Manage Web
User Manual

Manage Web User Manual

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Log a Case and Search Knowledge:

Website: novatel.com/support

Log a Case, Search Knowledge and View Your Case History: (login access required)

Web Portal: https://novatelsupport.force.com/community/login

E-mail:

support.novatel@hexagon.com

Telephone:

U.S. and Canada: 1-800-NOVATEL (1-800-668-2835)

International: +1-403-295-4900

Chapter 1 Overview

Manage Web is a browser based tool used to monitor, configure and update a variety of receiver functions.

Manage Web runs on the receiver and can be accessed by any Wi-Fi or Ethernet enabled device, such as a smart phone, tablet or laptop, using a web browser.

Chapter 2 Open Manage Web

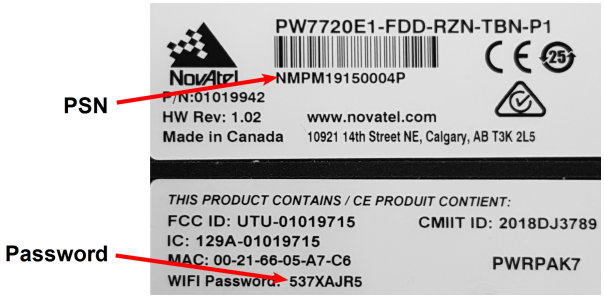
To open Manage Web, connect to the receiver using Wi-Fi or Ethernet and then start a Manage Web session.

2.1 Connect to the Receiver Using Wi-Fi

A Wi-Fi connection is only available on Wi-Fi enabled receivers such as the PwrPak7 and SMART7.

1. Open the Wi-Fi settings page on your device and locate the receiver on the list of detected Wi-Fi networks.

   The default network name (SSID) of the receiver is on a label on the receiver. The format of the SSID is <Receiver>-<Receiver PSN>, e.g. "PwrPak7-ABCDEF1234567". The figure below shows an example of the label on a PwrPak7.



2. Enter the Wi-Fi password for the receiver.

   The default Wi-Fi password is on a label on the receiver.

2.2 Connect to the Receiver Using Ethernet

To use Manage Web over Ethernet, an Ethernet connection must be established between the receiver and the computer. For information about establishing an Ethernet connection, refer to the Ethernet section in the OEM7 Receiver User Documentation Portal (docs.novatel.com/OEM7).

No password is required as long as the receiver is connected and has an IP address.

2.3 Start a Manage Web Session

1. Open a web browser on the device connected to the receiver.
2. Enter **192.168.19.1** in the address (URL) bar of the browser.

   If using an Ethernet connection, enter the IP address assigned to the receiver.

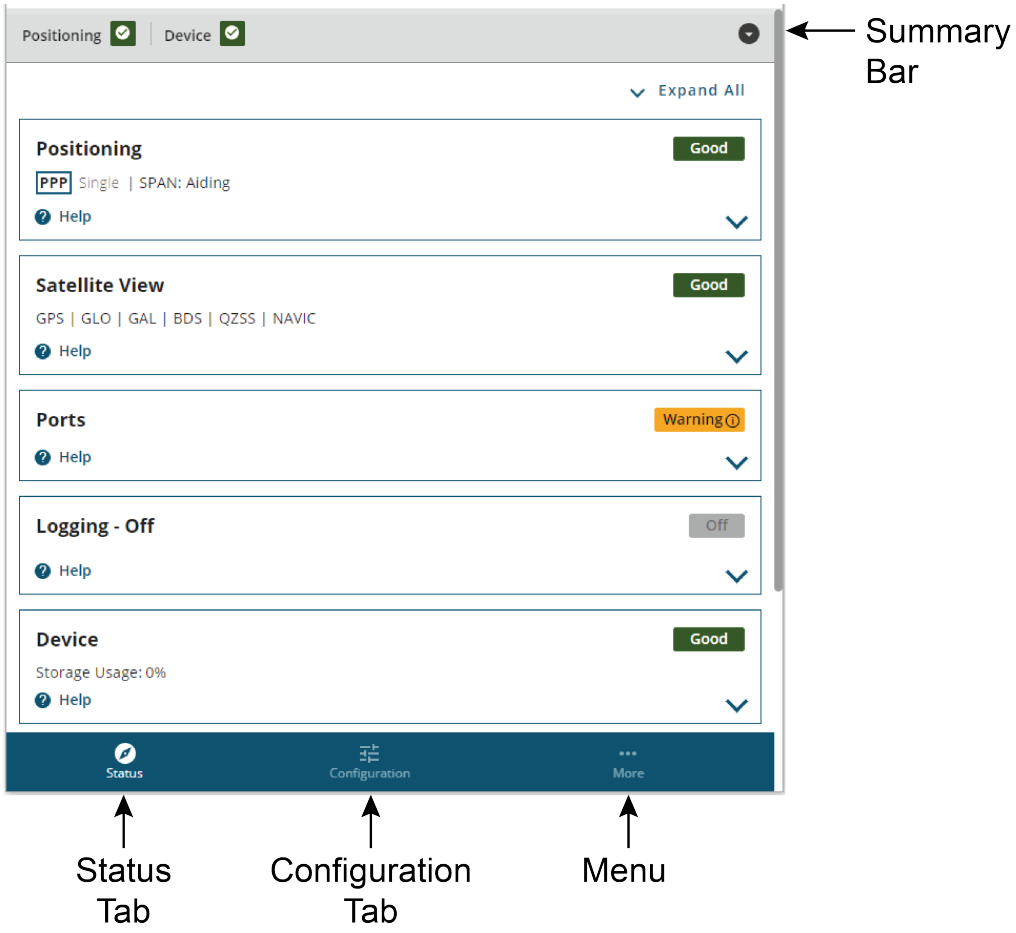
   The Manage Web Home page appears.

Manage Web is compatible with Chrome, Firefox and Safari.

Cookies should always be on and never blocked on the browser being used to connect to the Wi-Fi network.

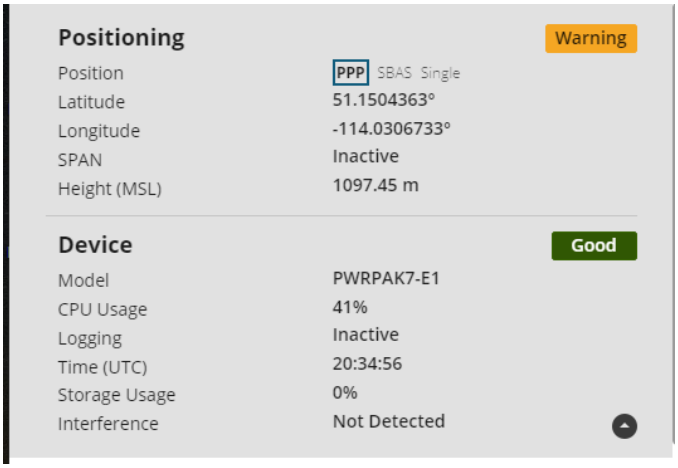
Chapter 3 Manage Web Home Page

After opening Manage Web, the Home page appears. From the Home page you can access all of the Manage Web features.



3.1 Summary Bar

The Summary bar appears on all Manage Web pages and provides status information about the receiver. The information is shown in two parts. Swipe the Summary bar left or right to switch between the parts.



Status Indicator

A colored bar with text indicates the status of the summary information shown.

Color	Text	Description
Green	Good	The receiver is functioning and there are no warnings or errors.
Amber	Warning	The receiver is functioning, but there are one or more issues that may require attention.
Red	Error	An issue is preventing the receiver from functioning. The Error state will remain until the situation is resolved.

If the receiver has a warning or error, go to the *Status* tab and scroll through the status bars. An amber or red status indicator appears on the status bars where more information about the warning or error can be found. See *Status Window* on page 23 for more information.

Position (Pos)

The *Position* field shows all of the positioning types available on the receiver. The positioning type that is currently being used to calculate the position is highlighted in a box.

Latitude (Lat)

The *Latitude* field shows the latitude of the calculated position in degrees.

Longitude (Long)

The *Longitude* field shows the longitude of the calculated position in degrees.

SPAN

The *SPAN* field shows the status of SPAN GNSS+INS technology.

Height

The *Height* field shows the height above mean sea level of the calculated position in metres.

Model

The *Model* field shows the receiver type.

CPU Usage

The *CPU Usage* field shows the amount of receiver computing (CPU) power currently being used.

Logging

The *Logging* field shows the status of logging to the receiver's internal memory.

Time

The *Time* field shows the current UTC time.

Storage Usage

The *Storage Usage* field shows the amount of receiver internal memory that has been used.

Interference

The *Interference* field indicates if the receiver has detected interference in the GNSS signal.

3.2 Status Tab

Click **Status** to view the *Status* tab. From the *Status* tab, all of the Status windows available for the receiver can be viewed. For information about the Status tab, see *Status Window* on page 23.

3.3 Configuration Tab

Click **Configuration** to view the *Configuration* tab. From the *Configuration* tab, all of the Configuration windows available to the receiver can be viewed. For information about the Configuration tab, see *Configuration Window* on page 37.

3.4 Menu

The Manage Web menu is available on all Manage Web pages. It provides access to other pages in the Manage Web and settings for the Manage Web interface. On full width displays, such as a laptop, the menu is available at the top of the window. On narrower displays, such as tablets and smart phones, click the menu button to display the menu options.

3.4.1 Status

Click **Status** to display the Status window. See *Status Window* on page 23 for more information.

3.4.2 Configuration

Click **Configuration** to display the Configuration window. See *Configuration Window* on page 37 for more information.

3.4.3 Settings

General

Click **General** to open the *General* page.

From the *General* page you can change the standard used for reporting the height of the receiver. For more information, see *General Settings* on page 12.

Networking

Click **Networking** to open the *Networking* page.

From the *Networking* page you can edit the Wi-Fi client, Ethernet and Wi-Fi Hotspot parameters for the receiver. For information about the networking parameters, see *Networking* on page 12.

Theme

From the Theme option, you can select the color scheme used for the Manage Web user interface. The themes available are Light and Dark.

3.4.4 Tools

Terminal

Click **Terminal** to open the *Terminal* page.

The *Terminal* page provides an interface to the receiver's command line interface. From the command line interface, you can access the entire suite of OEM7 commands and logs. For more information about the *Terminal* page, see *Terminal* on page 16.

3.4.5 Device

Details

Click **Details** to open the *Details* page.

From the Details page you can view information about the receiver hardware and enabled software options. For information about the *Details* page, see *Details* on page 16.

Storage

Click **Storage** to open the *Storage* page.

From the Storage page you can manage the log files stored on internal memory. For information about the *Storage* page, see *Storage* on page 19.

Update

Click **Update** to open the *Update* page.

From the *Update* page you can load new software on to the receiver. For information about the *Update* page, see *Update* on page 21.

Restart

Click **Restart** to open the *Restart* page.

The **Restart** page provides two restart options.

- **Factory Reset**
  Click the **Factory Reset** button to set the receiver configuration parameters back to factory defaults and restart the receiver.
- **Restart**
  Click the **Restart** button to restart the receiver without changing configuration parameters.

To erase all LUA scripts on the receiver, select the **Remove LUA Scripts on restart** option before clicking **Factory Reset** or **Restart**.

3.4.6 Help

Click **Help** to open the Manage Web help file.

Login

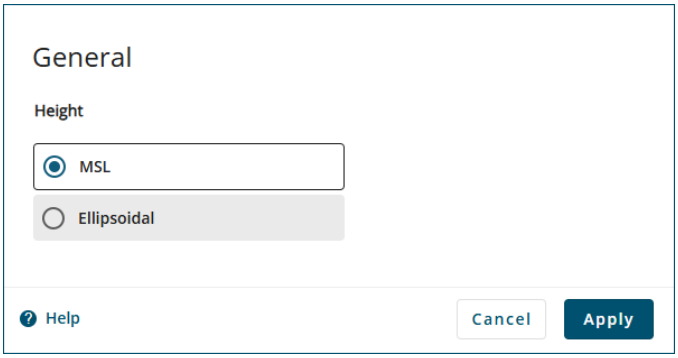
Click **Login** to open the *Login* window.

You must login to Manage Web to access the configuration windows and menu items. For information about logging in, see *Login* on page 21.

Logout

Click **Logout** to exit from the Manage Web.

3.5 General Settings



Use the *General* window to configure the standard Manage Web uses for reporting the height of the receiver. This setting applies to all of the height fields.

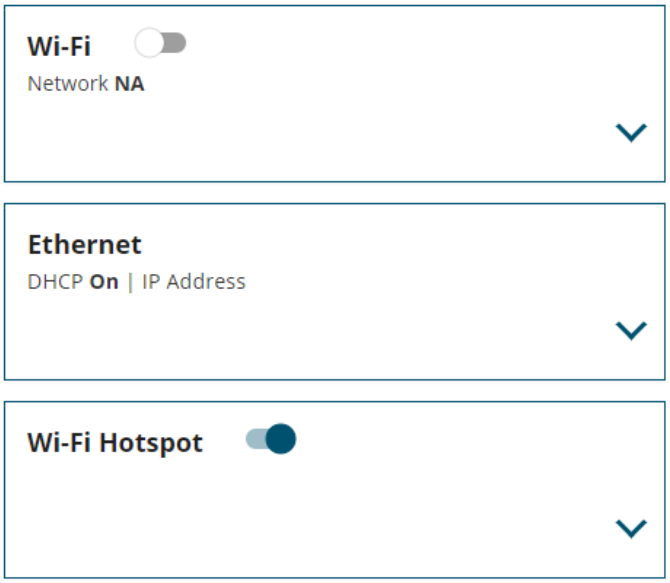
Height

Select **MSL** to display the receiver height relative to mean sea level.

Select **Ellipsoidal** to display the ellipsoidal height of the receiver.

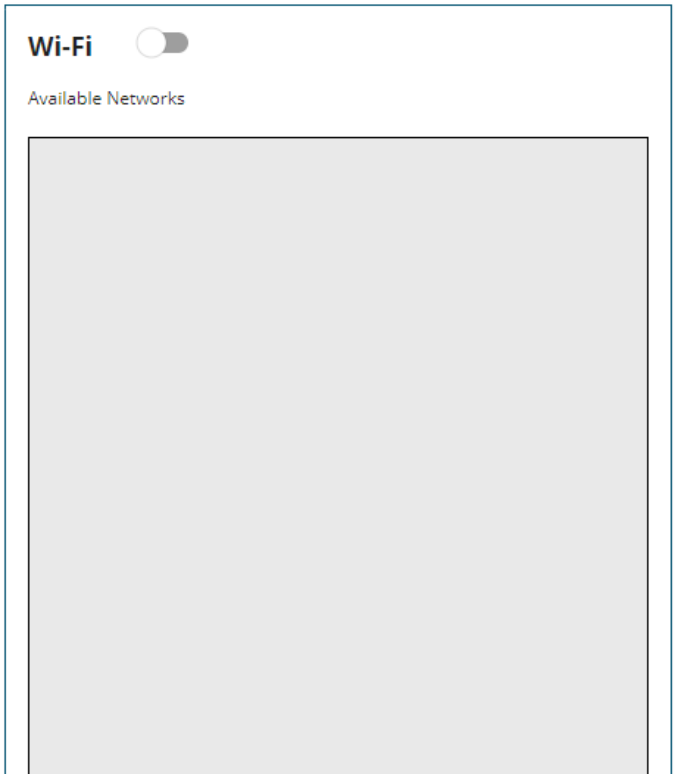
For OEM7 receivers, the default is MSL.

3.6 Networking



Use the *Network* page to configure the Wi-Fi and Ethernet interfaces on the receiver. Manage Web only shows the interfaces that are available on the receiver.

3.6.1 Wi-Fi



Click the *Wi-Fi* bar to open the *Wi-Fi* window.

Use the *Wi-Fi* window to configure the receiver to connect to a Wi-Fi access point.

Off/On

Set the Wi-Fi switch to **On** ( ) to enable the Wi-Fi client on the receiver.

Set the Wi-Fi switch to **Off** ( ) to disable the Wi-Fi client.

Available Networks

The Available Networks box displays the Wi-Fi access points (hotspots) the receiver has detected.

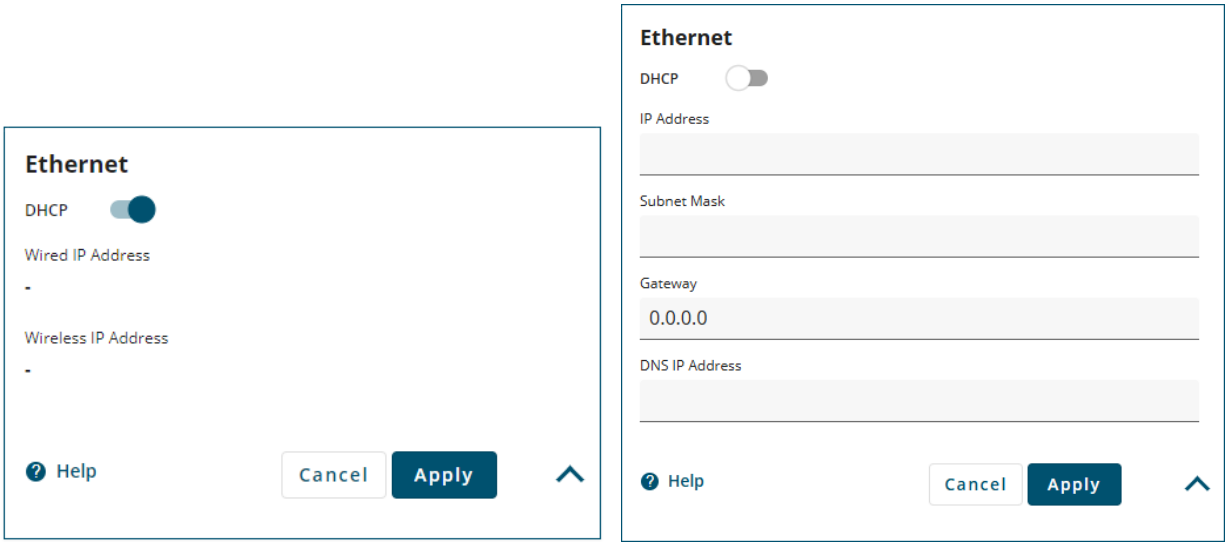
Click the access point to which you want the receiver to connect. If the access point is secured, and this is the first time the receiver has attempted to connect, an access dialog box appears. Enter the user name and password for the selected Wi-Fi access point and click **Connect**.

When the receiver makes a connection to an access point, the connection details are stored on the receiver. Up to four access points are stored on the receiver. When the receiver gets into range of a stored access point, it will automatically connect.

To remove an access point from receiver memory:

1. Click the **X** button on the access point. A dialog box appears.
2. Click **Yes**.

3.6.2 Ethernet



Click the *Ethernet* bar to open the *Ethernet* window.

Use the *Ethernet* window to configure the Ethernet interface on the receiver.

If the receiver is connected to a network that uses DHCP:

1. Set the *DHCP* switch to **On** ( ) to enable DHCP.
2. Click the **Apply** button.

   The *IP Address* field displays the IP address assigned to the receiver.

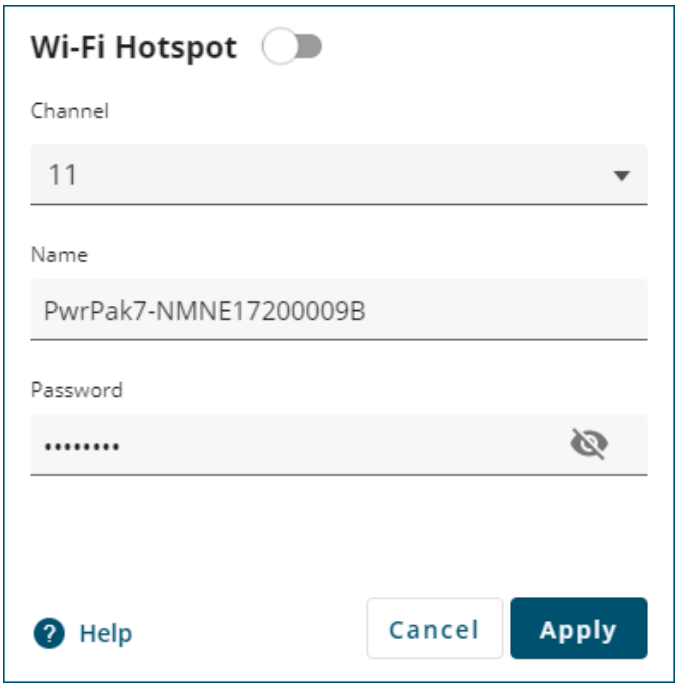
If the receiver is being configured to use a static IP address:

1. Set the *DHCP* switch to **Off** ( ) to disable DHCP.
2. In the *IP Address* box, enter the IP address for the receiver.
3. In the *Subnet Mask* box, enter the subnet mask for the receiver.
4. In the *Gateway* box, enter the IP address of the gateway.
5. In the *DNS IP Address* box, enter the IP address of the primary DNS server.
6. Click the **Apply** button.

3.6.3 Wi-Fi Hotspot

Click the *Wi-Fi Hotspot* bar to open the *Wi-Fi Hotspot* window.

Use the Wi-Fi Hotspot window to configure the receiver to function as a Wi-Fi hotspot (access point). Devices, such as the device used to run Manage Web, can then access the receiver using Wi-Fi.



Wi-Fi Hotspot
Use the *Wi-Fi Hotspot* switch to enable or disable the Wi-Fi hotspot hosted by the receiver.

If you disable the Wi-Fi hotspot, Manage Web will not be able to access the receiver using Wi-Fi.

Channel
This parameter sets the 802.11 channel that the Wi-Fi hotspot uses.

To change the 802.11 channel used, click the **Channel** drop list and select the new channel.

Name
This parameter is the SSID that the receiver broadcasts from the Wi-Fi hotspot.

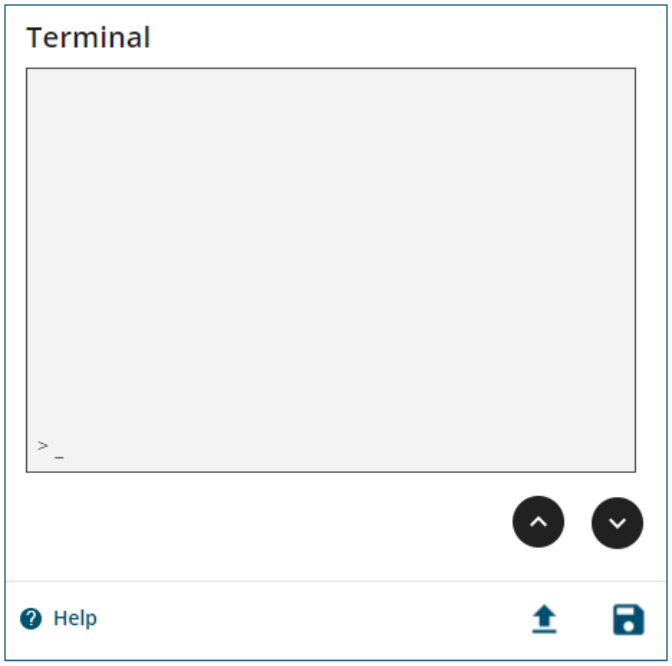
To change the SSID, enter the new SSID in the *Name* box. The SSID can be up to 33 characters long.

Password
This parameter is the password that Wi-Fi clients must enter to access the receiver's Wi-Fi hotspot.

To change the password, enter the new password in the *Password* box. The password must be between 8 and 64 characters long.

Click **Apply** to save the Wi-Fi Hotspot changes to the receiver.

3.7 Terminal



Use the *Terminal* window to send commands to the receiver and display any receiver acknowledgments and outputs.

To enter a command:

1. Enter the command and click **RETURN**.

For information about the commands available and commands parameters, refer to the OEM7 Receiver User Documentation Portal (docs.novatel.com/OEM7).

To re-issue a command:

1. Use the Up and Down arrow keys on the keyboard to select the command to re-issue.
2. Press **ENTER**.

Two buttons are also available on the *Terminal* window.

Load

Click **Load** to load a list of commands from a file to the receiver and automatically execute those commands.

A semicolon (;) can be used to comment out a line in the file being loaded. When a semicolon is added to the start of a line, the command in that line will not be run by the receiver and the receiver will not generate an error message.

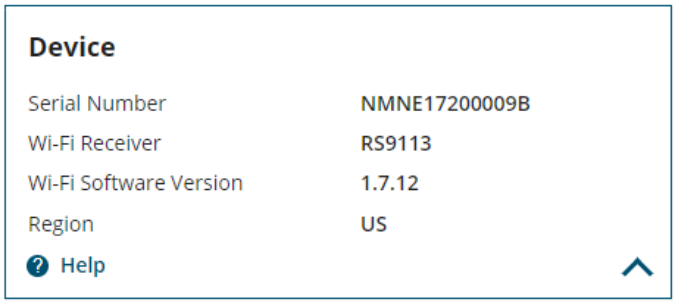
Save

Click **Save** to save the commands issued and responses received in the current session of the Terminal to a file.

3.8 Details

Use the *Details* page to view information about the receiver.

3.8.1 Device



The *Device* tile provides information about the receiver.

Serial Number

This is the serial number for the receiver enclosure. For example, on a PwrPak7 this is the serial number for the PwrPak7 enclosure, not the serial number of the GNSS card in the enclosure.

Wi-Fi Receiver

This is the model number for the Wi-Fi radio in the receiver.

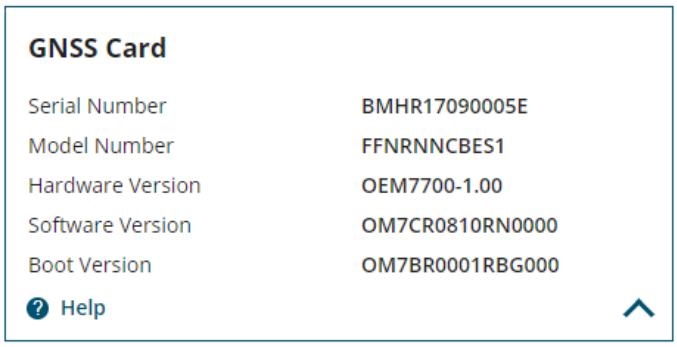
Wi-Fi Software Version

This is the version of the software running on the Wi-Fi radio in the receiver.

Region

This is the regulatory region the Wi-Fi radio has been configured to comply with.

3.8.2 GNSS Card



The *GNSS Card* tile provides information about the GNSS receiver card (e.g. OEM7700). For enclosure style receivers, such as PwrPak7, the information is about the receiver card in the PwrPak7.

Serial Number

This is the serial number for the receiver card.

Model Number

This is the model number for the receiver card. The model indicates the receiver's current model functionality.

Hardware Version

This parameter provides information about the receiver card hardware. The hardware version is in the format of **P**-**R**, where:

P = hardware platform

R = hardware revision

Example: OEM7720-1.00

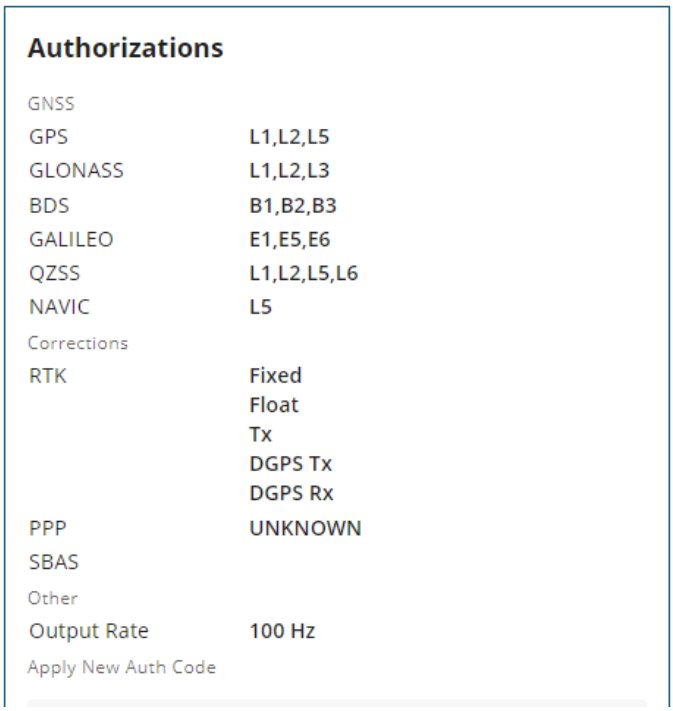
Software Version

This is the version of software (firmware) that is running on the receiver card.

Boot Version

This is the version of boot code running on the receiver card.

3.8.3 Authorizations



The *Authorizations* tile provides information about the functionality enabled on the receiver. The information shown varies depending on the receiver model number and any Auth Codes installed on the receiver.

An Auth Code (authorization code) enables additional functionality on the receiver, such as access to additional constellations or positioning modes. The *Authorizations* tile can be used to add new Auth Codes, and thus new functionality, to the receiver.

If an L model is loaded on the receiver, the PPP value is Basic Enabled.

If a P model is loaded on the receiver, the PPP value is Basic High Accuracy Enabled.

If an R model is loaded on the receiver, the PPP value is Basic High Accuracy Enabled.

If an N model is loaded on the receiver, the PPP label is not be shown.

To add an Auth Code:

1. Obtain the new Auth Code from NovAtel Sales or your local NovAtel dealer.
2. Enter the new Auth Code in the *Apply New Auth Code* box.

3. Click the **Apply** button to save the changes to the receiver.

   The receiver will restart when a new Auth Code is applied.

If a demonstration Auth Code has been applied to the receiver, the expiry date for the Auth Code is shown in the *Auth Expiry Date* field.
The *Auth Expiry Date* field is shown only if a demonstration Auth Code has been applied.

3.8.4 Subscription Information

The *Subscription Information* tile provides information about the correction services enabled on the receiver.

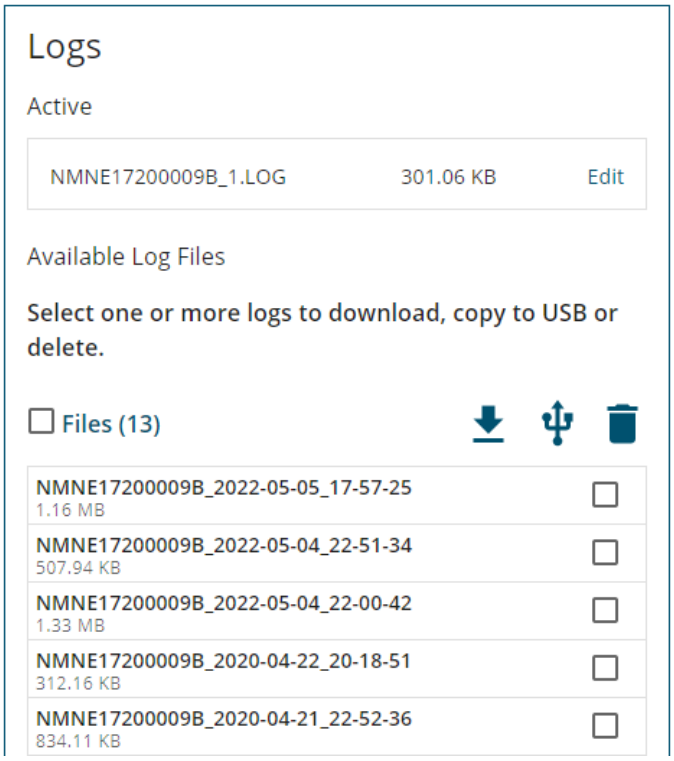
When there is no active subscription, this tile displays *no contract found*.

The *Subscription Information* tile appears only if the receiver has PPP services enabled.

Service Level
This is the type of correction service enabled on the receiver.

End Date
This is the end date for the correction services subscription.

3.9 Storage



Use the *Storage* page to manage the log files saved on the receiver's internal storage.

3.9.1 Edit Active Log File

To edit the active log file, click the **Edit** link beside the active log file. The *Logging* configuration window displays. Make any changes required to the messages being stored in the active log file.

If you click the **Stop All** button on the *Logging* configuration window, the log file will be closed and added to the *Available Log Files* list.

3.9.2 Download

Log files stored on the receiver's internal memory can be downloaded to the device running Manage Web. To download files:

1. Select the check box of one or more of the log files in the *Available Log Files* box.

   To select all of the log files stored on internal memory, click **Select All**.
2. Click **Download** ( ).
3. Navigate to the storage location on the device where the file will be saved.
4. Click **Save**.

3.9.3 Copy to USB

Log files stored on the receiver's internal memory can be copied to a storage device connected to the receiver's USB Host port (Transfer port on PwrPak7). To copy files to a USB device:

1. Connect a storage device, such as a USB memory key, to the receiver's USB Host port.
2. Select the check box of one or more of the log files in the *Available Log File* box.

   To select all of the log files stored on internal memory, click the **Files** option.
3. Click **Copy to USB**.

3.9.4 Remove

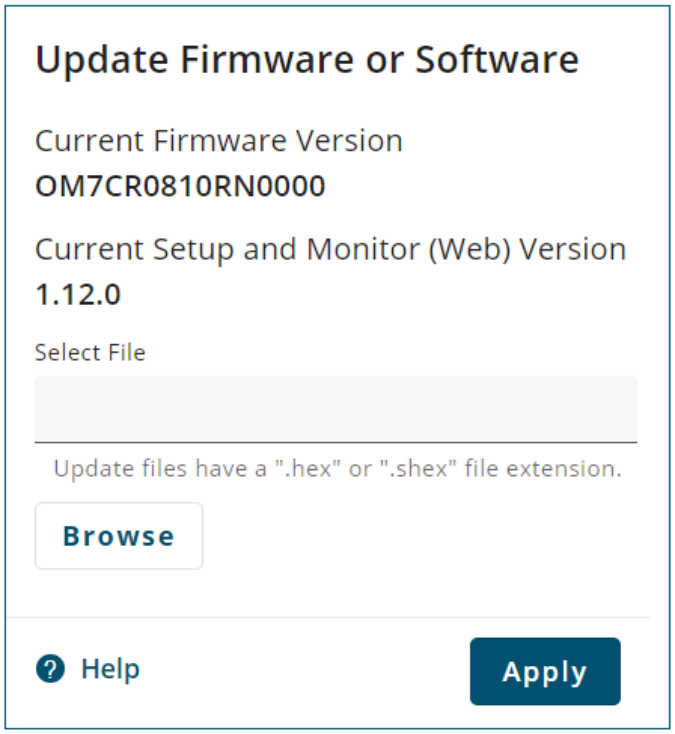
To delete log files from the receiver's internal memory:

1. Select the check box of one or more of the log files in the *Available Log Files* list.

   To select all of the log files stored on internal memory, click the **Files** option.
2. Click **Remove**.

   A confirmation dialog displays.
3. Click **Yes** to delete the log files.

3.10 Update



Use the *Update* window to view the software currently loaded on the receiver and to load new software onto the receiver.

The Current Firmware Version field shows the version of the software loaded on the receiver. The Current Manage Web Version field shows the version of the Manage Web software loaded on the receiver.

The new software must be copied onto the device used to run Manage Web before starting this procedure.

To load new software on the receiver:

1. Click the **Browse** button.

   The *Select File* dialog box appears.
2. Navigate to the folder in which the new software to load is stored and select the software file.

   The selected file appears in the *File name* field.
3. Click the **Open** button.

   The Update window appears with the name of the selected file in the *Select File* field.
4. Click the **Apply** button

After the new software is loaded, the receiver will restart.

3.11 Login

You must log in to Manage Web to access the configuration windows and menu options.

To log in to Manage Web:

1. Click the **Login** menu.

   The *Login* window appears.

   > The *Login* window automatically appears if you attempt to access a configuration window or menu item before logging in.

2. Enter the receiver administration password.

   The default administration password is the enclosure PSN. The enclosure PSN is shown on the receiver label.

   To change the administration password, use the **SETADMINPASSWORD** command. Information about using this command is available on the OEM7 User Documentation portal (docs.novatel.com/OEM7).

3. Click the **Log in** button.

Chapter 4 Status Window

The *Status* window provides access to all the status information available for the receiver. The status information is organized onto several status windows.

- *Positioning* below
- *Satellite View* on page 27
- *Ports Status* on page 28
- *Logging Status* on page 29
- *Device Status* on page 30
- *Interference Status* on page 30
- *ALIGN Status* on page 30
- *SPAN Status* on page 31
- *PPP Corrections Status* on page 34
- *Radio Status* on page 36

The Status tiles available vary depending the type of receiver and the software features enabled.

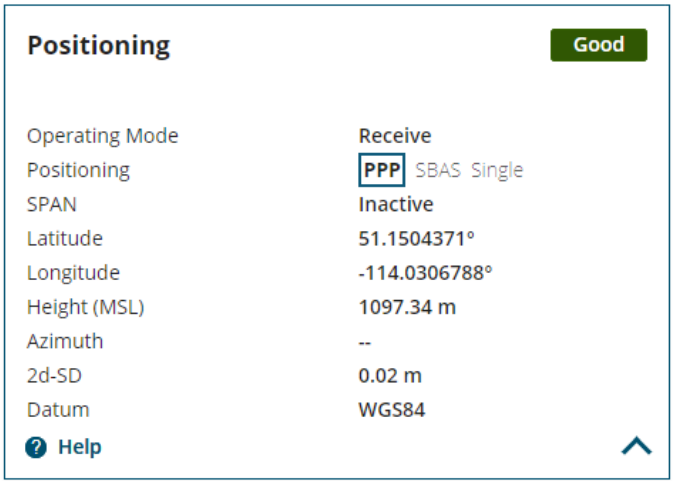
Each tile has a color coded bar with text to indicate the overall status of the information on that tile.

Color	Text	Description
Green	Good	The receiver is functioning and there are no warnings or errors.
Amber	Warning	The receiver is functioning, but there are one or more issues that may require attention.
Red	Error	An issue is preventing the receiver from functioning. The Error state will remain until the situation is resolved.
Gray	Off	The feature has been disabled or has not yet been configured.

If the receiver has a warning or error, click the status indicator on the status box to open a tooltip with more information about the warning or error.

4.1 Positioning

The *Positioning* status window displays information about the position calculated by the receiver.



Operating Mode

The receiver operating mode.

- **Transmit**

  The receiver is configured as a base station, but is not yet transmitting corrections. A base station receiver generates differential corrections and sends that data to rover receivers. The receiver can operate as an RTK base station.

- **Transmit (FIXEDPOS)**

  The receiver is configured as a base station, has determined its fixed position and is transmitting corrections.

- **Receive**

  The receiver is configured to receive GNSS correction data from an RTK base station, an RTK network, a correction service such as TerraStar, or from SBAS to calculate a more accurate position.

- **Standalone**

  The receiver is configured to calculate a position using observed GNSS data only. This is the default operating mode.

Position

The positioning type used to calculate the position.

This field shows all of the position types configured on the receiver. The position type being used is highlighted with a box.

- **None**

  A position solution has not been calculated.

- **Single**

  A GNSS code based position is being calculated without the use of any correction sources. This is the default positioning type.

- **SBAS**

  A GNSS code based position is being calculated using corrections provided by an SBAS system, such as WAAS.

- **FIXEDPOS**

The fixed position of the receiver has been configured in the receiver, but the receiver is not configured as an RTK base station.

- **PPP**

  A carrier based position is being calculated using corrections provided by TerraStar or Oceanix.

- **RTK**

  A carrier based position is being calculated using the Real Time Kinematic (RTK) method. If the Operating Mode is Transmit, this receiver is acting as the base station and is providing corrections to a rover receiver. If the Operating Mode is Receive, this receiver is acting as the rover receiver and is receiving corrections from a base station.

- **PSR DIFF**

  A GNSS code based position is being calculated using corrections provided by differential GNSS base station.

SPAN

SPAN is a GNSS+INS navigation technology that provides a reliable position, velocity and attitude solution.

- **Off**

  SPAN IMU type is not configured.

- **Inactive**

  SPAN IMU type is configured and the *Inertial Solution Status* is any status other than INS_SOLUTION_GOOD.

- **Ready**

  The *Inertial Solution Status* is INS_SOLUTION_GOOD and the INS position type is any status other than INS positions.

- **Aiding**

  The *Inertial Solution Status* is INS_SOLUTION_GOOD and the INS position type is any status of INS positions.

Latitude

Latitude of the receiver position in degrees.

Longitude

Longitude of the receiver position in degrees.

Height

The height of the receiver in metres.

The height is shown as height above mean sea level (MSL) or as ellipsoidal height. When the height set to show height above sea level, "(MSL)" is included in the field name.

Azimuth

Left-handed rotation around the z-axis in degrees clockwise from North. (0° to 359.99°)

This is the inertial azimuth calculated from the IMU gyros and the SPAN filters.

Azimuth is available only if SPAN is active.

Heading

Heading in degrees clockwise from North. (0° to 359.99°)

Heading is determined from the positions of two GNSS antennas. This can be antennas connected to two ALIGN capable receivers configured to communicate with each other or a dual antenna receiver such as the PwrPak7D or OEM7720.

Heading is available only on ALIGN capable receivers.

- If ALIGN is not configured, this field displays **--**.
- If ALIGN is configured and Heading data is not available, this field displays **--**.
- If ALIGN is configured and Heading data is available, this field displays the Heading in degrees.

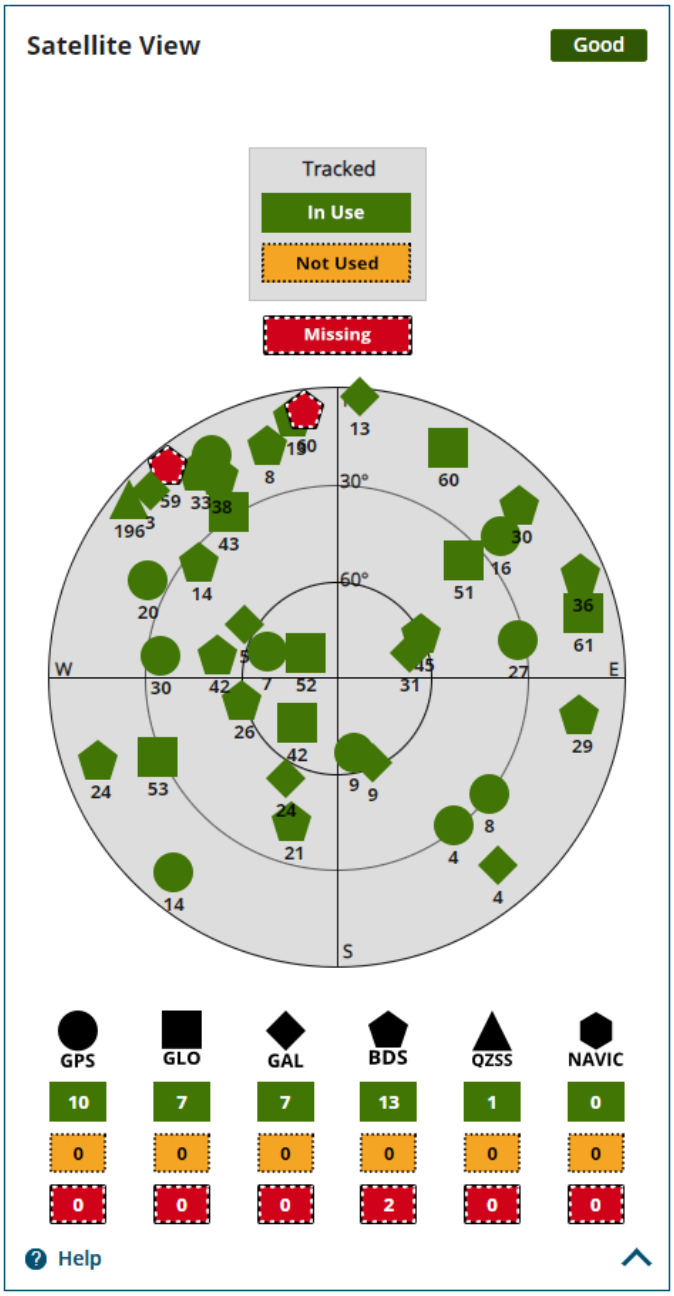
2d-SD

The horizontal standard deviation of the position.

Datum

The datum in which the Latitude, Longitude and Height are reported. The default is WGS84.

4.2 Satellite View



The *Satellite View* tile displays each satellite the receiver is tracking in graphical format. Concentric circles from 0° to 90° represent elevations from the horizon to directly overhead.

The satellites being tracked are represented with icons according to their satellite system. The PRN of the satellite tracked appears below the Satellite icon.

- If the Satellite icon is green, the satellite is used in the positioning solution.
- If the Satellite icon is amber, the satellite is being tracked but is not used in the positioning solution.
- If the Satellite icon is red, the satellite is missing.

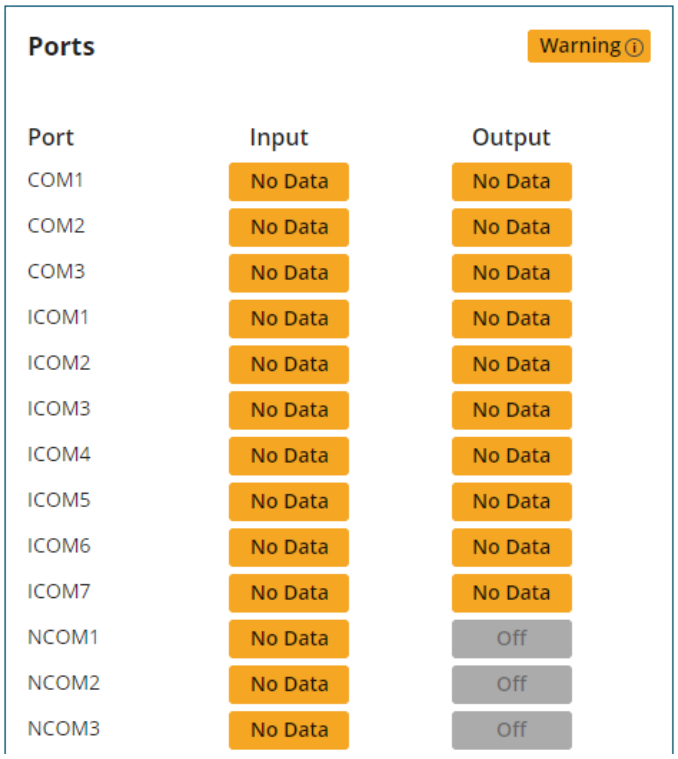
A legend on the *Satellite View* tile identifies the icon used for each GNSS constellation and the number of satellites used in the solution, the number tracked but not used and the number missing.

The Dilution Of Precision (DOP) values for the position solution are shown.

- HDOP – Horizontal Dilution Of Precision
- PDOP – Position Dilution Of Precision
- VDOP – Vertical Dilution of Precision

To view information about a specific satellite, click on the Satellite icon. A pop up box displays PRN, azimuth, elevation and tracking information about the satellite.

4.3 Ports Status

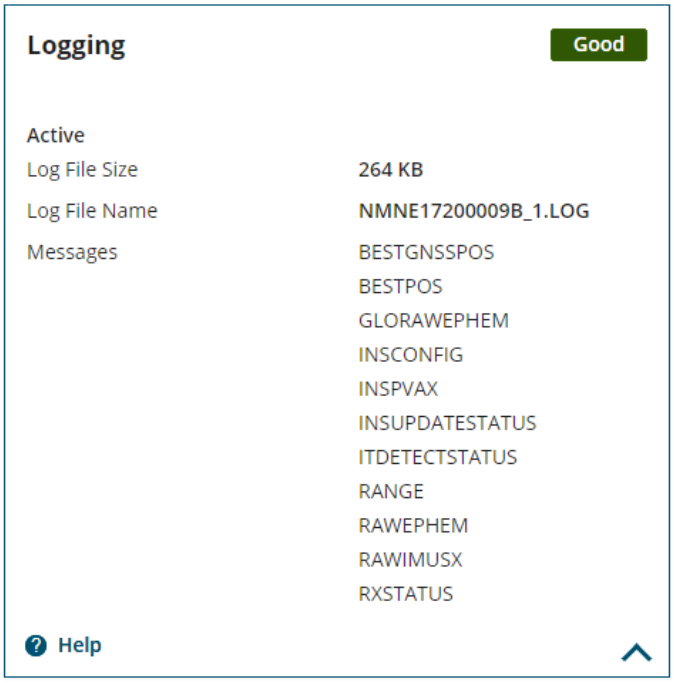


The *Ports* status tile displays the communication ports available on the receiver and indicates if the port is configured to receive messages (Input), send messages (Output) or both.

- Green – Configured and active
- Amber – Configured and not active
- Red – Error. An issue is impeding port function.
- Gray – Not configured

If the status indicator on the *Ports* title is gray, no ports are configured.

4.4 Logging Status



The *Logging* status window displays the current status of logging to the internal memory of the receiver. This window is applicable receivers with internal storage such as the PwrPak7 or CPT7.

Status
The status of logging.

Active if logging information is being stored on the receiver's internal memory or a computer.

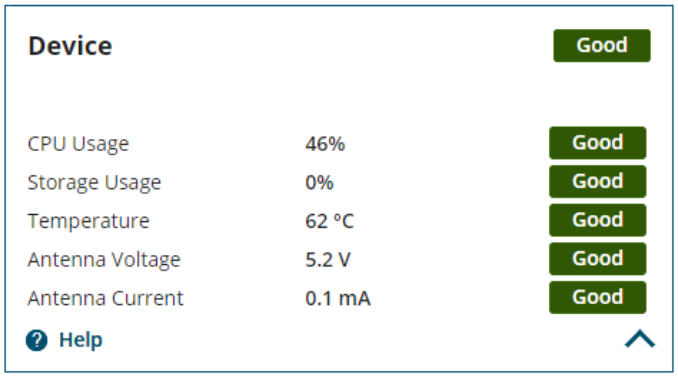
Logging-Off if logs are not being stored.

Log File Size
The size of the file in which logs are being stored.

Log File Name
The name of the file in which logs are being stored.

Messages
The logs that are being stored in the log file.

4.5 Device Status



The *Device* status tile provides hardware status information about the receiver. The color of the icon beside each parameter indicates the status of the parameter: Green = OK, Yellow = Warning, Red = Error.

CPU Usage

The percentage of computing power currently being used by the receiver.

Storage Usage

The amount of internal storage used by the receiver.

Temperature

The approximate temperature of the PCB surface near critical components of the receiver.

Antenna Voltage

The voltage provided by the receiver to the GNSS antenna.

Antenna Current

The amount of current being drawn by the active antenna (mA).

4.6 Interference Status

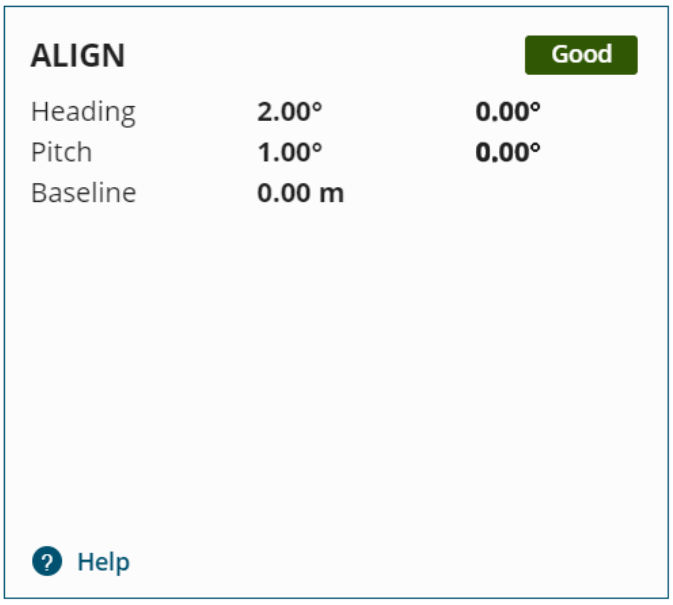
The *Interference* status window displays whether the receiver has detected interference in the received GNSS signal.

If interference is detected, the *Interference* status window displays the signals in which interference is being detected.

4.7 ALIGN Status

The *ALIGN* status window provides position information about the ALIGN solution.

Two ALIGN capable receivers, or a dual antenna receiver, are required to use ALIGN.



Heading

The heading in degrees from true north. (0° to 359.99°)

To the right of the heading value is the standard deviation of the heading in degrees.

Pitch

The pitch in degrees. (±90)

To the right of the pitch value is the standard deviation of the pitch in degrees.

Baseline

The baseline length is the distance between the two GNSS antennas in metres.

For ALIGN Heading models with position access, this field is -1.

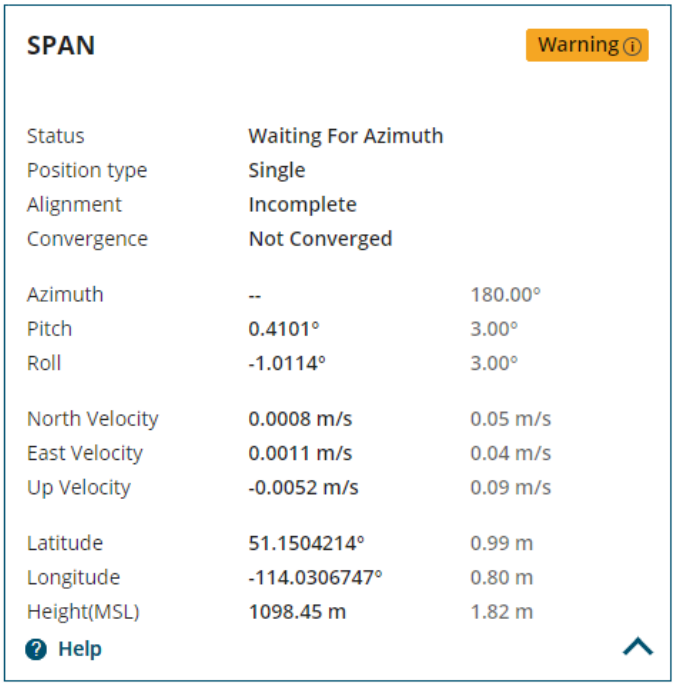
For ALIGN Heading models without position access, this field is only the decimal portion of the baseline in metres.

For ALIGN Relative Positioning models receiving corrections from a master with a fixed position, this field is -1.

For ALIGN Relative Positioning models receiving corrections from a master in moving baseline mode, this field is the complete baseline length in metres.

4.8 SPAN Status

The *SPAN* status window shows position information from the SPAN solution.



Status

The current status of the SPAN solution.

Position Type

The position type used to calculate the position.

Alignment

Alignment Indication status. The status can be Incomplete, Static, Kinematic, Dual Antenna, User Command or NVM Seed.

Converged

Status of the INS solution convergence. This field can be Converged or Not Converged.

Azimuth

Left-handed rotation around the z-axis in degrees clockwise from North. This is the inertial azimuth calculated from the IMU gyros and the SPAN filters.

To the right of the azimuth value is the standard deviation of the azimuth in degrees.

Pitch

Right-handed rotation from local level around the x-axis in degrees.

To the right of the pitch value is the standard deviation of the pitch in degrees.

Roll

Right-handed rotation from local level around the y-axis in degrees.

To the right of the roll value is the standard deviation of the roll in degrees.

North Velocity

The velocity in a northerly direction. A negative (-) value implies a southerly direction. The velocity is in m/s.

To the right of the north velocity value is the standard deviation of the velocity in m/s.

East Velocity
The velocity in an easterly direction. A negative (-) value implies a westerly direction. The velocity is in m/s.

To the right of the east velocity value is the standard deviation of the velocity in m/s.

Up Velocity
The velocity in an upward direction. A negative (-) value implies a downward direction. The velocity is in m/s.

To the right of the up velocity value is the standard deviation of the velocity in m/s.

Latitude
The latitude of the receiver position in degrees.

To the right of the latitude value is the standard deviation of the latitude in metres.

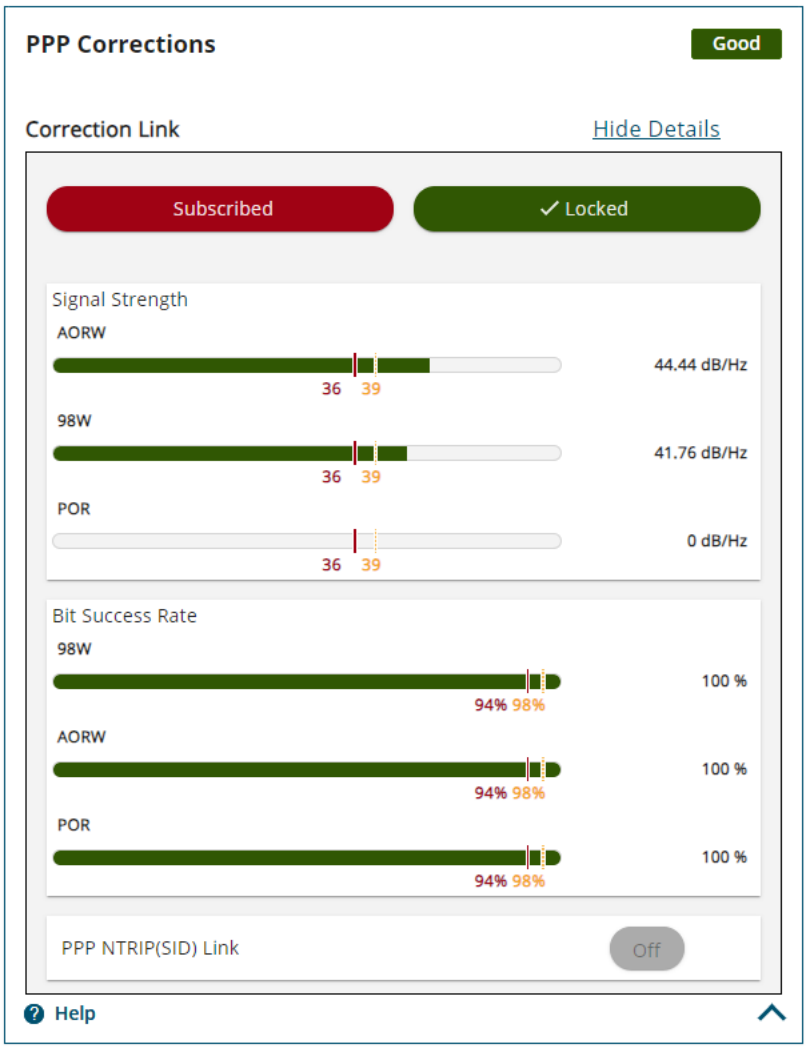
Longitude
The longitude of the receiver position in degrees.

To the right of the longitude value is the standard deviation of the longitude in metres.

Height (MSL)
The height above mean sea level of the receiver position in metres.

To the right of the height value is the standard deviation of the height in metres.

4.9 PPP Corrections Status



The *PPP Corrections* tile shows information about the PPP corrections.

Subscribed

Displays *Subscribed* on a green background when there is a valid TerraStar or Oceanix subscription.

Displays *Unsubscribed* on a red background if there is no valid TerraStar or Oceanix subscription.

Locked

Displays *Locked* on a green background when the receiver has successfully locked onto at least one L-Band beam.

Displays *Unlocked* on an amber background while the decoder is in searching state.

Displays *Unlocked* on a gray background when PPP is off.

Lband Tracking

Displays **Enabled** when L-Band tracking is enabled on the receiver.

Displays **Off** when L-Band tracking is disabled on the receiver.

The *Lband Tracking* field is not shown when PPP is off.

Primary Signal

Displays the access status and name of the primary L-Band beam.

The status button displays **Enabled** (green) if the receiver has a valid subscription to access the primary L-Band beam. The button displays **Error** (red) if the receiver does not have access.

The *Primary Signal* field is not shown when PPP is off.

Signal Strength

Displays a status bar that shows the carrier to noise ratio (C/No) of the primary L-Band signal. The bar also displays the thresholds at which there are C/No warnings and errors. Beside the status bar, the real-time C/No level (in dB-Hz) of the transmission beam is displayed.

When the **Show Details** link is clicked, the *Signal Strength* field expands to show the C/No status for all of the L-Band signals the receive is tracking. Click the **Hide Details** link to return to showing only the C/No status for the primary L-Band signal.

Bit Success Rate

Displays a status bar that shows the percentage of bits successfully received from the primary L-Band signal. The bar also displays the thresholds at which there are bit rate warnings and errors. Beside the status bar, the real-time bit rate success of the transmission beam is displayed.

When the **Show Details** link is clicked, the *Bit Success Rate* field expands to show success rate for all of the L-Band signals the receive is tracking. Click the **Hide Details** link to return to showing only the success rate for the Primary L-Band signal.

PPP NTRIP (SID) Link

Displays the status of the NTRIP link configured for the receiver.

Displays **Good** (green) when the decoder is locked using the PPP NTRIP link.

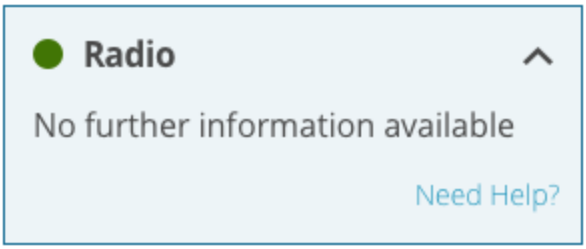
Displays **Error** (red) when PPP NTRIP is enabled, but the decoder is not locked.

Displays **Off** (gray) when PPP NTRIP has not been enabled.

The *PPP Corrections* tile is not available for OEM718D receivers.

If the receiver is loaded with a model number with an N as the 4th character, the *PPP Corrections* tile is not shown.

4.10 Radio Status



The *Radio* status window provides the operating status of the radio module.

Color	Text	Description
Green	Good	The radio is functioning and there are no warnings or errors.
Amber	Warning	The radio is functioning, but there are one or more issues that may require attention.
Red	Error	An issue is preventing the radio from functioning. The Error state will remain until the situation is resolved.
Gray	Off	The radio has been disabled or has not yet been configured.

This window is available only on systems with an external transmission radio connected.

Chapter 5 Configuration Window

The *Configuration* window provides access to all the configuration parameters available for the receiver.

The configuration parameters are organized onto several configuration windows.

- *Positioning Configuration* below
- *Ports Configuration* on page 51
- *Logging Configuration* on page 58
- *ALIGN Configuration* on page 63
- *SPAN Configuration* on page 67
- *Radio Configuration* on page 70
- *GNSS Configuration* on page 71

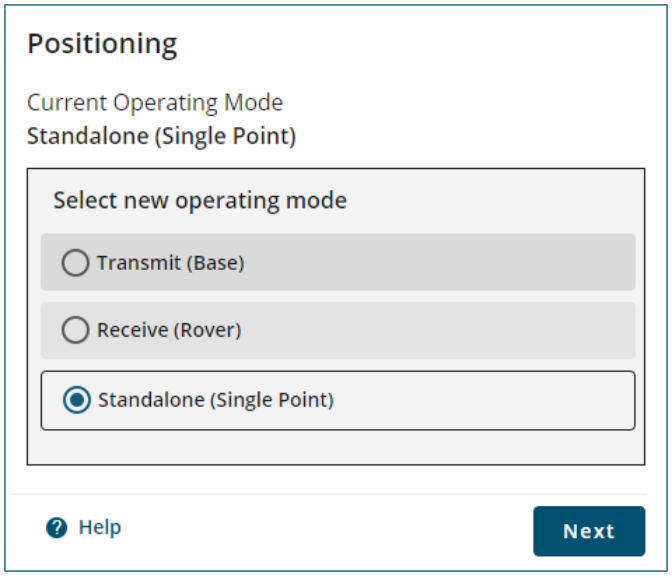
To view all of the parameters on a configuration window, click the configuration bar.

The configuration bars available on the *Configuration* window varies depending on the type of receiver and the software features enabled.

You must be logged in to Manage Web to access the configuration windows. For information about logging in, see *Login* on page 21.

5.1 Positioning Configuration

Use the *Positioning Configuration* window to change the positioning method the receiver uses to calculate a position. This window is also used to set whether the receiver sends or receives corrections.



The **Current Operating Mode** displays the current receiver configuration.

To change the positioning mode, click one of the three buttons to select a new operating mode and then click **Next**.

- *Transmit (Base)* below

  Select this button to configure the receiver as a base station receiver. A base station receiver generates differential corrections and sends that data to rover receivers.

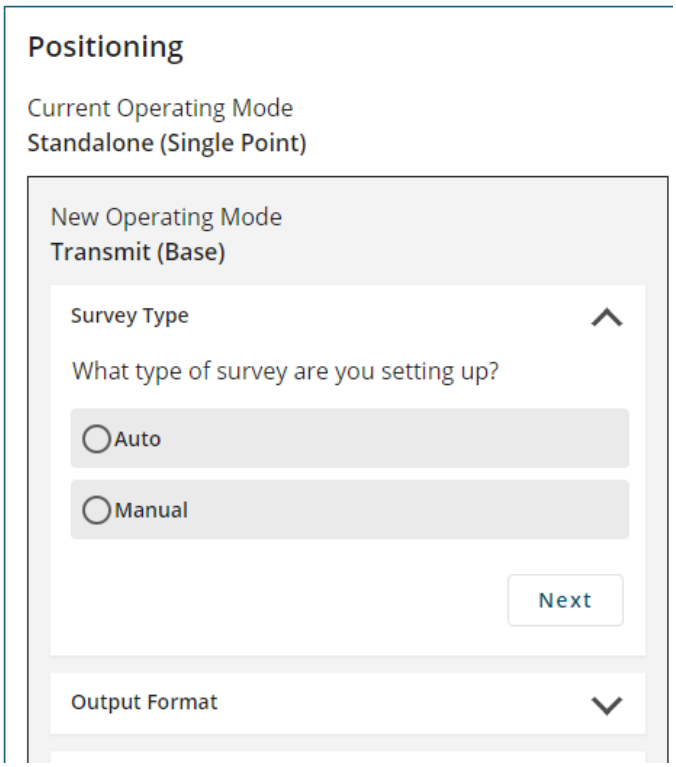
- *Receive (Rover)* on page 45

  Select this button to configure the receiver as a rover receiver. A rover receiver uses correction data received from either a base station receiver, an SBAS system or TerraStar to calculate a more accurate position.

- *Standalone (Single Point)* on page 51

  Select this button to configure the receiver to calculate a position using observed measurements only. No correction data will be used to improve position accuracy. This is the default mode for a receiver.

5.1.1 Transmit (Base)



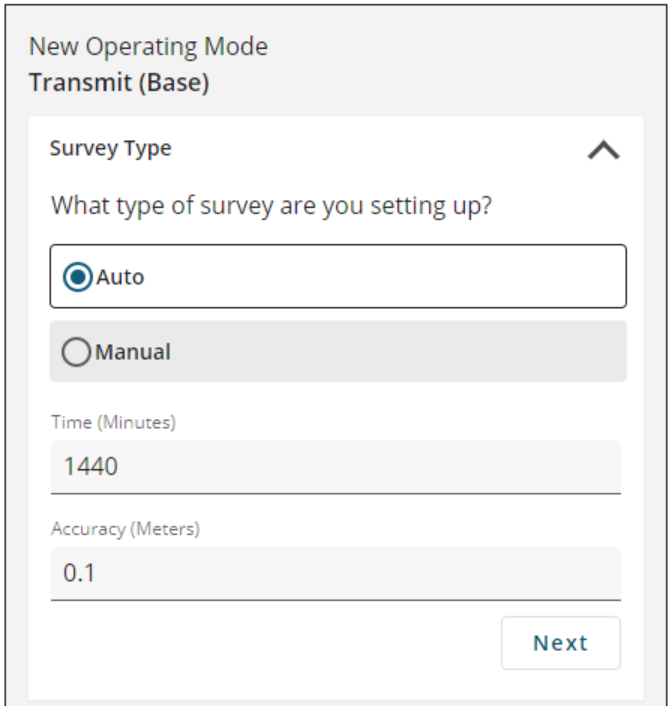
After clicking **Transmit (Base)** and **Next**, the *Positioning* window changes to show the Transmit options.

To configure the receiver to transmit corrections, set the parameters for Survey Type, Output Format and Output Destination.

Survey Type

The GNSS position calculated by a receiver is located at the phase center of the GNSS antenna. A receiver acting as a base station must know the location of the GNSS antenna phase center accurately to generate accurate differential correction data for the rover receiver. If the GNSS antenna is installed in a location with a well known position, use the Manual option to enter the position of the GNSS antenna phase center into the receiver. If the GNSS antenna is not installed in a well known position, use the Auto option to have the receiver calculate the antenna position.

Auto



The Auto option uses position averaging to determine the position of the GNSS antenna phase center. The position averaging starts when the Positioning configuration is applied. The position averaging continues until a specified accuracy level is met or until the specified survey time expires. When position averaging is complete, the averaged position is saved as the fix position for the base station. This fix position is then used when calculating differential corrections for the rover.

The calculated base station position is in WGS84.

On subsequent power ups or resets, the receiver uses position averaging to determine if the base station has moved. The average position calculated is compared to the saved fix position. If the average position is within tolerance, the receiver assumes it has not moved and uses the previously saved fix position. If the average position is outside of the tolerance, the receiver assumes it has moved and will continue calculating a position average until the accuracy level is met or until the specified survey time expires.

Click the **Auto** button to show the auto survey options.

Time

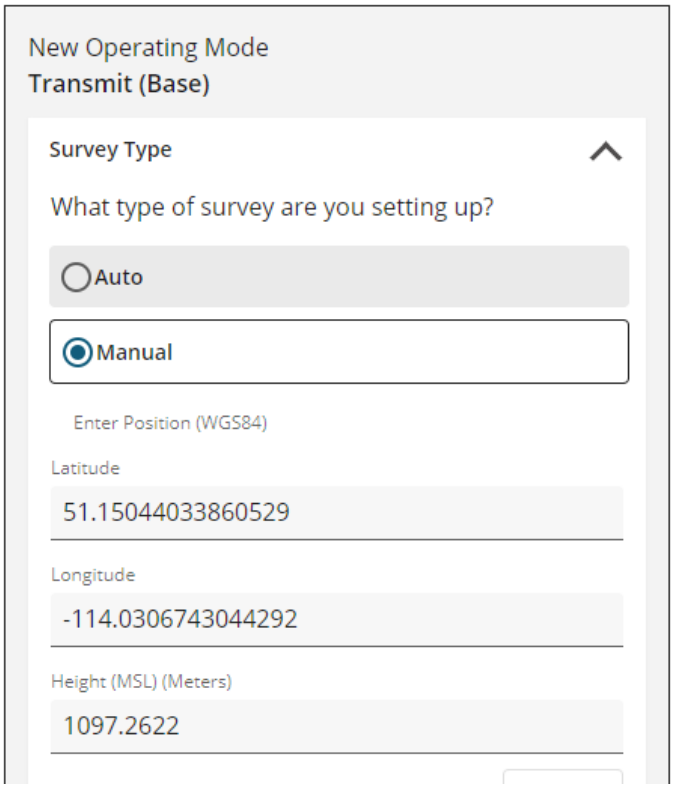
Enter the maximum amount of time allowed for the receiver to perform an automatic survey.

Receiver Family	Time Range	Default
OEM7	1 to 6000 minutes	1440 minutes

Accuracy

Enter the desired horizontal standard deviation in metres. Accuracy can be a value from 0 to 100 metres. The default is 0.1 metres.

Manual



Use the Manual option to set the fix position of the base station receiver. The position entered using the Manual option should be as accurate as possible. The receiver uses this position to generate the differential correction data, so the accuracy of this position directly impacts the accuracy of the differential corrections sent to the rover receiver.

Click **Manual** to show the fix position options.

Latitude

Enter the latitude of the GNSS antenna phase center. The latitude can be -90 to +90 degrees where a '**-**' sign denotes south and a '**+**' sign denotes north.

Longitude

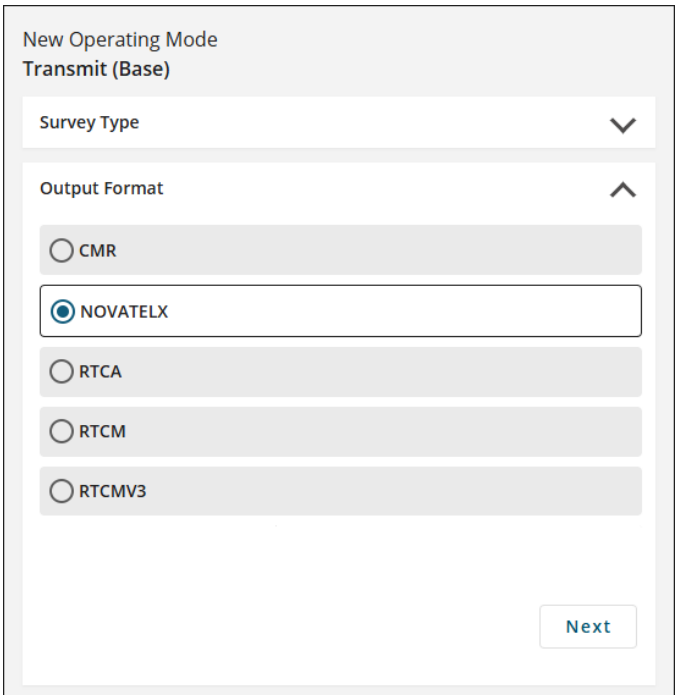
Enter the longitude of the GNSS antenna phase center. The longitude can be -360 to +360 degrees where a '**-**' sign denotes west and a '**+**' sign denotes east.

Height

Enter the height of the GNSS antenna phase center above Mean Sea Level (MSL). The height can be -1000 to +20000000 metres.

After setting the Survey Type parameters, click **Next** to show the Output Format parameters.

Output Format



Use the Output Format parameters to set the message format the receiver uses for the differential corrections messages sent to the rover receiver.

CMR
The receiver sends differential correction messages in CMR format.

NOVATELX
The receiver sends differential correction messages in NOVATELX format.

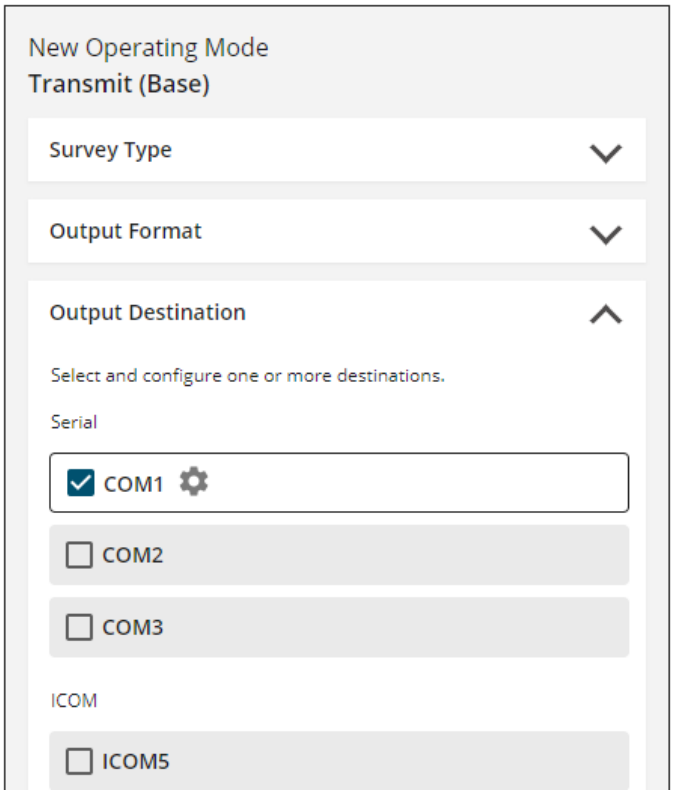
RTCA
The receiver sends differential correction messages in RTCA format.

RTCM
The receiver sends differential correction messages in RTCM format.

RTCMV3
The receiver sends differential correction messages in RTCM Version 3.0 format.

Click the button for the message format to use and then click **Next**.

Output Destination



The Output Destination is the communication port, or ports, through which the receiver sends differential corrections to the rover receiver.

Serial

Click the COM buttons to select the serial ports used to send differential corrections. The number of COM ports available varies depending the type of NovAtel receiver.

When a COM button is selected, the button changes to show a settings icon. Click the settings icon to change the communication parameters used for the COM port. From the COM Configuration window that appears, set the serial communication parameters to match the parameters used by the device to which the receiver is communicating.

Baud Rate

Scroll the list of baud rates and then click a baud rate to select the communication rate (bps) used by this serial port. The default baud rate is 9600.

Parity

Click **N**, **E** or **O** to select the parity used by this serial port.

N = No parity, E = Even parity, O = Odd parity

The default parity is N (No Parity).

Data Bits

Click **7** or **8** to select the number of data bits used for each data message transmitted. The default is 8 bits.

Stop Bits

Click **1** or **2** to select the number of stops bits used for each data message transmitted.

After setting the communication parameters, click **Done** to save the new settings.

ICOM

Click the ICOM buttons to select the network ports used to send differential corrections over the receiver's Ethernet connection.

When an ICOM button is selected, the button changes to show a settings icon. Click the settings icon to change the communication parameters used for the ICOM port.

To configure an ICOM port:

1. In the **Domain** box, enter the hostname or IP address of the device.
2. In the **Port** box, enter the TCP/UDP port number used by this ICOM port.
3. Click one of the following buttons to select the protocol used by this ICOM port.
    - **Disabled** – Disable this ICOM port.
    - **TCP** – Use raw TCP on this port.
    - **UDP** – Use raw UDP on this port.
4. After setting the communication parameters, click the **Done** button to save the new settings.

NTRIP

Click the NCOM buttons to select the network ports used to send differential corrections. Network ports are used when the receiver is acting as an NTRIP server. The receiver must have an Ethernet connection to use NCOM ports.

When an NCOM button is selected, the button changes to show a settings icon. Click the settings icon to change the communication parameters used for the NCOM port.

To configure a NCOM port:

1. Click the **Domain** box and enter the hostname or IP address of the Endpoint.
2. Click the **Port** box and enter the TCP/UDP port number of the Endpoint.
3. Click the **Search for Mountpoint** button.
4. Click the **Mountpoint** drop menu and click on the mountpoint to use.
5. Click the **Username** box and enter the login user name. The username can be up to 30 characters long.
6. Click the **Password** box and enter the login password. The Password can be up to 30 characters long.

After setting the communication parameters, click **Done** to save the new settings.

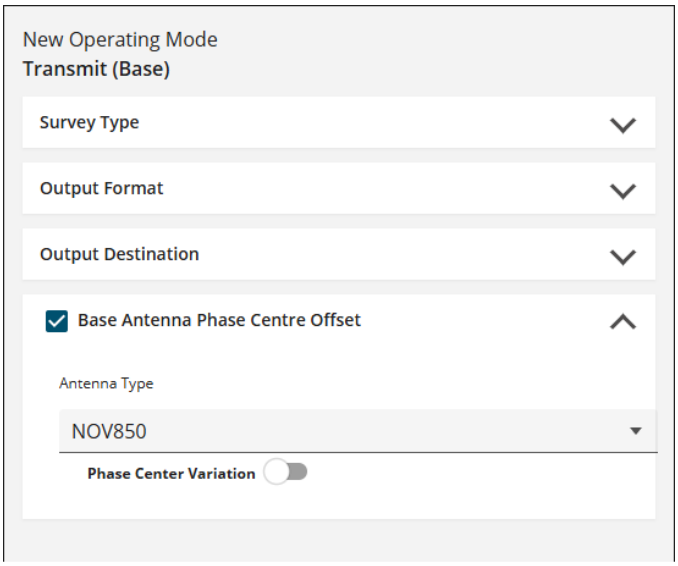
File

Click the **FILE** button to save the differential corrections to a file.

When Output Destination ports have been selected, click **Done**.

When all of the Transmit parameters have been set, click **Apply**.

Base Antenna Phase Centre Offset



Configuring the phase center offset of the antenna used by the RTK base receiver improves RTK accuracy.

Antenna Type

There are several predefined antenna types taken from the IGS ANTEX file. To choose one of the predefined antennas, click the **Antenna Type** drop down menu and select the type of antenna connected to the base receiver that is providing RTK corrections.

Frequency

Select the **GPS L1** check box to enter phase center offset values for the GPS L1 signal.

Select the **GPS L2** check box to enter phase center offset values for the GPS L2 signal.

ARP to APC

For each frequency selected in **Frequency** field, enter the distance in millimetres from the Antenna Reference Point (ARP) to the Antenna Phase Center (APC).

East

Enter the East phase center offset in millimetres.

North

Enter the North phase center offset in millimetres.

Up

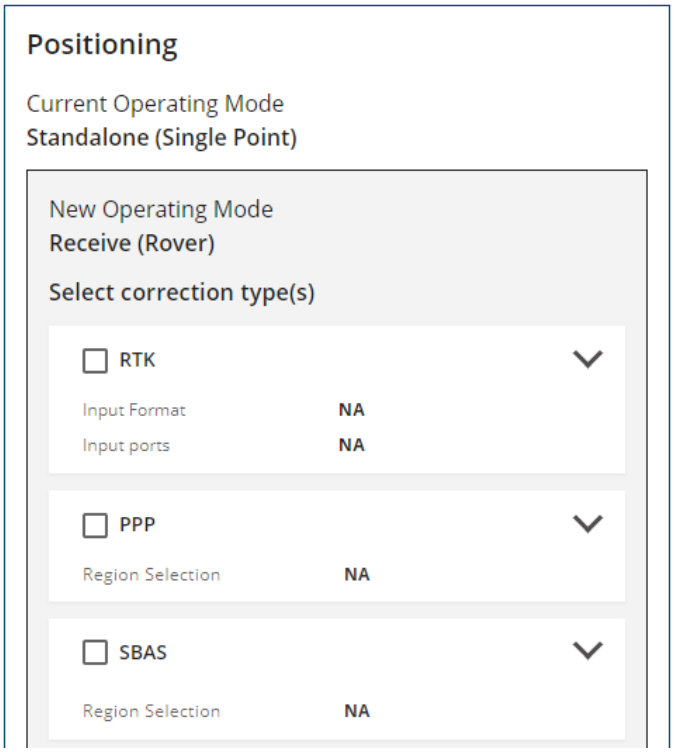
Enter the Up phase center offset in millimetres.

Phase Center Variation

To use the phase center variation defined for the antenna, set the switch to enabled ( ).

To ignore the phase center variation defined for the antenna, set the switch to the disabled ( ).

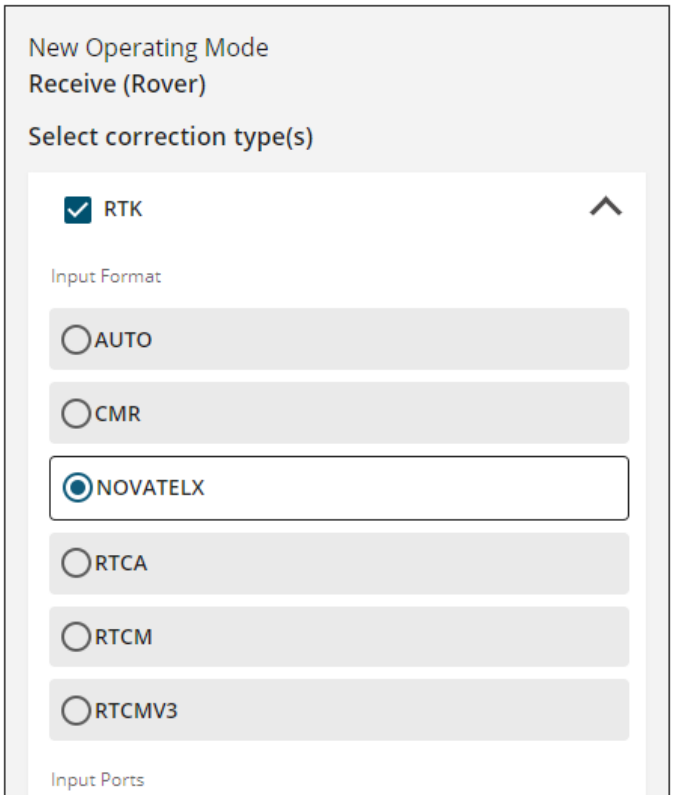
5.1.2 Receive (Rover)



After clicking **Receive (Rover)** and **Next**, the Positioning window changes to show the Input Source options.

The receiver can be configured to receive three types of corrections: RTK, PPP and SBAS.

RTK



To use RTK corrections, the receiver must have a communications link to an RTK base station. Use the *Input Format* and *Input Ports* pages to configure the receiver as an RTK rover.

To enable RTK, select the **RTK** checkbox and configure the Input Format and Input Ports settings.

To disable RTK, clear the **RTK** checkbox.

Input Format

Use the Input Format parameters to set the message format for the differential corrections message received from the RTK base station.

Auto
Set the receiver to automatically detect the format of the incoming RTK corrections.

CMR
Set the receiver to accept RTK correction messages in CMR format.

NOVATELX
Set the receiver to accept RTK correction messages in NOVATELX format.

RTCA
Set the receiver to accept RTK correction messages in RTCA format.

RTCM
Set the receiver to accept RTK correction messages in RTCM format.

RTCMV3
Set the receiver to accept RTK correction messages in RTCM Version 3.0 format.

Click the button for the message format to use.

Input Ports

The Input Ports set the communication port, or ports, through which RTK correction messages are received.

Serial Ports

Click the COM buttons to select the serial ports used to receive differential corrections. The number of COM ports available varies depending the type of NovAtel receiver.

When a COM button is selected, the button changes to show a settings icon. Click the settings icon to change the communication parameters used for the COM port. From the COM Configuration window that appears, set the serial communication parameters to match the parameters used by the device to which the receiver is communicating.

Baud Rate
Scroll the list of baud rates and then click a baud rate to select the communication rate (bps) used by this serial port. The default baud rate is 9600.

Parity
Click **N**, **E** or **O** to select the parity used by this serial port.

N = No parity, E = Even parity, O = Odd parity

The default parity is N (No Parity).

Data Bits

Click **7** or **8** to select the number of data bits used for each data message transmitted. The default is 8 bits.

Stop Bits

Click **1** or **2** to select the number of stops bits used for each data message transmitted.

ICOM

Click the ICOM buttons to select the network ports used to receive differential corrections over the receiver's Ethernet connection.

When an ICOM button is selected, the button changes to show a settings icon. Click the settings icon to change the communication parameters used for the ICOM port.

To configure an ICOM port:

1. In the **Domain** box, enter the hostname or IP address of the device.
2. In the **Port** box, enter the TCP/UDP port number used by this ICOM port.
3. Click one of the following buttons to select the protocol used by this ICOM port.
    - **Disabled** – Disable this ICOM port.
    - **TCP** – Use raw TCP on this port.
    - **UDP** – Use raw UDP on this port.
4. After setting the communication parameters, click the **Done** button to save the new settings.

NTRIP

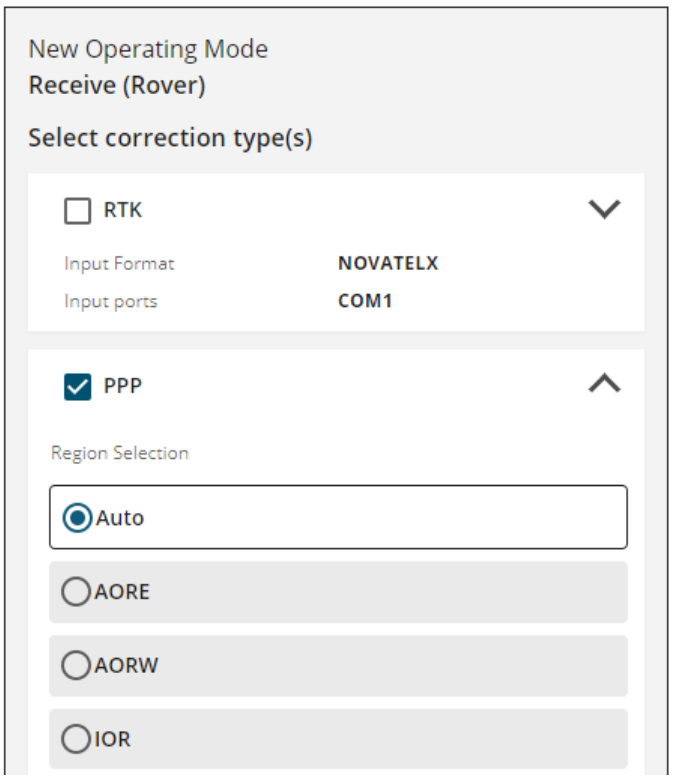
Click the NCOM buttons to select the network ports used to receive RTK corrections. Network ports are used when the receiver is acting as an NTRIP client. The receiver must have an Ethernet connection to use NCOM ports.

When an NCOM button is selected, the button changes to show a settings icon. Click the settings icon to change the communication parameters used for the NCOM port.

To configure a NCOM port:

1. Click the **Domain** box and enter the hostname or IP address of the Endpoint.
2. Click the **Port** box and enter the TCP/UDP port number of the Endpoint.
3. Click the **Search for Mountpoint** button.
4. Click the **Mountpoint** drop menu and click on the mountpoint to use.
5. Click the **Username** box and enter the login user name. The username can be up to 30 characters long.
6. Click the **Password** box and enter the login password. The Password can be up to 30 characters long.
7. To enable GGA output to the NTRIP caster, select the **GGA OUTPUT** check box.

PPP



To use PPP positioning, a subscription to a correction service (TerraStar or Oceanix) is required. To obtain a subscription, contact your local NovAtel sales representative. The NovAtel product serial number (PSN) is needed to obtain a subscription.

To enable PPP positioning:

1. Select the **PPP** checkbox.
2. Select the button for the L-Band beam to use.

   If **Auto** is selected, the receiver searches for multiple L-Band beams on the L-Band channels. If the receiver position is known, the selection criteria is a ranking of granted access L-Band beams by descending elevation angle. If the receiver position is not known, the selection criteria is a ranking of granted access L-Band beams in the order they appear in the stored beam table.

To disable PPP positioning:

1. Clear the **PPP** checkbox.

Manually Configure the L-Band Beam

The L-Band beam used to receive PPP corrections can be manually configured.

To enable PPP and manually configure the L-Band beam:

1. Select the **PPP** checkbox.
2. Select the **Manual** option.
3. Click the settings icon ( ).

   The *Manual Configuration* dialog box appears.
4. In the **Frequency** box, enter the transmit frequency of the L-Band beam.

   The frequency must be between 1525 and 1560 MHz.

5. Select the **Baud Rate** used for the correction messages.
6. Click the **Apply** button.

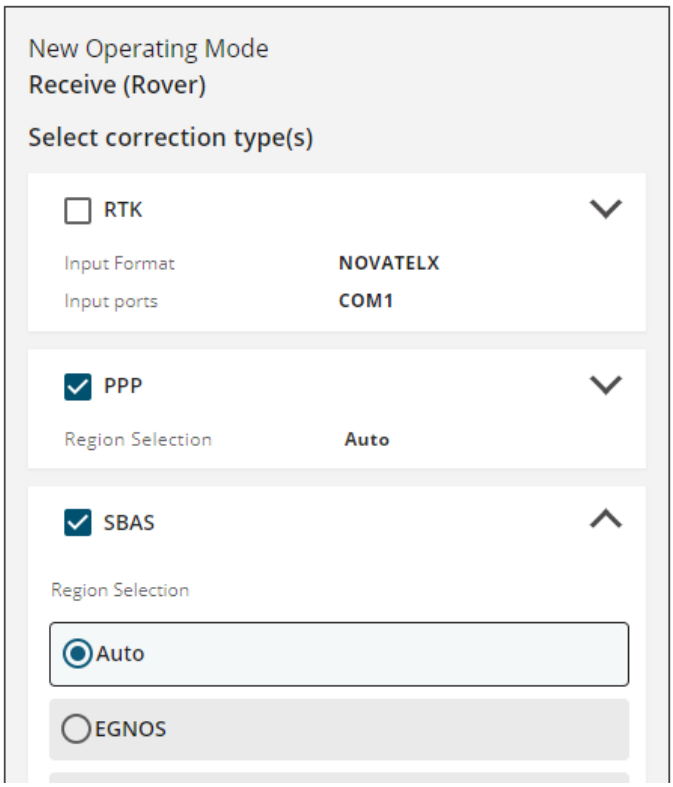
PPP Corrections over NTRIP

TerraStar or Oceanix PPP corrections can be received over an NTRIP connection.

To enable PPP corrections over NTRIP:

1. Select the **PPP** checkbox.
2. Select the NCOM ports over which PPP corrections are received.
3. Click the **Apply** button.

SBAS



To enable SBAS positioning on the receiver, select the **SBAS** checkbox and select the appropriate region on the *Region Selection* window.

To disable SBAS positioning, clear the **SBAS** checkbox.

Auto

The receiver automatically determines the satellite system to use based on the receiver's position and prevents the receiver from using satellites from outside of the service area.

EGNOS

The receiver uses only EGNOS satellites.

GAGAN

The receiver uses only GAGAN satellites.

MSAS

The receiver uses only MSAS satellites.

QZSS

The receiver uses only QZSS SAIF signals.

WAAS

The receiver uses only WAAS satellites.

Base Antenna Phase Center Offset

Configuring the phase center offset of the antenna used by the RTK base receiver improves RTK accuracy.

Antenna Type

There are several predefined antenna types taken from the IGS ANTEX file. To choose one of the predefined antennas, click the **Antenna Type** drop down menu and select the type of antenna connected to the base receiver that is providing RTK corrections.

Frequency

Select the **GPS L1** check box to enter phase center offset values for the GPS L1 signal.

Select the **GPS L2** check box to enter phase center offset values for the GPS L2 signal.

ARP to APC

For each frequency selected in **Frequency** field, enter the distance in millimetres from the Antenna Reference Point (ARP) to the Antenna Phase Center (APC).

East

Enter the East phase center offset in millimetres.

North

Enter the North phase center offset in millimetres.

Up

Enter the Up phase center offset in millimetres.

Rover Antenna Phase Center Offset

Configuring the phase center offset of the antenna used by the RTK rover receiver improves RTK accuracy.

Antenna Type

There are several predefined antenna types taken from the IGS ANTEX file. To choose one of the predefined antennas, click the **Antenna Type** drop down menu and select the type of antenna connected to the receiver that is receiving RTK corrections.

To use custom phase center offsets, select **Custom** from the **Antenna Type** drop down menu. The **Frequency** and **ARP to APC** fields are added to the tile.

Frequency

Select the **GPS L1** check box to enter phase center offset values for the GPS L1 signal.

Select the **GPS L2** check box to enter phase center offset values for the GPS L2 signal.

ARP to APC

For each frequency selected in **Frequency** field, enter the distance in millimetres from the Antenna Reference Point (ARP) to the Antenna Phase Center (APC).

East

Enter the East phase center offset in millimetres.

North

Enter the North phase center offset in millimetres.

Up

Enter the Up phase center offset in millimetres.

Phase Center Variation

To use the phase center variation defined for the antenna, set the switch to enabled ( ).

To ignore the phase center variation defined for the antenna, set the switch to the disabled ( ).

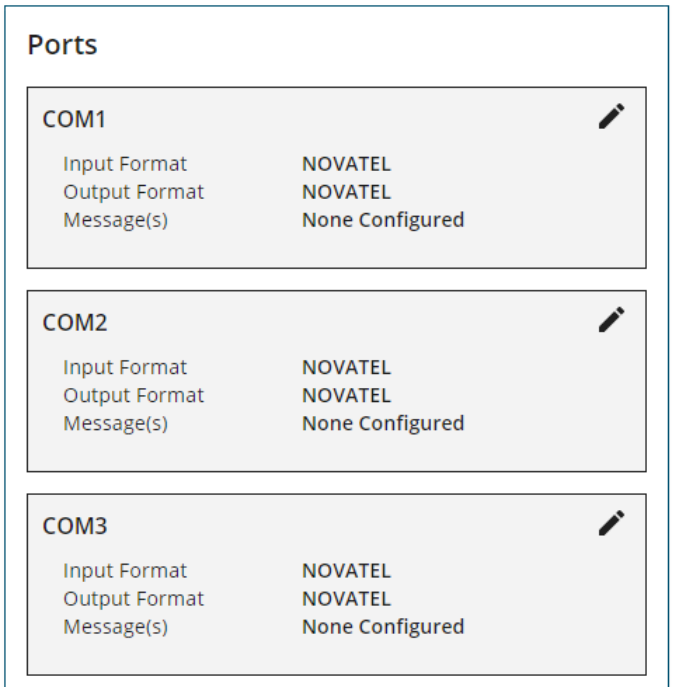
Click **Apply** to save the configuration on the receiver.

5.1.3 Standalone (Single Point)

Click **Standalone (Single Point)** and then **Next** to configure the receiver to use standalone mode to calculate the position.

Click **Apply** to save the configuration on the receiver.

5.2 Ports Configuration

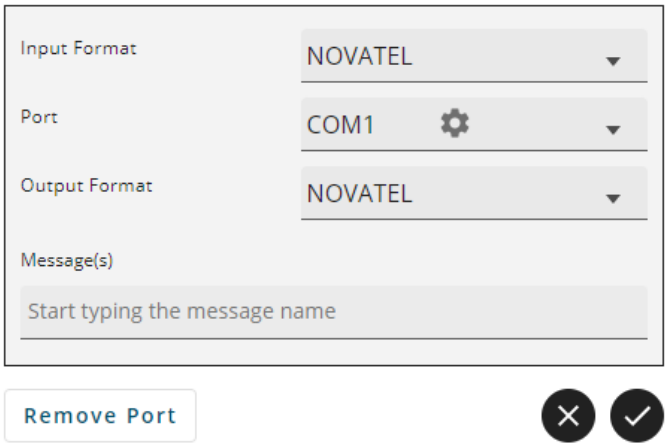


Use the *Ports* configuration page to configure the communication ports on the receiver. The *Ports* configuration page is also used to configure the logs that are output from a specific communications port.

Click the *Ports* bar to open the *Ports* configuration window. The communication ports that have been configured (changed from default values) are listed on the *Ports* page.

If the communication port to be configured is not listed on the *Ports* page, click **Add Port** or **Add Another Port**.

To configure a port, click the **Edit** icon beside the port.



5.2.1 Input Format

The input format sets the type of message the port will accept. To set the input format, click the **Input Format** drop menu and select the format to use.

Auto
Set the port to automatically detect the format of the incoming RTK corrections.

CMR
Set the port to accept RTK correction messages in CMR format.

None
Disable input on the port.

NOVATEL
Set the port to accept NovAtel commands

NOVATELX
Set the port to accept RTK correction messages in NOVATELX format.

RTCA
Set the port to accept RTK correction messages in RTCA format.

RTCM
Set the port to accept RTK correction messages in RTCM format.

RTCMV3
Set the port to accept RTK correction messages in RTCM Version 3.0 format.

VERIPOS
Set the port to accept PPP correction messages over IP.

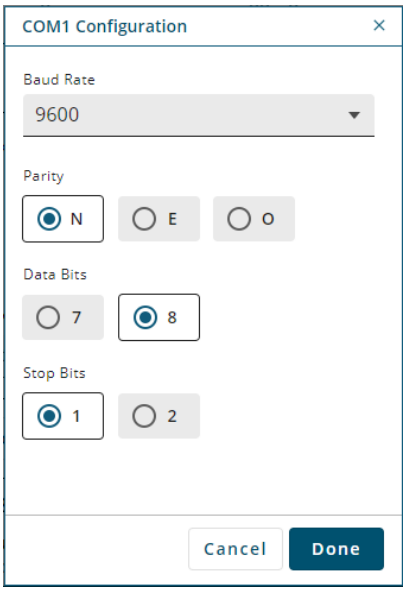
5.2.2 Port

There are several types of communication port that can be configured.

COM Port

A COM port is a serial communication port. The number of COM ports available varies depending on the type of receiver. To configure a COM port:

1. Click the **Port** drop menu and select the COM port to configure.
2. Click the settings icon (⚙) and set the communication parameters to match the device connected to the port



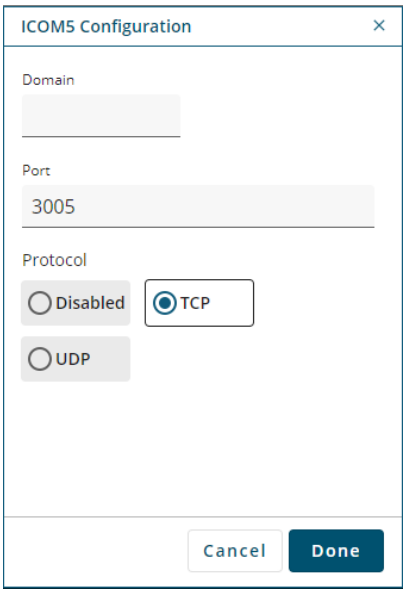
3. Click the **Baud Rate** drop menu and select the communication rate (bps) used by this serial port. The default baud rate is 9600.
4. Click **N**, **E** or **O** to select the parity used by this serial port.

   N = No parity, E = Even parity, O = Odd parity. The default parity is N (No Parity).
5. Click **7** or **8** to select the number of data bits used for each data message transmitted. The default is 8 data bits.
6. Click **1** or **2** to select the number of stop bits used for each data message transmitted. The default is 1 stop bit.
7. Click the **Done** button to save the changes and close the *COM Configuration* window.

ICOM Port

ICOM ports are virtual ports used for Ethernet or Wi-Fi connections. To configure an ICOM port:

1. Click the **Port** drop menu and select the ICOM port.
2. Click the settings icon (⚙) and set the communication parameters used for the ICOM port.



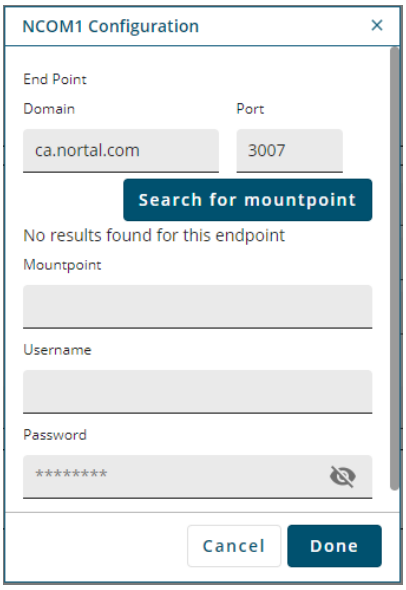
3. In the **Domain** box, enter the hostname or IP address of the device.
4. In **Port** box, enter the TCP/UDP port number used by this ICOM port.
5. Click one of the following buttons to select the protocol used by this ICOM port.
   - **Disabled** – Disable this ICOM port.
   - **TCP** – Use raw TCP on this port.
   - **UDP** – Use raw UDP on this port.
6. Click the **Done** button to save the changes and close the *ICOM Configuration* window.

NCOM

Network ports are used when the receiver is acting as an NTRIP server. The receiver must have an Ethernet connection to use NCOM ports.

To configure a NCOM port:

1. Click the **Port** drop menu and select the NCOM port.
2. Click the settings icon (⚙) and set the communication parameters used for the NCOM port.



3. In the **Domain** box, enter the hostname or IP address of the Endpoint.
4. In **Port** box, enter the TCP/UDP port number of the Endpoint.
5. Click the **Search for Mountpoint** button.
6. Click the **Mountpoint** drop menu and click on the mountpoint to use.
7. Click the **Username** box and enter the login user name. The username can be up to 30 characters long.
8. Click the **Password** box and enter the login password. The Password can be up to 30 characters long.
9. Click the **Done** button to save the changes and close the *NCOM Configuration* window.

USB

A USB port is used to communicate with a device using a USB cable. To add a USB port, click the **Port** drop menu and select one of the USB ports.

5.2.3 Output Format

The output format sets the type of message the port will send. To set the output format, click the **Output Format** drop menu and select the format to use.

CMR

Set the receiver to send RTK correction messages in CMR format.

NMEA

Set the port to send NMEA format logs.

NONE

Disable output on the port.

NOVATEL

Set the port to send NovAtel logs.

NOVATELX

Set the receiver to send RTK correction messages in NOVATELX format.

RTCA

Set the receiver to send RTK correction messages in RTCA format.

RTCM

Set the receiver to send RTK correction messages in RTCM format.

RTCMV3

Set the receiver to send RTK correction messages in RTCM Version 3.0 format.

5.2.4 Messages

The *Messages* box shows the logs being sent out of this port.

To add a log:

1. Click the *Messages* box and start typing the name of the log to add.

   A list of logs that start with the letters typed appears.

2. Click the name of the log to add.

Message Settings

To edit the collection parameters of the log:

1. Click the settings icon.
   The *Message Settings* dialog box appears.
2. Adjust the setting for the log.

   To change the logging settings for a log, select the parameter from the drop menus for the log.

   Format

   Click **ASCII**, **Binary** or **Abbr ASCII** to select the format in which this log is generated.

   Trigger

   The trigger determines when the log is generated.

   - **ONTIME**

     Outputs the log at a regular interval. The number of seconds between log generation is set in the Period option.

   - **ONCHANGED**

     Outputs the current message and then continues to output when the message is changed.

   - **ONCE**

     Outputs the current message. If no message is currently present, the next message is output when available.

   - **ONNEW**

     Does not output the current message, but outputs when the message is updated (not necessarily changed).

   - **ONALL**

     Outputs the current message and then continues to output when the message is updated (not

necessarily changed).

The ONALL trigger is available on firmware versions 7.09.01 and higher.

The triggers available depend on the log type.

Table 1: Log Type Triggers

Type	Recommended Trigger	Illegal Triggers
Synch	ONTIME	ONNEW, ONCHANGED
Asych	ONCHANGED or ONCE	–
Polled	ONCE or ONTIME	ONNEW, ONCHANGED

Period

The log period in seconds (for ONTIME trigger).

Valid values for the high rate logging are 0.01, 0.02, 0.05, 0.1, 0.2, 0.25 and 0.5. For logging slower than once per second, any integer value is accepted.

If the value entered is lower than the minimum measurement period, the value will be rejected.

3. Repeat these steps to adjust the message settings for each log being collected.
4. Click **Apply** to save the changes for all of the logs.

Message Settings NMEA Logs

To edit the collection parameters of a NMEA log:

1. Click the settings icon.
   The *Message Settings* dialog box appears.
2. Select the **NMEA Log Prefix** option for this log.
   - **GP**

     The NMEA log will have a prefix of GP and the NMEA log will only include information about the GPS satellites, even when the receiver is tracking multiple constellations.
   - **Auto**

     The NMEA log prefix changes as per the constellations enabled on the receiver. When there is one constellation in the solution and SPAN is disabled, the NMEA Talker ID is output as: GP for GPS, GL for GLONASS, GA for Galileo, and GB/BD for BeiDou. If more than one constellation is in the solution, the prefix is GN with the exception of GPGSV.
3. If *Auto* was selected as the *NMEA Log Prefix*, select the **BeiDou Log Prefix**.
   - Select **GB** to use the current NMEA ID for BeiDou.
   - Select **BD** to use the legacy NMEA ID for BeiDou.
4. Click one of the **Precision** buttons to select the number of decimal places used for the latitude and longitude values in this log.
5. Click one of the **Quality Indicator** buttons to select the quality indicator that will be used for this log.
6. Click the **Trigger** drop menu and select the trigger used for the log.

7. Enter the log **Period** in seconds.

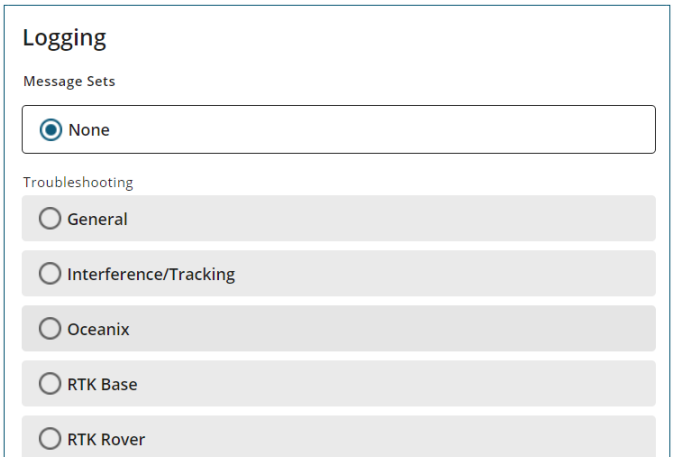
   Valid values for the high rate logging are 0.01, 0.02, 0.05, 0.1, 0.2, 0.25 and 0.5. For logging slower than once per second, any integer value is accepted. If the value entered is lower than the minimum measurement period, the value will be rejected.

8. Set the Trigger and Period for each NMEA log.
9. Click the **Apply** button to save the changes for all of the logs.

To remove a log from this port, click the **X** icon on the button for the log.

Click **Apply** to save the configuration on the receiver.

5.3 Logging Configuration



Use the *Logging* configuration page to set the logs that will be saved on the receiver's storage device (internal storage or a USB device).

Use the *Ports* configuration tab to configure the logs that will be output from a specific port.

Click the *Logging* bar to open the *Logging* page.

The Logging page has several *Message Sets*. A Message Set is a group of logs recommended for a specific purpose. When a Message Set is selected, all of the logs in the set are added to the list of logs to save on the receiver's storage device.

None

No logs are selected to be saved. This is the default Message Set.

ALIGN

The recommended logs to collect for troubleshooting issues with the ALIGN heading feature.

General

A set of logs useful for troubleshooting issues on the receiver.

Interference/Tracking

The recommended logs to collect for troubleshooting issues with interference and tracking incoming GNSS signals.

Oceanix

The recommended logs to collect for troubleshooting issues when using Oceanix corrections to generate a PPP position.

RTK Base

The recommended logs to collect for troubleshooting issues when the receiver is acting as an RTK base station.

RTK Rover

The recommended logs to collect for troubleshooting issues when the receiver is acting as an RTK rover.

SPAN

The recommended logs to collect for troubleshooting issues when the receiver is part a SPAN GNSS+INS system.

TerraStar

The recommended logs to collect for troubleshooting issues when using TerraStar corrections to generate a PPP position.

GrafNav

The recommended logs to save when the data collected will be post-processed using Waypoint GrafNav software.

Inertial Explorer

The recommended logs to save when the data collected will be post-processed using Waypoint Inertial Explorer software.

Rinex

The recommended logs to collect a complete set of RINEX data from a NovAtel receiver.

To configure the logs to be saved to the storage device:

1. In the *Message Sets* section, click the button for one of the message sets. The logs contained in the selected message set will be collected.
2. To add other logs, click the *Custom Messages* box and start typing the name of the log. A list of logs with names that start with the typed letters appears.
3. Click the name of the log to add it to the logs collected.
4. Repeat steps 2 and 3 for each log to add.
5. Click **Next**. A dialog box appears.

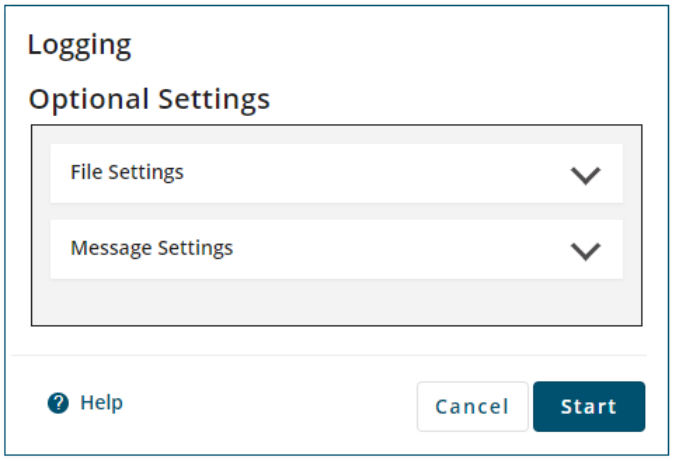
The **Next** button is disabled until a Message Set other than *None* is selected or logs are entered in the *Custom Messages* box.

6. If you want to collect the logs with the current message settings, click **Start** to start collecting logs.

   If you want to change the message settings for the logs, click **Edit Optional Settings**. The *Optional Settings* page appears.

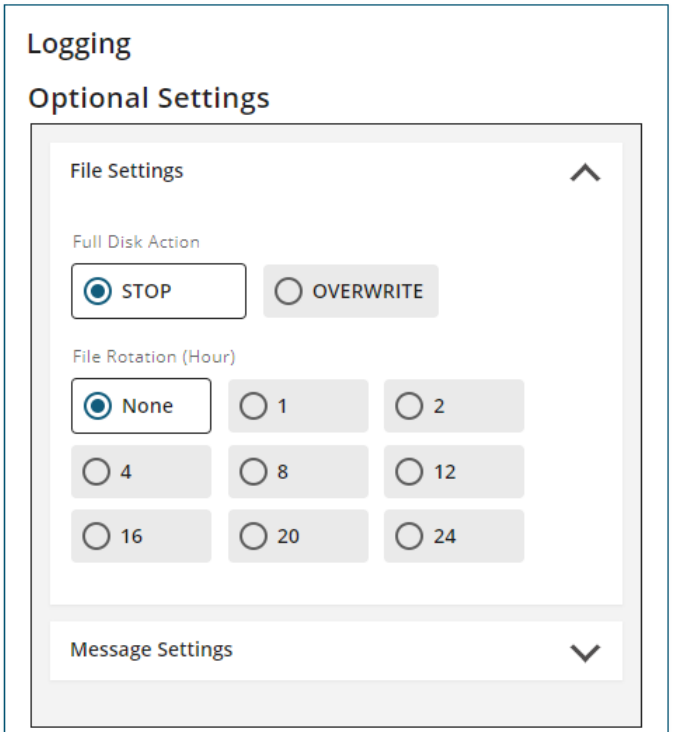
7. Adjust the Optional Settings as required. See the following sections for information about the settings.
8. Click **Start** to start collecting logs.

5.3.1 Optional Settings



The *Optional Settings* window has two tabs: *File Setting* and *Message Settings*.

File Settings



The File Settings configure how the receiver handles the files in which the logs are stored.

Full Disk Action

The Full Disk Action options determine how the receiver acts when the file storage device is full.

- **STOP**

The receiver stops logging when the file storage device has 1 MB of free space or less.
When logging to the computer running Manage Web (local computer), logging stops when the disk space is less than 10 MB.

- **OVERWRITE**

  The receiver deletes the oldest log file when the file storage device has 10 MB of free space or less.
  When logging to the local computer, the oldest log file is deleted when there is 10 MB of disk space or less.
  To be deleted, the log file must have the default naming scheme, exist in the current logging folder and be created by this receiver.

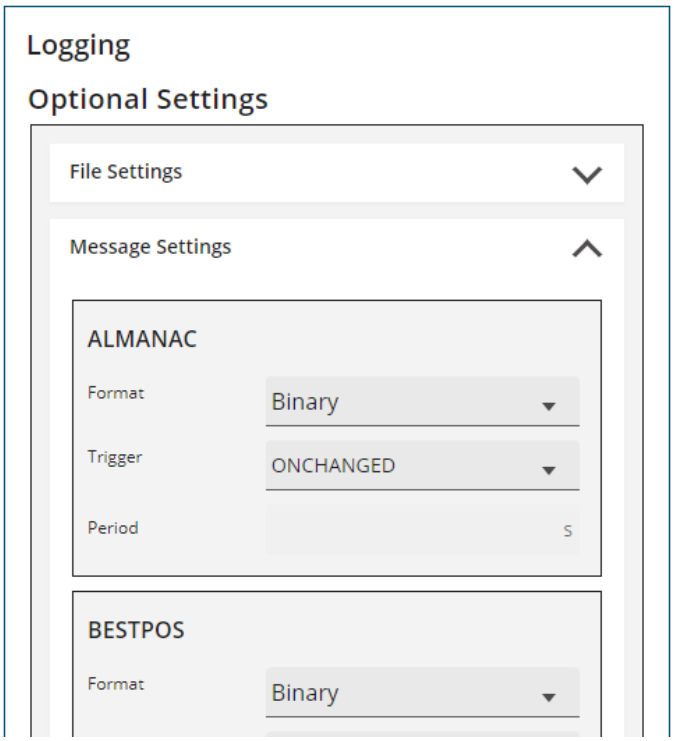
File Rotation

The File Rotation options determine when the receiver closes the current log file and starts storing logs in a new file. There is no data loss when the receiver changes log files and individual logs within the file are not spread between log files.
When logging to the local computer, Manage Web closes the log file.

To enable File Rotation, click one of the numbered buttons to select the number of hours that a log file is kept open.

To disable File Rotation, click **None**.

Message Settings



The Message Settings tab lists the logs being saved to the file storage device.

To change the logging settings for a log, use the drop menus and text box beside the log.

Format

Click **ASCII**, **Binary** or **Abbr ASCII** to select the format in which this log is generated.

Trigger

The trigger determines when the log is generated.

- **ONTIME**

  Outputs the log at a regular interval. The number of seconds between log generation is set in the Period option.

- **ONCHANGED**

  Outputs the current message and then continues to output when the message is changed.

- **ONCE**

  Outputs the current message. If no message is currently present, the next message is output when available.

- **ONNEW**

  Does not output the current message, but outputs when the message is updated (not necessarily changed).

- **ONALL**

  Outputs the current message and then continues to output when the message is updated (not necessarily changed).

The ONALL trigger is available on firmware versions 7.09.01 and higher.

The triggers available depend on the log type.

Table 2: Log Type Triggers

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Asych	ONCHANGED or ONCE	–
Polled	ONCE or ONTIME	ONNEW, ONCHANGED

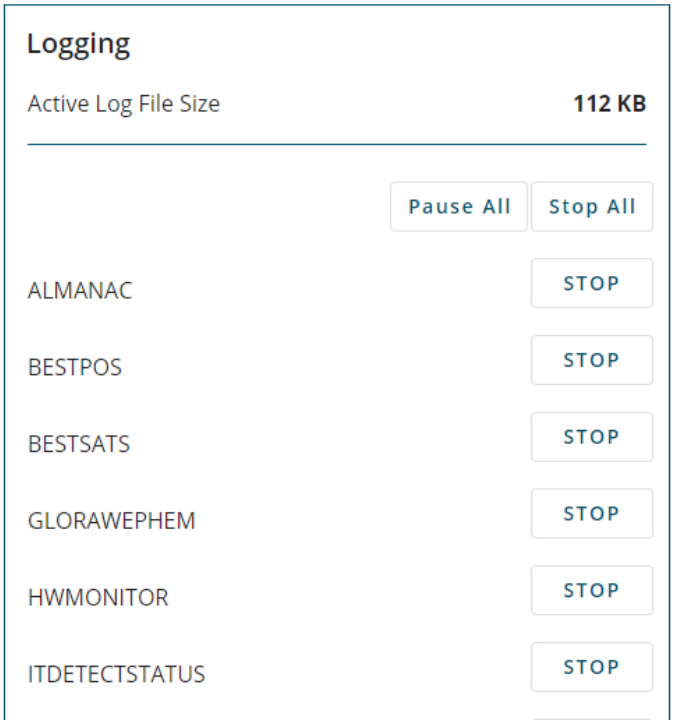
Period

The log period in seconds (for ONTIME trigger).

Valid values for the high rate logging are 0.01, 0.02, 0.05, 0.1, 0.2, 0.25 and 0.5. For logging slower than once per second, any integer value is accepted.

If the value entered is lower than the minimum measurement period, the value will be rejected.

5.3.2 Logging Active



If logging to a storage device is already active, the *Logging Configuration* page shows the size of the active log file and the list of logs being collected.

To stop collecting a log, click **Stop** beside the log.

To stop collecting all logs, click **Stop All**.

To temporarily suspend the collection of logs, click **Pause All**. Click the button again to resume logging.

5.4 ALIGN Configuration

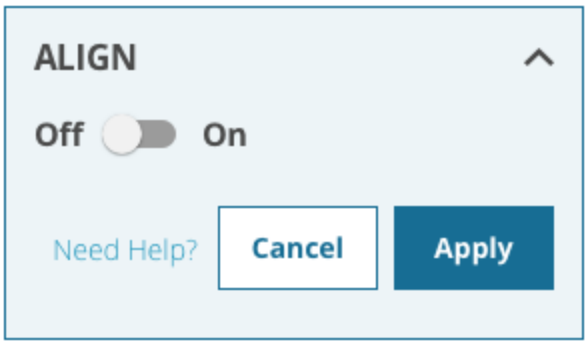
ALIGN technology combines two or more receivers to generate high precision heading and pitch angles between two receivers for real-time navigation.

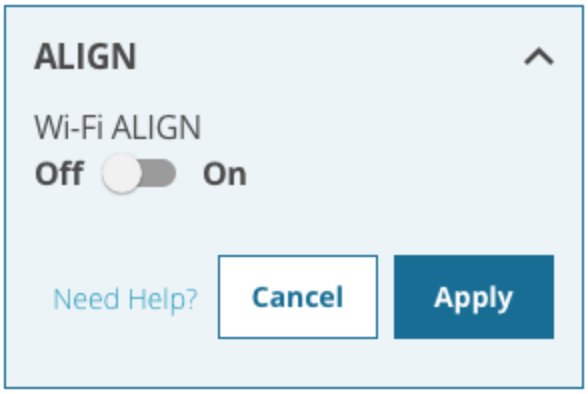
Use the ALIGN configuration window to enable ALIGN on a dual antenna receiver or set up an ALIGN master station with an ALIGN capable rover receiver for applications that require heading output. The ALIGN configuration should be run from the ALIGN rover receiver.

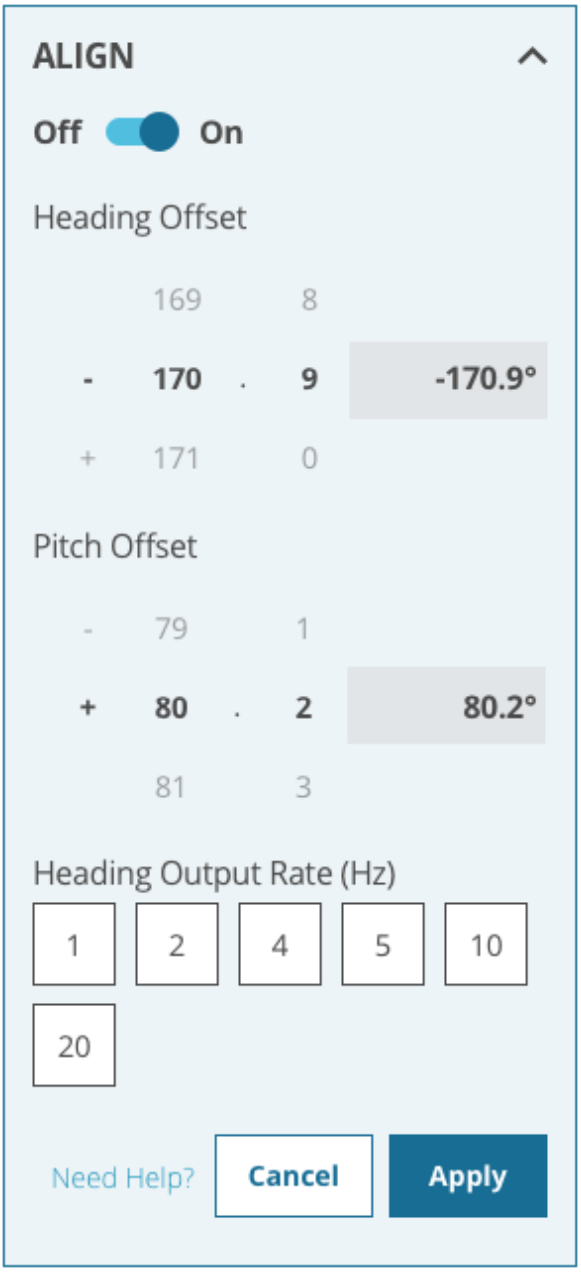
Dual antenna receivers, such as the OEM7720, PwrPak7D, PwrPak7D-E1, PwrPak7D-E2 and CPT7, can provide an ALIGN solution without additional receivers or configuration.

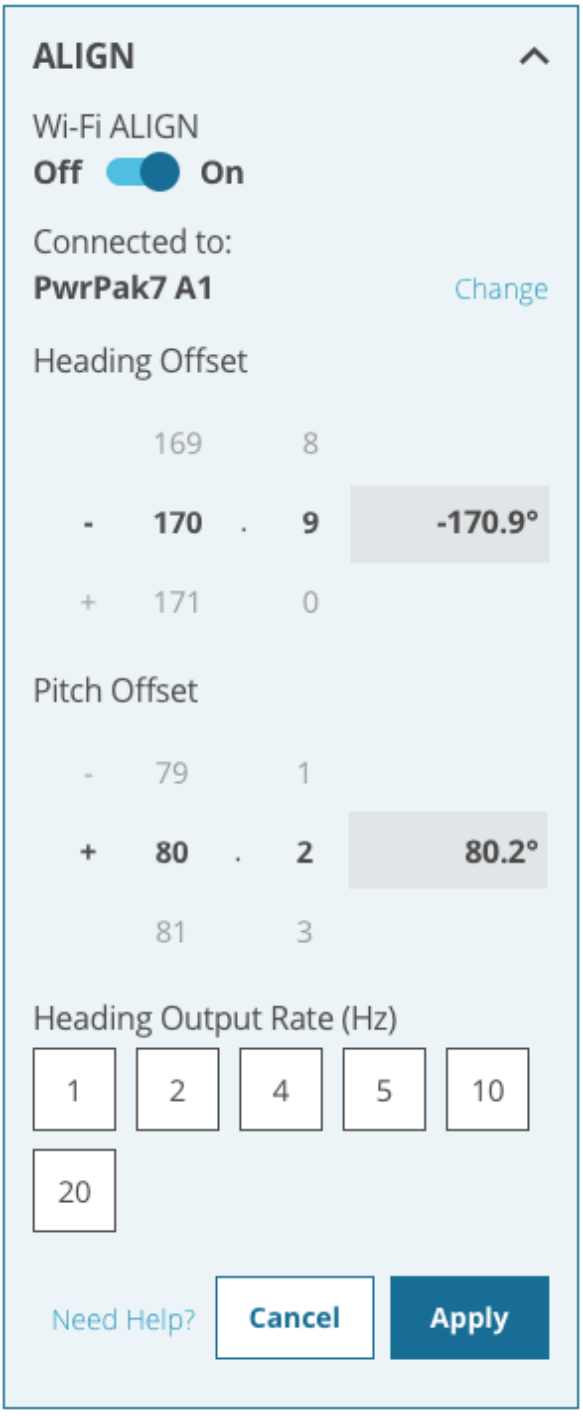
A dual frequency capable GNSS antenna is required to use ALIGN.

Click the *ALIGN* tab to open the *ALIGN* configuration window.
The content on the *ALIGN* configuration window varies depending on the type of receiver and how the rover receiver is connected to the master receiver.


ALIGN
Off
On
Need Help?
Cancel
Apply


ALIGN
Wi-Fi ALIGN
Off
On
Need Help?
Cancel
Apply





ALIGN Switch

Set the ALIGN switch to On ( ) to configure the receivers to pass ALIGN messages and enable ALIGN. If ALIGN is already enabled, set the ALIGN switch to Off ( ) to disable ALIGN.

On dual antenna receivers, the *Type* options appear below the ALIGN switch.

- Click the **Onboard** button to calculate an ALIGN solution using the two GNSS antennas connected to the receiver.

- Click the **Serial** button to use the COM2 serial port to pass ALIGN messages between the rover and master receivers.
- Click the **Wi-Fi** button to use a Wi-Fi connection to pass ALIGN messages between the rover and master receivers.

Connected to

Displays the name of the receiver with which ALIGN messages are exchanged.

To connect to a different receiver, click **Change** and select the master receiver to connected to.

This option is available only if a Wi-Fi connection is used to exchange ALIGN messages and the master and rover receivers are both Wi-Fi capable receivers.

Heading Offset

Enter a value in the **Heading Offset** box to add an offset, in degrees, to the heading value displayed on the ALIGN status page and the heading logs (HEADING2 and GPHDT).

The receiver determines heading based on the relative location of the two GNSS antennas. This offset is used to align the heading determined by the receiver with the forward motion of the vehicle.

Pitch Offset

Enter a value in the **Pitch Offset** box to add an offset, in degrees, to the pitch value displayed on the ALIGN status page and the heading logs (HEADING2 and GPHDT).

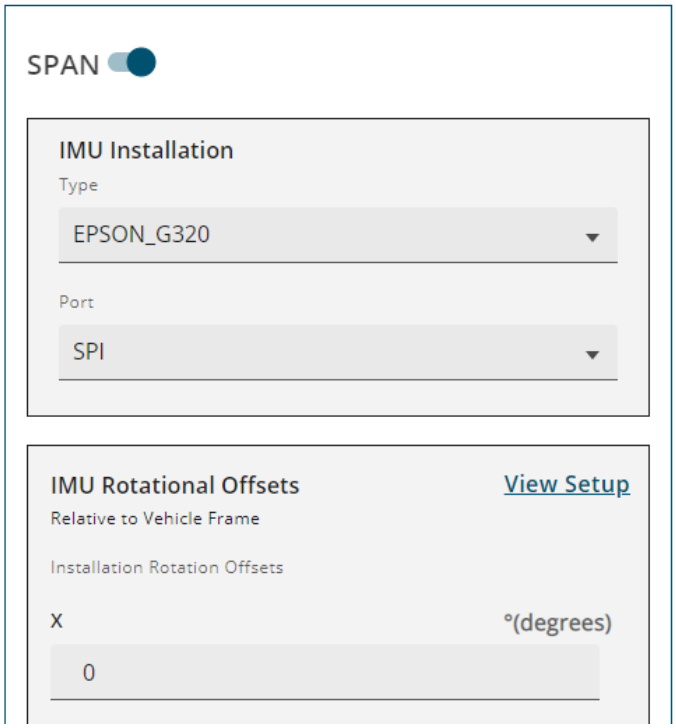
The receiver determines pitch based on the relative location of the two GNSS antennas. This offset is used to align the pitch determined by the receiver with the pitch of the vehicle.

Heading Output Rate

Select one of the numbered buttons to set the rate (in Hz) at which heading data is output. The default is 10 Hz.

After setting the ALIGN parameters, click **Apply** to save the configuration on the receiver.

5.5 SPAN Configuration



Use the SPAN configuration page to configure SPAN GNSS+INS technology on the receiver.

To use SPAN, the receiver must have an internal IMU (CPT7, CPT7700, PwrPak7-E1, PwrPak7D-E1, PwrPak7-E2, PwrPak7D-E2 or SMART7-S) or be connected to a SPAN compatible IMU.

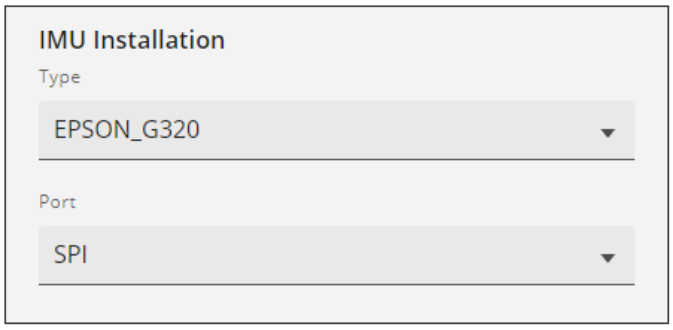
A dual frequency capable GNSS antenna is required to use SPAN.

Click the *SPAN* bar to open the *SPAN* page.

SPAN

Use this switch to enable or disable SPAN.

5.5.1 IMU Installation



For receivers with an internal IMU (CPT7, CPT7700, PwrPak7-E1, PwrPak7D-E1, PwrPak7-E2, PwrPak7D-E2 or SMART7-S), do not change the IMU Type or Port. The correct IMU Type and Port are configured at the factory.

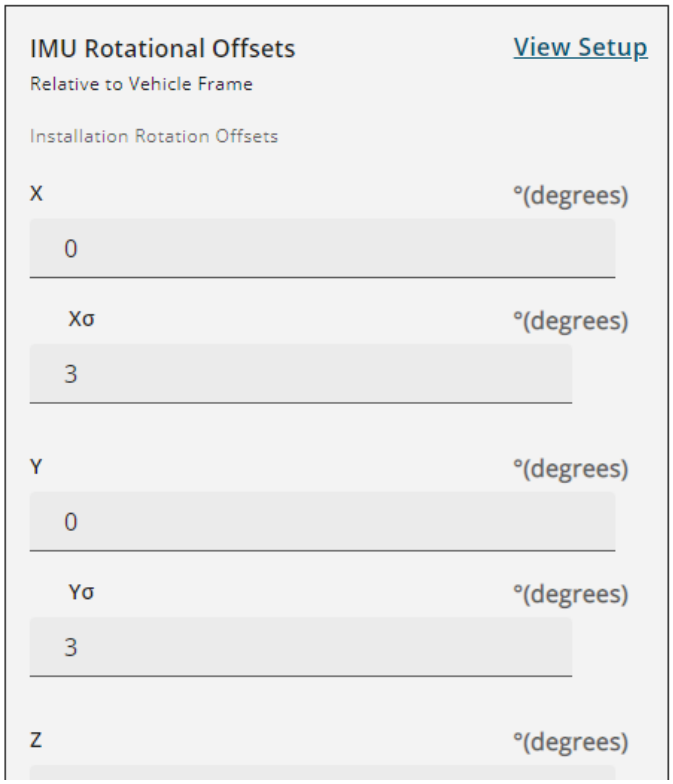
Type

Click the *Type* drop menu and click on the IMU connected to the receiver.

Port

Click the *Port* drop menu and click on the communication port to which the IMU is connected.

5.5.2 IMU Rotational Offsets



The Installation Rotational Offsets are the differences in orientation between the IMU Body Frame (typically marked on the IMU enclosure) and the vehicle frame. In the vehicle frame, Z is always considered to be upwards, Y is forward through the direction of travel, and X is to the right.

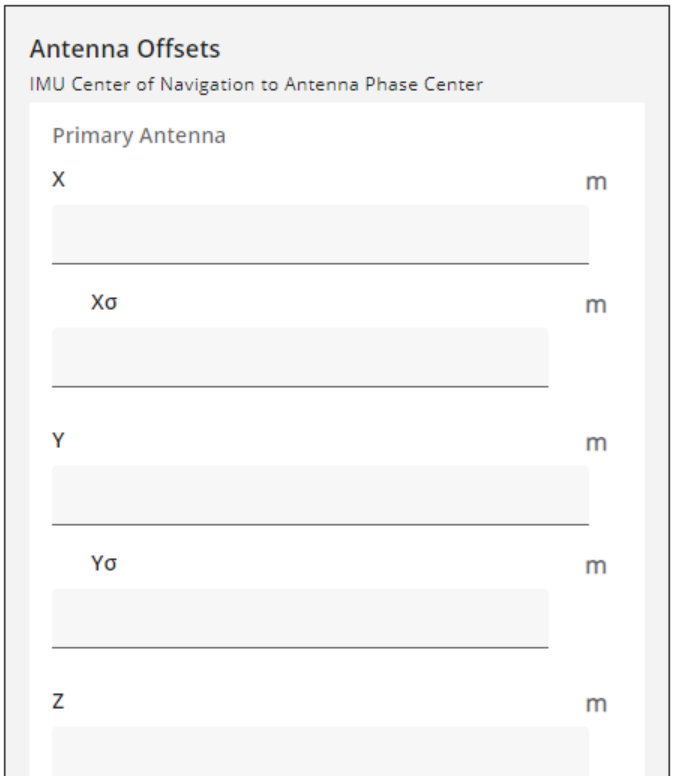
The order of rotations is Z-X-Y and all rotations are right handed.

In the **X**, **Y** and **Z** boxes, enter the rotations, in degrees, from the IMU Body Frame to the vehicle frame.

In the **Xσ**, **Yσ** and **Zσ** boxes, enter the rotation offset standard deviation. The standard deviation settings are optional.

Click **View Setup** to see a representation of the IMU rotation.

5.5.3 Antenna Offsets



Primary Antenna

The Primary Antenna offset is the three dimensional distance from the IMU to the GNSS antenna. The primary antenna offsets are required for all SPAN systems.

In the **X**, **Y** and **Z** boxes, enter the distance, in metres, from the IMU center of navigation to the GNSS antenna phase center. The offsets are measured in three directions, X axis, Y axis and Z axis, relative to the IMU Body frame.

In the **Xσ**, **Yσ** and **Zσ** boxes, enter the offset standard deviation in metres. The standard deviation settings are optional.

The measurements for the offsets should be done as accurately as possible, preferably to within millimetres especially for RTK operation. Any error in the offsets will translate into an error in the INS position.

Large standard deviations can lead to an inaccurate position solution. Therefore, it is highly recommended to measure translation offsets as accurately as possible and to manually enter translation offset standard deviations that reflect that accuracy.

Secondary Antenna

If the SPAN system has a second GNSS antenna, the secondary antenna offset parameters display.

In the **X**, **Y** and **Z** boxes, enter the distance, in metres, from the IMU center of navigation to the phase center of the secondary GNSS antenna. The offsets are measured in three directions, X axis, Y axis and Z axis, relative to the IMU Body frame.

In the **Xσ**, **Yσ** and **Zσ** boxes, enter the offset standard deviation in metres. The standard deviation settings are optional.

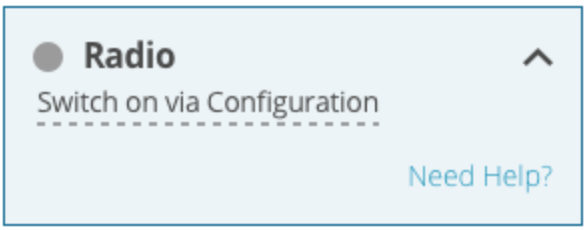
User

If the SPAN system has another device for which the relative location is needed by the SPAN system, set the User offset parameters.

In the **X**, **Y** and **Z** boxes, enter the distance, in metres, from the IMU center of navigation to the location of the device. The offsets are measured in three directions, X axis, Y axis and Z axis, relative to the IMU Body frame.

Click **Apply** to save the changes to the receiver.

5.6 Radio Configuration



Use the *Radio* configuration page to configure the radio connected to the receiver.

The settings on the *Radio* configuration page are saved on the radio module, not on the receiver.

Do not interrupt power while the radio is being configured.

Click the *Radio* bar to open the *Radio* page.

If the radio has not been configured, the **Detect Radio** button displays. Click the **Detect Radio** button. If the receiver finds a radio, the *Radio* configuration page displays the type of radio detected and the configuration parameters for that radio.

Connected Radio

Displays the type of radio connected to the receiver.

Connected Port

Displays the communication port to which the radio is connected.

The compatibility mode settings vary depending on the radio module installed.

5.6.1 Compatibility Mode (450 MHz)

1. Click the *Compatibility Mode* bar to open the *Compatibility Mode* page.
2. Click the compatibility button for the protocol that the radio will use.
   The Modulation options appear.

3. Click the button for the modulation the radio will use.
   The Link Rate options appear.
4. Click the button for the link rate, in bps, the radio will use.
   The Channel Spacing options appear.
5. Click the button for the channel spacing the radio will use.
   The FEC options appear.
6. Click the button to enable or disable Forward Error Correction (FEC).

5.6.2 Power & Frequency (450 MHz)

1. Click one of the *Transmit Power* buttons to select the power at which the radio transmits.
2. Scroll the *Transmit Frequency* list and then click the transmit frequency the radio will use.
3. Click **Apply** to save the changes to the radio.

5.6.3 Compatibility Mode and Transmit Power (900 MHz)

1. Click one of the *Compatibility Mode* buttons to select the protocol the radio will use.
2. Click one of the *Transmit Power* buttons to select the power at which the radio transmits.
3. Click the *Channel* box and enter channel number the radio will use.
4. Click **Apply** to save the changes to the radio.

5.7 GNSS Configuration

Use the GNSS configuration window to configure elevation mask and Pulse Per Second (PPS) output.

Elevation Mask

The Elevation Mask is the elevation cut-off angle for tracked satellites in degrees. The receiver does not start searching for a satellite until it rises above the cut-off angle (when the satellite position is known). Tracked satellites that fall below the cut-off angle are no longer tracked

Enter a value between 1 and 90 degrees, where 1 degree is just above the horizon and 90 degrees is directly overhead.

Pulse per Second

To enable the PPS output signal, set the **Pulse per Second** switch to enable ( ).

To disable the PPS output signal, set the **Pulse per Second** switch to disable ( ).

Polarity

Select **Positive** to use a positive polarity on the pulse generated on the PPS output

Select **Negative** to use a negative polarity on the pulse generated on the PPS output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