



archer⁴_{TM}

Archer Connect Software

USER MANUAL

Archer Connect User Manual

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CHAPTER 1

1 Get Started

Archer Connect is a communication utility for the Archer 4 GNSS expansion that allows you to change the receiver settings and to deliver centimeter-level RTK corrected position data.

1.1 Install Archer Connect

Archer Connect is available as an app from the Google Play Store.

1.2 Attach the GNSS Expansion

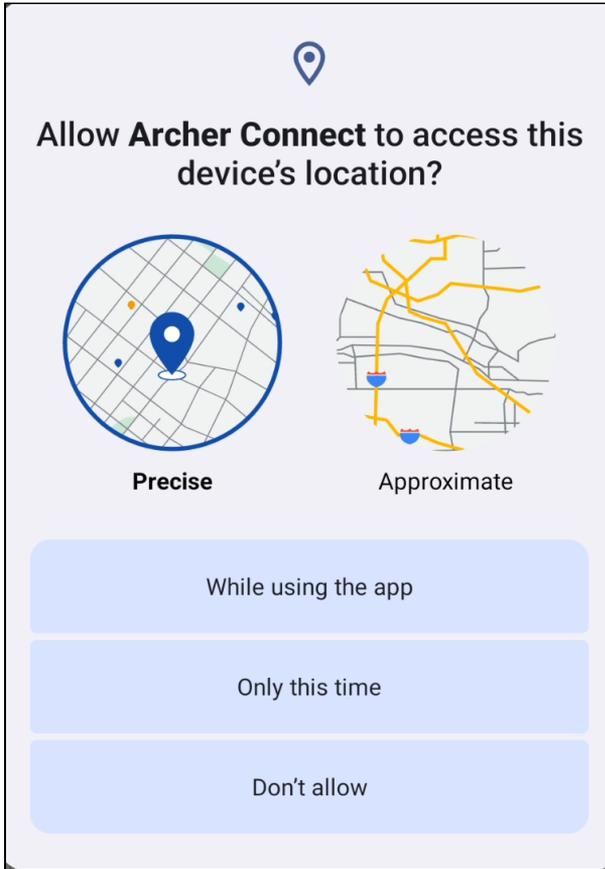
Instructions for installing the GNSS expansion are available in the Archer 4 User Manual. (See [3.2 Sub-meter GPS/GNSS, page 26.](#))

1.3 Set Up Permissions

The first time you use Archer Connect, you need to give permission for Archer Connect to communicate with various Android capabilities. To set up the Android permissions,

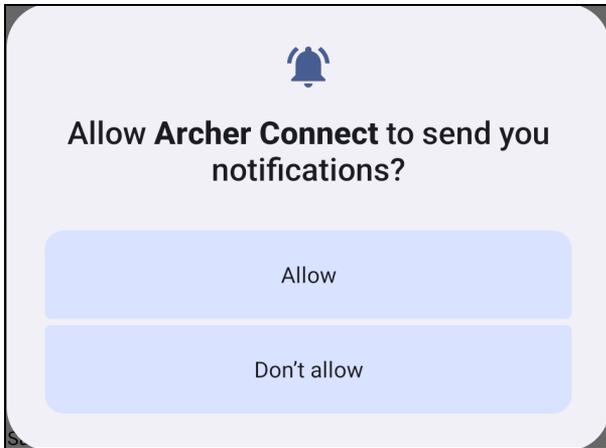
1. Ensure the GNSS expansion is attached to the Archer 4 and Archer Connect is installed.
2. Open Archer Connect.
3. When asked to allow the Archer Connect to access the handheld's location, select
 - **While using the app** to give access any time you use Archer Connect. (Recommended)
 - **Only this time** to grant one-time access. You will be asked to allow access the next time you open

Archer Connect.



4. When asked to allow Archer Connect to send notifications, select

- **Allow** to see when Archer Connect is running. (Recommended)



- **Don't Allow** if you do not want see notifications while Archer Connect is running.
Note: If you choose not to allow notifications, you will not see evidence that Archer Connect is running in the background while you use other apps.

If you didn't select the U-Blox USB GPS receiver during the installation of the GNSS expansion, the following prompt appears.

GNSS Expansion not found

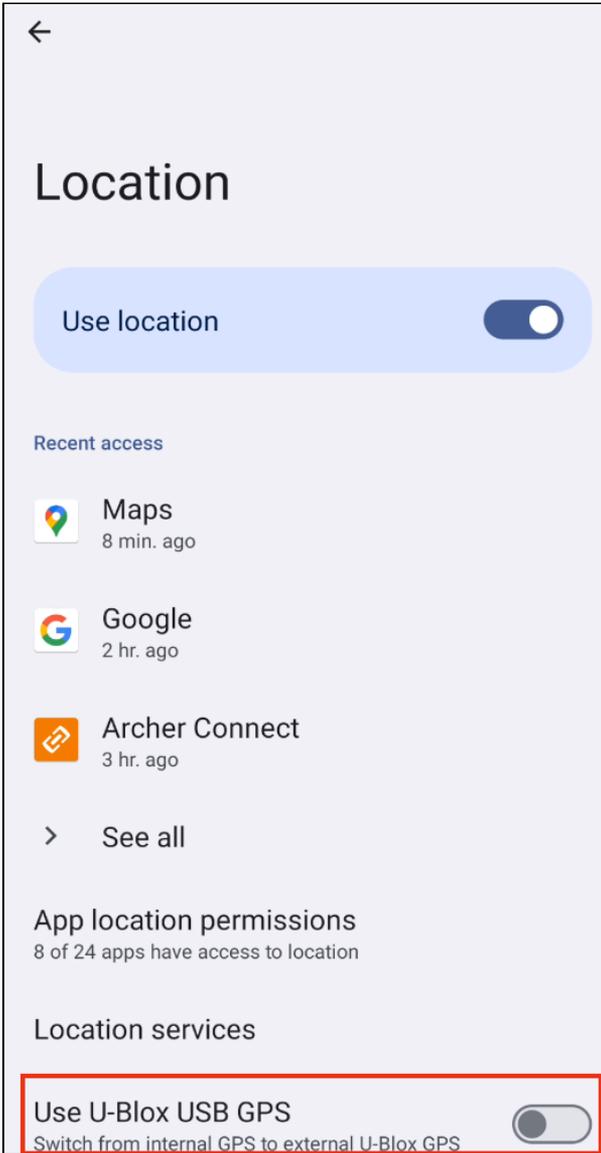
Archer Connect requires Location to be enabled, and the option to Use U-Blox USB GPS to be enabled in the Android location settings.

1. Tap Open Location Settings
 2. Make sure that the option Use location is enabled.
 3. Make sure that the option Use U-Blox USB GPS is enabled.
- Restart your device if you continue to see this prompt.

Dismiss **Open Location Settings**

1. Tap **Open Location Settings**.

2. Enable **Use U-Blox USB GPS**.



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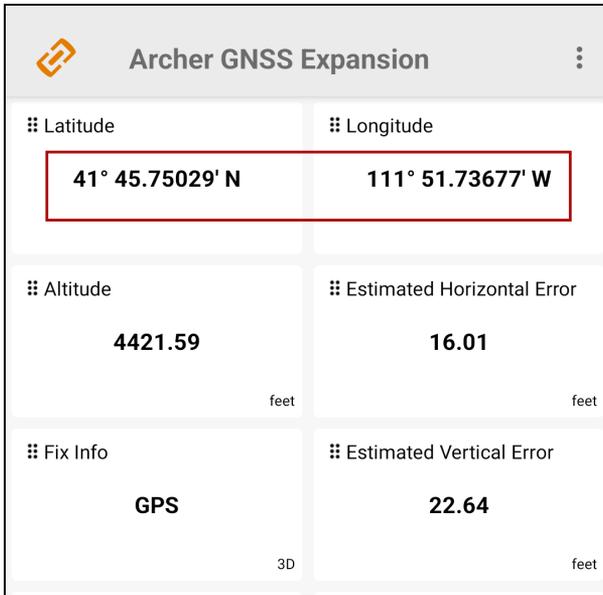
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CHAPTER 2

2 Connect to the GNSS Expansion

After a few seconds, the location information updates, indicating that you are receiving GNSS data.



The screenshot shows the Archer GNSS Expansion app interface. The title bar at the top contains an orange icon, the text "Archer GNSS Expansion", and a vertical ellipsis menu icon. The main content area is divided into six sections, each with a header and a value:

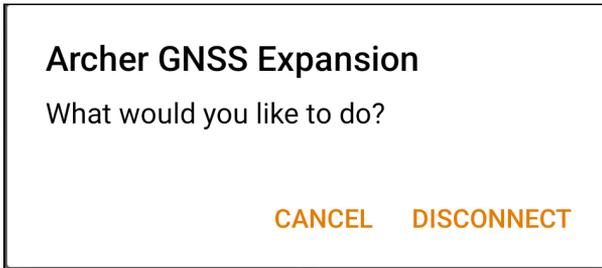
Latitude	Longitude
41° 45.75029' N	111° 51.73677' W
Altitude	Estimated Horizontal Error
4421.59	16.01
feet	feet
Fix Info	Estimated Vertical Error
GPS	22.64
3D	feet

2.1 Disconnect from GNSS Expansion

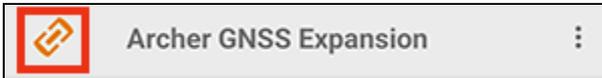
To disconnect from the GNSS expansion,

1. Tap .

2. Tap **Disconnect**.



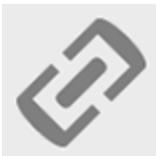
At the top of the screen, you can tap  to quickly disconnect from or connect to the GNSS expansion.



The color of the Archer Connect icon shows the connection status.



Connected

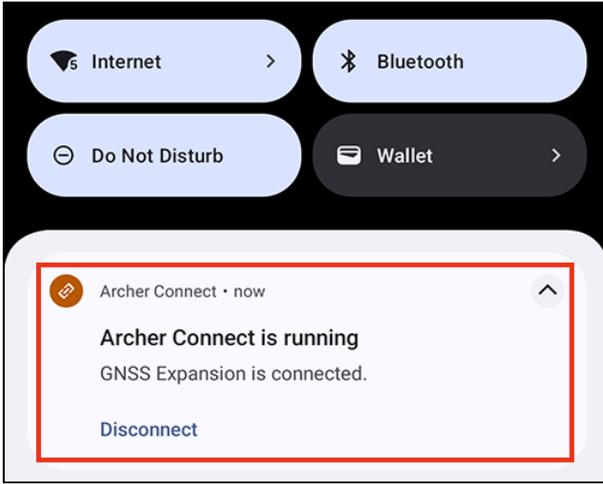


Disconnected

2.2 Allow Archer Connect to Run in Background

After you connect the GNSS expansion to Archer Connect, you can close the Archer Connect app and it continues to run as an app service in the background. To view Archer Connect's status, swipe down from the top of the screen to open the Android no-

tifications. When Archer Connect is running, there is a notification.



Note: if you opted not to allow notifications when you set up permission, you will not see the Archer Connect is running notification.

To disconnect Archer Connect from the GNSS expansion, tap **Disconnect**. (You may need to expand the notification.)

When Archer Connect is running, you will also see a bubble on the icon.



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CHAPTER 3

3 Understand the Home Screen

The Home screen serves as the dashboard for the GNSS receiver. On this screen, you can view

- Latitude
- Longitude
- The altitude
- The estimated horizontal error
- The estimated vertical error
- The fix info (GPS, DGPS, RTK, etc.)
- Your speed
- Your heading
- The number of satellites in fix
- PDOP
- The correction signal

Tap  to open the Settings menu. (See [Customize Settings](#) for more information.)



Drag and drop each box to organize the screen as you prefer.

The screenshot shows the Archer GNSS Expansion app interface. At the top, there is a title bar with the app icon and the text "Archer GNSS Expansion" and a menu icon. Below the title bar, the data is organized into a grid of widgets. Each widget has a title, a main value, and a unit. The widgets are:

- Latitude:** 41° 45.7414424' N
- Longitude:** 111° 51.7372422' W
- Altitude:** 4425.7 feet
- Estimated Horizontal Error:** 3.62 feet
- Fix Info:** GPS 3D
- Estimated Vertical Error:** 6.23 feet
- Speed:** 0.02 miles per hour
- Heading:** - degrees
- Satellites In Fix:** 21 of 34
- PDOP:** 1.11
- Correction Type:** None

At the bottom of the screen, there is a navigation bar with four icons: a home icon labeled "Home", a GNSS icon, a screen icon, and a settings icon.

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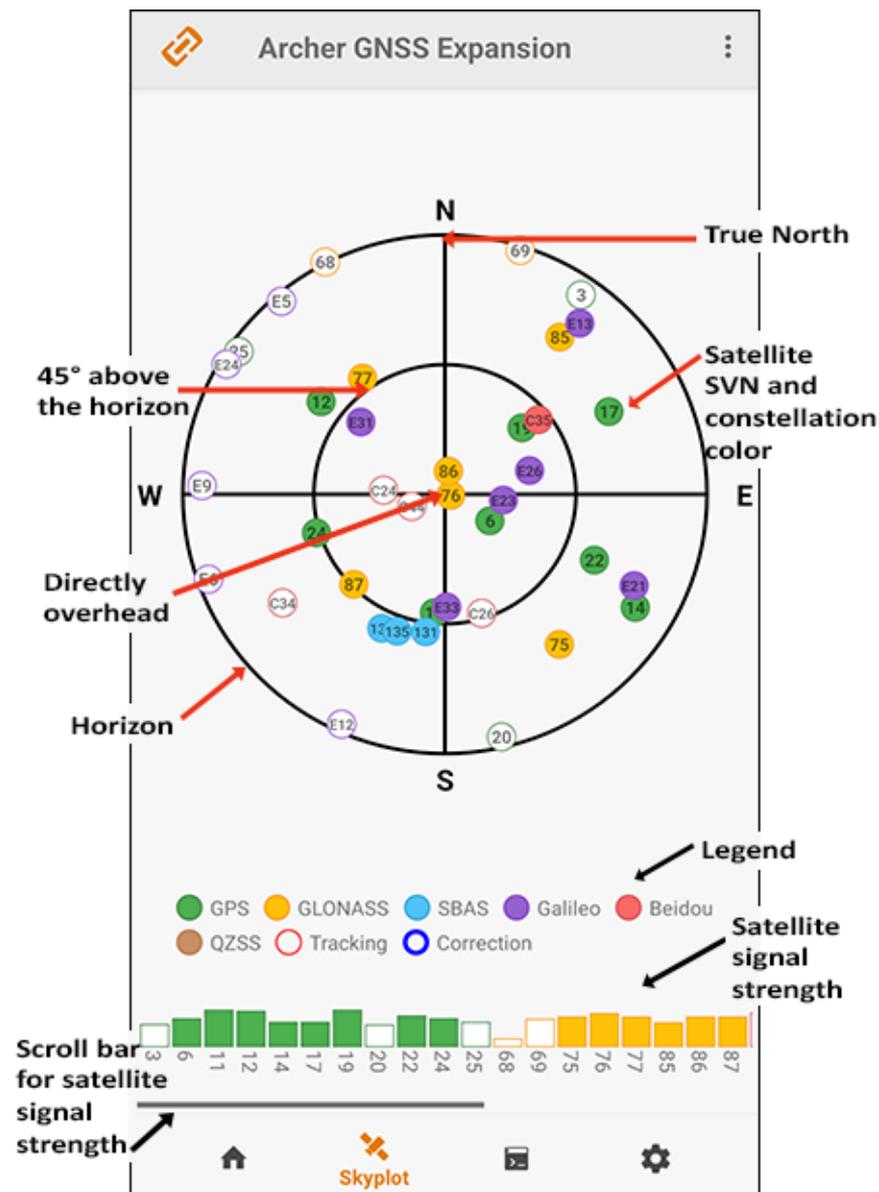


CHAPTER 4

4 Decode the Skyplot Screen

The Skyplot screen shows which satellites are being used in the positioning solution and where they are in the sky. It also shows satellites that are being tracked.

On the Skyplot screen, each satellite is identified by a space vehicle number (SVN) and color for its constellation. The location of each satellite on the Skyplot indicates its location in the sky relative to true north. The outside ring is 0° elevation (horizon). The inside ring is 45° elevation—halfway above the horizon from your present location. The intersection of the two lines indicates directly overhead.



The color of the satellite outline shows the connection status.

- A red outlined satellite is being tracked but not part of the positioning solution.

- A blue outlined satellite indicates that a correction is being applied to the signal and is part of the positioning solution.

The Skyplot screen is meant to be used as a guide. It shows the relative visibility of satellites in the sky, but it is not an absolute reference for satellites used in the positioning solution.

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CHAPTER 5

5 View the Terminal Screen

The Terminal screen displays the NMEA sentences output by the Archer GNSS expansion. The GNSS expansion driver implements the following NMEA messages: GGA, GLL, GNS, GRS, GSA, GST, GSV, GBS, RMC, VTC, and ZDA. From the Terminal screen, you have the option to

- Clear the screen 
- Show the precise time in front of each line 
- Pause the stream 
- Capture the NMEA sentences by saving a recording of the screen 

To adjust the data resolution, see [NMEA Precision](#).

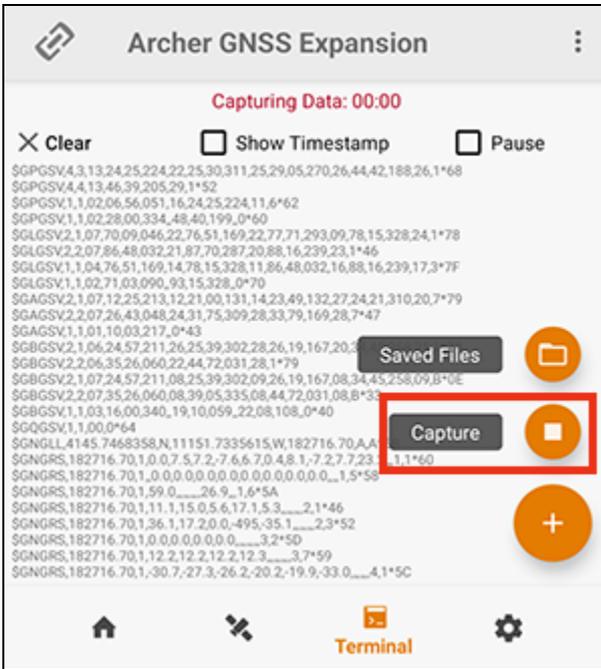
5.1 Capture Screen Recording

To capture the NMEA sentences output by the GNSS expansion, you will start and stop a recording.

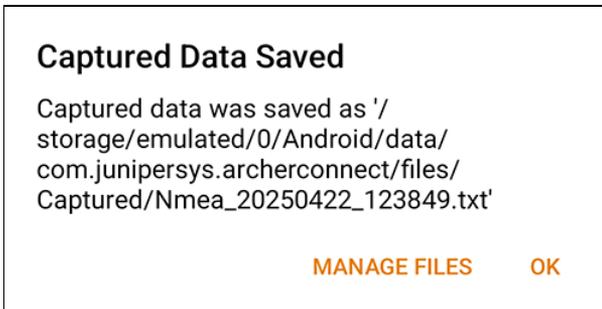
To begin recording,

1. Tap .

- When you have captured the desired strings, tap **Capture** again.



- When you stop recording, Archer Connect shows the file location.

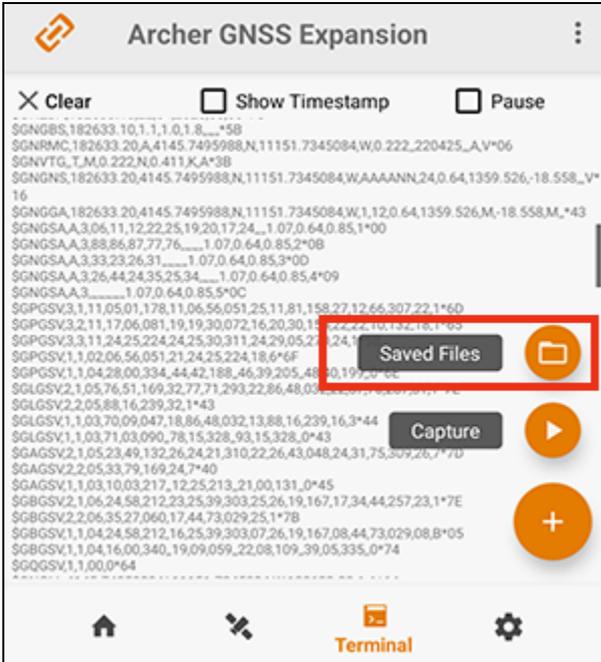


- Tap **OK** to save in that location with that name.
- Tap **Manage Files** to see the saved files.

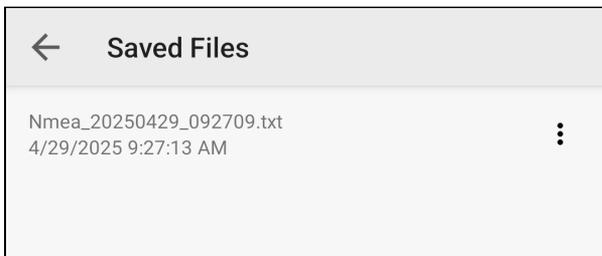
5.2 View Saved Screen Recording(s)

From the Terminal screen,

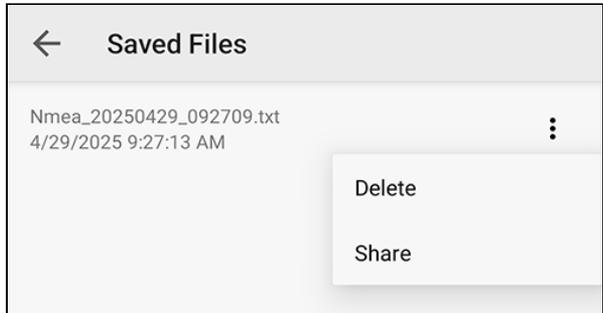
1. Tap .
2. Tap **Saved Files** to see the files that you have captured and saved.



- To view the contents of the file, tap the file name.



- To share or delete each file tap the  .
 - Tap **Delete** to remove the file.
 - Tap **Share** and choose the method you would like to use to share.
For example, if you choose to share through email, an email will be opened in your default email app with the captured TXT file attached.



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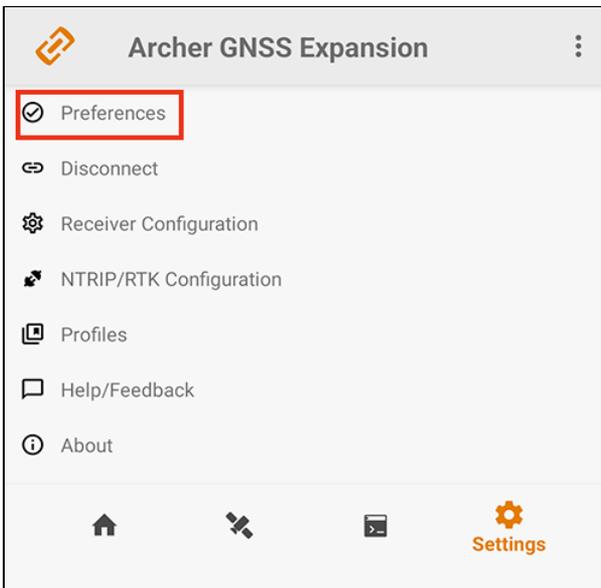
CHAPTER 6

6 Customize Settings

From Settings, you can adjust your app preferences, configure the GNSS expansion receiver, enter your NTRIP/RTK service credentials, access your profiles, send log files to Juniper Systems' technical support, and find the details about the version of Archer Connect.

6.1 Preferences

Tap **Preferences** to customize how information is displayed in Archer Connect.

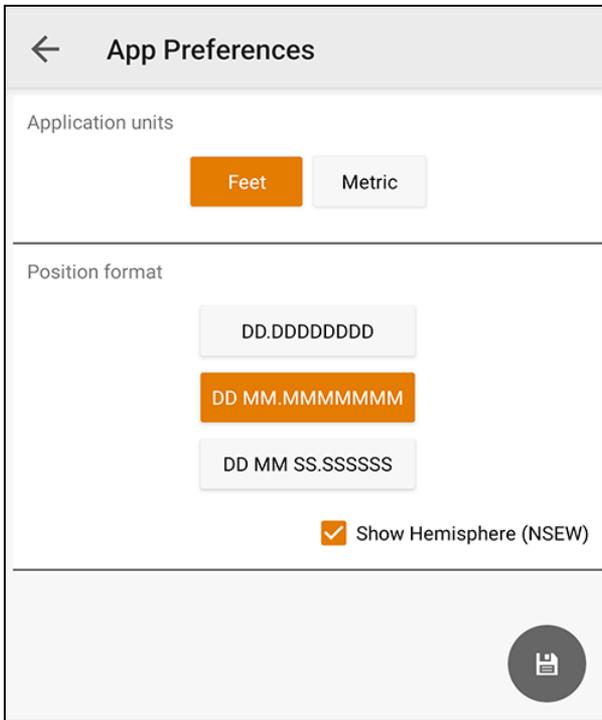


Choose to use feet or meters for the distance unit displayed on the Home screen.

Choose the position format that will appear in the latitude and longitude measurements on the Home screen. You can choose

- decimal degrees (DD.DDDDDDDD)
- degrees and minutes (DD MM.MMMMMMM)
- degrees, minutes, and seconds (DD MM SS.SSSSSS)

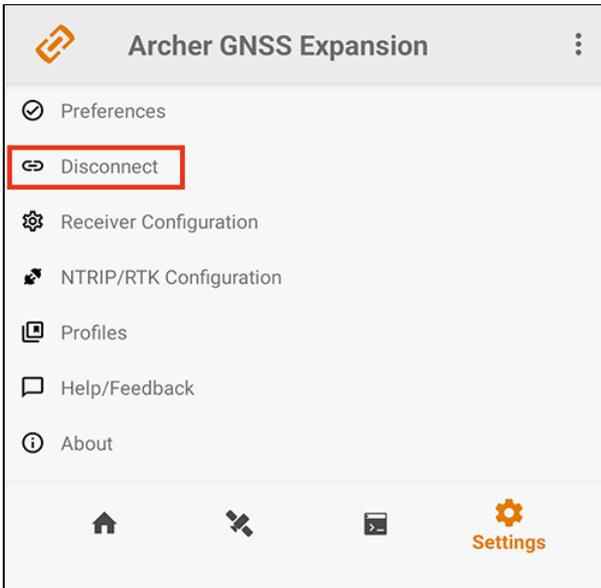
Enable Show Hemisphere to see the North (N), South (S), East (E), or West (W) at the end of latitude and longitude coordinates on the Home screen.



Note: Changes must be saved. An orange save icon  means there has been a change that needs to be saved. Tap the save icon  to save the changes.

6.2 Disconnect/Connect

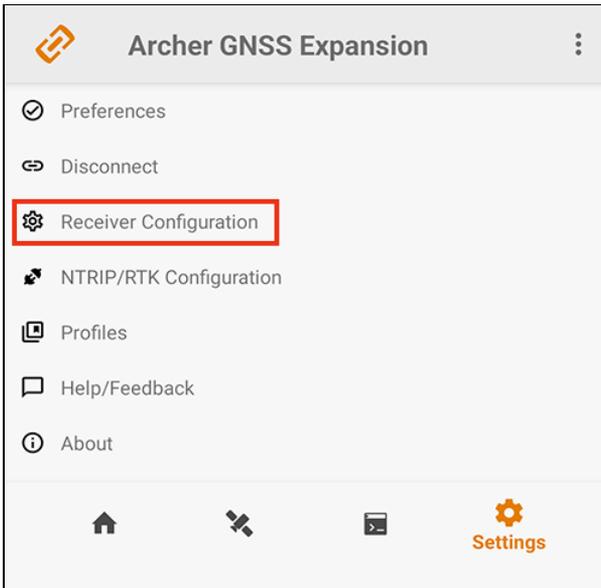
Tap  to connect or disconnect from the GNSS expansion.



6.3 Receiver Configuration

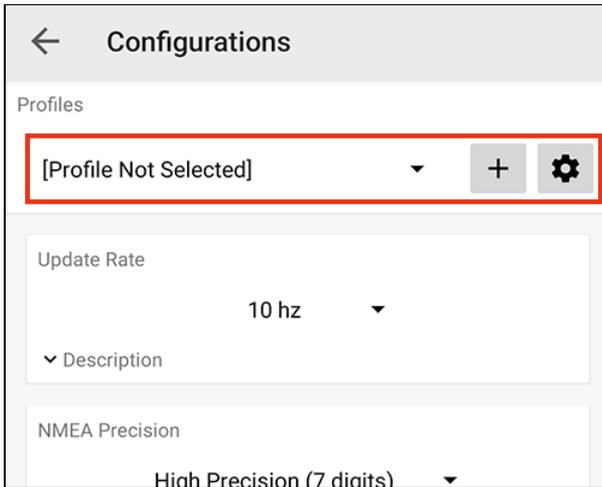
Note: The Receiver Configuration option is only available if you are connected to the GNSS expansion.

Tap **Receiver Configuration** to set up the GNSS expansion to meet the needs of your project.



The active profile is shown at the top of the Configurations screen. If no profile is selected, *[Profile Not Selected]* displays. To change the active profile, tap the drop-down arrow and select from the list of available profiles.

More information can be found in [Profiles](#).



The **+** adds a profile. See [Add Profile](#).

The **⚙️** opens the Manage Profiles screen. See [Profiles](#).

6.3.1 Update Rate

The update rate sets the message output rate through the active connection/port. You can specify your preferences for the update rate. Choose 1, 2, 5 or 10 Hz. We recommend 1 Hz.

6.3.2 NMEA Precision

This specifies the data resolution to the number of decimal places to output. Choose high precision (7 digits), standard (5 digits), or compatibility (4 digits). See [View the Terminal Screen](#) for additional information about the NMEA messages output.

6.3.3 Elevation Mask Angle

The elevation mask angle sets the minimum elevation (in degrees) that a satellite can be above the horizon and be used in the navigation solution. Any satellites below this angle will be ignored, even if they are available. Low elevation satellites may provide degraded accuracy because of the long distance that

the signal travels through the atmosphere. The default value is 5°.

6.3.4 Enabled Correction Sources

Choose the correction source(s) to use. You can use one, both, or neither.

- **SBAS** differential corrections
- **QZSS SLAS** differential corrections

Note: RTK is automatically enabled when the NTRIP/RTK client is connected.

6.3.5 SBAS

Specify which SBAS satellite signal to use for an SBAS corrected solution.

- **Auto**—The auto-tune option sets the appropriate SBAS PRNs based on the autonomous GPS position. This is the default.
- **EGNOS**—European Geostationary Navigation Overlay Service (Europe SBAS) PRN 136, 123, 126
- **GAGAN**—GPS Aided GEO Augmented Navigation (India SBAS) PRN 127, 128, 132
- **MSAS**—MTSAT Satellite Augmentation System (Japan SBAS) PRN 129, 137, 139
- **SDCM**—System for Differential Correction and Monitoring (Russia SBAS) PRN 125, 140, 141
- **SouthPAN**—Southern Positioning Augmentation Network (Australia and New Zealand SBAS) PRN 122
- **WAAS**—Wide Area Augmentation System (North America SBAS) PRN 131, 133, 135

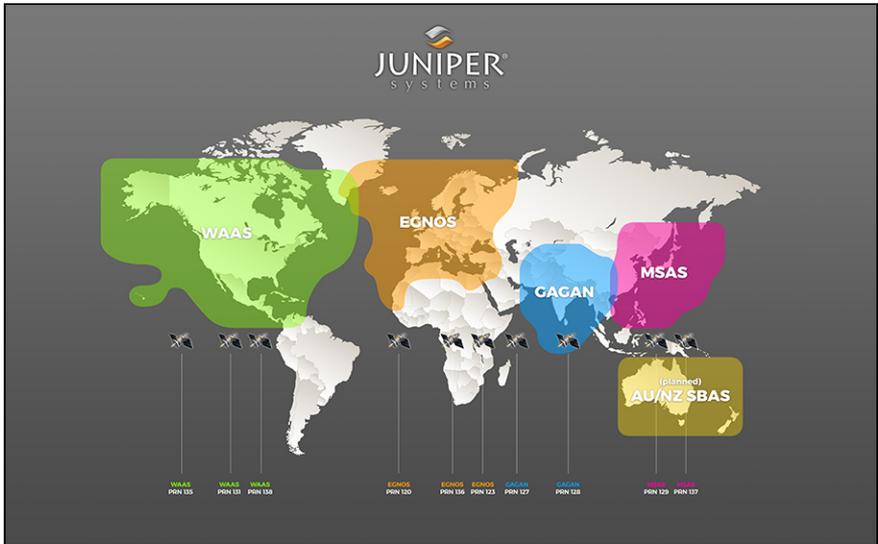
Usually, selecting Auto (the default) is sufficient because the various SBAS services cover different geographical areas. However, there are some areas where these services overlap. (See the map below.)

For example, if you are collecting corrected GNSS positions in the Northeastern United States, you may be receiving SBAS cor-

rections from WAAS or EGNOS. If the receiver is set to Auto, it may even jump back and forth between the two.

The two services use different reference datum or models. Switching between them can cause significant error between different points of data.

In areas of overlap, the best practice is to select a specific SBAS service to accept corrections data from.



6.3.6 Receiver Reset

Use Reset Options to return all of the options on the Configurations screen to the default values. Your previous settings cannot be reapplied without manually entering the desired values.

A receiver reset does not remove your profiles, preferences, or NTRIP/RTK Configuration information.

6.3.7 NTRIP/RTK Configuration >

Tap **NTRIP/RTK Configuration >** to view the NTRIP/RTK Configuration screen. See [NTRIP/RTK Configuration](#) for details.

6.4 NTRIP/RTK Configuration

NTRIP stands for Network Transport of RTCM via Internet Protocol. It delivers the corrections used for Real-Time Kinematic (RTK) positioning. Where available, RTK networks stream data corrections over the internet, allowing the GNSS expansion receiver to calculate an RTK Fix/Float position solution.

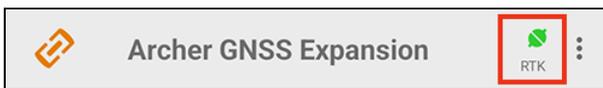
NTRIP makes it possible to create networks of base stations that increase both the availability and reliability of RTK corrections. Since distance from a base station strongly affects position precision and accuracy, NTRIP-enabled RTK networks are able to calculate the user's closest base station or use algorithms and modeling to create a virtual base station very close to the user's receiver. The GNSS expansion accesses NTRIP-enabled RTK services via the cellular data or internet capabilities of the Archer 4. These services require a subscription and a stable internet connection. The GNSS expansion uses the data (RTCM version 3.x) provided by the NTRIP-enabled RTK network to achieve a precise RTK Fix solution in most instances. The GNSS expansion expects RTCM version 3.x formatted messages to compute an RTK solution.

Note: NTRIP/RTK settings are stored in the Archer Connect app, not in the GNSS expansion.

The GNSS expansion can calculate an RTK Fix/Float position with sub-meter to centimeter-level accuracy. NTRIP services require an internet or cell data connection and usually involve either a free or paid subscription to the service.

If you have a subscription to an NTRIP/RTK service, Archer Connect will allow you to configure the GNSS expansion to use that service.

When you are connected to an NTRIP/RTK service provider, the Settings and Home screens show an RTK icon. Tap it to open the NTRIP/RTK configuration screen.





NTRIP/RTK connection is working.



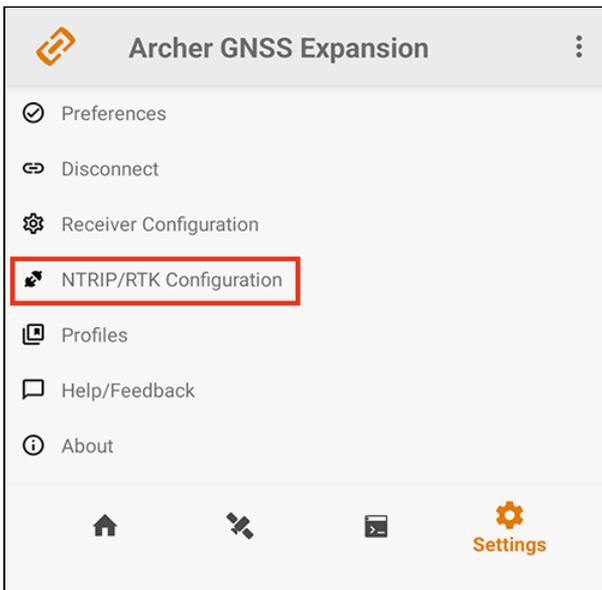
Connection to the NTRIP service is in progress.

6.4.1 Connect to NTRIP/RTK Service

To connect to an NTRIP/RTK service,

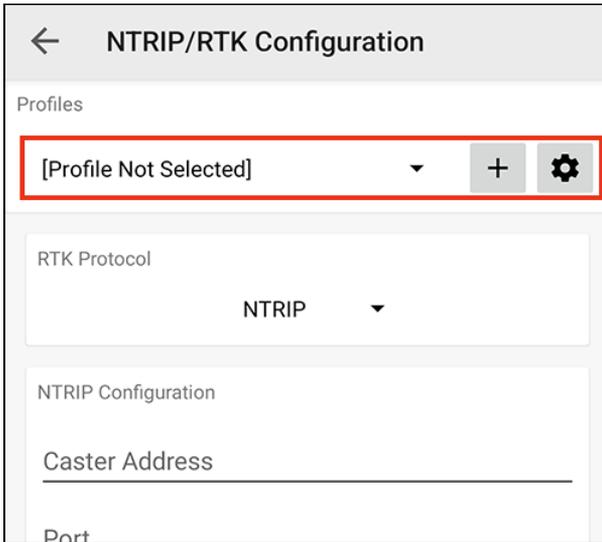
The active profile is shown at the top of the screen. If no profile is selected, *[Profile Not Selected]* displays.

1. Ensure Archer Connect is connected to the GNSS expansion and you have a data connection.
2. Tap **NTRIP/RTK Configuration**.



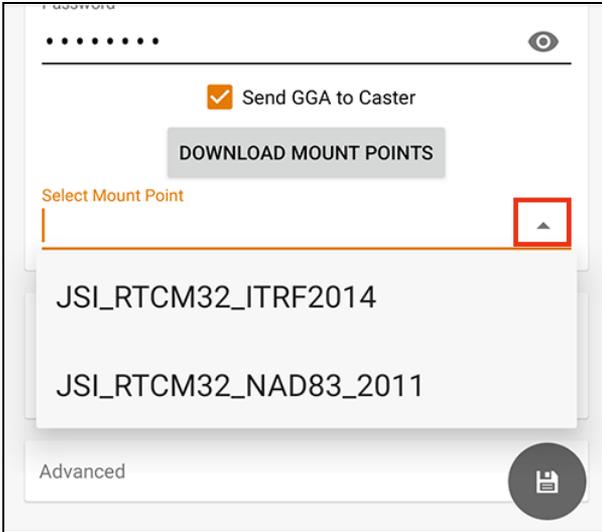
3. To change the active profile, tap the drop-down arrow and select from the list of available profiles. For more informa-

tion, see [Profiles](#).



4. Depending on the requirements of your NTRIP/RTK service provider, select
 - **NTRIP** if the information from your NTRIP/RTK service provider includes caster IP address, port, username, and password.
 - **Direct IP** if the only information you have from your NTRIP/RTK service provider is an IP address.
5. Enter the NTRIP credentials supplied by your NTRIP/RTK service provider.
 - Caster Address
 - Port
6. Enter your username and password for your NTRIP/RTK service provider.
7. If required by your service provider, select **Send GGA**. This sends your location to your service provider so that the NTRIP network can give you the closest or best mount point(s).
8. Tap **Download Mount Points**.

9. Tap the drop-down arrow and select from the list of mount points one close to the your position.



10. Tap **Start NTRIP/RTK**.

When NTRIP/RTK is connected and working, Start NTRIP/RTK changes to Stop NTRIP/RTK. The connection is not instantaneous. If the GNSS expansion has trouble connecting, try selecting a different mount point.

To end an NTRIP/RTK connection, tap **Stop NTRIP/RTK**.

6.4.2 Direct IP Configuration

If your NTRIP/RTK service provider gave you only an IP address, use the direct IP option to connect.

To establish an NTRIP/RTK connection,

1. Ensure you have a data connection.
2. Enter the address and port supplied by your NTRIP/RTK service provider.
3. Tap **Start NTRIP/RTK**.

When NTRIP/RTK is connected and working, the Start NTRIP/RTK changes to Stop NTRIP/RTK.

6.4.3 Advanced

The NTRIP/RTK **Configurations** > **Advanced** screen allows you to give more direction about how the GNSS expansion will communicate with your RTK server.

TLS/SSL Configuration

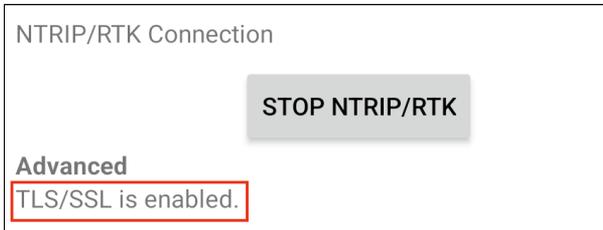
Some NTRIP/RTK service providers use a TLS/SSL connection. Your NTRIP service provider will let you know if you need to use this option.

To use a TLS/SSL connection,

1. Enable **Use TLS/SSL Connection**.
2. Tap .



When a TLS/SSL connection is enabled, it shows on the Receiver Configuration screen.

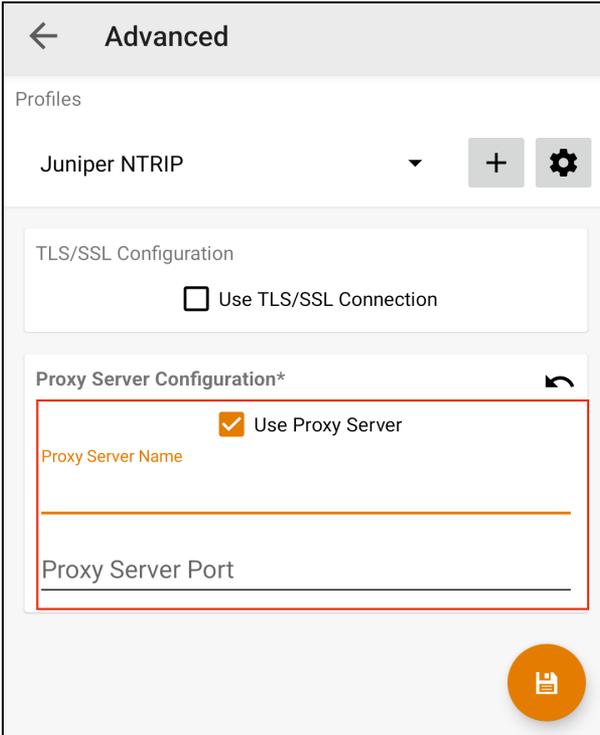


Proxy Server Configuration

You may need to use a proxy server if a network firewall blocks the port that your NTRIP service is using.

To use a proxy server,

1. Enable **Use Proxy Server**.
2. Enter the name of your proxy server.
3. Enter the port of your proxy server.
4. Tap .

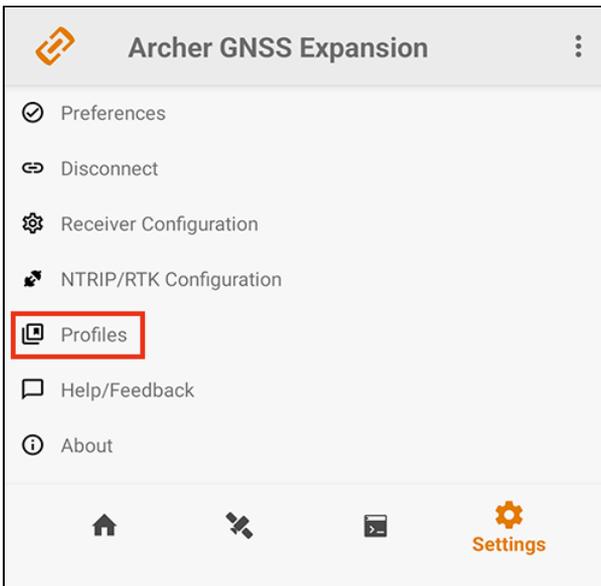


When a proxy server is enabled, it shows on the Receiver Configuration screen.

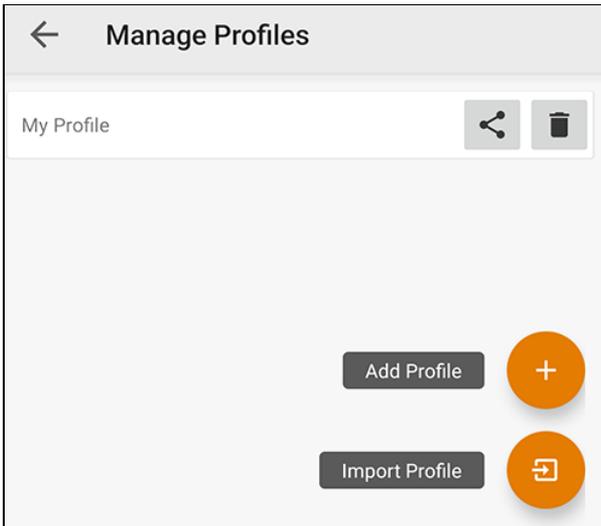


6.5 Profiles

A profile allows you to save your customized settings for reuse in the future or to share with other devices to quickly apply consistent settings among devices. You can have multiple profiles to fit different use cases.



From the Manage Profiles screen, you can add, share, import, or delete a profile.



6.5.1 Share Profile

To share a profile,

1. Tap  on the same line as the profile you want to share.
2. Choose the method you would like to use to share the profile.

For example, if you choose to share through email, an email will be opened in your default email app with the profile JSON file attached.

6.5.2 Delete Profile

Tap  to remove a profile. Tap **Delete** when prompted.

6.5.3 Add Profile

The new profile is based on the current receiver settings. Any changes you make to the receiver settings are applied to the current profile. To add a profile,

1. Tap **Add Profile**.

2. Enter the profile name and tap **OK**.

Enter profile name

Enter profile name

New

CANCEL OK

6.5.4 Import Profile

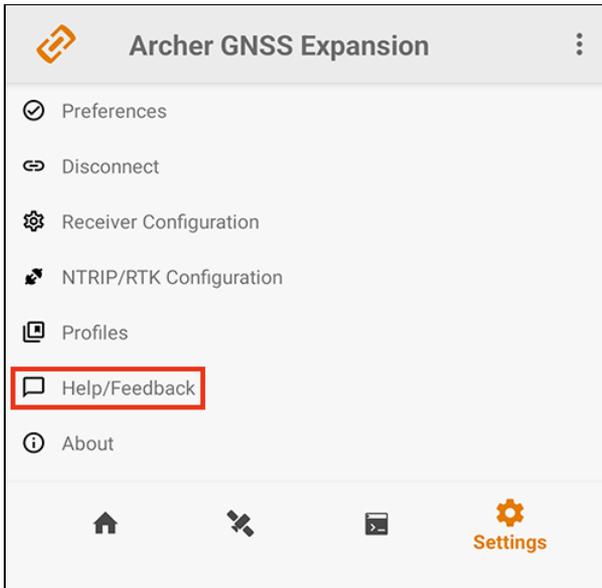
If you have received a profile and want to import it,

1. Tap **Import Profile**.
2. Choose the file to import.

The imported profile will be listed on the Manage Profiles screen.

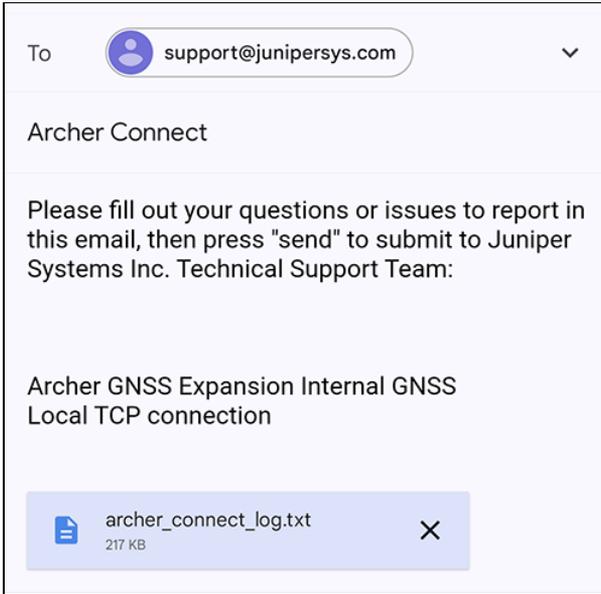
6.6 Help/Feedback

To request help or send a log file to Juniper Systems customer support, tap Help/Feedback.



This opens an email addressed to Juniper Systems Support from the email account configured on your device. The email includes an attached log file from Archer Connect that allows Juniper Systems support to diagnose and solve problems more efficiently.

You can enter additional information into the email to provide a further explanation about your issue.



6.7 About

The About screen shows the Archer Connect version currently in use.

