



# USER GUIDE

## GeoBeacon™ receiver



# User Guide

## GeoBeacon™ receiver

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This is the December 2005 release (Revision C) of the *GeoBeacon Receiver User Guide*. It applies to version 1.16 of the GeoBeacon receiver firmware.

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To obtain warranty service for the Product, please contact your Trimble dealer. Alternatively, you may contact Trimble to request warranty service at +1-408-481-6940 (24 hours a day) or e-mail your request to [trimble\\_support@trimble.com](mailto:trimble_support@trimble.com). Please be prepared to provide:

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#### Registration

To receive information regarding updates and new products, please contact your local dealer or visit the Trimble website at [www.trimble.com/register](http://www.trimble.com/register). Upon registration you may select the newsletter, upgrade or new product information you desire.

## Notices

Class B Statement – Notice to Users. 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 communication. 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 the receiver.
- Connect the equipment into 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.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

## 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.

## Europe

This product has been tested and found to comply with the requirements for a Class B device pursuant to European Council Directive 89/336/EEC on EMC, thereby satisfying the requirements for CE Marking and sale within the European Economic Area (EEA). Contains BlueRadios radio module POOWML-C29XX. These requirements are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential or commercial environment.



## Australia and New Zealand

This product conforms with the regulatory requirements of the Australian Communications Authority (ACA) EMC framework, thus satisfying the requirements for C-Tick Marking and sale within Australia and New Zealand.



## Taiwan – Battery Recycling Requirements

The product contains a removable Lithium-ion battery. Taiwanese regulations require that waste batteries are recycled.



## Notice to Our European Union Customers

For product recycling instructions and more information, please go to [www.trimble.com/ev.shtml](http://www.trimble.com/ev.shtml).

Recycling in Europe: To recycle Trimble 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: Trimble Europe BV  
c/o Menlo Worldwide Logistics  
Meerheide 45  
5521 DZ Eersel, NL





# Safety and Warnings

## Battery Safety

The GeoBeacon receiver is powered by a rechargeable Lithium-ion battery. Charge and use the battery only in strict accordance with the instructions below.



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**WARNING –** To prevent injury or damage:

- Never attempt to remove, replace, or repair the battery yourself.
  - Do not damage the battery.
  - Do not use the handheld if the battery appears to be leaking.
  - If the battery requires attention, send the handheld to your local Trimble Service center.
- 

## AC Adaptor Safety



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**WARNING –** To use AC adaptors safely:

- Use only AC adaptors intended for the GeoBeacon receiver. Using any other external power source can damage your product and may void your warranty.
  - Make certain that the input voltage on the adaptor matches the voltage in your location.
  - Make certain that the adapter has prongs compatible with your outlets.
  - AC adaptors are designed for indoor use only. Avoid using the AC adaptor in wet outdoor areas.
  - Unplug the AC adaptor from power when not in use.
  - Do not short the output connector.
-





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# Introduction

Welcome to the *GeoBeacon Receiver User Guide*. This manual describes how to set up and use the Trimble® GeoBeacon™ receiver.

The GeoBeacon receiver is a lightweight and cable-free receiver that tracks and decodes differential GPS (DGPS) beacon broadcasts. Using integrated Bluetooth® wireless technology, the GeoBeacon receiver outputs DPGS corrections to GPS receivers, providing accuracy in real-time. For more information about DGPS and using beacons, see [Understanding Differential GPS, page 26](#).

The GeoBeacon receiver works cable-free with the GeoExplorer® series handhelds and the GPS Pathfinder® Pro series receivers. It can be worn on a belt, carried in a backpack, or mounted on a range pole.

## Related information

Sources of related information include the following:

- Help – the GeoBeacon Controller software has built-in, context-sensitive help that lets you quickly find the information you need. To access it from an office computer, press **[F1]**. On a device that is running the Microsoft® Windows Mobile® software, select Start / Help.
- Trimble training courses – Consider a training course to help you use your GPS system to its fullest potential. For more information, go to the Trimble website at [www.trimble.com/training.shtml](http://www.trimble.com/training.shtml).
- For more information on GPS, go to [www.trimble.com/gps](http://www.trimble.com/gps).
- For more information on Bluetooth wireless technology, go to [www.bluetooth.com](http://www.bluetooth.com).

## Technical assistance

If you have a problem and cannot find the information you need in the product documentation, go to the Trimble technical support website ([www.trimble.com/support.shtml](http://www.trimble.com/support.shtml)). This site contains additional support documentation.

If you cannot find the information you need, you can purchase Priority Support by going to [www.trimble.com/mgis\\_rqst\\_home.asp](http://www.trimble.com/mgis_rqst_home.asp). If you already have Priority Support, you can also use this link to request support from your Trimble Dealer.

## Your comments

Your feedback about the supporting documentation helps us to improve it with each revision. E-mail your comments to [ReaderFeedback@trimble.com](mailto:ReaderFeedback@trimble.com).

# Getting Started with the GeoBeacon Receiver

This section describes the components and software that are provided with the GeoBeacon receiver. Follow the steps provided at the end of this section to start using your GeoBeacon receiver.

## What's in the box?

When you receive the GeoBeacon receiver, check that you have received all the components, as detailed on the packing list and shown in Figure 1. Depending on the system that you have purchased, you may receive additional accessories.



Figure 1 Standard components provided with the GeoBeacon receiver

Inspect all contents for visible damage (scratches, dents) and if any components appear damaged, notify the shipping carrier. Keep the shipping and packaging material for the carrier's inspection.

## Accessories

The following optional accessories are available:

- Vehicle power adaptor
- Portable external power kit
- Range pole bracket
- Hard carry case

For more information, contact your local Trimble dealer.

## Software provided with the receiver

The software provided on the *GeoBeacon Receiver User Guide and Software CD* is described below.

### GeoBeacon Controller software

The GeoBeacon Controller software runs on an office computer or a Windows Mobile-based device. It enables you to:

- configure settings on the GeoBeacon receiver
- view real-time correction status information

For more information, see [Using the GeoBeacon Controller Software, page 13](#).

### Bluetooth Activation Manager software

The Bluetooth Activation Manager software runs on an office computer. It enables you to deactivate the Bluetooth radio, or to reactivate the Bluetooth radio if it has been deactivated. For more information, see [Deactivating the Bluetooth radio, page 6](#).

## Getting started

To use the GeoBeacon receiver, complete the following steps:

1. Before you use the receiver for the first time, make sure that the battery is fully charged (see [page 10](#)).
2. Turn on the GeoBeacon receiver (see [page 5](#)).
3. Connect to a GPS receiver (see [page 17](#)).
4. Set up the GPS data collection software to receive realtime corrections from the GeoBeacon receiver (see [page 21](#)).
5. If you want to, wear the GeoBeacon receiver on your belt, carry it in a backpack, or mount it on a range pole (see [page 24](#)).

# Operating the GeoBeacon Receiver

You can operate the receiver with or without using the integrated Bluetooth radio. Use the buttons to operate the receiver. The LEDs provide status information.

## Parts of the GeoBeacon receiver

Figure 2 shows the main features of the GeoBeacon receiver.



Figure 2 Features and functions of the GeoBeacon receiver

## Turning on and off the GeoBeacon receiver

To turn on the receiver, give the Power button a short press (less than one second):

- By default, the Bluetooth radio is turned on simultaneously and is made discoverable. See [Turning on and off the Bluetooth radio](#) below.
- LEDs show Power, Bluetooth, and Beacon status.

The first time you turn on the GeoBeacon receiver, it automatically locks onto and tracks the best beacon signal.

To simultaneously turn off the receiver **and** the Bluetooth radio, give the Power button a long press (one second).

**Note** – *When the GeoBeacon receiver is turned off and back on again, your current settings are retained. For example, if the Bluetooth radio was off when you turned off the receiver, the Bluetooth radio will be off when you turn on the receiver again.*

## Using the Bluetooth radio

Bluetooth wireless technology is an industry-standard specification that eliminates the need for cables between mobile devices such as Personal Digital Assistants (PDAs), mobile phones, and GPS receivers. Using Bluetooth wireless technology, real-time DGPS corrections are sent from the GeoBeacon receiver to your GPS receiver.

The Bluetooth radio has a range of up to 10 meters (32.8 feet).

**Note** – *You cannot operate the radio over a cabled connection and use Bluetooth wireless technology at the same time. Disconnect any cables from the GeoBeacon receiver before turning on the Bluetooth radio.*

For more information about connecting to other devices using Bluetooth wireless technology, see [page 17](#).

## Turning on and off the Bluetooth radio

To turn on or turn off the Bluetooth radio, press the Beacon button for five seconds.

- When the radio is turned off, the Bluetooth (blue) LED flashes quickly five times and then turns off.
- When the radio is turned on, the Bluetooth (blue) LED flashes quickly five times and then stays on.

When you first use the GeoBeacon receiver, the Bluetooth radio is already on by default (also known as **discoverable**). This means that the GeoBeacon receiver can be found by other Bluetooth devices such as your GPS receiver or field computer.

## Deactivating the Bluetooth radio

The GeoBeacon receiver is shipped with Bluetooth wireless technology activated. You may need to deactivate the Bluetooth radio in the GeoBeacon receiver if the country in which you are working does not approve the use of Bluetooth wireless technology. If you are unsure about whether the GeoBeacon Bluetooth radio is approved for use in your country, check with your local Trimble Distributor.

Use the Bluetooth Activation Manager software to deactivate the Bluetooth radio, or to reactivate the Bluetooth radio if it has been deactivated.

The Bluetooth Activation Manager software runs on an office computer. A copy of the Bluetooth Activation Manager software is provided on the *GeoBeacon Receiver User Guide and Software CD*. Alternatively, you can download the latest copy of the software from the Internet. To download the software, go to the GeoBeacon receiver product page at [www.trimble.com/geobeacon.shtml](http://www.trimble.com/geobeacon.shtml), click the *Support* link, and then click *Downloads*.

## Beacon tracking modes

The GeoBeacon receiver has two operating modes for tracking beacon signals: **Best** mode (the default mode) and **Fixed** mode.

### Best mode

Use the Best mode to automatically track the *optimum* signal in the area where you are working.

When you first turn on the receiver, the receiver automatically searches for a beacon in Best mode. The Beacon LED turns green and rapidly flashes. Once the receiver locks onto the optimal beacon frequency, the Beacon LED slows to a steady flash.

For more information, see [Status information, page 7](#).

### Fixed mode

Use the Fixed mode to lock onto a *specific* beacon signal. For example, if there are multiple beacon stations in the area where you are working, you may want to use a specific one that has a lower signal strength but a shorter baseline to provide better accuracy.

To manually select a specific beacon frequency, use the GeoBeacon Controller software (see [page 13](#)), or the Beacon button. Every short press of the Beacon button increases the frequency that the receiver will try to search for by 0.5 kHz.

For more information, see [Button functions](#) and [Status information, page 8](#).



## Status information

When you turn on the receiver, the Power, Beacon, and Bluetooth LEDs on the front panel light up.

**Note** – After reset, the Beacon and Power LEDs display solid red and the Bluetooth LED displays solid blue for approximately 6 seconds.

During operation, the LEDs provide the following status information:

| LED              | Color | Mode                      | Status   |
|------------------|-------|---------------------------|--|
| <b>Power</b>     | Off   |                           | The receiver is not turned on.   |
|                  | Green | Solid                     | The receiver is using its internal battery, and has a good battery level.                        |
|                  | Red   | Short flash <sup>1</sup>  | Power is getting low. There is one hour or less of power remaining.                              |
|                  | Amber | Pulse flash <sup>2</sup>  | The battery in the receiver is charging.   |
|                  | Amber | Solid                     | The battery in the receiver is fully charged, or the receiver is using an external power supply. |
| <b>Beacon</b>    | Green | Long flash <sup>3</sup>   | Locked onto beacon frequency in Best mode.   |
|                  | Green | Rapid flash <sup>4</sup>  | Searching for beacon frequency in Best mode.   |
|                  | Amber | Long flash                | Locked onto beacon frequency in Fixed mode.  |
|                  | Amber | Rapid flash               | Searching for beacon frequency in Fixed mode.  |
| <b>Bluetooth</b> | Off   |                           | The radio is turned off, or it is deactivated.   |
|                  | Blue  | Pulse flash               | The radio is on, but no connection has been formed to another device.                            |
|                  | Blue  | Long flash                | A connection has been formed between the receiver and another device.                            |
|                  | Blue  | Toggle flash <sup>5</sup> | A command is sent to toggle the radio on or off.   |

<sup>1</sup>Short flash – one flash per second

<sup>2</sup>Pulse flash – one flash every three seconds

<sup>3</sup>Long flash – one flash every two seconds

<sup>4</sup>Rapid flash – two flashes per second

<sup>5</sup>Toggle flash – five short flashes over two seconds

## Button functions

There are two buttons on the receiver. The following table explains how to use these buttons to operate the receiver.

| Button                           | Length of press            | Function  |
|----------------------------------|----------------------------|---|
| <b>Power</b>                     | Short (less than 1 second) | Does one of the following: <ul style="list-style-type: none"> <li>• When the receiver is turned off and not connected to external power, it turns on the receiver.</li> <li>• If the receiver is off and charging from an external power source, it turns on the receiver.</li> <li>• If the receiver is on and using external power, then a short press does not do anything.</li> </ul> |
|                                  | Long (1 second)            | Turns off the receiver.   |
| <b>Beacon</b>                    | Short (less than 1 second) | Switches from Best mode to Fixed mode. Stays locked on beacon frequency used in Best mode.  |
|                                  | Short (less than 1 second) | Stays in Fixed mode. Moves to the next beacon frequency (0.5 kHz spacings).   |
|                                  | Long (1 second)            | Switches from Fixed mode to Best mode. Searches for best beacon frequency.  |
|                                  | Very Long (5 seconds)      | Turns on or turns off the Bluetooth radio.  |
| <b>Power and Beacon together</b> | Very Long (5 seconds)      | Resets the receiver to its factory defaults and then restarts the receiver. The receiver starts in Best mode, with the Bluetooth radio turned on.   |

# Batteries and Power

The GeoBeacon receiver uses an internal rechargeable Lithium-ion battery, which can only be replaced at an authorized Trimble Service Center. When fully charged, the battery provides ten hours of power with the Bluetooth radio operating.

The rechargeable Lithium-ion battery is supplied partially charged. Charge the battery completely (see [page 10](#)) before using it for the first time. If the receiver has been stored for longer than one month, fully charge it before use.

To extend the time between charges, use the optional vehicle power adaptor to charge the receiver (see [page 11](#)). Alternatively, the optional portable external power kit provides extra power to the receiver (see [page 11](#)). Figure 3 shows the different options available for powering the GeoBeacon receiver.



Figure 3 GeoBeacon receiver power sources

## Battery performance

Batteries perform best when they are not used in extreme temperature conditions. The GeoBeacon receiver is designed to be used in operating temperatures of  $-20^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$  to  $122^{\circ}\text{F}$ ). However, extremely cold temperatures of less than  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) can cause the battery life to quickly drop. Do not expose the GeoBeacon receiver to storage temperatures above  $70^{\circ}\text{C}$  ( $158^{\circ}\text{F}$ ) or below  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ).

## Battery safety

The GeoBeacon receiver is powered by a rechargeable Lithium-ion battery. Charge and use the battery only in strict accordance with the instructions below.



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**WARNING** – To prevent injury or damage:

- Never attempt to remove, replace, or repair the battery yourself.
  - Do not damage the battery.
  - Do not use the handheld if the battery appears to be leaking.
  - If the battery requires attention, send the handheld to your local Trimble Service center.
- 

## AC adaptor safety



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**WARNING** – To use AC adaptors safely:

- Use only AC adaptors intended for the GeoBeacon receiver. Using any other external power source can damage your product and may void your warranty.
  - Make certain that the input voltage on the adaptor matches the voltage in your location.
  - Make certain that the adapter has prongs compatible with your outlets.
  - AC adaptors are designed for indoor use only. Avoid using the AC adaptor in wet outdoor areas.
  - Unplug the AC adaptor from power when not in use.
  - Do not short the output connector.
- 

## Charging the battery

The battery takes approximately eight hours to fully charge.

*Note* – When charging the battery at temperatures above normal room temperature (above 22 °C or 71 °F) the battery may take longer to fully charge. At temperatures below 0 °C (32 °F) the battery will not charge.

You can charge the battery using either the AC adaptor or the vehicle power adaptor.



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**WARNING** – The GeoBeacon receiver is not compatible with the AC adaptor or vehicle adaptor supplied with other Trimble equipment, for example, the Beacon-on-a-Belt (BoB™) receiver. You must use the AC adaptor (P/N 61234-00) and vehicle power adaptor (P/N 61235-00) provided with the GeoBeacon receiver.

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To charge the receiver using the AC adaptor:

1. Connect the AC adaptor to the mains power supply.
2. Connect the AC adaptor to the external power port on the GeoBeacon receiver.

The receiver switches off and into charging mode. The Power LED is lit, and pulse-flashes amber.

3. Leave the receiver until the battery is fully charged.

When the receiver is fully charged, the Power LED turns solid amber.

#### To charge the receiver while using it in a vehicle:

1. Connect the vehicle power adaptor to the external power port on the GeoBeacon receiver.
2. Connect the other end of the vehicle power adaptor to the vehicle cigarette lighter.

The receiver switches off and into charging mode. The Power LED is lit, and pulse-flashes amber.

3. Leave the receiver until the battery is fully charged.

When the receiver is fully charged, the Power LED turns solid amber.

When mains power supply or the vehicle adaptor is plugged in, the receiver turns off and starts charging. When the receiver is turned on again, it runs from external power and does not charge.

## Portable external power kit

The portable external power kit (P/N 57123-00) provides additional power to the GeoBeacon receiver (it does not charge the battery). The kit contains the following items:

- a Lithium-ion battery
- a flexible cable to connect the battery to the receiver
- a battery charger for charging the Lithium-ion battery
- a pouch that can be attached to your belt for carrying the external Lithium-ion battery

The external Lithium-ion battery supplies at least 40 hours extra power to the receiver.

#### To connect the external power supply to the receiver:

1. Connect the locking connector on the cable to the power connector on the GeoBeacon receiver.
2. Clip the Lithium-ion battery to the other end of the cable.

When the Lithium-ion battery is plugged in, the receiver runs on external power and the Power LED turns solid amber.

## Power status

There are three places where you can view the battery status of the receiver:

- The Power LED on the receiver (see [page 7](#)).
- In the GeoBeacon Controller software ( for example, 10% = one hour of power left at an operating temperature of 20°C).
- In the *External Beacon* field of your Trimble GPS field software.

The GeoBeacon receiver is fully compatible with the following versions of Trimble GPS field software:

- version 2.03 and later of the GPS Controller software
- version 2.52 and later of the TerraSync™ software
- version 1.11 and later of the Trimble GPSCorrect™ extension for ESRI ArcPad software
- version 1.20 and later of the Trimble GPS Analyst™ extension for ESRI ArcGIS software

You can use earlier versions of these software products to receive corrections from the GeoBeacon receiver, but status information for the receiver will not be available.

To view the battery status, do one of the following:

- In the GPS Controller software or the GPSCorrect extension, select the *Real-Time* screen from the drop-down menu.
- In the TerraSync software, select the *Status* screen from the drop-down menu and then select *Real-Time*.
- In the GPS Analyst extension, open the *GPS Status* window and select the Real-time tab.

**Note** – When the GeoBeacon receiver is reset to factory default settings (by simultaneously pressing the **Power** and **Beacon** buttons for 5 seconds), the battery status is reset to show 20%. You must fully recharge the receiver before the battery status is reported correctly.

## Conserving power

The battery can operate for a full work day without recharging. However, if you are away from the office for an extended period, you should purchase the portable external power kit. To conserve battery power as much as possible:

- Turn off the receiver when it is not in use (see [page 5](#)).
- Turn off the Bluetooth radio when it is not in use (see [page 5](#)).

# Using the GeoBeacon Controller Software

Use the GeoBeacon Controller software to configure settings on the GeoBeacon receiver and to view status information.

The GeoBeacon Controller software runs on the following Microsoft operating systems:

- field devices running Windows Mobile version 5.0 software
- field devices running Windows Mobile 2003 software
- Windows 2000
- Windows XP Home, Professional, and Tablet PC Edition

## Installing the GeoBeacon Controller software

Before you install the software on a Windows Mobile-based device, you will need:

- A supported Windows Mobile-based device
- An office computer with Windows 2000 or XP operating system installed
- Microsoft ActiveSync® technology

You can install the GeoBeacon Controller software to a Windows Mobile-based device at the same time that you install it to an office computer, or you can install the software to the device later.

## Simultaneously installing to a computer and Windows Mobile-based device

To install the GeoBeacon Controller software to an office computer and a Windows Mobile-based device at the same time:

1. On your office computer, close all applications.
2. Use ActiveSync technology to connect to the device:
  - a. Install ActiveSync on your office computer.
  - b. Connect the device to the office computer.
  - c. Establish a connection using ActiveSync.
3. Insert the *GeoBeacon Receiver User Guide and Software CD* into the office computer. The *Trimble Setup* screen appears.
4. Click *Register*.

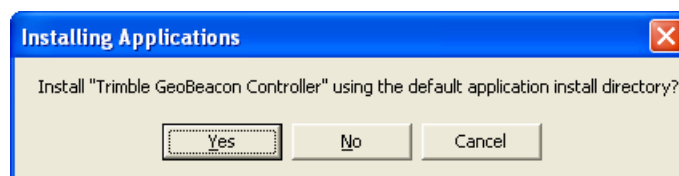
The Registration page opens in your default Web browser.

5. Follow the instructions on the screen to register. You will need to enter the serial number that is on the base of your GeoBeacon receiver.
6. Return to the *Trimble Setup* screen. Click *Install GeoBeacon Controller software*.
7. Follow the installation dialogs and enter appropriate details when necessary.

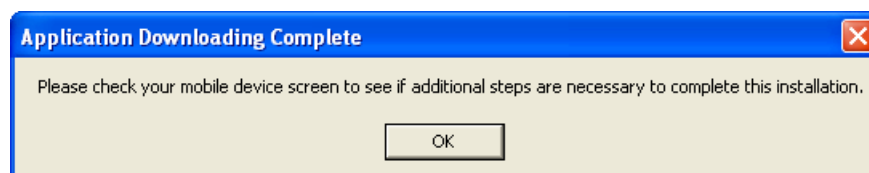
**Note** – *If you are installing the software to an office computer running the Windows 2000 operating system, you may be prompted to download “.Net Framework” version 1.1. Follow the prompts to download it from the Internet, or you can install it from the GeoBeacon Receiver User Guide and Software CD.*

The software is installed on your office computer. If you have a GeoExplorer 2005 series handheld connected to your office computer, the software is automatically installed on the handheld.

If you have a Windows Mobile 2003-based device connected to your computer, the following dialog appears:



8. Do one of the following:
  - To install the software to a GeoExplorer series or Trimble Recon<sup>®</sup> handheld, click **No** and then select the *Install to disk* option.
  - To install the software to a Windows Mobile 2003-based device that does not have a disk and only stores programs in RAM, click **Yes**.
9. A dialog appears, prompting you to check whether you need to follow any additional steps to complete the installation on the device:



### Installing to a Windows Mobile-based device only

To install the GeoBeacon Controller software to a Windows Mobile-based device *after* you have installed the software to an office computer:

1. Use ActiveSync technology to connect to the device.
  - a. Install ActiveSync on your office computer.
  - b. Connect the device to the office computer.
  - c. Establish a connection using ActiveSync.



2. In ActiveSync, select *Tools / Add / Remove Programs*.
3. Select GeoBeacon Controller.
  - a. To install the software to a GeoExplorer series or Trimble Recon handheld, ensure that the *Install program into the default installation folder* check box is not selected.
  - b. Click **OK**.
  - c. A dialog appears asking you to select the location for the software. From the *Save in* drop-down list, select Disk.
4. Click **OK**.

The software will now install to the Windows Mobile-based device.

## Using the GeoBeacon Controller software

To run the GeoBeacon Controller software:

1. Do one of the following:
  - On a Windows Mobile-based device, select *Start / Programs / GeoBeacon Controller*.
  - On an office computer, select *Start / Programs / Trimble / GeoBeacon / GeoBeacon Controller*.

The first time you run the GeoBeacon Controller software, it automatically attempts to connect to the GeoBeacon receiver using COM port 1 on your device. After that, it attempts to connect to the COM port that was last used. If a connection cannot be made, an error message appears. For more information, see [GeoBeacon Controller software connection issues, page 33](#).

2. If the *Connection* dialog appears, from the *Port* field, select an appropriate COM port to connect to. Click **Connect**.
3. When the connection succeeds for the first time, the *Primary Channel Status* screen appears.

Each time you subsequently open the GeoBeacon Controller software, it will open to the last status screen viewed.

Each screen in the GeoBeacon Controller software is described on the following page. For more information, refer to the *GeoBeacon Controller Software Help*.

## Status menu

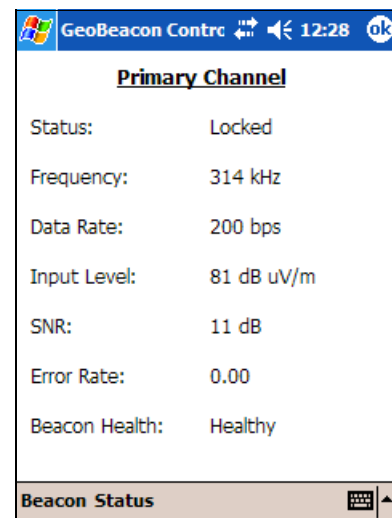
The Status menu provides access to the following screens:

- *Primary Channel and Secondary Channel status*

There are two channel status screens—one for the primary channel and one for the secondary. In these screens, you can view information such as the frequency, signal strength, error rate, and the health of the DGPS beacon that is being tracked.

- *Receiver Status*

In this screen, you can view information about which operating mode the receiver is currently in, the status of the Bluetooth radio, and the battery level of the receiver.



## Beacon menu

The Beacon menu provides access to the following screens:

- *Connection*

Allows you to connect and disconnect from the GeoBeacon receiver.

- *Settings*

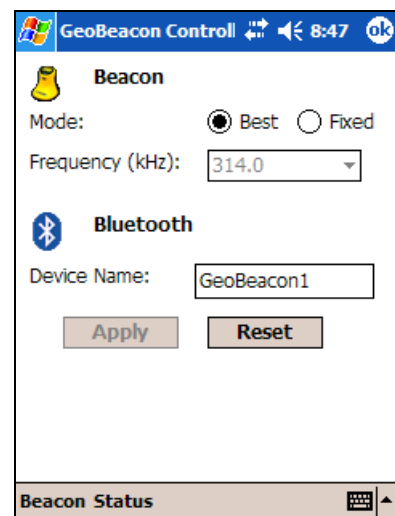
The screen is divided into two groups:

- *Beacon*

In this group, you can select the mode that you want the receiver to operate in (for more information, see [Beacon tracking modes, page 6](#)). If you select Fixed mode, you must choose the frequency of the DGPS beacon station from which you will be receiving signals.

- *Bluetooth*

If you are connected using a serial cable, you can change the name of the GeoBeacon receiver to make it easier to recognize the receiver when a device searches for it using Bluetooth wireless technology.



**Note** – Do not change the name in the Device Name field while you are connected to the receiver using Bluetooth wireless technology. If you do, the software ends the connection.

To accept any settings changes you have made, click or tap **Apply**.

To reset the search settings, click or tap **Reset**.

# Connecting to a GPS receiver

This section describes how to connect the GeoBeacon receiver to:

- a GeoExplorer series handheld
- a Recon handheld connected to a GPS Pathfinder Pro series receiver

To connect a GeoBeacon receiver to a field device or GPS receiver, do the following:

1. Establish a connection between the GeoBeacon receiver and the GPS receiver.
  - If you are using a cable connection, make sure the Bluetooth radio on both devices is turned off and then connect the cable to the two devices.
  - If you are using a Bluetooth connection, turn on the Bluetooth radio on both devices and establish a Bluetooth connection.
2. If you have not established a Bluetooth connection between the two devices before, you must set up the Bluetooth connection on the field device or GPS receiver (see [Setting up the Bluetooth connection](#) below).
3. Configure your GPS receiver to use the GeoBeacon receiver as its source of real-time DGPS corrections.

The following sections describe these steps in more detail.

## Connecting to a GPS receiver using Bluetooth wireless technology

Bluetooth wireless technology is an industry standard specification that eliminates the need for cables between Bluetooth-enabled mobile devices.


To communicate using a Bluetooth connection, the *client* device (for example, a GPS receiver) scans the Bluetooth radio frequency to discover other Bluetooth devices. Once it discovers a *host* (for example a GeoBeacon receiver), the client selects the service that it will use. A service defines what type of information can be transferred to or from the host, and how to transfer it.

### Setting up the Bluetooth connection

Before you can establish a Bluetooth connection between two devices that have not been connected before, you must set up the Bluetooth connection. You need to create a *bond* so that your GPS device can connect to the GeoBeacon receiver (this concept is also known as *pairing* or *creating a bonded device*).

*Note* – You only need to create this bond once. After that, the devices only need to have their radios turned on, and be within range of each other, to exchange information.

### Setting up the Bluetooth connection on a GeoExplorer series handheld

1. On the GeoExplorer series handheld, turn on the Bluetooth radio:
  - a. Tap  / *Settings* / *Connections* / *Bluetooth*.
  - b. In the *Mode* tab, tap the *On* option.
2. In the Bluetooth control, select the *Serial Ports* tab. In the *Client Serial Ports* group, tap *New*.

The handheld scans for available Bluetooth devices in range.
3. From the list of available Bluetooth devices, select your GeoBeacon receiver and tap **Next**. The Bluetooth device setup screen appears.

The next available COM port is assigned by default.
4. Clear the *Authentication* and *Encryption* check boxes so there is no check mark next to them. This means you will be able to create the bond without entering a password.
5. Click **Finish**.

The connection between your GeoExplorer series handheld and the GeoBeacon receiver has now been set up, and added to the list of Client Serial Ports.

To use this connection any time, turn on the Bluetooth radio in both devices.

For more information, refer to the *GeoExplorer Series Getting Started Guide*.

To use the data from the GeoBeacon receiver, you must configure your GPS field software to use the connection (see [page 21](#)).

### Setting up the Bluetooth connection when using a Recon handheld with a GPS Pathfinder Pro series receiver:

You can use a Recon handheld running Windows Mobile 2003 software to receive GPS data from a GPS Pathfinder Pro series receiver and real-time DGPS corrections from the GeoBeacon receiver using Bluetooth wireless technology.

As long as your Recon handheld supports multiple Bluetooth connections, you can set up a Bluetooth connection from the handheld to the GPS receiver, and another Bluetooth connection from the handheld to the GeoBeacon receiver.



**Tip** – If your handheld has a Socket flash card driver that does not support two Bluetooth connections, you may be able to download the latest Socket flash card driver from the Socket website. Go to [www.socketcom.com/support](http://www.socketcom.com/support), click the *Software/Drivers* link and then from the *Bluetooth* list select *CF Connection Kit*.

**Note** – *If your handheld does not support multiple Bluetooth connections, connect the GeoBeacon receiver to the GPS Pathfinder Pro series receiver using a cable (see [page 20](#)).*

**To set up the Bluetooth connection to the GeoBeacon receiver:**

1. Form a Bluetooth connection between the GPS Pathfinder ProXH™ or ProXT™ receiver and the handheld. For more information, refer to the *GPS Pathfinder Pro Series User Guide*.
2. Use the Bluetooth connection software running on your handheld to scan and connect to a second client/outgoing port.
3. To bypass requests for a passkey, turn off any authentication/secure connections.

The blue LEDs on the GPS receiver and the GeoBeacon receiver begin long-flashing, indicating the Bluetooth connection is active. To use the data from the GeoBeacon receiver, you must configure your GPS field software to use the connection (see [page 21](#)).



Figure 4 Using a Recon handheld that supports multiple Bluetooth serial ports to connect to a GPS receiver and the GeoBeacon receiver

## Connecting to the GPS receiver using a cable

If you are not able to or do not want to use a Bluetooth connection, you can connect the GeoBeacon receiver to a GPS receiver using the null modem cable supplied with the GeoBeacon receiver.

**Note** – You cannot operate the radio over a cabled connection and use Bluetooth wireless technology at the same time. Turn off the radio before connecting the cable to the GeoBeacon receiver.

### To connect to a GeoExplorer series handheld using a cable:

1. Turn off the GeoBeacon receiver's Bluetooth radio (see [page 5](#)).
2. Attach the correct serial clip to the handheld. The GeoExplorer 2005 series handheld uses P/N 53550-00, and the GeoExplorer series handheld uses P/N 46509-00.
3. Plug the null modem cable (P/N 18532) supplied with the GeoBeacon receiver into the serial port of the GeoBeacon receiver.
4. Connect the other end of the cable to the GeoExplorer series handheld.



For more information, refer to the *GeoExplorer Series Getting Started Guide*.

### To connect to a GPS Pathfinder Pro series receiver using a cable:

1. Turn off the GeoBeacon receiver's Bluetooth radio (see [page 5](#)).
2. Using the splitter cable (P/N 55443-00) provided with the ProXH or ProXT receiver, connect the *To Receiver* end of the cable to the GPS receiver.
3. Connect one end of the null modem cable (P/N 18352) provided with the GeoBeacon receiver to the *Data In* port of the splitter cable, and the other end of the null modem cable to the serial port on the GeoBeacon receiver.



**Tip** – If you want to use a Bluetooth connection between the GPS Pathfinder Pro series receiver and the field device running the data collection software, you can connect the GeoBeacon receiver to the GPS receiver using only the null modem cable.

For more information, refer to the *GPS Pathfinder Pro Series User Guide*.

## Configuring the GPS data collection software

Once you have connected the GeoBeacon receiver to the GPS receiver, you must configure the GPS receiver to use real-time corrections received by the GeoBeacon receiver using your Trimble GPS field software. This software also enables you to view status information about the GPS receiver, GeoBeacon receiver, GPS satellites, and real-time correction sources.

The GeoBeacon receiver is fully compatible with the following versions of Trimble GPS field software:


- version 2.03 and later of the GPS Controller software
- version 2.52 and later of the TerraSync software
- version 1.11 and later of the Trimble GPSCorrect extension for ESRI ArcPad software
- version 1.20 and later of the Trimble GPS Analyst extension for ESRI ArcGIS software

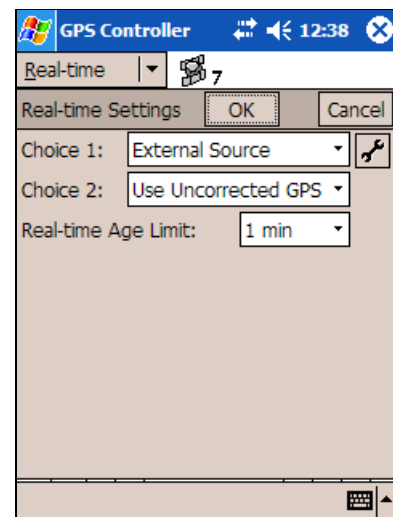
You can use earlier versions of these software products to receive corrections from the GeoBeacon receiver, but status information for the receiver will not be available.


The GPS Controller software duplicates the GPS configuration, status, and planning features of the TerraSync software and the GPSCorrect extension. If you have either of these applications installed on your field device, you do not need to use or install the GPS Controller software.

**Note** – This section assumes you are using the GPS Controller software.

To set up the GeoBeacon receiver as the source of real-time DGPS corrections for a GeoExplorer series handheld:

1. Run the GPS Controller software and then select the *Setup* section.
2. Tap **Real-time settings**. The *Real-time Settings* form appears.
3. In the *Choice 1* field, select External Source.
4. Tap the Setup button  that appears beside the *Choice 1* field. The *External Source Settings* form appears.
5. From the *Connection Method* drop-down list, select Serial Port.





6. From the *Port* drop-down list, select the Port that will receive the corrections:
  - If you are using a Bluetooth connection, select the COM port that was assigned in the Bluetooth Manager.
  - If you are using a cabled connection, select COM1. Tap the Setup button  beside the *Port* field. From the *Port Configuration* drop-down list, select Cabled GeoBeacon and then tap **OK** to return to the *External Source Settings* form.

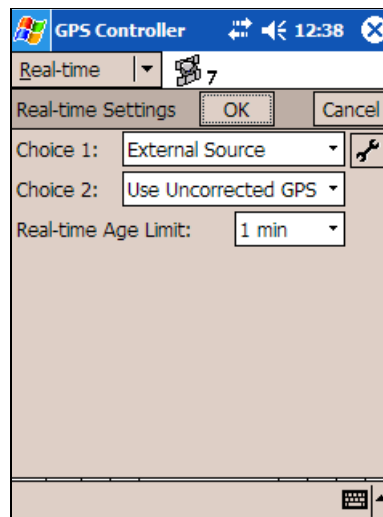
**Note** – If you are using an earlier version than the recommended versions of Trimble GPS field software, the Cabled GeoBeacon option is not available. From the *Port Configuration* drop-down list, select *Custom* and configure a baud rate of 4800, with 8 data bits, 1 stop bit, and no parity.

7. To close the *Real-time Settings* form, tap **OK**.

For more information, refer to the *GPS Controller Software Help* provided with your copy of the software.

#### To set up the GeoBeacon receiver as the source of real-time DGPS corrections for a GPS Pathfinder Pro series receiver:

1. Run the GPS Controller software and then select the *Setup* section.
2. Tap **Real-time settings**. The *Real-time Settings* form appears.
3. In the *Choice 1* field, select External Source.
4. Tap the Setup button  that appears beside the *Choice 1* field. The *External Source Settings* form appears.
5. If you have connected the GeoBeacon receiver to the Recon handheld (using either a Bluetooth connection or the null modem cable):
  - a. From the *Connection Method* drop-down list, select *Serial Port*.
  - b. From the *Port* list, select the COM port that the GeoBeacon receiver is connected to.
6. If you have connected the GeoBeacon receiver to the GPS Pathfinder Pro series receiver (using either the splitter cable or the null modem cable):
  - a. From the *Connection Method* drop-down list, select *Receiver Port*.
  - b. Click or tap the Setup button  that appears beside the *Connection Method* field.





- c. From the *Port* drop-down list, select the Port that will receive the corrections:
  - If you are using the splitter cable **and** the null modem cable to connect the receivers, select Port 2 (Splitter). From the *Port Configuration* drop-down list, select Cabled GeoBeacon.
  - If you are using the null modem cable to connect the receivers (with a Bluetooth connection to a handheld), select Port 1 (Serial Port). From the *Port Configuration* drop-down list, select Cabled GeoBeacon.

**Note** – *If you are using an earlier version than the recommended versions of Trimble GPS field software, the Cabled GeoBeacon option is not available. From the Port Configuration drop-down list, select Custom and configure a baud rate of 4800, with 8 data bits, 1 stop bit, and no parity.*

- 7. To return to the *External Source Settings* form, click or tap **OK**.
- 8. To close the *Real-time Settings* form, click or tap **OK**.

For more information, refer to the *GPS Controller Software Help* provided with your copy of the software.

# Mounting the GeoBeacon Receiver

The receiver has an accessory interface that enables you to mount the receiver on a range of equipment, and easily change between them.

The receiver can be:

- worn on a belt, using the belt pouch provided with the receiver
- carried in a backpack
- mounted on the side of a range pole, with a Hurricane or Zephyr™ antenna or a GPS Pathfinder Pro series receiver on top of the pole

To ensure that you get effective reception from the beacon signals, always make sure that you mount or carry the receiver upright so that the internal antenna is horizontal.

When you wear the receiver on a belt, ensure that the LEDs are always visible so that you can easily check the status of the GeoBeacon receiver.

## Using the receiver in a backpack

If required, the GeoBeacon receiver can be carried in a backpack. However, the receiver **must not** be shielded by metal objects or touch other GPS equipment, and there must be **at least** 30 cm (11.8 inches) between the GPS equipment to avoid signal interference.

## Mounting the receiver on a range pole

If required, the GeoBeacon receiver can be mounted on the side of a range pole. To do this:

1. Fix the range pole bracket (P/N 55710-00) to the side of the range pole.
2. Slide the base of the accessory interface into the range pole bracket.
3. If you are using the GeoBeacon receiver with another device on the range pole, ensure that there is **at least** 30 cm (11.8 inches) between the two devices to avoid signal interference (see [Figure 5](#)).

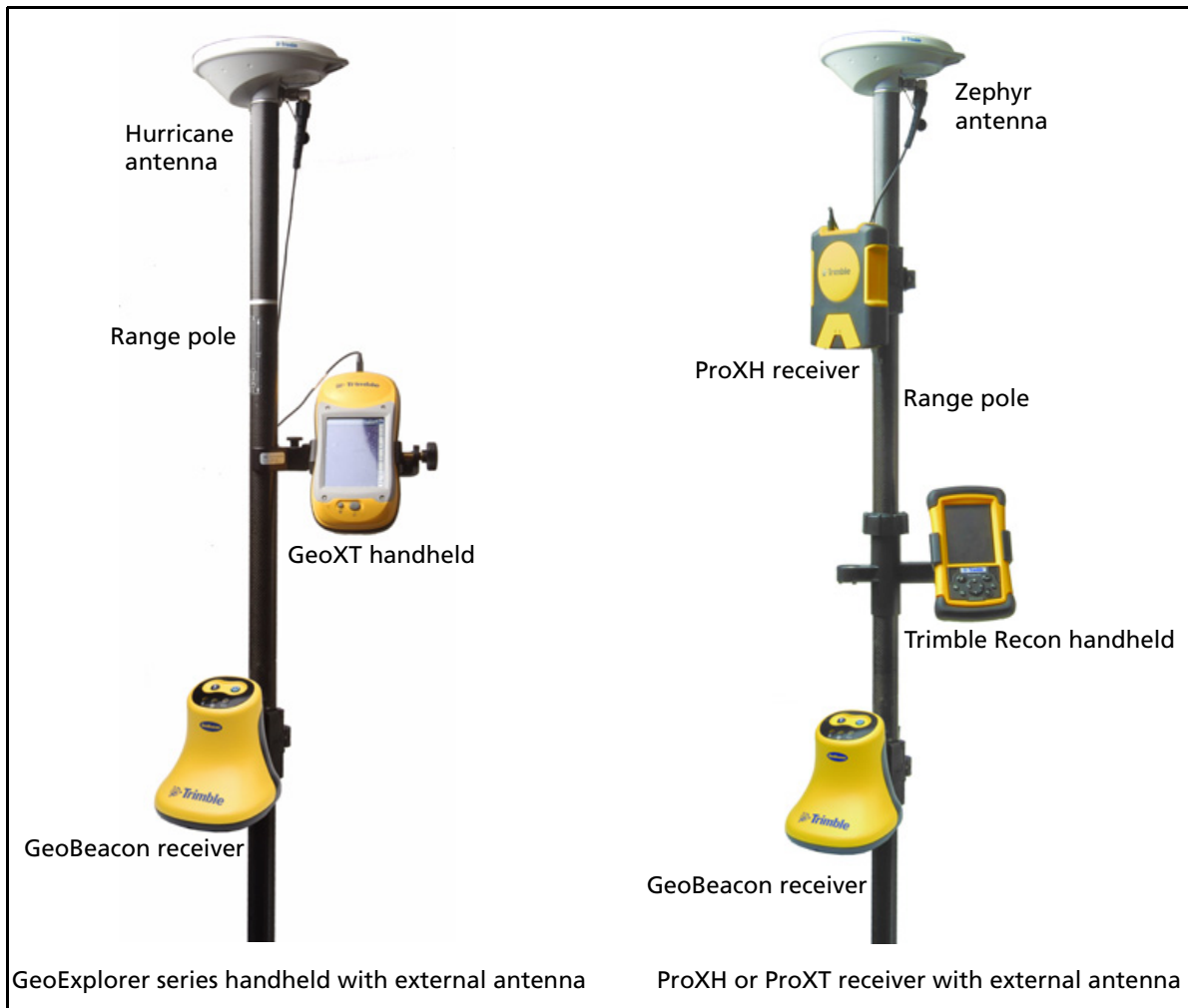


Figure 5 GeoBeacon receiver, GPS receiver, and external antenna mounted on a range pole

# Understanding Differential GPS

GPS measurements contain inaccuracies. However, a technique called Differential GPS (DGPS) can be used to correct the effects of errors caused by the ionosphere and troposphere, and GPS system errors. For example, through DGPS, ionosphere errors can be reduced from 5.0 meters to 0.4 meters.

The GeoBeacon receiver gets DGPS corrections from a DGPS beacon and delivers the corrections to compatible DGPS receivers. There are two types of DGPS—postprocessed and real-time. The GeoBeacon receiver outputs real-time DGPS corrections for immediate results.

For a review of GPS, complete the All About GPS tutorial at [www.trimble.com/gps/index.html](http://www.trimble.com/gps/index.html).

## Worldwide DGPS beacon coverage

Beacons originated as a way to provide DGPS accuracy for maritime navigation and are typically concentrated around coastal areas or navigable inland waterways. They are often administered by Coast Guards or similar authorities. As the benefits of beacons for land-based applications has become increasingly recognized, networks are constantly expanding to cover greater land areas. In the United States, the beacon network is being expanded with the aim of providing seamless coast-to-coast coverage.

Radiobeacon stations transmit low frequency ground wave signals (283.5-325 KHz) free to air. The advantage of using DGPS beacons is that line of sight is not required between the GeoBeacon receiver and the DGPS beacons (in contrast to SBAS signals that do require line of sight). This means that you can work under canopy, in mountains or hilly terrain, and in urban canyons without losing DGPS signals.

Coverage of DGPS beacons now continues to expand throughout the world. To determine DGPS coverage in your area, check with your local IALA authority or go to <http://site.ialathree.org/index.html>.

For a list of DGPS beacons, go to [www.trimble.com/findbeacon.asp](http://www.trimble.com/findbeacon.asp).

## Errors in GPS

Errors in GPS come from a variety of sources, described in the following table:

| Error source                                      | Description  |
|---|--|
| Atmosphere-induced errors                         | The distance calculations assume that the GPS signal travels at a constant speed (the speed of light). However, the speed of light is constant only in a vacuum. Once the GPS signal enters the ionosphere (a band of charged particles 80 to 120 miles above the surface of the earth) and the troposphere (our weather), the signal slows down, which results in incorrect distance calculations.  |
| Atomic clock and satellite orbit errors           | These errors can occur, but are usually very minor. The U.S. Department of Defense adjusts for these errors from the GPS monitor stations.   |
| Multipath error                                   | Multipath occurs when the signal is reflected off other objects at or near the earth's surface and can introduce errors into a GPS position.<br><br>Examples of multipath sources are trees, buildings, and bodies of water. DGPS cannot correct multipath because it occurs at the receiver.  |
| Receiver error                                    | GPS receivers can introduce their own errors in the range measurement. The errors are usually from slightly inaccurate internal clocks or electrical interference.<br><br>DGPS cannot correct these types of errors.   |
| Out-of-date ephemeris (or satellite orbital) data | The GPS satellites are constantly transmitting ephemeris data. Receivers maintain an almanac of this data for all satellites and they update these almanacs as new data comes in.  |
| Geometry errors                                   | Relative angles of satellites in the sky can magnify or lessen other GPS errors. The wider the angle between satellites, the better the measurement.<br><br>Position Dilution of Precision (PDOP) is a unitless measure of the current satellite geometry. When satellites are spread around the sky, the PDOP value is low, which means that the computed GPS position are more accurate. When the satellites are grouped closely together, the PDOP value is high, and the computed position is less accurate.<br><br>If a PDOP value exceeds the mask that you set in your datalogger software, the software stops logging positions. |

## How differential GPS removes GPS errors

Differential GPS involves two GPS receivers. One receiver is stationary (the base station) and is put on a known location. It calculates its position from the GPS satellite data and then compares the answer with its known position. It broadcasts, through a radio link, the correction for each satellite as it receives the data. The correction is sent to the rover receiver, and applied to the position that the rover receiver is calculating. As a result, the position that the datalogger displays and logs to a data file is a differentially corrected position.

Differential GPS can eliminate errors that are common to both the reference receiver and the roving receiver. It cannot correct errors that occur only at the DGPS base station or the rover receiver. Because GPS errors are constantly changing, the base station continuously monitors the errors and sends corrections to the rover receiver.

### Components of a real-time differential GPS beacon system

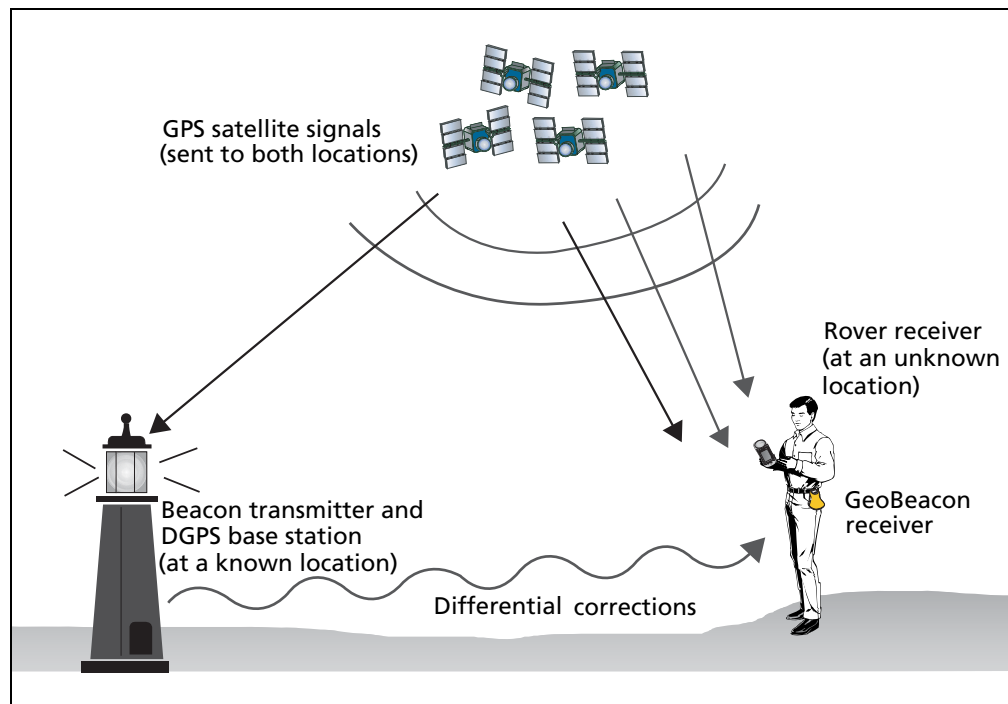


Figure 7 The three components of a real-time DGPS beacon system

A real-time DGPS beacon system requires the following components:

- DGPS beacon network

The DGPS beacon network is made up of a number of beacon transmitters situated around the world in broadcast sites. A broadcast site transmits free-to-air correction data in the low frequency 283.5 to 325 kHz band.

The IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities) has established a standard for broadcasting DGPS corrections over existing radio-beacons using a technique called Minimum Shift Keying (MSK) modulation.

- DGPS base station

Also called a *reference* station. A receiver (and antenna) that is set up at a precisely known stationary location. The DGPS base station calculates pseudorange corrections in the RTCM SC-104 (Radio Technical Commission for Maritime Services) format. For more information on RTCM standards, go to the RTCM website ([www.rtcn.org/default.php](http://www.rtcn.org/default.php)).

- Rover receiver

The rover comprises two receivers linked together:

- The GeoBeacon receiver
- A GPS receiver (such as a GPS Pathfinder Pro series receiver)

The GeoBeacon receives RTCM corrections from the DGPS base station and transfers the corrections through Bluetooth wireless technology to the GPS receiver.

## Errors in real-time differential GPS

The effectiveness of DGPS techniques is limited by several factors, described below.

### RTCM message frequency

The frequency at which the RTCM messages containing the DGPS corrections are output from the GPS base station can affect accuracy. The base station cannot wait too long to send the corrections to the rover receiver because if it does the corrections will no longer be accurate. This delay period is also referred to as *latency*.

Most beacon stations transmit corrections every five seconds.

### The number of RTCM messages

Corrections come in either a single RTCM Type 1 message or several RTCM Type 9 messages. These messages are similar in content, but depending on the rate of output and the strength of the signals output from the DGPS base station, can affect the accuracy of positions that the rover records:

- RTCM Type 1 messages are the primary message type that provide the pseudorange and range rate corrections. Type 1 messages contain every correction for each of the satellites in view by the base station. The length of the message depends on the number of satellites tracked by the base station. With Type 1 messages, the receiver has to wait until it receives the information for all satellites before it can correct a particular position (greater latency).

- RTCM Type 9 messages also contain the same corrections. However, the messages do not require a complete satellite set to be transmitted at once. Type 9 messages group corrections together in smaller groups until all the corrections are sent. DGPS corrections from partial Type 9 messages can be applied as soon as they are received. This further reduces the effects of message latency. With Type 9 messages, the receiver can use the information as soon as the first message group arrives (less latency).

Between RTCM correction messages, the GPS receiver continues to apply the corrections from the most recent RTCM message. The longer it takes to get new correction information, the less effective the correction will be. The GeoBeacon receiver must also maintain reception with the DGPS base station. If it loses contact, the GPS receiver stops computing positions or computes positions with non-DGPS accuracy. The action that the GeoBeacon receiver takes, depends on the positioning mode that you configure in the controlling software. By default, the GeoBeacon receiver applies corrections from RTCM correction messages that are less than 60 seconds old. The RTCM age limit is set in the GPS receiver.

### **Distance from the DGPS beacon station**

The further away the GeoBeacon receiver is from the DGPS beacon station, the longer the baseline length. This can affect the accuracy of GPS positions depending on the strength of the signal from the DGPS base station.

When using real-time DGPS, the DGPS base station broadcasts the correction values to the rovers within coverage range. The positions calculated when using the GeoBeacon receiver with a GPS Pathfinder Pro series receiver or a GeoExplorer series handheld are of submeter accuracy + 1 ppm.



# Caring for and Storing the GeoBeacon Receiver

To maintain and care for the receiver, close the covers over the serial and power ports when not in use. This keeps the outer surface and the ports free of dirt and dust.

To clean the receiver, use a dampened or dry soft clean cloth to wipe the unit.

If you are not going to use the receiver for one month or more, fully charge the receiver battery and then switch it off. To use the receiver after storage, fully recharge the internal battery (see [page 10](#)) for eight hours before use.

# Troubleshooting

Use this section to identify and solve common problems that may occur with the GeoBeacon receiver. Please read this section before you contact technical support.

## Bluetooth connection issues

| Problem  | Cause   | Solution   |
|--|---|--|
| Bluetooth wireless technology is not operating.  | You are using a cabled connection to other equipment. You cannot operate the radio over a cabled connection and use Bluetooth wireless technology at the same time. | Disconnect the cable from the GeoBeacon receiver.  |
|  | You are working in a country where type approval for Bluetooth-enabled GeoBeacon receivers has not been granted.  | Use a cable to connect the GeoBeacon receiver to your GPS device.  |
|  | Bluetooth wireless technology may have been deactivated for security reasons.   | <ul style="list-style-type: none"> <li>• Contact the person who set up the GeoBeacon receiver for you, or use a cable to connect the GeoBeacon receiver to your GPS device.</li> <li>• Reactivate the radio (see <a href="#">page 6</a>).</li> </ul>                                     |
|  | Bluetooth wireless technology is not enabled on one or both devices.  | Make sure that the Bluetooth radio is turned on, on both the receiver (see <a href="#">page 5</a> ) and the other Bluetooth device.  |
|  | The Bluetooth radio has lost the connection.  | Turn off the Bluetooth radio on both the receiver and the other device, and then turn on the Bluetooth radio on both devices (see <a href="#">page 5</a> ).  |
| The receiver cannot be discovered by a device that uses Bluetooth wireless technology. | Bluetooth wireless technology is not activated.   | <ul style="list-style-type: none"> <li>• Contact the person who set up the GeoBeacon receiver for you, or use a cable to connect the GeoBeacon receiver to your GPS device.</li> <li>• Reactivate the radio (see <a href="#">page 6</a>).</li> </ul>                                     |
| Bluetooth connection fails while in use.   | The receiver is out of range.   | Move the two devices closer to each other. The devices should reconnect automatically. If they do not, on the GPS device, select the Bluetooth device in the <i>Bonded Devices</i> tab. Tap and hold the device name and select <i>Delete</i> . Tap <b>New</b> to rediscover the device. |

## Cable connection issues

| Problem  | Cause   | Solution  |
|--|---|---|
| The GeoBeacon receiver cannot connect to a GPS receiver or field device. | The Bluetooth radio is turned on. You cannot operate the radio over a cabled connection and use Bluetooth wireless technology at the same time. | Turn off the Bluetooth radio before connecting the cable to the GeoBeacon receiver.   |
|  | The serial port settings are not correctly configured.  | Set the RTCM input source correctly in the GPS data collection software. The GeoBeacon receiver communicates at a baud rate of 4800, with 8 data bits, 1 stop bit, and no parity. |
|  | The cable is faulty.  | Check your cabling and connections.   |

## GeoBeacon Controller software connection issues

| Problem   | Cause  | Solution  |
|---|--|---|
| The GeoBeacon Controller software cannot connect to the receiver. | The GeoBeacon receiver is not set up correctly for the connection.                 | <ul style="list-style-type: none"> <li>• Check that the GeoBeacon receiver is turned on.</li> <li>• Check that the Bluetooth radio is turned on, or that the cable is connected.</li> </ul>   |
|   | The connection is not configured correctly.  | <ul style="list-style-type: none"> <li>• Check that the correct COM port is configured (refer to the GeoBeacon Controller Software Help).</li> </ul>  |
|   | The connection is lost between the GeoBeacon Controller software and the receiver. | <ul style="list-style-type: none"> <li>• Do not change the name in the <i>Device Name</i> field of the GeoBeacon Controller software while you are connected to the receiver using Bluetooth wireless technology. If you do, the software will end the connection.</li> <li>• When changing the name in the <i>Device Name</i> field while you are connected using the serial port, use upper case or lower case characters and numbers only. No special characters are supported.</li> </ul> |

## Power issues

| Problem                                  | Cause                         | Solution   |
|--|-------------------------------|--|
| The GeoBeacon receiver does not turn on. | The internal battery is flat. | <ul style="list-style-type: none"> <li>• Recharge the internal battery (see <a href="#">page 10</a>).</li> <li>• Use the portable external power kit (see <a href="#">page 11</a>).</li> </ul> |

## Real-time correction issues

| Problem  | Cause  | Solution   |
|--|--|--|
| The GeoBeacon receiver is not receiving real-time corrections.   | The receiver is not turned on.   | Turn on the receiver (see <a href="#">page 5</a> ).  |
|  | You are outside the beacon coverage area.  | Find a beacon in the area where you are working (see <a href="#">page 26</a> ).  |
|  | There is an interference source <sup>1</sup> disrupting the beacon signal.   | Remove or move away from the interference source.  |
|  | The GeoBeacon receiver is not connected to the COM port correctly.   | In the Real-time section in the GPS Controller, TerraSync, or GPScorrect software, select the serial (COM) or Bluetooth (BSP) port that the GeoBeacon receiver is connected to.<br><br>If you are using a GeoExplorer series handheld running a non-Trimble application, use GPS Connector to create a connection between the COM or BSP port and the integrated GPS receiver's real-time COM port (COM4). |
| The GeoBeacon receiver does not get real-time corrections when in Fixed mode.  | The receiver has been set to track a specific beacon station that has a weak signal. This may be because you have moved to the edge of the beacon coverage, or because local conditions for beacon reception are poor. | Switch to Best mode (see <a href="#">page 6</a> ) where the receiver will search for the best signal. Once it has locked onto a station, switch back to Fixed mode. The receiver maintains its lock on the new station.  |
| The GeoBeacon receiver will not track just one beacon station in Best mode (that is, there is excessive switching between beacon stations in Best mode). | You are in an area where equally good signals are available from more than one beacon station.   | Switch to Fixed mode: use a short press of the beacon button to select the beacon station you wish to use (see <a href="#">page 8</a> ).   |

<sup>1</sup>Interference can come from a number of sources and can affect either beacon signal reception by the GeoBeacon receiver, or the Bluetooth connection between the GeoBeacon receiver and another device. GPS receivers, cell phone towers, electric motors, car engines, or another beacon receiver are all potential sources of interference. To avoid interference, there must be at least 30 cm (11.8 inches) between a GeoBeacon receiver and other GPS equipment.



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