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GeoExplorer 6000 series: Customer FAQs

This document includes information about the Trimble® GeoExplorer® 6000 series GeoXH™ and GeoXT™ handhelds.

For information about the Trimble GeoXR Network Rover, refer to the Trimble GeoExplorer 6000 series GeoXR Network Rover web page.

What is the GeoExplorer 6000 series?

The Trimble GeoExplorer 6000 series is a family of rugged handheld computers with an integrated high-accuracy GNSS (Global Navigation Satellite System) receiver. It comprises a variety of configurations to match accuracy requirements ranging from centimeter to submeter.

A key feature of the GeoExplorer 6000 series is Trimble Floodlight™ satellite shadow reduction technology. Using this technology enhances GNSS performance to deliver more positions and better accuracies in tough GNSS conditions—such as next to buildings or under tree canopy.

What are the main features and benefits of the GeoExplorer 6000 series?

Feature	Benefits
Integrated 220 channel professional grade GNSS receiver and antenna	High accuracy positioning without the need for an external receiver or antenna. Capable of using satellites from both the GPS and GLONASS constellations when Floodlight technology is enabled. Supports all common real-time differential correction sources, including SBAS, Beacon, reference station and VRS™ network corrections, so accuracy can be verified in the field.
Trimble Floodlight satellite shadow reduction technology	Uses a combination of technologies to deliver better accuracy and more reliable positioning in difficult conditions such as urban canyons. Ideal when you require high accuracy but work in conditions with obstructed sky views.

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Feature	Benefits
Integrated 3.5G cellular modem option	Eliminates the need to bring a separate phone to the field to connect to the Internet. No extra battery to charge. Completely rugged and integrated. Allows easy access to VRS network corrections, websites, email, and most Internet based services.
Integrated 5 megapixel camera	Eliminates the need to bring a separate camera to the field to capture photographic data. Streamlines the workflow of associating images with GIS data. Completely integrated with field software applications. Allows proof of completion and regulatory requirements to be fulfilled.
4.2 inch sunlight readable display	Increases ease of use by providing more 45% more screen area than standard 3.5 inch displays. Sunlight readability reduces user eye-strain and fatigue, reduces data entry errors, and increases the speed at which the user can work.
Long-life field swappable battery	Allows all day operation without the need to worry about running out of power. Field swap function allows batteries to be changed without shutting down, closing files or losing application state.
Rugged design	Designed for use in the rugged and sometimes wild terrains that are typical for field work. Able to withstand rain, blizzards, dirt, dust and sand, extreme temperatures, abrasion, mist, high humidity, vibrations, and drops of up to 1.5 m.

What configurations are available?

The following main configurations are available:

Configuration	Accuracy	Floodlight	NMEA
GeoXT handheld	Submeter	Optional	Optional
GeoXH handheld	Decimeter	Yes	Optional
GeoXH Centimeter edition handheld	Centimeter	Yes	Optional

What is the GeoExplorer 6000 series GeoXT handheld?

The Trimble GeoXT handheld includes an L1 GPS- and GLONASS-capable receiver and antenna, and delivers submeter accuracy in real-time and accuracy improvements down to 50 cm after postprocessing. With the optional Trimble Floodlight technology upgrade, the GeoXT handheld is designed for productive data collection in the most difficult GNSS environments. The GeoXT is compatible with a wide variety of Trimble and third party field applications.

What is the GeoExplorer 6000 series GeoXH handheld?

The Trimble GeoXH handheld includes an L1/L2 GPS- and GLONASS-capable receiver and antenna, and delivers decimeter accuracy in real-time and after postprocessing. With Trimble Floodlight technology included as a standard feature on the GeoXH, the handheld is designed for productive data collection in the most difficult GNSS environments, and high accuracy decimeter to sub-foot accuracy in more places than ever before. The GeoXH is compatible with a wide variety of Trimble and third party field applications.

What is the GeoExplorer 6000 series GeoXH Centimeter edition handheld?

The Trimble GeoXH Centimeter edition handheld is a special configuration of the GeoXH handheld, enabling accuracies down to one centimeter.

What upgrade options are available for the GeoExplorer 6000 series?

You can purchase the following optional receiver upgrades for the Trimble GeoExplorer 6000 series:

- Centimeter output upgrade
- Floodlight satellite shadow reduction technology
- NMEA output upgrade

What is the Centimeter output option?

The Centimeter output option is an upgrade for the GeoExplorer 6000 series GeoXH handheld. It enables you to upgrade your GeoXH handheld to the GeoXH Centimeter edition, and in conjunction with the Trimble TerraSync™ Centimeter edition software, increases the accuracy achievable on the GeoXH platform from decimeter to centimeter level.

Which GeoExplorer 6000 series handhelds are able to have the Centimeter output upgrade applied?

The Centimeter output option is an upgrade for the GeoExplorer 6000 series GeoXH handheld only.

What sort of GNSS correction sources are required for a GeoXH Centimeter edition?

To achieve centimeter-level positions, dual frequency corrections from a single base or a VRS™ network are required. Corrections from the Trimble VRS Now H-Star™ service may be used, but will only result in decimeter (10 cm / 4 inch) level accuracy.

Can a GeoXH Centimeter edition handheld still be used with DGNSS corrections?

Yes, using Trimble TerraSync Centimeter edition software, the receiver generates whatever position quality it can, based on the GNSS correction source(s) available—including uncorrected autonomous positions, SBAS corrected positions, and DGNSS code corrected positions.

What is Floodlight satellite shadow reduction technology?

Trimble Floodlight technology is a combination of technology including GPS and GLONASS satellite measurements, advanced tracking and altitude-assisted positioning to provide more positions and better accuracies in conditions with restricted sky views. Floodlight technology supports real-time and postprocessed workflows.

Which GeoExplorer 6000 series handhelds are able to use Floodlight technology?

Trimble Floodlight technology is included as a standard feature on the GeoXH handheld and is available as an optional upgrade for the GeoXT handheld.

Is Floodlight technology available on any other hardware platform?

Trimble Floodlight technology is exclusive to the GeoExplorer 6000 series handhelds.

What is NMEA output?

NMEA 0183 (or just NMEA for short) is a standard protocol used by GNSS receivers to transmit data. NMEA output is used and understood by most third party GNSS software applications. NMEA output is available as an optional upgrade for the GeoExplorer 6000 series.

Which GeoExplorer 6000 series handhelds are able to have the NMEA output upgrade applied?

NMEA output is available as an upgrade for both GeoXT and GeoXH configurations.

Do I need NMEA output?

The Trimble GeoExplorer 6000 series handhelds communicate with Trimble software applications using a Trimble proprietary protocol. If you are using Trimble TerraSync software, Trimble Positions™ Mobile extension, or Trimble GPScorrect™ extension for Esri ArcPad software, there is no need for NMEA output. If you want to use ArcGIS for Windows mobile application without the Trimble Positions Mobile extension, or the ArcPad application without the GPScorrect extension, or any other software, you will need to purchase and activate the NMEA output option first.

Can I output NMEA data to an external device?

Yes. Provided that the NMEA output upgrade has been activated, the GeoExplorer 6000 series handheld can output NMEA data to external equipment data over an outgoing serial port.

What accuracy is the NMEA output on the GeoExplorer 6000 series handheld?

The accuracy of NMEA output matches the accuracy of the receiver, and depends on the model of Trimble GeoExplorer 6000 series handheld being used, and the choice of real-time correction source. The GeoXH handheld can output 10 cm accuracy NMEA data. The GeoXT handheld can output 75 cm accuracy NMEA data. NMEA output will match the real-time specification of the handheld; however it is not able to be postprocessed in Trimble GPS Pathfinder® Office software or other back office GNSS software.

How do I purchase receiver options and upgrades?

Contact your Trimble reseller for information on how to purchase optional upgrades.

How do I activate receiver options and upgrades?

Options that come pre-bundled with your GeoExplorer 6000 series handheld, and upgrade options assigned to you handheld by your Trimble reseller, must be activated before they can be used.

Your GeoExplorer handheld is equipped with the Trimble Option Activation Wizard—a tool that can connect to Trimble's servers to download the unique Option Activation File (OAF) for your handheld, and can then activate the correct options on the receiver.

If the handheld can be connected to the Internet, the Option Activation Wizard can automatically download an OAF. If the handheld cannot be connected to the Internet, the OAF must be manually loaded on to the device. For more information, see the *Activating Options* section in the *GeoExplorer*

6000 Series User Guide (available on the GeoExplorer 6000 Series Technical Support page) or contact your local Trimble Reseller.

What accuracy can I achieve with the GeoExplorer 6000 series GeoXT handhelds?

The accuracy you can achieve depends on a number of factors including environment, method of use, and the type and availability of differential correction information.

The following table provides typical scenarios for real-time usage with a Trimble GeoXT handheld and the accuracies that you may expect to achieve.

Real-time correction source	Horizontal	Vertical	Baseline	Notes
Single frequency base station	75 cm + 1ppm (2.5 ft. + 1ppm)	1.5 m + 1ppm (5 ft. + 1ppm)	Up to 250 km	Depends on the antenna, base station, the range, and connection latency.
SBAS (WAAS/EGNOS/ MSAS)	< 1 m (< 3 ft.)	< 2 m (< 6 ft.)	Within the coverage area	Coverage depends on the specific SBAS service used.

The following table provides typical scenarios for postprocessing and the accuracies that you may expect to achieve.

Postprocessed correction type	Horizontal	Vertical	Baseline	Notes
Carrier	1 cm +2 ppm	2 cm + 2ppm	< 10 km	Requires 45 minutes uninterrupted carrier data.
	10 cm + 2 ppm (4 inches + 2ppm)	20 cm + 2 ppm (8 inches + 2ppm)	< 10 km	Requires 20 minutes uninterrupted carrier data.
	20 cm + 2 ppm (8 inches + 2ppm)	40 cm + 2 ppm (16 inches + 2ppm)	< 10 km	Requires 10 minutes uninterrupted carrier data.
Code	50 cm + 1ppm (1.5 ft. + 1ppm)	1 m + 1ppm (3 ft. + 1ppm)	Up to 250 km	

The following factors increase the availability of specified accuracy: availability of GPS and GLONASS data at the base station(s) used for corrections, longer elapsed time tracking uninterrupted L1 carrier phase data, use of the optional external Tempest antenna, shorter distance to the base station(s), and use of more (than one) base stations for postprocessing.

What accuracy can I achieve with the GeoExplorer 6000 series GeoXH handhelds?

The accuracy that you can achieve depends on a number of factors including environment, method of use, and the type and availability of differential correction information.

The following table provides typical scenarios for real-time usage with a Trimble GeoXH handheld and the accuracies that you may expect to achieve.

Real-time correction source	Horizontal accuracy	Vertical accuracy	Baseline length	Notes
H-Star capable VRS network	10 cm (4 inches)	10 cm (4 inches)	Anywhere within the VRS network	Accuracy is typically achieved within 2 minutes. Accuracy degrades outside the VRS network even though corrections may still be available.
H-Star capable (dual frequency) base station	10 cm + 1ppm (4 inches + 1ppm)	10 cm + 1ppm (4 inches + 1ppm)	Up to 250 km	H-Star accuracy is typically achieved within 2 minutes.
Single frequency base station	75 cm + 1ppm (2.5 ft. + 1ppm)	1.5 m + 1ppm (5 ft. + 1ppm)	Up to 250 km	Depends on the antenna, base station, the range, and connection latency.
SBAS (WAAS/EGNOS/ MSAS)	< 1 m (< 3 ft.)	< 2 m (< 6 ft.)	Within the coverage area	Coverage depends on the specific SBAS service used.

The following table provides typical scenarios for postprocessing and the accuracies that you may expect to achieve.

Postprocessed correction type	Horizontal accuracy	Vertical accuracy	Baseline length	Notes
Carrier	1 cm +2 ppm	2 cm + 2ppm	< 10 km	Requires 45 minutes uninterrupted carrier data.
H-Star	10 cm + 1ppm (4 inches)	10 cm + 1ppm (4 inches)	Up to 250 km	
Code	50 cm + 1ppm (1.5 ft. + 1ppm)	1 m + 1ppm (3 ft. + 1ppm)	Up to 250 km	

The following factors increase the availability of specified H-Star accuracy: availability of GPS and GLONASS data at the base station(s) used for corrections, longer elapsed time tracking uninterrupted L1/L2 carrier phase data, use of the optional external Tornado antenna, tracking of more satellites with L2 measurements, shorter distance to the base station(s), and use of more (than one) base stations for postprocessing.

What accuracy can I achieve with the GeoExplorer 6000 series GeoXH Centimeter edition handhelds?

The following table provides typical scenarios for real-time usage with a Trimble GeoXH Centimeter edition handheld and the accuracies that you may expect to achieve, when using the recommended Trimble Zephyr™ Model 2 external antenna.

Real-time correction source	Horizontal accuracy	Vertical accuracy	Baseline length	Notes
Dual frequency VRS network	1 cm (0.4 inches)	1.5 cm (0.6 inches)	Anywhere within the VRS network	Accuracy is typically achieved within 2 minutes. Accuracy degrades outside the VRS network even though corrections may still be available.
Dual frequency Single base	1 cm + 1.0ppm (0.4 inches)	1.5 cm + 2.0 ppm (0.6 inches)	< 30 km	

The following table provides typical scenarios for postprocessing and the accuracies that you may expect to achieve.

Postprocessed correction type	Horizontal accuracy	Vertical accuracy	Baseline length	Notes
Dual frequency VRS network	1 cm (0.4 inches)	1.5 cm (0.6 inches)	Anywhere within the VRS network	
Dual frequency Single base	1 cm + 1.0ppm (0.4 inches)	1.5 cm + 1.0 ppm (0.6 inches)	< 30 km	

When should I use the GeoExplorer 6000 series monopole?

Trimble recommends using the carbon fiber monopole kit whenever you collect data with the internal GNSS antenna. Using the monopole is a good way to ensure consistent vertical and horizontal positioning of the receiver over your features. The monopole has a telescopic height adjustment mechanism that allows you to position the handheld at a comfortable height for data entry which is useful for data collection missions over long durations. For more information on the monopole kit, contact your Trimble reseller.

When should I use an external antenna?

Trimble recommends using an optional external antenna if you need to obtain the best possible accuracy more often. Over and above Trimble Floodlight technology, an external antenna improves GNSS performance with use of a larger antenna ground plane, and can be attached to a pole to avoid the operator's body shading the receiver. Using a range pole it is possible to position the antenna both horizontally and vertically over the feature being mapped with more precision.

What external antennas are recommended for the GeoExplorer 6000 series?

Trimble recommends the latest L1 GPS and GLONASS Trimble Tempest™ antenna as an external antenna for use with a GeoXT handheld.

Trimble recommends the L1/L2 GPS and GLONASS capable Trimble Zephyr Model 2 antenna or the L1/L2 GPS and GLONASS capable Trimble Tornado™ antenna as an external antenna for use with the GeoXH handheld.

Trimble recommends the L1/L2 GPS and GLONASS capable Zephyr Model 2 antenna as an external antenna for use with the GeoXH Centimeter edition handheld.

Does use of an external antenna adapter cable affect the IP rating of the system?

No.

What is H-Star technology?

Trimble H-Star technology is a patented Trimble technology that uses GNSS code and carrier data to compute decimeter (10 cm / 4 inch) accuracy positions. H-Star technology supports real-time and postprocessed workflows.

Does the GeoExplorer 6000 series support GLONASS?

Yes. GLONASS tracking is enabled with the Trimble Floodlight satellite shadow reduction technology option. L1/L2 GLONASS tracking is available on the GeoXH 6000 series handhelds which include Floodlight technology as standard. L1 GLONASS tracking on the GeoXT 6000 series handhelds is possible by purchasing and activating the Floodlight technology optional upgrade.

Does the GeoExplorer 6000 series support Galileo?

Galileo tracking is not available on the Trimble GeoExplorer 6000 series.

Which GeoExplorer 6000 series handhelds are able to use H-Star technology?

Trimble H-Star processing is available on Trimble GeoXH handhelds only.

Can the GeoExplorer 6000 series be used with an external receiver?

No. Trimble Mapping & GIS field software does not support connections to external receivers from the Trimble GeoExplorer 6000 series.

What real-time differential correction protocols are supported?

The following data formats are supported when receiving real-time corrections from a VRS network, or a single reference station:

- RTCM 2.x, RTCM 3.x
- CMR, CMRx and CMR+™

Not all correction formats fully support GPS and GLONASS, or code and carrier corrections. The following table summarizes which constellations and types of signal corrections are supported by each format:

Format	GPS	GLONASS
RTCM 2.x DGPS	Code only	
RTCM 2.x Carrier	Code and carrier	Not supported
RTCM 2.x DGPS + Carrier	Code and carrier	Code only
RTCM 3.x	Code and carrier	
CMR	Code and carrier	
CMRx	Code and carrier	
CMR+	Code and carrier	

Check your reference station settings or your VRS network administrator to confirm which format is broadcast by the correction source you want to use.

My base station infrastructure produces GPS only corrections. Will I still benefit from Floodlight technology?

Yes. Trimble Floodlight technology includes a combination of methods to improve position yield and accuracy. Even if your base station infrastructure does not generate corrections for GLONASS satellites, there is still benefit from using Floodlight technology. Altitude-assisted positioning enhances accuracy and position yield in particularly difficult conditions. Using an enhanced tracking and acquisition technology will benefit users in all environments.

How many satellites do I need to track to generate differentially corrected 3D positions?

In general, you need a minimum of four measurements per position in order to postprocess data collected with your Trimble GeoExplorer 6000 series handheld. Using Trimble Floodlight technology will allow four measurements to be obtained from only three satellites. Depending on whether you are using GPS only or GPS and GLONASS base station data, you need the following numbers of satellites per position:

Base station	GeoExplorer 6000 series with Floodlight technology	GeoExplorer 6000 series without Floodlight technology
GPS only	3 or more GPS satellites	4 or more GPS satellites
GPS and GLONASS	3 GPS satellites or 3 GLONASS satellites or 2 GPS + 2 GLONASS satellites	Not supported

Can I use the GeoExplorer 6000 series handheld as a base station?

The Trimble GeoExplorer 6000 series can be used with Trimble TerraSync software to log a file with L1/L2 data (GeoXH), or L1-only data (GeoXT) as a temporary base station solution. The GeoExplorer 6000 series is not supported as a base receiver in the TRS™ (Trimble Reference Station) software, GPSBase software, or other Trimble base station software.

Which operating system languages are available?

The first time you turn on your handheld, you must select the language used by the operating system. You can only select the language once.

The following languages are available: English, Spanish, French, German, Italian, Portuguese, Chinese (Simplified), Japanese, Korean and Russian.

Can the operating system language be changed?

Yes. However, to change the language used on the handheld after you have already used the handheld for the first time, you must reinstall the operating system and all application software. This process can only be performed by an authorized Trimble service provider. Contact your Trimble Reseller for more information.

What software is included with the GeoExplorer 6000 series?

- Microsoft Windows Mobile applications including Internet Explorer®, Calendar, Email, Contacts, Messenger, Alarms, Calculator, Tasks, and Notes.
- Microsoft ActiveSync® technology and Microsoft Windows Mobile Device Center for connecting the handheld to computers running the Windows Vista®, Windows® XP, or Windows 2000 operating system, and for synchronization of files with Outlook® Mobile applications.
- Microsoft Office Mobile 2010, including Word Mobile, Excel® Mobile, PowerPoint® Mobile, OneNote® Mobile and SharePoint WorkSpace Mobile.
- Wireless Manager for configuring and controlling Bluetooth® wireless technology, Wi-Fi, and cellular modem connections.
- Windows Media® player to allow playback of sound and video files.

What Trimble Mapping & GIS field software applications are compatible with the GeoExplorer 6000 series?

Full details of hardware and software version compatibility are listed in the Mapping & GIS software compatibility matrix.

Are Trimble Survey applications such as the Trimble Access™ software or Survey Pro™ software supported on the GeoExplorer 6000 series handhelds?

No.

Can I tag pictures with location data using the integrated camera?

Yes. If you are using the Trimble TerraSync software, photos added as attributes to features are automatically geotagged with the location of the feature. If you are not using the TerraSync software, the built-in camera software application has the ability to record GNSS position. Geotagging with the built-in camera application requires NMEA output to be activated.

What is the focus range of the integrated camera?

The camera can resolve distances from 20 cm to infinite.

Does the GeoExplorer 6000 series camera support barcode scanning?

Barcode scanning is not included with the camera control application on the GeoExplorer 6000 series handheld; however third party applications exist that enable photographic barcode scanning.

Is the TrimPix™ Pro system supported on the GeoExplorer 6000 series?

Yes, from version 2.10 of the TrimPix Pro system. The TrimPix Pro system is a bundle comprising the TrimPix Pro software and an Eye-Fi Pro card, that enables you to take high-resolution photographs with any SDHC-compatible digital camera and then transfer them in real-time wirelessly to a Trimble handheld for integration into your GIS data collection workflow.

Which wireless technologies are available on the GeoExplorer 6000 series?

All GeoXH and GeoXT 6000 series models include a Wi-Fi 802.11 b/g and Bluetooth wireless technology 2.0. Both the GeoXH and GeoXT handhelds are available with or without a 3.5G cellular data modem.

What type of modem is used in the GeoExplorer 6000 series 3.5G edition handhelds?

The GeoExplorer 6000 series 3.5G edition handhelds come with an integrated quad-band 3.5G UMTS/HSDPA cellular data modem. The modem operates at the following frequency bands:

- UMTS/HSDPA: 850/900/2100 MHz
- GPRS/EDGE 850/900/1800/1900 MHz

Can the cellular modem be added as an upgrade?

No.

Is the cellular modem AT&T certified?

Not at this time.

Does the cellular modem support voice calling?

No.

Can I use Voice over IP (VoIP) on the GeoExplorer 6000 series?

There is no specific application provided on the GeoExplorer 6000 series to use VoIP. However, there may be third party applications available that operate with the Windows Mobile 6.5 operating system.

Does the GeoExplorer 6000 series include a CDMA modem edition?

No, but an external CDMA modem with a Wi-Fi or Bluetooth wireless technology connection can be used.

Can I connect the GeoExplorer 6000 series to a network using an Ethernet cable?

No. Use the integrated Wi-Fi radio to transfer data at Ethernet speeds.

Can I connect the GeoExplorer 6000 series to external sensors (for example, scientific instruments, or laser range finders)?

Yes. The Trimble GeoExplorer 6000 series supports external sensors over serial connections using Bluetooth wireless technology, or using a serial cable and the optional USB to serial converter cable.

What types of SD card are supported on the GeoExplorer 6000 series?

The SD card slot can use cards that are Standard SD (Secure Digital) 4 MB to 4 GB, and SDHC (Secure Digital High Capacity) 4 GB to 32 GB. MiniSD, MicroSD, and higher density formats like MiniSDHC and MicroSDHC can also work with the use of "passive" adapters that conform to the width and thickness specifications of a standard SD card.

Example of a passive adapter:

Can I use SDIO or SDXC cards with the GeoExplorer 6000 series?

No.

Are GeoExplorer 2008/3000 series accessories compatible with the GeoExplorer 6000 series handheld?

No. Except for external antennas and antenna cables, GeoExplorer 2008 and 3000 accessories are not compatible with the GeoExplorer 6000 series.

Where can I find more information?

For more information, contact your local Trimble reseller.