geode™

OWNER'S MANUAL

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WARNING! This symbol indicates that failure to follow directions could result in serious injury.

CAUTION: This symbol indicates that failure to follow directions could result in damage to equipment or loss of information.

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INTRODUCTION

Introduction

The Juniper Systems Geode is a full-functioned GPS receiver. It is capable of sub-meter accuracy with 95% reliability. The Geode is designed to work in heavy canopy and mountainous areas. The Geode is available in one of four configurations:

- Geode GPS, 1 Hz
- Geode GPS with GLONASS, 1 Hz
- Geode GPS with 9-pin Serial port, 1 Hz
- Geode GPS with GLONASS and 9-pin Serial port, 1 Hz

The Geode receiver is able to stream NMEA or Binary data to another computing device, such as Android phone or tablet, Windows laptop or tablet, etc.

The Geode can be upgraded to include three additional update intervals; 2, 5, and 10 Hz. This enables the user to use a faster rate when more detail is needed. A slower rate can be used when high detail is not required. The receiver can also be upgraded to receive the GLONASS GNSS constellation.

Like other Juniper Systems products, the Geode receiver is designed to stand up to the harshest conditions. With a rating of IP68, it can handle exposure to water and dust. It has been tested to withstand multiple drops onto concrete. The plastic case of the Geode is also chemically resistant.

The Geode has external ports for charging the on-board battery, and for connecting an external antenna. These ports remain sealed even with the covers open.

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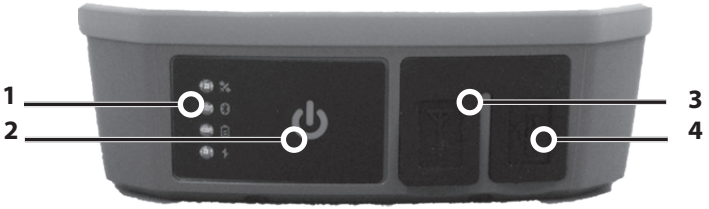
GETTING STARTED

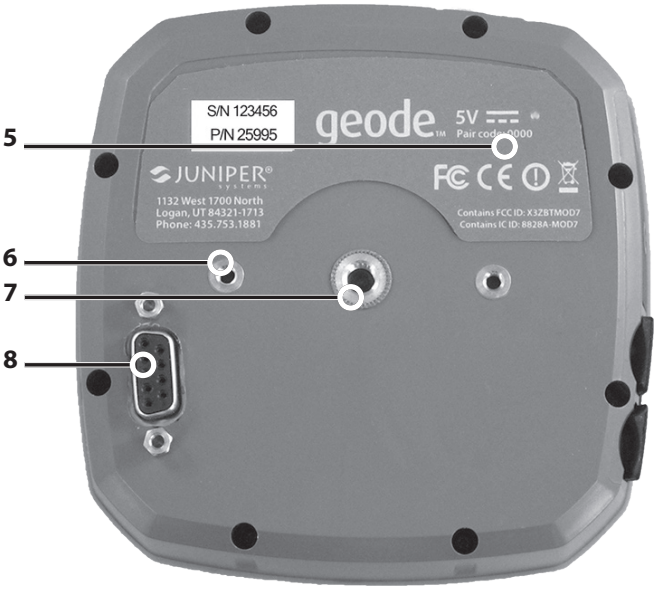
Getting Started

The Geode is designed to be ready to use *right* out of the box, with minimal preparation needed. All the Geode should need is to have the battery fully charged. It will then be ready to mount to a tripod or surveying pole.

Anatomy of the Geode



1 Status LEDs
2 Power Switch
3 MCX Antenna Connector
4 Micro USB



5 Bluetooth Pairing Code (0000)
6 6-32 Amps Attachment Point (1 of 2)
7 1/4-20 Attachment Point
8 Serial Connector (optional)

Charging the Battery

The Geode has an internal, non-removable battery that can provide up to 10 hours of use. Recharging the battery can be done through the micro USB jack. Plug the AC wall power charger that came with the Geode into a wall socket. Insert the USB end of the included USB charge cable into the charger. Insert the micro USB end into the Geode.

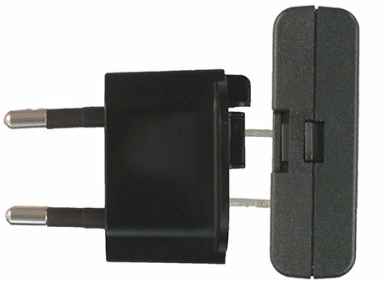
For best results, only use the included wall charger and cable to charge the internal battery. Using a standard USB cable may result in extremely long charge times, or it may cause an error condition in the Geode, resulting in the unit not charging at all.

When the Geode is completely discharged, it will take about four hours to get a full charge.

While the Geode is charging, the red LED will blink. Once the battery has a full charge, the LED will stay on. The cable may then be removed, and the LED will turn off.

Connecting the International Plugs

The Geode comes equipped with a plug kit designed to fit an assortment of AC outlets outside the United States. To connect an adapter, slide it onto the blades of the U.S. plug. Once fully inserted, apply slight downward pressure to lock the adapter into place.



To remove, release the tab on the top of the U.S. plug, and, with slight upward pressure, remove the adapter.

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FEATURES OF THE GEODE

Features of the Geode

With a single button and four status LEDs, the Geode is designed for ease of operation. This chapter discusses the functions of the LEDs and the button.

LEDs

There are four LEDs on the Geode, which can provide you with important information. The LEDs and their functions are listed below.

Amber—Blinks when a GPS fix is made. Turns on solid once a DGPS fix is made.

Blue—On when Geode unit is connected via Bluetooth.

Red—Blinks when battery is charging, solid when battery is full, off when battery is discharging. The LED will blink at a faster rate for a fault condition in the charging system, such as if the internal battery will not accept a charge.

Green—Power. Turns on when the power button is pressed. The LED will blink when the internal battery needs to be recharged.

Power Button - Modes

To turn on the Geode, press the power button until the green LED turns on. Press again to turn it off.

Ports

Bluetooth

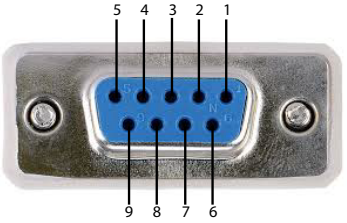
The Geode's default method of communicating with a computing device is through its integrated Bluetooth port. Turning on the Geode automatically puts the unit into Bluetooth pairing mode. If your device does not connect automatically, follow the instructions for your device to pair it with the Geode. The Geode's default pairing code is 0000. Your Geode can then be easily connected to your handheld device. The Geode will appear as *Geode xxxxx*, where xxxxx is the serial number of the Geode.

USB

The Geode has an integrated micro USB port, which you can use for both charging the battery and communicating between a PC and the receiver.

Serial (option)

The Geode has an optional configuration that provides a 9-pin RS-232C serial port. This allows you to mount the receiver to a piece of equipment, and maintain a constant connection for data and power to the receiver. Use a straight-through 9-pin cable to communicate with your device. The functions of each pin are listed below.



Pin	Signal	Condition
1	PPS output	Normally low, pulsing high
2	TXD out	
3	RXD in	
4	Event Mkr in	High to mark
5	GND	
6	GPS Lock out	High indicates GPS lock
7		
8	Speed Pulse out	Normally low, pulsing high
9	+12V in	

You can remotely power on and off the Geode through pin 9 of the serial connection. Apply or remove 12V (nominal) to cycle power on the Geode.

External Antenna port

The Geode has an MCX port that allows connection

to an external antenna. This allows you to attach an auxiliary antenna to maximize accuracy. The Geode will automatically sense when an external antenna has been connected and disable the main antenna.

Juniper recommends the Juniper PN 26319 for external antenna use. The external antenna port supplies 3.3 volts up to 20 mA for powering the external antenna.

Power Supply

Plug the AC wall power charger that came with the Geode into a wall socket. Insert the USB end of the included USB charge cable into the charger, and insert the micro USB end into the Geode. For charging in the field, the Geode can also be charged using a vehicle's 12V power port using an easily available USB adapter. Be sure your adapter is rated at 2 Amps output current, or 10 watts.

Attachment Options

The Geode Receiver is equipped with two mounting options. Choose the option that provides the best results for your application.

Camera Tripod Mount

The Geode Receiver can be attached to a camera tripod using the 1/4-20 mounting hole in the case. The screw must be less than 0.3" (7mm) long to avoid damaging the case.

#6-32 AMPS

The Geode Receiver can also be mounted on a standard Amps-style mounting plate. To do so, position the plate on the receiver so that the plate fits diagonally, and insert the 6-32 screws. The screws must be less than 0.17" (4.5mm) long.

Pole Adapter

Also included with the Geode is a 5/8-11 adapter that you can screw into the camera tripod hole. This will allow you to mount the Geode to a standard 2-meter survey pole.

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COMMUNICATING WITH THE GEODE

Communicating with the Geode

Bluetooth

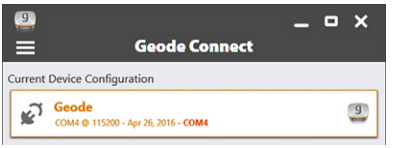
Connecting with the Geode over Bluetooth is as simple as turning on the Bluetooth function in your handheld device. With the Geode powered on, activate Bluetooth on your device. Geode will automatically be discovered, and may then be connected. If there are several Geode units available, you can identify the correct unit using the serial number of the unit as shown on the bottom of the Geode. If necessary, use the Geode pairing code of 0000 to pair. Once the connection has been made, the blue LED on the Geode will come on.

Note: the Geode has a Class 1 Long Range Bluetooth. Be sure the devices stay within range of each other or the connection will need to be re-established.

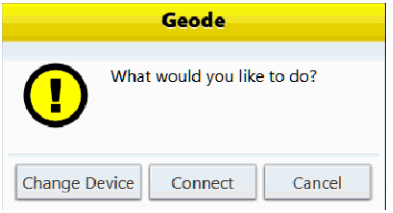
We recommend using the Geode Connect software to perform the initial pairing of the Geode to the computing device. See Chapter 5.

USB

The Geode can also communicate with a PC over a standard USB cable. Plug the cable into your computer, and then into the USB port of the Geode.



Select the Geode title block to bring up the Connect dialog box.



Select *Connect*. The Geode will then connect to the host device.

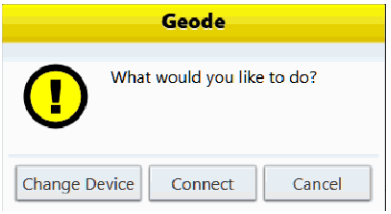
The Geode may not connect to the PC using the same COM port on subsequent connections. This is normal.

Since most computers do not have sufficient power to charge the Geode through the USB, the red LED on the front of the Geode may flash quickly, indicating that the Geode is not charging. This will not affect data transfer. Please use the included charger and USB cable for charging the Geode.

Serial RS-232 (option)

To communicate between a PC and a Geode over a straight-through serial cable, plug the cable into your computer's RS-232C port, and then into the Geode's optional RS-232C port.

Select the Geode title block to bring up the Connect dialog box.



Select *Connect*. The Geode will then connect to the host device.

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GEODE CONNECT SOFTWARE

Geode Connect Software

As its name implies, the Geode Connect software allows you to establish communication with your Geode receiver. Once you have set up the required communication parameters, the Geode is ready to work with any third-party GNSS applications. You will need to close Geode Connect before opening your GPS app. Once the Geode is working with your GPS app, you may only need Geode Connect if your configuration settings need adjusting.

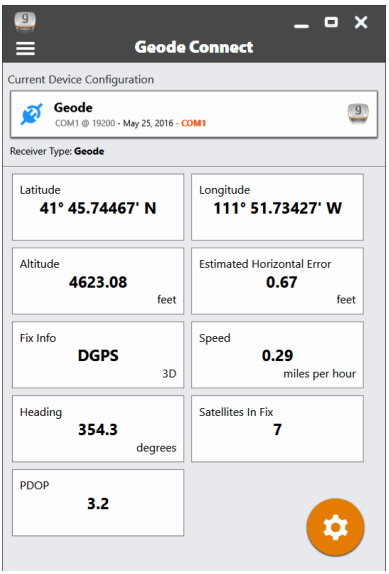
Geode Connect is currently available for Windows 8 or 10, Android version 4.2 and above, and Windows Mobile 6.x.

Geode Connect for Windows 8 or 10

Geode Connect is compatible with Windows 8 or 10. Visit the Juniper Systems website to download Geode Connect at *http://www.junipersys.com/Juniper-Systems-Rugged-Handheld-Computers/support/Downloads*.

Navigating the software

Geode Connect opens to the Location Information screen shown below. This is also the software's Home screen.



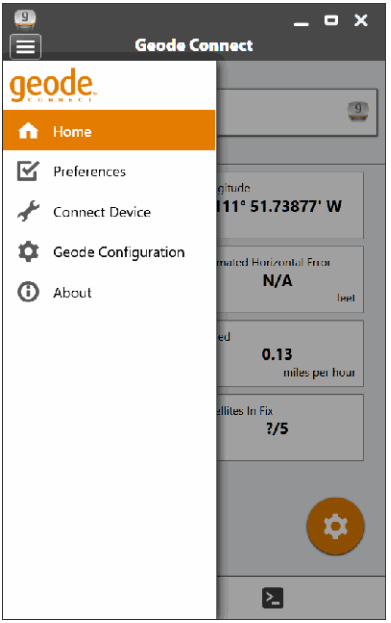
You can find the following information on the Location Information screen:

- Latitude
- Longitude
- Altitude
- Estimated Horizontal Error (EHE)
- Fix Info
- Speed
- Heading
- Satellites in Fix
- PDOP

Geode Connect User Settings

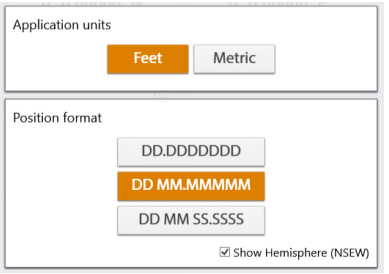
Preferences

Select the menu icon in the upper-left of the screen to open the main menu.



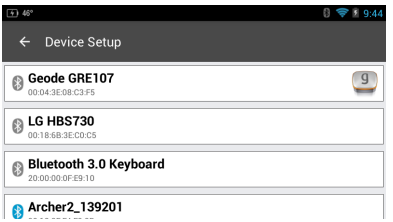
Selecting the *Home* tab returns you to the Location Information screen.

Selecting the *Preferences* tab allows you to select English or metric units of measurement, along with the format for the latitude and longitude. You can also select whether to view the position information with the hemisphere included.



Connect Device

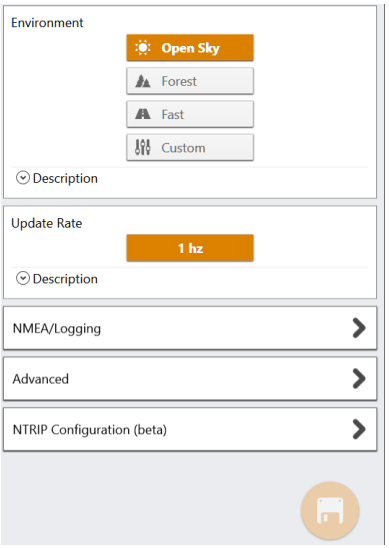
If you have Bluetooth on your PC, selecting the *Connect Device* tab allows you to set up a Bluetooth connection between your computer and the Geode receiver.



When you open the *Connect Device* screen, the Bluetooth devices available to your computer are displayed. If a Geode receiver is visible, it will be at the top of the list. If this is the first time you have paired with your Geode receiver, you may be asked for the pairing code, which is 0000.

Geode Configuration

Opening the *Geode Configuration* tab allows you to set the best parameters for your current application. Be sure to click the icon in the lower right to save your changes.



In addition to setting the environment in which you will use your Geode, and the update rate you prefer (if you have purchased this option), you can also set other parameters using the *NMEA Logging* and *Advanced* tabs. *NMEA Logging* allows for setting which NMEA sentences you want to use. If you have purchased a Geode that can support GLONASS, you can choose which GNSS constellations. Also selectable here is NMEA precision.

The *Advanced* tab allows you to set the mask angle, the type of SBAS used in your area, receiver mode, and baud rate. Here you can also reset the Geode receiver to its factory defaults. There are two types of resets available. One is a soft reset, which resets the receiver to the default operating parameters. A hard reset also clears the real-time clock, the ephemeris and almanac, and reboots the receiver. Resetting the receiver cannot be undone. For more information on any of these features, except baud rate, open the Description button at the bottom.

About

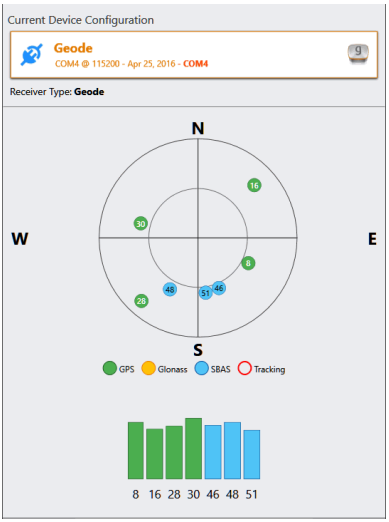
The *About* tab shows version and copyright information relating to your Geode Connect software. Refer to this to determine if you need to update your software.

Notifications

At the bottom of the main menu is a section showing the recent messages generated by Geode Connect. The types of messages can be either informational, or advising of an error condition. When you no longer need these messages, you may delete them one at a time, or all at once.

Viewing Satellite Information

Along the bottom edge of the Home screen are four icons. The left one displays the Location Information screen, as mentioned earlier. The left-middle one shows the sky plot, along with the relative strength of each satellite signal.



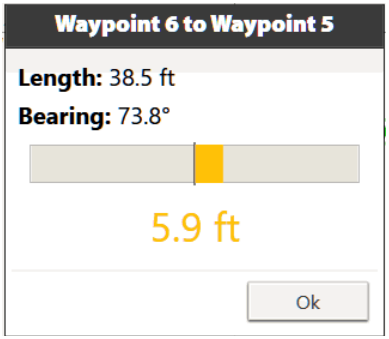
Open Street Map

The right-middle icon displays the Open Street Map utility, which is built into Geode Connect.

Open Street Map allows you to see your position in relation to public roads and other landmarks. At the top right of the screen are two zoom controls, one for zooming in, and another for zooming out. If supported by the device, you can also adjust the zoom level by pinching in or out on the display. As you zoom in on the image, the position information precision increases. The bottom right of the screen also displays a scale that updates with the zoom level.

To save a waypoint in Open Street Map, navigate to the first position you want to record. Once there, select the waypoint icon, to save your point. You may then save other waypoints following the same procedure. After you have established your waypoints, you can open the waypoint information screen by selecting one waypoint on the map.

This screen gives you information about the waypoint you selected, such as when you marked it, your current distance from it, and waypoint elevation. You can use this screen to delete the selected waypoint. Select *From here to...* if you want to see the bearing and distance between the selected waypoint and another waypoint.

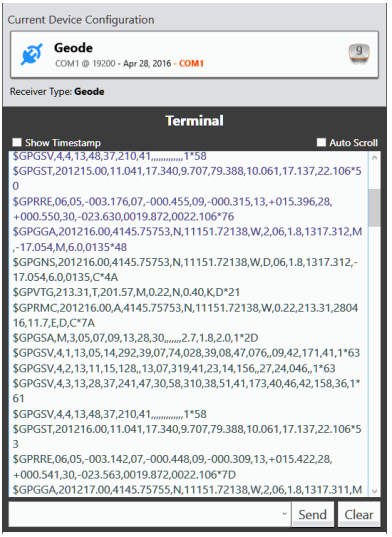


The centerline of the graph shows you the most direct path between waypoints. Deviations from that path are called *cross track errors*, and are shown as a shaded area to the left or right of the center line. The amount of error is also given, here shown as 5.9 feet.

Click the garbage can icon on the main Open Street Map screen to clear all waypoints.

Terminal Mode

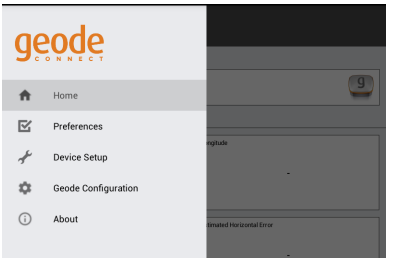
The right-most icon allows you to view the raw NMEA data being sent by the Geode receiver. If desired, you can add a time-stamp in front of the data string. You can also allow the data to auto scroll, or you can deselect auto scroll to enable you to view the data in detail.



The lower end of the screen is a terminal window. This allows you to send queries and commands to the Geode receiver.

Geode Connect for Android

The Android version of Geode Connect is very similar to the Windows PC version, with a few small differences. One such difference is the Preferences menu. The Android version replaces the words, *Connect Device* with *Device Setup,* as seen below:

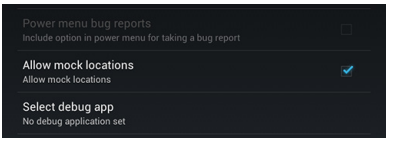


Geode Connect for Android does not currently include On Street Maps.

Downloading Geode Connect

You can download the Android version of Geode Connect from the Google Playstore.

Geode Connect is compatible with all Android versions 4.2 or higher. For best results, go into the Settings menu on your Android device, open the Developer Options menu, and turn on *Allow Mock Locations.* This allows the device to access the GPS information from the Geode, instead of using any on-board GPS.



You will also need to go into the Preferences menu of Geode Connect and enable mock locations. For more instructions on allowing mock locations on your device, see the *Description* tab in the Preferences menu.

6

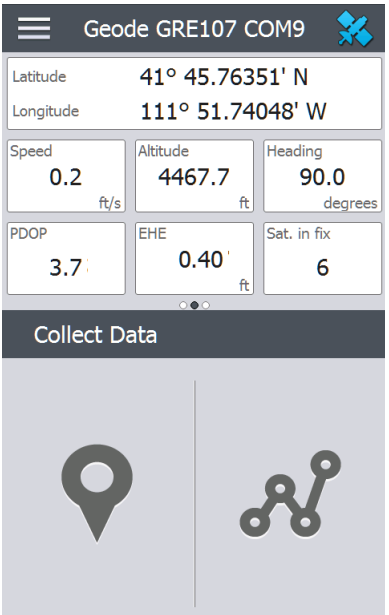
GEODE CONNECT FOR WINDOWS MOBILE 6.X

Geode Connect for Windows Mobile 6.x

When used on a Windows Mobile device such as a Juniper Systems Archer 2, Geode Connect is a GPS/GNSS application that lets you easily collect waypoint or track data.

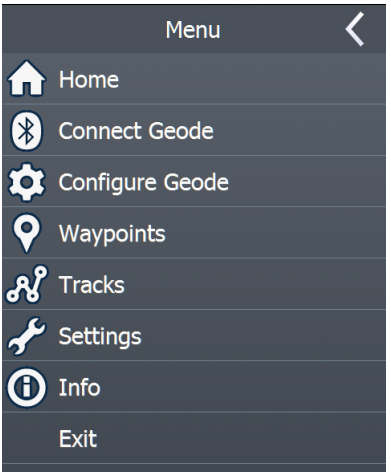
From the device Home screen, tap on the Geode Connect gadget . A splash screen appears while the application opens, and then the main Geode Connect screen appears. Tap on the satellite icon in the upper right corner to turn GPS/GNSS on or off. (A gray icon means GPS/GNSS is not connected, red means there is no fix, yellow means a 2D fix, and blue means a DGPS fix.)

Once there is a fix, information about the current position is given as well as PDOP (position dilution of precision), EHE (estimated horizontal error), and the number of satellites used for a fix. The bottom portion of the screen is used to collect waypoint or track data.



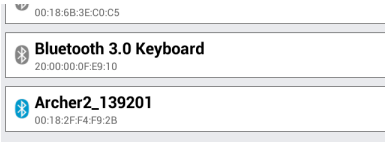
Geode Connect Settings

When you tap on the menu icon ☰ in the upper left corner of the screen, the Geode main menu appears.



Connect Device

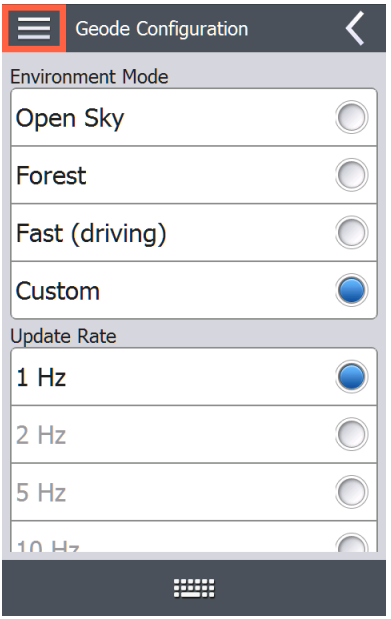
Selecting the *Connect Device* tab allows you to set up a Bluetooth connection between your device and the Geode receiver.



When you open the *Connect Device* screen, the Bluetooth devices available to your device are displayed. If a Geode receiver is paired, it will be at the top of the list. If this is the first time you have paired with your Geode receiver, you may be asked for the pairing code, which is 0000.

Configure Geode

Opening the *Configure Geode* tab allows you to set the best parameters for your current application. Your changes will be saved automatically.

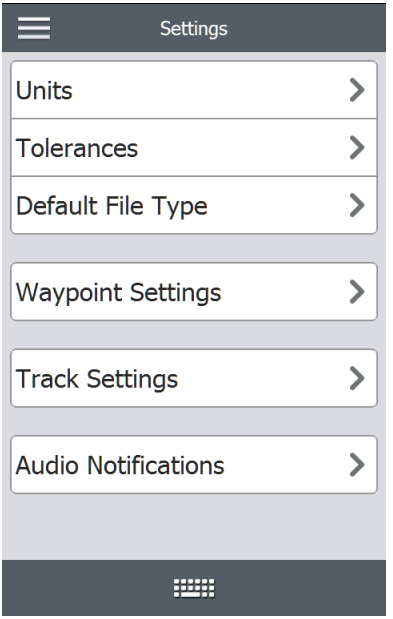


In addition to setting the environment in which you will use your Geode, and the update rate you prefer (if you have purchased this option), you can also set other parameters using the *NMEA Logging* and *Advanced* tabs. *NMEA Logging* allows for setting the types of NMEA sentences you want to use. If you have purchased a Geode that can support GLONASS, you can choose the type of GNSS constellations. Also selectable here is NMEA precision.

The *Advanced* tab allows you to set the mask angle, the type of SBAS used in your area, and receiver mode. Here you can also reset the Geode receiver to its factory defaults. There are two types of resets available. One is a soft reset, which resets the receiver to the default operating parameters. A hard reset also clears the real-time clock, the ephemeris and almanac, and reboots the receiver. Note that resetting the receiver cannot be undone.

Settings

The *Settings* tab opens the following menu. Go through the menu options to set up Geode Connect.



Units: Select English or metric units of measurement and the display format for latitude and longitude.

Tolerances: Select the maximum PDOP for collecting points, minimum navigation speed you need to be traveling for navigation to update properly, and the navigation distance threshold. This is the distance you can be from the point to which you are navigating to show that you have arrived.

Default File Type: Select .kml (keyhole markup language used in Google Earth) or .csv (comma separated value). Note that tracks with more than 1000 points default to .csv due to memory limitations.

Waypoint Settings: Set up the waypoint file naming scheme, including the waypoint prefix, increment step size, and current value. For example, if the waypoint prefix is Point, increment step size is 10, current value is 100, and default

file type is .kml, file names would be Point110.kml, Point120.kml, Point130.kml, etc.) Also select the number of points to average. The default is 1.

Track Settings: Set up the track file naming scheme (see Waypoint Settings). You can select a minimum time and minimum distance needed before a point is collected. If both are enabled, both conditions must be met before a point is added to a track. You can disable suspend when track points are being collected.

Audio Notifications: You can turn on notifications for waypoint arrival, waypoint collected, and track point collected.

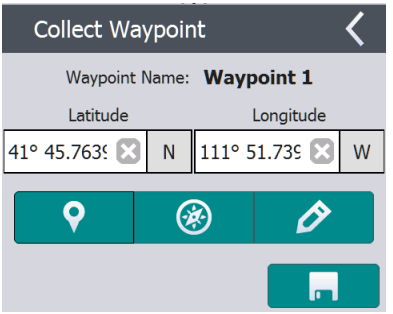
Some settings can be customized for a particular waypoint or track using edit on the data collection screens.

View Signal Strength and NMEA Strings

View the strength of satellites being used in a fix (shown in green) by swiping the area where position is shown on the Home screen to the right. View the NMEA strings that are coming in through the GNSS receiver by swiping the same area to the left. Strings can be saved to a file.

Collect Waypoint Data

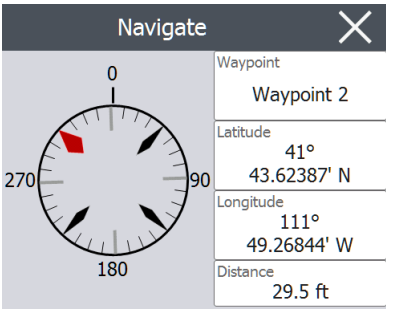
From the main Geode Connect screen, tap the waypoint icon to open the *Collect Waypoint* screen.



To collect a waypoint, tap the waypoint icon at the bottom of the screen. Position information for the waypoint is recorded.

Tap the edit icon to add or edit the name, description, notes, and file type for this waypoint.

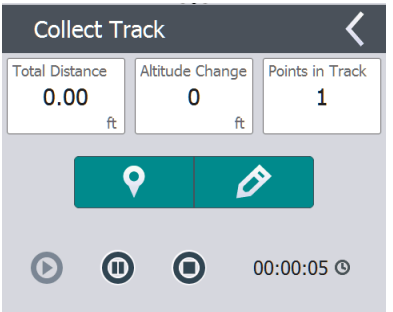
To navigate back to the waypoint you just collected, tap the compass icon. A rotating compass is shown. Walk in the direction of the red arrow. The distance shown decreases as you get closer. Text saying *Arrived* is shown and you will hear a beep (if audio notifications are set up) when you reach the navigation distance threshold set up in GPS Settings.



Tap the disc icon to save the waypoint to *My Documents\My Waypoints*.

Collect Track Data

From the main Geode Connect screen tap the track icon to open the *Collect Track* screen.



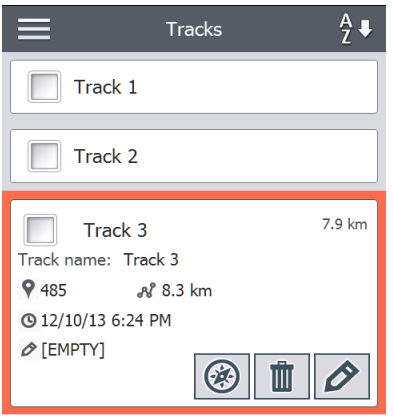
To collect points in a track, tap the play button and start moving along the desired track. Tap the pause button as needed, and tap play to start again. Current position information, total distance, altitude change, and points in the track are collected.

When you are finished, tap the stop button. A dialog box is shown with the track name. You can use that name or edit it. Press the check mark when you are finished. The track is saved in \My Documents\My Tracks.

Tap the edit icon to add or edit the name, description, notes, and file type for this track

Managing Waypoints and Tracks

To view the waypoints and tracks you have saved, tap the menu icon, then select *Waypoints* or *Tracks* from the menu. A list of waypoints or tracks is shown.



To open a file, tap on the name. You can view collected data, select the file for exporting or deletion by tapping the box to the left of the name, navigate back to the waypoint or track points, delete the file, or edit the file. To select all of the files, tap the check box at the bottom of the screen. You can delete or export all selected files. Exported files are placed into a directory called Exports inside of your *My Documents folder.*

Importing Waypoints and Tracks

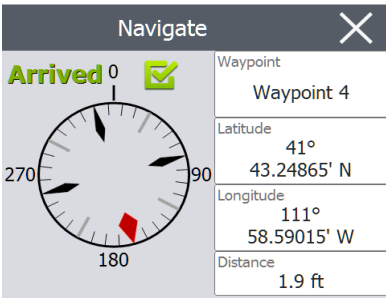
Waypoint and track file formats must be .kml, .kmz, or .csv. CSV files must contain a column for both latitude and longitude.

To import a waypoint or track file, place the file into the *\My Documents\My Waypoints* or *\My Tracks directory*. You can create subdirectories to organize your data if you want. Once you place a waypoint or track file into the proper directory or subdirectory, it appears in the list of waypoint or track files.

An imported track file can only contain one track if you are going to navigate to a specific track. If a file contains multiple tracks, a button inside of Geode Connect is available to extract the tracks into separate files.

Navigating to a Waypoint or Track

You can navigate back to any saved waypoint or track. Select the file you want to navigate to as described in the previous section, *Managing Waypoints and Tracks*. Tap the compass icon.



A rotating compass is shown. Travel in the direction of the red arrow. The distance shown decreases as you get closer. When you reach the navigation distance threshold set up in the settings, text saying *Arrived* is shown and you will hear a beep if audio notification has been set up.

A

WARRANTY AND REPAIR INFORMATION

Limited Product Warranty

Juniper Systems, Inc. ("JS") warrants that the Geode Receiver shall be free from defects in materials and workmanship, under normal intended use, for a period of 24 months from the date of shipment.

JS warrants that the following items shall be free from defects in materials and workmanship, under normal intended use, for a period of ninety (90) days from the date of shipment:

- User documentation
- Accessories

Warranty Exclusions

This warranty shall not apply in the following conditions:

(i) The product has been set up improperly or has been improperly installed or calibrated

(ii) The product is operated in a manner that is not in accordance with the user documentation

(iii) The product is used for a purpose other than for which it was designed

(iv) The product has been used in environmental conditions outside of those specified for the product

(v) The product has been subject to any modification, alteration, or change by or on behalf of customer (except and unless modified, changed or altered by JS or under direct supervision of JS)

(vi) The defect or malfunction results from misuse or accident

(vii) The serial number on the product has been tampered with or removed

(viii) The product has been opened or tampered with in any way

This warranty is exclusive and JS will not assume and hereby expressly disclaims any further warranties, whether express or implied, including, without limitation, any warranty as to merchantability, fitness for a particular purpose, non-infringement or any warranties arising from

the course of performance, dealing, or usage of trade. JS specifically makes no warranties as to the suitability of its products for any particular application. JS makes no warranties regarding the following:

- Its products will meet your requirements or will work in combination with any hardware or applications software products provided by third parties
- The operation of its products will be uninterrupted or error-free
- All defects in the product will be corrected

JS shall not be responsible for software, firmware, information, or memory data contained in, stored on, or integrated with any products returned to JS for repair, whether under warranty or not.

Remedy

In the event a defect in materials or workmanship is discovered and reported to JS within the specified warranty period, JS will, at its option, repair the defect or replace the defective part or product. Replacement products may be new or reconditioned. JS warrants any replaced or repaired product for a period of ninety (90) days from the date of return shipment, or through the end of the original warranty period, whichever is longer.

Limitation of Liability

To the fullest extent allowed by law, the obligation of JS shall be limited to the repair or replacement of the product. JS shall in no event be liable for special, incidental, or consequential, indirect, special or punitive damages of any kind, or for loss of revenue or profits, loss of business, loss of information or data, or other financial loss arising out of or in connection with the sale, installation, maintenance, use, performance, failure, or interruption of any product. Any responsibility and/or liability of JS shall, in connection with a warranted product, be limited in the maximum amount to the original purchase price.

Warranty Repairs
To obtain warranty repair or service on the Geode Receiver, submit a repair order on our website at *http://www.junipersys.com/Juniper-Systems/support/Repairs* or contact an authorized repair center within the applicable warranty period. Products returned for repair or service without proper authorization may acquire an additional handling fee and/or delay in the repair. The customer is responsible to prepay all shipping costs when sending equipment to a repair center. The repair center will return the repaired equipment by the same method it was received with costs of shipping prepaid.

Governing Law
This warranty is governed by the laws of Utah, U.S.A. and excludes the United Nations Convention on Contracts for the International Sale of Goods. The courts of Utah shall have exclusive personal jurisdiction in case of any disputes arising out of or in connection with this warranty.

Services and Materials Provided Under Warranty

- Analysis of problem by service technician
- Labor and materials required to fix defective parts
- Functional analysis performed after repair
- Repair turnaround within 10 working days of receipt unless special circumstances exist
- Shipping costs to return device to customer

Warranty Information
Warranty information for the Geode Receiver is located on our website at *http://www.junipersys.com/Juniper-Systems/support/Warranty*. You can check warranty status, and view warranty terms and conditions.

Repairing the Geode Receiver

CAUTION: Do not attempt to repair the Geode Receiver yourself. This action voids the warranty. There are no user serviceable parts inside the Geode.

Information about repairs, upgrades, and evaluations is located on our website at *http://www.junipersys.com/Juniper-Systems/support/Repairs*. You can locate a repair center, submit a repair order, check repair status, view terms and conditions, get shipping instructions, and view lead times.

Before returning a unit, please get permission by submitting a repair order from our website and waiting for confirmation or by contacting a repair center directly. Be prepared to provide the following information:

- Product serial number (see label on bottom of unit)
- Your name
- Name and shipping address of company/university/agency
- Best contact method (phone, fax, email)
- Clear, highly-detailed description of the repair or upgrade
- Credit card or purchase order number and billing address (for a repair or upgrade that is not covered by the standard warranty or an extended warranty policy)

B

REGULATORY INFORMATION

Warnings, Regulatory Information, Licensing

Product Warnings

Follow the warnings listed below to use the Geode and accessories safely.

Battery Warnings

WARNING! This device comes with a lithium-ion rechargeable battery pack. To reduce the risk of fire or burns, do not disassemble, crush, puncture, short external contacts, or expose the battery pack to fire.

The Geode unit contains no user-serviceable parts. If the unit needs service, please send it to a authorized service center.

Improper battery use may result in a fire, explosion or other hazard.

Wall Charger Warnings

WARNING! To reduce the risk of personal injury, electrical shock, fire or damage to the equipment:

Plug the wall charger into an electrical outlet that is easily accessible at all times.

Do not place anything on the wall charger cord or any of the other cables. Arrange them so that no one may accidentally step on or trip over them.

Do not pull on a cord or cable. When unplugging the wall charger from the electrical outlet, pull on the plug, not the cord.

Use only wall chargers intended for the Geode Receiver. Using any other external power source can damage your

product and void your warranty.

Certifications and Standards

FCC - United States

In compliance with the FCC rules 47 CFR 15.19(a)(3), the statements that follow must appear on the device or in the user documentation.

This device complies with Part 15 of the FCC Rules. Operation of this equipment is subject to the following two conditions:

(i) 1. The device may not cause harmful interference.

(ii) 2. This device must accept any interference received, including interference that may cause undesired operation.

In compliance with the FCC rules, 47 CFR 15.105(b), the user must be notified that this equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment 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.

In compliance with the FCC rules, 47 CFR 15.21, the user must be notified that changes or modifications to the Rugged Handheld that are not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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

This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Contains FCC ID: X3ZBTMOD7

Industry Canada
In compliance with Industry Canada rules, the following statement must appear on the device or in the user documentation:

> This Class B digital apparatus complies with Canadian ICES-003.

Contains IC ID: 8828A-MOD7

Radio Frequency Safety
This device operates in compliance with the FCC radio frequency exposure limits for an uncontrolled environment. Users must follow instructions provided in the user documentation to satisfy compliance with FCC radio frequency exposure requirements.

CE Marking (European Union)
Products bearing the CE marking comply with the 2004/108/EC (EMC Directive), 1999/5/EC (R&TTE Directive), 2006/95/EC (Low Voltage Directive) issued by the

Commission of the European Community.

CE compliance of this device is valid only if powered with/by a CE-marked wall charger provided by the manufacturer. This device has been evaluated using the following standards to demonstrate compliance with applicable directives:

- EN 60950-1:2006
- IEC 60950-1:2005 / A1:2009 / A2:2013
- EN 300 440-2 V1.4.1

Declaration of Conformity
The Declaration of Conformity for CE Marking is available at: *http://www.junipersys.com/Juniper-Systems-Rugged-Handheld-Computers/support/Documentation/Geode*

C

SPECIFICATIONS

Geode Receiver Specifications

FEATURE	SPECIFICATION
Receiver	▪ Receiver Type: GNSS single frequency with carrier tracking ▪ Signals Received: GPS, SBAS, GLONASS (optional) ▪ Channels: 372 ▪ SBAS Tracking: 3-channel parallel tracking ▪ Update Rate: 1 Hz standard, 2~10 Hz (optional)
Accuracy	▪ SBAS (WAAS): <30 cm Horizontal RMS ▪ (<60 cm 2DRMS)1 ▪ Cold Start: <60 sec typical (no almanac) ▪ Reacquisition: <1 sec
Communications	▪ Bluetooth® 4.0 (Serial Port Profile) ▪ Bluetooth Range: Class 1 Long Range up to 100 m (330 ft) depending on connection host device range. ▪ Ports: Micro USB Client 2.0; Serial RS232C DB-9 (optional) ▪ Serial Baud Rates: 4800–115200
Receiver Protocols	▪ Data I/O Protocol: NMEA 0183, Raw Binary (proprietary), RTCM2 ▪ Other: 1PPS Timing Output, Speed Pulse, Event Marker Input (optional)
Power	▪ USB Input Voltage: 5 VDC @ 2A ▪ Power Consumption: 1.7–2 W nominal ▪ Overtime Technology™ Battery: 3.65V 5300 mAh Li-ion (~10 hours) ▪ Charging Time: ~4 hours
Output Power	▪ Output signals variable from 6 to -6 VDC
Input Power	▪ 0 to 5 VDC (max +/- 15 VDC)

FEATURE	SPECIFICATION
Antenna	▪ Internal precision multi-GNSS with integrated ground plane ▪ External Antenna Port: MCX type, 50 ohm 3.3VDC @ 20 mA maximum
Juniper Rugged™	▪ 2-meter pole drop ▪ Operating Temp: -20 C to +60 C ▪ Storage Temp: -30 C to +60 C ▪ Enclosure Rating: IP68 ▪ Dimensions: 4.4 x 4.4 x 1.7 inch (111 x 111 x 43 mm) ▪ Weight: 0.8 lb (360 g) ▪ Mount: 1/4 x 20 camera stud and #6-32 AMPS (diagonal)
Receiver Upgrades	▪ 2 Hz to 10 Hz update rate ▪ GLONASS upgrade

Software	▪ Geode Connect™: Provides configuration, communications setup, and receiver settings
	▪ Available for:
	  ▪ Windows Embedded Handheld 6.5
	  ▪ Android 4.2.x and above
	  ▪ Windows PC (8/10)

Included Accessories	▪ 5VDC USB Universal Charger ▪ USB Data/Charging Cable (USB-A to Micro-B) ▪ Universal Plug Kit ▪ 5/8 x 11 Pole Mount Adapter
Optional Accessories	▪ Field Carrying Case ▪ Smartphone Adapter Tray ▪ External Patch Antenna ▪ Precision GNSS Antenna ▪ Antenna Cable
Models	▪ Geode GPS, 1 Hz ▪ Geode GPS with GLONASS, 1 Hz ▪ Geode GPS with 9-pin Serial port, 1 Hz ▪ Geode GPS with GLONASS and 9-pin Serial port, 1 Hz

D

GLOSSARY

NMEA sentence descriptions:

- DTM—Datum reference
- GBS —Satellite fault detection used for RAIM
- GGA— Detailed GPS position information
- GLL—Latitude and longitude data
- GNS—Fix data for single or combined satellite navigation systems
- GRS—GNSS range residuals
- GSA—GPS DOP and active satellite information
- GST—GNSS pseudorange error statistics
- GSV—GNSS satellites in view
- RMC—Recommended minimum specific GNSS data
- RRE—Range residual message
- VTG—Course over ground and ground speed
- ZDA—UTC time and date information";

Active GNSS Constellations

- GPS—Sets the "GP" Talker ID prefix in any enabled NMEA strings
- GNSS—Selecting this ensures the GLONASS constellation is active. Sets the "GL" or "GN" Talker ID prefix in any enabled and compatible NMEA strings for GLONASS-enabled receivers";
- GLONASS—GLObal NAvigation Satellite System. A Russian alternative to GPS.
- NMEA Precision—Specify the number of decimal places to output in the GGA, GLL, and GNS messages";

Binary Messages Enable the output of the various binary messages—most notably the Bin95 and Bin96 messages—to be requested. The Bin95 and Bin96 messages contain information required for post processing.

- Bin1—GPS position message (position and velocity data)
- Bin65—GLONASS ephemeris information

- Bin66—GLONASS L1/L2 code and carrier phase information
- Bin76—GPS L1/L2 code and carrier phase information
- Bin95—GPS ephemeris information
- Bin96—GPS L1 code and carrier phase information

Environment

- OpenSky—Recommended for most mapping conditions (default)
- Forest—Environments with heavy tree canopy
- Fast—Moving with sudden direction changes (vehicle)
- Custom:—Indicates when an environment setting other than a predefined mode is selected (advanced settings)
- Update Rate—Sets the message output rate through the active connection/port
- Mask Angle—Sets the elevation mask angle cutoff for the receiver\n\nAny satellites below this mask angle will be ignored even if available. Selectable value of 0 to 60 degrees. The default angle is 5° as satellites below this angle may have significant tropospheric error

SBAS

- SBAS.Auto—Auto-tune mode to set the appropriate SBAS PRNs based on the autonomous GPS position (Default)";
- EGNOS:—European Geostationary Navigation Overlay Service (Europe SBAS): PRN 120, 124, 126";
- GAGAN—GPS Aided GEO Augmented Navigation (India SBAS): PRN 127";
- MSAS—MTSAT Satellite Augmentation System (Japan SBAS): PRN 129, 137";
- SDCM:—System for Differential Correction and Monitoring (Russia SBAS): PRN 125, 141, 140";
- WAAS—Wide Area Augmentation System (North

America SBAS): PRN 133, 135, 138";

- None:—SBAS corrections disabled

Receiver Mode—Settings for various receiver performance parameters. This section affects the "Environment" mode setting

- Base—Enables/disables base mode functionality
- Forest—Enable/disable high gain functionality for tracking under canopy
- GPS Only—If GLONASS is available, enabling this setting will cause the receiver to only use GPS data
- L1 Only—Set the receiver to use L1 data even if L2 data is available
- Mixed—Include satellites that do not have DGPS or SBAS corrections in the position solution
- NULL NMEA—Sets receiver to output NULL fields in NMEA 0183 messages when there is no fix (when position is lost)
- SBAS No RTK—Disable/enable the use of SBAS ranging signals (carrier phase) in RTK
- SBAS Ranging—Allows SBAS satellites to be used for initial position ranging for a faster initial position fix
- SureTrack—Enable/disable SureTrack functionality (default is enabled)
- NMEA Time Keep—Enable/disable continuous time updating in NMEA 0183 messages when there is no fix (when position is lost)
- Tunnel—Enables faster reacquisition after coming out of a tunnel

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