

GeoExplorer CE Series

Frequently Asked Questions and Answers

Product Introduction

What is the GeoExplorer CE series?

The GeoExplorer® CE series is a range of GPS handhelds from Trimble that are powered by the Microsoft® Windows® CE operating system. These handhelds integrate the power of the Windows CE .NET operating system, high-performance Trimble GPS with integrated WAAS/EGNOS, and Bluetooth® wireless technology—all in a rugged, portable handheld.

The GeoExplorer CE series consists of the **GeoXM™** for mobile GIS and the **GeoXT™** for GIS data collection and data maintenance. The series represents a breakthrough in GPS handheld technology that offers GIS professionals and mobile GIS users the ultimate platform for their requirements.

For detailed specifications please visit www.trimble.com/geoexplorerce.html.

What are the major differences between the GeoXT and GeoXM?

The **GeoXM** provides 2–5 meter accuracy required for mobile GIS applications, it integrates reliable, real-time corrected GPS into your mobile GIS application, so you can re-locate assets with confidence and fulfill work orders efficiently.

The **GeoXT** provides submeter accuracy required for professional GPS/GIS data collection and data maintenance, and EVEREST™ multipath rejection technology for tough GPS environments. It's ideal for working under canopy, in urban canyons, or anywhere you need high-accuracy data collection and maintenance.

The GIS and GPS relationship

What is mobile GIS?

Mobile GIS integrates GPS technology, portable hardware platforms, and GIS software. It provides field inspectors, maintenance teams, utility crews, emergency repair workers, and many other field workers timely access to enterprise GIS data while they are in the field. To facilitate the flow of information to and from the field, mobile GIS solutions leverage advances in wireless technology and the Internet. With mobile GIS, data is directly accessible to field-based personnel whenever and wherever it is needed.



What is data collection?

Data collection is the process of collecting position and attribute information about real-world features for inclusion in a GIS or spatial database. Features can be any of the following:

- Points (such as trees, poles, or sample sites)
- Lines (such as roads, streams, or power lines)
- Areas (such as fields, lakes, or wetlands)

A GPS data collection system collects GPS positions for each feature while the user enters its attributes (information about the feature such as height, condition, and material) into the field device.

What is data maintenance?

Data maintenance is the process of keeping spatial data current. This includes both position and attribute information. A GPS data maintenance system allows you to maintain spatial data from a variety of sources regardless of whether they were originally collected with GPS. In-field data maintenance includes the following tasks:

- Relocating existing features (navigation)
- Verifying the position and attributes of existing features
- Modifying the position and attributes of existing features as necessary
- Collecting previously unrecorded features

Field Software Details

What is Windows CE?

Windows CE is the Microsoft operating system for mobile devices. It supports a wide range of communication options so you can be mobile and still have access to your enterprise data, e-mail and the Internet. The GeoExplorer CE series uses embedded Windows CE .NET version 4.2, so you can choose the software that meets your field requirements.

What software is available for my field requirements?

A range of software is available for the GeoExplorer CE series including:

- Trimble's TerraSync™ software, for powerful data collection and data maintenance. Use the TerraSync software to populate and update your GIS with quality data and ensure accurate and up-to-date information for decision-making. To find out more, visit www.trimble.com/terrasync.html.
- ESRI® ArcPad™ with GPSCorrect™, to ensure high quality position data for ESRI mobile GIS applications. Trimble's GPSCorrect extension provides full GPS data control within ArcPad, and also collects data for postprocessing. To find out more, visit www.trimble.com/gpscorrect.html.



- Custom software developed with the GPS Pathfinder® Tools version Software Development Kit (SDK), to meet your organization's unique requirements. To find out more about how Trimble's GPS Pathfinder Tools SDK makes it easy to add GPS capabilities to your field software, visit www.trimble.com/pathfindertools.html.
- GPS data collection applications using the industry-standard NMEA protocol designed for Windows CE. NET version 4.2 devices with StrongARM processors. Software applications are available for a wide variety of industry-specific needs. For more information on the NMEA standard, visit www.nmea.org/pub/index.html
- Software designed for Windows CE. NET version 4.2 devices with StrongARM processors that support your field data requirements.

What software is standard on the GeoExplorer CE series?

- GPS Controller and GPS Connector for full GPS control, comprehensive status information, and in-field mission planning.
- Bluetooth Manager for configuration and control of Bluetooth connections
- Microsoft Internet Explorer and Inbox for Web browsing and e-mail.
- Microsoft File Viewers for viewing Excel, PDF, PowerPoint, Word & Image files.
- Transcriber handwriting recognition software.
- Microsoft Windows Explorer, Terminal, Calculator, and WordPad for day-to-day tasks.
- Voice Recorder for recording and playing back voice files.

GPS Accuracy

What is differential correction?

Differential correction removes many of the errors in GPS data to improve accuracy. This is done by comparing GPS data collected on a field device (the rover) with data collected simultaneously at a known location (the base). Because the base data is collected at a known location, any errors can be measured, and the necessary corrections can then be applied to the rover data.

What differential correction techniques are offered by the GeoExplorer CE series?

The GeoExplorer CE series has two main correction techniques:

- **Real-time correction**—corrections are transmitted from a base GPS receiver to the roving GeoExplorer CE series handheld, and are applied to the GPS positions as they are generated. This has the benefit of giving accurate positions while you are in the field, and is excellent for navigating and relocating GIS data features in the real world.



- **Postprocessing**—corrections are recorded at the base GPS receiver and applied to the positions recorded by the roving GeoExplorer CE series handheld using office software. This is a good technique when you need the best possible accuracy for your GIS but you don't require real-time accuracy for navigation.

Trimble's field and office software solutions make it easy for you to postprocess GPS data collected in real time, giving you the best of both worlds.

What office software is available for my GPS data postprocessing requirements?

There are two options for processing GPS data collected with a GeoExplorer CE series handheld:

- **GPS Pathfinder Office software.** The GPS Pathfinder Office software adds value to your GIS data collection and data maintenance projects by enabling you to plan your data collection session before you go into the field—making field work more productive. In addition, you can differentially correct your data from a number of sources and review your data in map form before transferring it to your GIS. For more information, visit www.trimble.com/pathfinderoffice.html.
- **GPS Pathfinder Express on-line data processing service.** To submit your GIS data to this service, simply e-mail the data from the field, or upload it on the GPS Pathfinder Express website. The service processes your data using your preferred options, and returns it to you in your choice of common GIS format. For more information, visit www.trimble.com/pathfinderexpress.html.

What real-time options are offered by the GeoExplorer CE series?

The GeoExplorer CE series offers the following options for real-time differential correction:

- Free corrections from WAAS satellites within the USA, received with the integrated WAAS/EGNOS receiver (standard)
- Free corrections from EGNOS satellites within Europe, received with the integrated WAAS/EGNOS receiver (standard)
- Free RTCM corrections from differential GPS radio beacons, received with the BoB™ (Beacon-on-a-Belt) differential correction receiver (purchased separately)
- RTCM corrections from a differential GPS radio transmitter, received with a DGPS radio (purchased separately)
- RTCM corrections from an Internet or dial-up service received via a cell phone, such as Virtual Reference Station (VRS)

What are the accuracy specifications of the GeoExplorer CE series?

- The **GeoXM** GPS Windows CE handheld provides 2–5 meter accuracy.
- The **GeoXT** GPS Windows CE handheld provides submeter accuracy. It uses built-in EVEREST multipath rejection technology to eliminate multipath signals in difficult GPS environments.



What is WAAS?

The Wide Area Augmentation System (WAAS) was created by the Federal Aviation Administration (FAA) as a free-to-air differential correction service for the aviation industry. The system augments GPS with additional signals that increase the reliability, integrity, precision, and availability of GPS signals. For more information, refer to the Wide Area Augmentation System (WAAS) FAQ at www.trimble.com/geoxt.html.

What is EGNOS?

The European Geostationary Navigation Overlay System (EGNOS) is a joint project of the European Space Agency (ESA), the European Commission (EC) and Eurocontrol, the European Organization for the Safety of Air Navigation. EGNOS is the European equivalent of WAAS in the USA and provides a free-to-air differential correction service to increase the reliability, integrity, precision, and availability of GPS signals.

What is EVEREST multipath rejection technology?

Trimble's EVEREST multipath rejection technology provides a high-accuracy solution for code-based mapping. EVEREST rejects random errors in GPS measurements caused by multipath¹ before they are stored. This results in more accurate better quality data.

What protocols are supported?

The GeoExplorer CE series supports the NMEA and TSIP GPS data communication protocols.

What is NMEA?

NMEA is an open industry standard established by the National Marine Electronics Association (NMEA). The NMEA standard defines a format for communicating data collected or computed by a GPS receiver to an external device. The standard NMEA message types output by GeoExplorer CE series handhelds are GGA, VTG, GLL, GSA, ZDA, GSV, and RMC. For more information on the NMEA standard, visit www.nmea.org/pub/index.html.

What is TSIP?

The Trimble Standard Interface Protocol (TSIP) allows you to control a GPS receiver and set GPS configuration parameters. For receivers with appropriate capabilities, TSIP can be used to control beacon and satellite DGPS parameters and external sensor configurations.

Hardware Specifications

How rugged is the GeoExplorer CE series handheld?

The GeoExplorer CE series handheld operates from -10°C (14°F) to $+50^{\circ}\text{C}$ (122°F). It is dustproof, shock and vibration resistant, and will endure wind-driven rain.

¹ Multipath occurs when a GPS signal is reflected off another surface (such as a tree or building) before being measured by the GPS receiver. For more information, refer to the EVEREST multipath rejection technology white paper at www.trimble.com/geoxt.html.



What display does the GeoExplorer CE series handheld have?

The GeoExplorer CE series handheld has a new advanced ¼ VGA, full-color, TFT, outdoor display for visibility in direct sunlight and overcast conditions. The screen's high resolution allows background GIS data and imagery to be clearly displayed. The display has a multistage backlight so you can use it at night.

What are the battery specifications?

The GeoExplorer CE series handheld has an internal lithium-ion battery that will last up to 10 hours with GPS operating. The battery does not have to be removed from the handheld for recharging. Data is always preserved on the internal disk memory regardless of battery status.

What options are there for communicating with a PC?

The GeoExplorer CE series can connect to a PC using the following connection methods:

- USB support module for fast exchange of data and installation of software
- Bluetooth wireless technology for cable-free synchronization and file transfer with a Bluetooth-enabled PC
- For RS-232 connections to PCs without USB support using the optional serial clip

What options are there for communicating with other devices?

The GeoExplorer CE series can connect to various other devices using the following connection methods:

- using Bluetooth wireless technology for wireless connectivity
- via the RS-232 Serial Port

What devices can a GeoExplorer CE series handheld connect to using Bluetooth?

- Cell phones and modems for connection to e-mail and the Internet
- Cameras for the addition of digital imagery to your GIS
- Another GeoExplorer CE series handheld or Bluetooth-enabled PDA for sharing data

What devices can a GeoExplorer CE series handheld connect to using via the RS-232 Serial Port?

- Cell phones and modems for connection to e-mail and the Internet
- Laser rangefinders for supplementing GPS positions with offset or attribute measurements
- BoB (Beacon-on-a-Belt) receiver or DGPS radio for input of real-time corrections



What is Bluetooth?

Bluetooth wireless technology is an industry standard specification for short range wireless connectivity. As a short-range radio link, Bluetooth replaces cable connections between devices.

Where can Bluetooth be used?

Bluetooth operates on an unlicensed frequency (2.4 GHz), however some countries require type approval for Bluetooth devices. GeoExplorer CE series handhelds are approved for use with Bluetooth in the USA. For a complete list of other countries with Bluetooth approval please refer to www.trimble.com/geoxt_ts.asp.

What can Bluetooth be used for?

The integrated Bluetooth wireless technology in the GeoExplorer CE series handhelds allows you to connect to a range of Bluetooth-enabled devices. Supported devices include cell phones, PCs, other handhelds, and cameras.

For a list of tested devices go to www.trimble.com/geoxt_ts.asp.

What is the maximum distance for Bluetooth connections?

Two GeoExplorer CE series handhelds can connect up to 5 meters apart. When connecting to another device the maximum distance you can connect over will be affected by the range of that device. Please consult the manufacturers' specifications for this information.

Obstacles, such as people, may reduce the maximum distance over which a connection can be maintained.

How many Bluetooth connections can I have at once?

Bluetooth allows up to seven simultaneous connections, but as the number of connections increases the transfer rate of each will decrease.

Other Information

Where can I find more information about this product?

For detailed product specifications and accessories, refer to the GeoExplorer CE series datasheet at www.trimble.com/geoexplorerce.html.

How can I order this product?

To find your closest Trimble representative, use the Dealer Locator at www.trimble.com/locator/sales.asp.

