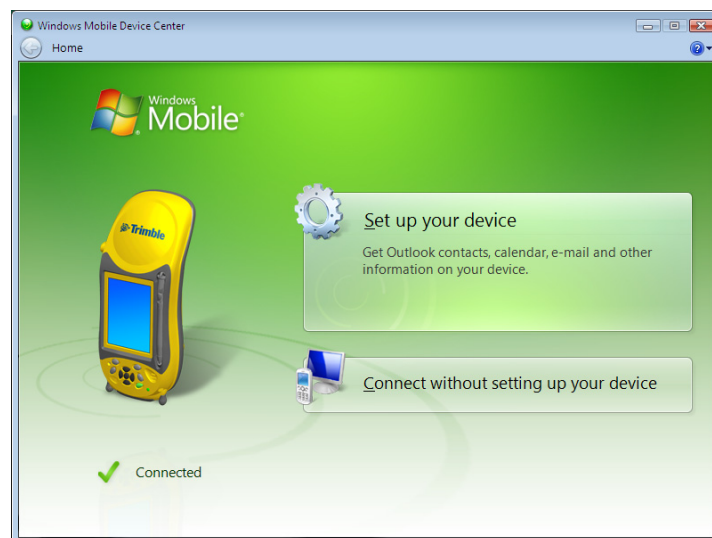


When the handheld and the computer are connected, you can manage the connection through a window that appears on the office computer. See one of the following:

- [Managing the connection using the Windows Mobile Device Center, page 56](#)
- [Managing the connection using ActiveSync technology, page 57](#)

Managing the connection using the Windows Mobile Device Center

1. Connect the handheld to the computer (see [page 55](#)).
2. If the Autoplay window appears, close the window.
3. The *Windows Mobile Device Center* window displays the message **Connected**:



Note – If the connection is not made automatically, check that the connection is enabled in the Windows Mobile Device Center software and on the handheld. For more information, see [Troubleshooting, page 113](#).

4. Do one of the following:
 - To synchronize files and data between the handheld and a computer, click *Set up your device* and then follow the instructions on screen.
 - To transfer data between the handheld and the computer without synchronizing the devices, click *Connect without setting up your device*.
5. To transfer files between the computer and the handheld, click *File Management*. A Windows Explorer-type window appears, displaying files stored on the handheld. Copy and paste files to other locations on the computer, or from the computer to the handheld.

6. To install software onto the handheld, see [Installing software onto the handheld](#), page 59.
7. To uninstall software from the handheld, click *Programs and Services* and then click *Add/Remove Programs*.



Tip – If the *Add/Remove Programs* option does not appear below *Programs and Services*, click *More*. The *Add/Remove Programs* option appears.

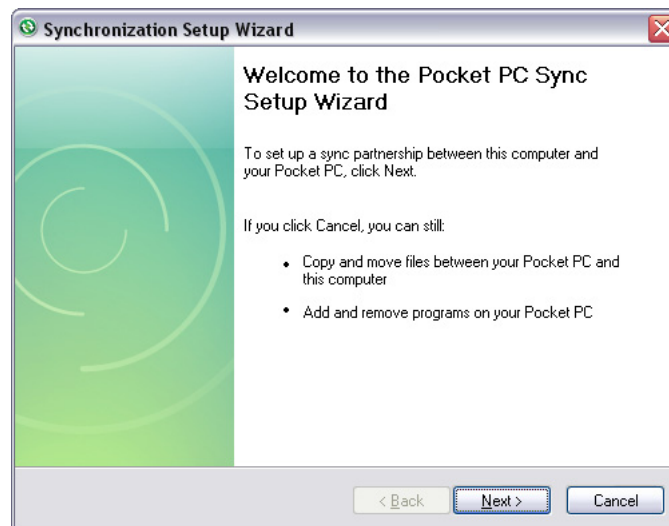
For more information, refer to the *Windows Mobile Device Center Help*.



Tip – If the GPS Pathfinder Office software is installed on the office computer, you can configure the Connection Manager utility in the GPS Pathfinder Office software to automatically detect when you connect a GeoExplorer 2008 series handheld to the computer. This enables you to automatically transfer data from the TerraSync software, differentially correct the data, and then export it to a GIS. For more information, refer to the *GPS Pathfinder Office Software Help*.

Managing the connection using ActiveSync technology

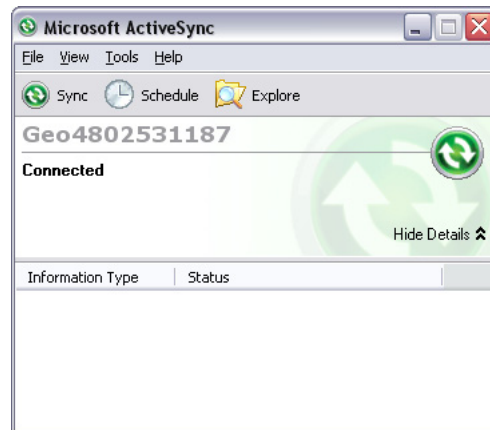
1. Connect the handheld to the computer (see [page 55](#)). The *Synchronization Setup Wizard* appears:



Note – If the connection is not made automatically, check that the connection is enabled in the ActiveSync software and on the handheld. For more information, see [Troubleshooting](#), page 113.

2. Do one of the following:
 - To synchronize files and data between the handheld and a computer, click **Next** and then follow the instructions in the *Synchronization Setup Wizard*.
 - To transfer data between the handheld and the computer without synchronizing the devices, click **Cancel** to close the wizard.

3. The *Microsoft ActiveSync* window displays the message Connected:



4. To transfer files between the computer and the handheld, click **Explore**. A Windows Explorer-type window appears, displaying files stored on the handheld. Copy and paste files to other locations on the computer, or from the computer to the handheld.
5. To install software onto the handheld, see [Installing software onto the handheld, page 59](#).
6. To uninstall software from the handheld, select *Add/Remove Programs* from the *Tools* menu. Clear the check box beside the program you want to remove and then click **OK**.

For more information, refer to the *ActiveSync Help*.



Tip – If the GPS Pathfinder Office software is installed on the office computer, you can configure the Connection Manager utility in the GPS Pathfinder Office software to automatically detect when you connect a GeoExplorer 2008 series handheld to the computer. This enables you to automatically transfer data from the TerraSync software, differentially correct the data, and then export it to a GIS. For more information, refer to the *GPS Pathfinder Office Software Help*.

Installing software onto the handheld

Before you begin, refer to the installation instructions provided with the software.

Some software installations are specifically designed to run on a Windows Mobile powered device. To install software that has a Windows Mobile installation setup:

1. Connect the handheld to a computer (see [page 55](#)).
2. Copy the installation files to a folder on the handheld.
3. Browse to the folder on the handheld. Tap and hold the installation setup file and then select Run.
4. If prompted after installation, perform a soft reset of the handheld (see [page 29](#)).

To install software that is provided on a CD, or as an installation setup that runs on an office computer:

1. Connect the handheld to a computer (see [page 55](#)).
2. If the software is provided on a CD, insert the software CD into the office computer.
3. Run the installation setup.
4. If prompted, select the install option for a Windows Mobile powered device. Once the software is installed on the computer, it is automatically transferred to the handheld.

Note – *If an memory card is inserted in the handheld, the card appears as an installation location option. Trimble recommends that you install software to the handheld's storage memory, not to a memory card. If you install software to a card and then remove the card from the handheld, the software will not be available for use.*

5. If prompted after installation, perform a soft reset of the handheld (see [page 29](#)).

Using the GPS receiver

In this chapter:

- Supported GPS field software
- Configuring the GPS field software to connect to the receiver
- Using the GPS field software
- Ensuring the accuracy of your GPS data
- Differential GPS explained
- Outputting GPS data to external equipment

The GeoExplorer 2008 series handheld includes an integrated GPS receiver that enables you to collect GPS data for incorporating into a GIS or for managing assets.

The Global Positioning System (GPS) is a satellite-based positioning system consisting of a constellation of operational NAVSTAR satellites that orbit the earth every 12 hours. This system provides worldwide, all-weather, 24-hour time and position information.

***Note** – To receive signals from GPS satellites, the handheld must have a clear view of the sky. GPS positions may not always be available, particularly in or near buildings, in vehicles, or under tree canopy.*

Supported GPS field software

You can use the GeoExplorer 2008 series handheld with any of the software products described below.

TerraSync software

You can install version 3.21 or later of the TerraSync software on a GeoExplorer 2008 series handheld. Use the software to collect and maintain GIS and GPS data.

To install the TerraSync software, either insert the *TerraSync Software CD* in the CD-ROM drive of a computer and use the menus provided, or run the downloaded setup file. To obtain an installation code for installation, you must register your copy of the software online. Detailed installation instructions are provided in the *TerraSync Software Getting Started Guide*.

ESRI ArcPad software and the Trimble GPSCorrect extension

You can install version 7.1.0 or later of the ESRI ArcPad software on a GeoExplorer 2008 series handheld. Use the software to collect and maintain GIS and GPS data. Detailed installation instructions for ESRI ArcPad software are provided in the ArcPad documentation.

To be able to differentially correct ArcPad GPS data, install version 2.41 or later of the Trimble GPSCorrect extension for ESRI ArcPad software on a GeoExplorer 2008 series handheld.

You must install the ArcPad software *before* you install the GPSCorrect extension.

Note – Make sure your version of the GPSCorrect extension is compatible with the version of ArcPad software you are using. For more information, go to www.trimble.com/gpsccorrect_ts.asp, click Support Notes and then search for the Mapping and GIS Product Compatibility List Support Note.

To install the GPSCorrect extension, either insert the *Trimble GPSCorrect Extension for ESRI ArcPad Software CD* in the CD-ROM drive of a computer and use the menus provided, or run the downloaded setup file. Detailed installation instructions are provided in the *Trimble GPSCorrect Extension Getting Started Guide*.

GPS Controller software

The GPS Controller software is pre-installed on the GeoExplorer 2008 series handheld. Use the software to configure and monitor the status of the internal GPS receiver.

Other GPS field applications

You can use the GeoExplorer 2008 series handheld with a custom application developed using version 2.31 or later of the Trimble GPS Pathfinder Tools Software Development Kit (SDK).

You can also use the GeoExplorer 2008 series handheld with any GPS field software that accepts NMEA messages.

TrimPix technology

You can install version 1.20 or later of the TrimPix™ technology on a GeoExplorer 2008 series handheld. Use TrimPix technology to quickly and easily add high quality digital photographs to your GIS data collection workflow.

Note – To use TrimPix technology, you must have a compatible high resolution WiFi-capable Nikon digital camera.

For more information, go to www.trimble.com/mgis_trimpix.shtml.

Configuring the GPS field software to connect to the receiver

The first time you use GPS field software on the handheld, you may need to specify which GPS COM port to connect to.

GPS COM ports

The integrated GPS receiver has three COM ports for communicating with software on the handheld and with external devices. Two ports are for outputting GPS data, and one port is for receiving real-time corrections into the receiver.




To use GPS, open the appropriate GPS COM port. The type of communication used for each port is described below:

Port	Function	Description
COM2	NMEA	Outputs NMEA-0183 messages. NMEA is a standard GPS communication protocol used by many GPS applications. The handheld outputs the following NMEA messages: GGA, GLL, GSA, GSV, RMC, VTG, ZDA. All messages are output at a one-second interval.
COM3	TSIP	Outputs and receives TSIP messages. TSIP (Trimble Standard Interface Protocol) is used by Trimble GPS applications, and is also supported by some other GPS applications.
COM4	Real-time corrections	Receives real-time correction messages. If you are using an external correction source connected to COM1 or a Bluetooth port, the corrections must be redirected to COM4. For more information, see Using real-time corrections from an external correction source, page 70 .

Note – COM1 is a standard serial port that connects to external devices. For more information, see [Connecting to other devices using the serial clip, page 109](#).

Connecting to the COM port

Details of how to configure different types of GPS field software to connect to the GPS COM port are as follows:

GPS field software	Configuration details
GPS Controller	Run GPS Controller. The software automatically activates the integrated GPS receiver on COM3.
TerraSync	Run Terrasync. The software automatically activates the integrated GPS receiver on COM3.
ArcPad with the GPSCorrect extension	When the Trimble GPSCorrect extension is installed, the extension automatically configures the ArcPad software to use the integrated GPS receiver on COM3 using the Trimble GPSCorrect protocol. To connect to GPS, tap the GPS button  and then tap Yes . To configure a real-time DGPS source, or to view status information, run the GPSCorrect extension. To do this, tap the GPSCorrect button in the Trimble toolbar.
ArcPad 7 without the GPSCorrect extension	<ol style="list-style-type: none"> 1. In ArcPad, tap the GPS drop-down menu  and then select <i>GPS Preferences</i> from the drop-down menu. Tap the <i>GPS</i> tab. 2. In the <i>Protocol</i> field, select NMEA 0183. 3. In the <i>Port</i> field, select COM2. 4. Tap OK. 5. Tap the GPS button  and then tap Yes.
NMEA application	Configure the software to connect to GPS on COM2 and then use the Connect or Activate GPS command.
TSIP application	Configure the software to connect to GPS on COM3 and then use the Connect or Activate GPS command.

Using the GPS field software

The GPS Controller software is pre-installed on all GeoExplorer 2008 series handhelds and enables you to check the current GPS status, or to configure the integrated GPS receiver.


Depending on the GPS field software you have installed, the default GPS field software will be GPS Controller, TerraSync, or the Trimble GPSCorrect extension for ESRI ArcPad software.

Note – *GPS Controller duplicates the status and setup features of TerraSync software and the Trimble GPSCorrect extension for ESRI ArcPad software. If one of these applications is installed, it runs instead of GPS Controller when you tap the GPS softkey in the menu bar of the Today screen. For more information about these applications, refer to the documentation for the application.*

Depending on the GPS field software you have installed, you can use the software to configure settings such as GPS, real-time correction, and antenna settings. You may also be able to use the software to connect to a real-time correction source, configure logging settings, and collect features. For more information, refer to the rest of this chapter and the documentation for the GPS field software.

Starting the GPS field software

Do one of the following:

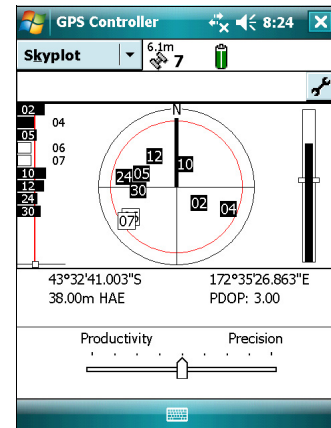
- From the *Today* screen, tap the *GPS* softkey in the menu bar.
- Tap  / *Programs* and then select the GPS field software, for example *GPS Controller*.

When you first open any Trimble GPS field software, the Skyplot section is displayed.

Viewing available GPS satellites

Use the graphical Skyplot section or the Satellite Info section in the Trimble GPS field software to view detailed GPS information, and to adjust the quality and yield of the GPS positions you are receiving.

Note – To receive signals from GPS satellites, the handheld must have a clear view of the sky. GPS positions may not always be available, particularly in or near buildings, in vehicles, or under tree canopy.



Resetting the GPS receiver

Trimble GPS field applications all have options to reset the receiver to:

- delete the almanac
- delete information stored on the last known position
- restart the receiver
- reset the GPS receiver to factory default settings

Ensuring the accuracy of your GPS data

GeoExplorer 2008 series handhelds are high performance GPS receivers that calculate very accurate GPS positions.

To correct errors in the collected data and to further improve the accuracy of the GPS positions, use differential GPS. Differential GPS (DGPS) requires one or more additional receivers, called **base stations** or reference stations, which are located at known points. Data collected at the base stations is used to determine GPS measurement errors and compute corrections to these errors. These corrections are then applied to data collected in the field either in real time or during postprocessing. For more information, see [Differential GPS explained, page 74](#).

The three different models in the GeoExplorer 2008 series offer three levels of DGPS accuracy:

- The GeoXM handheld provides reliable accuracy to within 1 to 3 meters with real-time or postprocessed differential correction. To achieve this level of accuracy, the DGPS infrastructure needs to provide single-frequency (L1) GPS corrections from a base station within 500 km.
- The GeoXT handheld uses EVEREST multipath rejection technology to provide submeter accuracy with differential correction. To achieve this level of accuracy, the DGPS infrastructure needs to provide single-frequency (L1) GPS corrections from a base station within 200 km. The GeoXT handheld can achieve better postprocessed DGPS accuracy by using longer occupations, a dual-frequency (L1/L2) GPS base station within 80 km, and carrier postprocessing techniques.
- The GeoXH handheld uses EVEREST multipath rejection technology as well as H-Star technology to provide decimeter (10 cm) to subfoot (30 cm) accuracy with real-time or postprocessed differential correction.

To achieve decimeter accuracy in real time, the DGPS infrastructure needs to provide dual-frequency (L1/L2) GPS corrections, either from a VRS™ network or from a base station within 30 km. When using a single base station within 30 to 80 km, typical real-time accuracy is subfoot or better. When postprocessing, decimeter accuracy is achieved when using a single base station within 30 km, and subfoot accuracy is achieved when using a single base station within 30 to 80 km (or three base stations at a distance of up to 200 km).

When using an external Zephyr antenna during data collection, postprocessed accuracy improves to 20 cm when using a single base station within 30 to 80 km (or three base stations at a distance of up to 200 km).

Where the DGPS infrastructure does not meet subfoot accuracy requirements (for example, the base station provides L1 corrections only, or is at a distance greater than recommended), the GeoXH handheld typically achieves submeter accuracy.

Note – To achieve decimeter or subfoot accuracy with a GeoXH handheld, data must be collected using Trimble field software (TerraSync software, the GPScorrect extension for ESRI ArcPad software, or a custom application developed using the GPS Pathfinder Tools Software Development Kit).

The list below identifies the most important settings and techniques that you can use in the field to improve the accuracy of your data:

Note – This list assumes that you are using Trimble GPS field software, and lists items in order of most important to less important.


1. If you are using TerraSync software to collect data, use accuracy-based logging. For more information, see [page 67](#).
2. Use real-time differential corrections. If you are using a GeoXH handheld and have access to dual-frequency corrections from a VRS network, use the corrections from the VRS network. For more information, see [page 68](#).
3. Configure the GPS settings for the receiver to increase the precision of your data, and to minimize the effect of atmospheric interference and poor satellite geometry. For more information, see [page 71](#).
4. Connect to an external antenna, if you have one. For more information, see [page 72](#).
5. If you are using a GeoXT handheld, configure the data collection software to log carrier data. If you are using a GeoXH handheld, the data collection software logs H-Star data, by default. For more information, see [page 73](#).
6. Plan GPS data collection around the times of the day when satellite geometry is best. For more information, see [page 73](#).

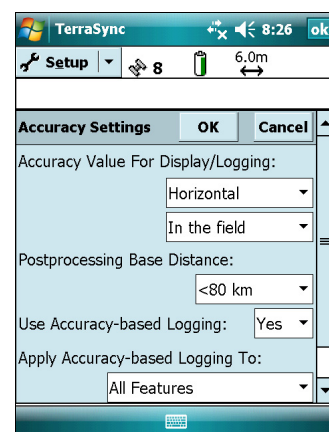
Using accuracy-based logging

If you are using the TerraSync software, use accuracy-based logging to ensure that only GPS positions that meet the specified estimated accuracy are logged. GPS positions that do not meet your accuracy requirements are not logged.

Note – Accuracy estimates for streaming (dynamic) GPS positions may not be as good as those for static GPS positions.

To configure accuracy-based logging in the TerraSync software:

1. In the Setup section of the TerraSync software, tap **Logging Settings**. The *Logging Settings* form appears.
2. Tap the **Setup** button  below the *Accuracy Settings* field. The *Accuracy Settings* form appears.
3. In the *Accuracy Value For Display/Logging* fields, select the parameters that will be used to determine the estimated accuracy:
 - Select whether to use the horizontal or vertical accuracy of the current GPS position.



- Select *In the field* to use the current estimated accuracy (recommended if you are using a real-time correction source), or select *Postprocessed* to use the predicted estimated accuracy that will be achieved after the field data has been postprocessed.
- 4. If you selected *Postprocessed*, select the estimated distance to the base station that will be used for postprocessing from the *Postprocessing Base Distance* field. If you will use more than one base station (during H-Star processing), specify the estimated distance to the closest base station.
- 5. Set the *Use Accuracy-based Logging* field to *Yes*. The settings fields for accuracy-based logging appear.
- 6. In the *Apply Accuracy-based Logging To* field, select the feature types that you want to log only if the GPS positions meet your required accuracy.
- 7. In the *Required Accuracy* field, select the estimated accuracy that is required before GPS positions are logged.
- 8. Tap **OK**.

Note – Accuracy settings do not affect GPS positions that are used for navigation. GPS positions are still calculated by the GPS receiver and are available for navigation.

Connecting to a real-time differential correction source

Use a real-time differential GPS (DGPS) source to give you better accuracy as you collect data. For more information about how real-time differential GPS works, see [Differential GPS explained, page 74](#).

Using real-time corrections from an Internet source

DGPS corrections are often broadcast over the Internet. For example, corrections generated by a VRS network are commonly broadcast over an Internet server. A VRS network uses data from several base stations to provide rover receivers with corrections that are generally more accurate than corrections from a single base station. Alternatively, you can connect to a server that provides DGPS corrections from a single base station.

For information on how to connect to the Internet and receive real-time corrections from an Internet server, see [Connecting to a Bluetooth-enabled phone for Internet access or real-time corrections \(including VRS networks\), page 88](#).

Using SBAS corrections

The GeoExplorer 2008 series handheld has an integrated receiver that uses Satellite Based Augmentation Systems (SBAS) correction messages to improve the accuracy and integrity of GPS data.

The default SBAS tracking mode is Auto. In Auto mode, the receiver tracks or locks onto the most powerful satellite signal. The GPS receiver can track two SBAS satellites at the same time in Auto or Custom mode. It uses corrections from only one SBAS satellite at a time, but tracking two satellites can improve the availability of SBAS real-time corrections. For example, if you are working in environments where obstacles may block the direct line of sight to the SBAS satellite, there is less chance of signal loss if you are tracking more than one SBAS satellite.

Note – To turn off multiple SBAS satellite tracking, select Custom mode and then deselect all other SBAS satellites except for the satellite you want to track.



The receiver tracks SBAS satellites according to your geographical location:

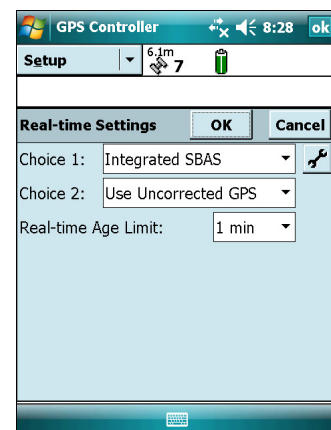
- Wide Area Augmentation System (WAAS) satellites are tracked in the Continental United States including Alaska, and parts of Canada and Mexico.
- European Geostationary Navigation Overlay Service (EGNOS) satellites are tracked in Europe.
- MTSAT Satellite-based Augmentation System (MSAS) satellites are tracked in Japan.

You can configure the receiver to use particular SBAS satellites in the *Integrated SBAS Settings* form of the Trimble GPS field software. Select the Custom option in the *Tracking Mode* field and then enable or disable tracking for any specific satellite.

Note – If you have other Trimble GPS field software installed, configure real-time correction settings in that application instead of the GPS Controller software.

To use SBAS corrections:

1. In the GPS field software, open the Real-time section and tap the **Setup** button .
2. In the *Choice 1* field, select Integrated SBAS.
3. To select particular satellites, tap the **Setup** button  next to the *Choice 1* field. Select Custom tracking mode and then enable or disable tracking of particular satellites. Tap **OK** to return to the *Real-time Settings* screen.
4. In the *Choice 2* field, specify whether to use uncorrected positions, or to stop using GPS positions, if corrections are not available.
5. Tap **OK**.





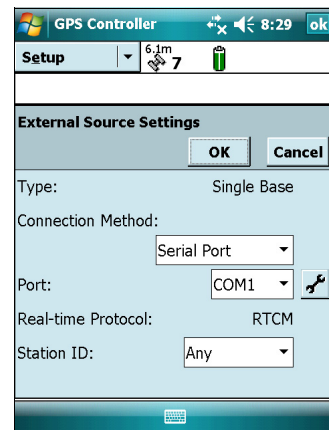
Using real-time corrections from an external correction source

You can improve the accuracy of your data by using real-time corrections from an external correction source, such as a GeoBeacon receiver or a DGPS radio. Connect the external correction source to a Bluetooth port (see [page 86](#)) or to the optional serial clip (see [page 109](#)). Use the GPS field software to set up and monitor the real-time input source that you want to use.

The integrated GPS receiver communicates only through its GPS COM ports (COM2, COM3, and COM4). Trimble GPS field software, such as TerraSync and GPS Controller, automatically redirects input from an external correction source connected to COM1 or to a Bluetooth port to the real-time GPS COM port (COM4).

To set up an external correction source in the Trimble GPS field software:

1. In the GPS field software, open the Real-time section and then tap the **Setup** button .
2. In the *Choice 1* field, select External Source.
3. Tap the **Setup** button  next to the *Choice 1* field.
4. In the *Connection Method* field, select Serial Port.
5. In the *Port* field, select the COM port to use. If you are using:
 - the serial clip, select COM 1.
 - a Bluetooth wireless connection, select the COM port you configured for the Bluetooth connection in the *COM Ports* tab of the Bluetooth manager.
6. Tap **OK**.



To set up an external correction source for use with non-Trimble GPS field software:

1. In the Trimble GPS Controller software, configure the GPS receiver to use real-time corrections on COM4. For more information, see the steps above.
2. In the GPS Connector software, manually redirect the real-time correction source to COM4 by tapping Setup then select the real-time source from the drop down list.
3. Configure your data collection software to monitor and use real-time corrections as required.

Note – To receive real-time corrections, the GPS Connector software must remain running on the handheld.

Configuring GPS settings


Note – This section describes the GPS Settings form in the GPS Controller software and the Trimble GPScorrect extension.

Use the *GPS Settings* form in the Trimble GPS field software to configure the GPS quality settings you require. The lower the GPS quality settings, the more productive you are likely to be, as the GPS receiver will track more satellites and be better able to calculate a GPS position. The stricter the GPS quality settings, the more precise the GPS positions that are calculated.

Note – If you are using the TerraSync software version 3.21 or later, Trimble recommends that you use accuracy-based logging (see [page 67](#)) to control the quality of the GPS positions logged. Use the default GPS quality settings and let the TerraSync software manage the logging of positions based on your required accuracy.

By default, the handheld is configured to receive satellite signals in most conditions.

To open the *GPS Settings* form, do one of the following:

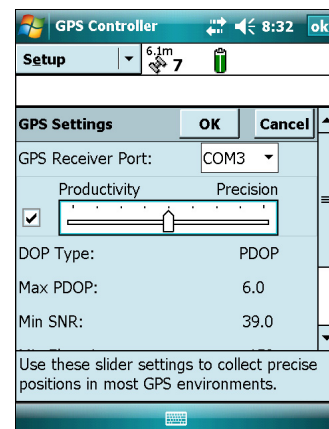
- Tap **GPS Settings** in the Setup section.
- Tap  in the Skyplot, Satellite Info, or Plan section.

Selecting predefined settings using the GPS slider

Use the GPS slider to select predefined GPS quality settings.

Select the slider check box. The slider control appears on the GPS slider, and some fields in the form become read-only. The values in these fields change as the slider control position changes.

Drag the slider control to the **left** to **decrease** the GPS quality requirements and to include more satellites when calculating GPS positions. Drag it to the **right** to **improve** the GPS quality and exclude satellites that do not meet the precision requirements from GPS position calculations.



Selecting custom GPS settings

To select custom GPS quality settings, clear the slider check box. The slider control disappears from the GPS slider, and the remaining fields change to editable numeric fields. To specify the required GPS quality settings, enter values in these fields. For more information about each field, see [Recommended GPS settings for maximum precision](#), [page 124](#).

Connecting to an external antenna


The GeoExplorer 2008 series handheld has an internal antenna, which is suitable for use in most conditions.

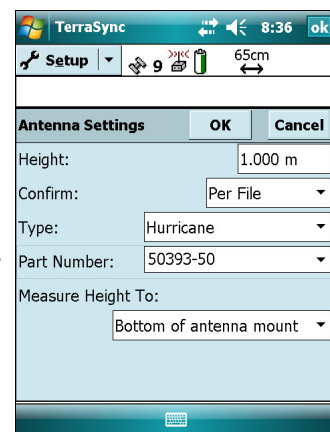
If you have a GeoXM or a GeoXT handheld, you can also connect a Hurricane or an external patch antenna for when you work in a vehicle. For improved yield under canopy, you can use a Hurricane antenna, or a patch antenna with a ground plane.

If you have a GeoXH handheld, you can connect an external Zephyr antenna for improved accuracy when you collect data for postprocessing using H-Star technology.

Configure antenna settings in the GPS field software, once you have connected the external antenna to the handheld.

To configure antenna settings in the TerraSync software:

1. In the Setup section of the TerraSync software, tap **Logging Settings**. The *Logging Settings* form appears.
2. Tap the **Setup** button  next to the *Antenna Height* field. The *Antenna Settings* form appears.
3. In the *Height* field, specify the height of the GPS antenna that is connected to the GPS position.
4. In the *Confirm* field, select how often the software will ask you to confirm the configured antenna height during data collection.
5. In the *Type* field, select the type of antenna that is connected. The number in the *Part Number* field is automatically updated when you select the antenna type.
6. In the *Measure Height To* field, select the point on the antenna that you have measured the height to.
7. Tap **OK** to return to the *Logging Settings* form.



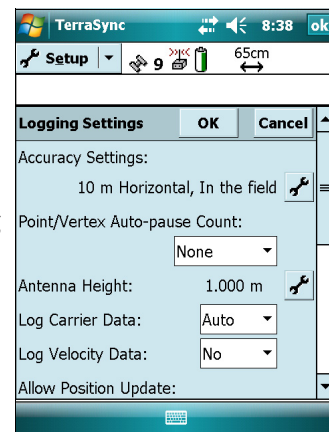
Logging carrier data

When you log carrier data, the GPS receiver logs additional data as well as GPS position records. The additional data is used during postprocessing to improve the accuracy of the GPS positions.

If you are using a GeoXH handheld, H-Star carrier data is logged by default. If you are using a GeoXT handheld, carrier data is not logged by default. If you want higher levels of accuracy and are willing to log data for 10 minutes or more while maintaining continuous lock on at least four satellites, you can configure the GPS field software to log carrier data.

To configure carrier data logging in the TerraSync software:

1. In the Setup section of the TerraSync software, tap **Logging Settings**. The *Logging Settings* form appears.
2. In the *Log Carrier Data* field, select the data logging option for the type of handheld you are using:
 - If you are using a GeoXT, select **Yes**.
 - If you are using a GeoXH, make sure **Auto** is selected.
3. Tap **OK**.

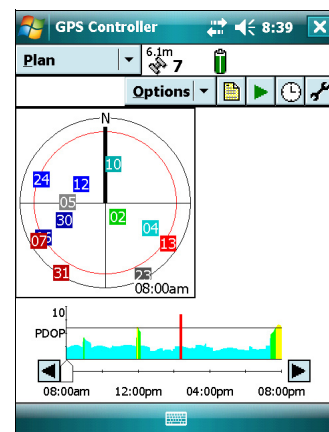


Planning a data collection session

To maximize productivity, plan GPS data collection around the times of the day when satellite geometry is best. The GPS Controller software includes a Plan section with an animated skyplot and DOP (satellite geometry) graph for your position for the next 12 hours.

In the Plan section, you can check the planning skyplot as you play a session, then use the timeline to zoom in on times when geometry is poor. As you adjust GPS settings, the Plan section is updated, so you can see the effect of different quality control settings.

Note – If you have other Trimble GPS field software installed, use the planning feature in that application instead of the GPS Controller software.



Differential GPS explained

Use differential GPS to correct errors in your collected data. Differential GPS (DGPS) requires one or more additional receivers, called **base stations** or reference stations, which are located at known points. Data collected at the base stations is used to determine GPS measurement errors and compute corrections to these errors. An unlimited number of mobile GPS receivers, called **rovers**, collect GPS data at unknown locations within the vicinity of the base station. Errors common at both the base station and the rover receiver are corrected with DGPS either in real time or during postprocessing.

Real-time DGPS

In real-time DGPS, the base station calculates and broadcasts the error for each satellite as each measurement is received, enabling you to apply corrections while in the field and collect accurate GPS data. DGPS corrections are available from a variety of public and commercial sources. They can be generated and broadcast in real-time by privately or self-owned GPS base stations, or by a wide range of government agencies.

Real-time DGPS sources include external beacon and radio sources, as well as Satellite Based Augmentation Systems (SBAS) such as WAAS in the US and EGNOS in Europe, and VRS networks. SBAS and VRS networks use multiple base stations to calculate the DGPS corrections that are then delivered to the user from a Geostationary satellite (SBAS) or from a radio or cellular phone (VRS networks).

Factors that affect real-time DGPS accuracy include how often the corrections are updated, how far you are from the base station, and whether the coordinate system used by the correction source matches the coordinate system used by the GPS receiver.

Postprocessed DGPS

In postprocessed DGPS, the collected GPS data is transferred to an office computer, and measurements from the base station are downloaded. You can postprocess GPS data collected with Trimble GPS field software using:

- the GPS Pathfinder Office software version 4.10 (with the latest updates) or later.
- the Trimble GPS Analyst extension for ESRI ArcGIS software version 2.10 (with the latest updates) or later.

Typically, postprocessed DGPS uses only one base station. However, when differentially correcting data collected with GeoXH receivers using H-Star technology, you can select multiple base stations to correct the file against for improved accuracy.

Factors that affect the accuracy of postprocessed DGPS include the type of receiver and antenna used at the base station, the distance between the base station and the location where the rover data was collected, the accuracy of the base station position, and the logging interval at the base station.