



NovAtel Connect User Guide

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NovAtel Customer Support

Contact Information

Log a support request with NovAtel Customer Support using one of the following methods:

Log a Case and Search Knowledge:

Website: www.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.com

Telephone:

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

International: +1-403-295-4900

Chapter 1 New in NovAtel Connect

1.1 Connections

New and past connections (History) appear side-by-side in the Connection Manager.

- Connections are shown in the form of Connection tiles.
- Desired Connection(s) can be selected for opening.
- Multiple receivers can be connected simultaneously.

1.2 Status, Configuration and Window Sizing

- Each Connection Window can be independently resized.
- Status Screen: Contains tiles primarily for viewing the data output from the receiver in organized graphical/text format.
- Configuration Screen: Contains tiles to view configuration status. The full view of each tile is used to configure the respective feature.
- Utilities: Has console, data logging, event status history, and firmware update tools which can be opened over the Status and Configuration screens.

1.3 Interference Toolkit (ITK)



Only OEM7 receivers have access to the ITK tile. Only interference mitigation models support the application of signal filters, attributed by an 'E' as the 9th character in the receiver model; however, all OEM7 models support the observing of the Wideband and Passband signals.

The ITK feature is used to detect and mitigate interference on GNSS Signals. Refer to "Interference Toolkit" on page 42 for details.

1.4 Tile Resizing and Movement

- Tile Resizing is restricted to pre-defined sizes. The amount of data shown in the tile is proportional to the size of the tile.
- Tiles can be moved to any location in the Connection Window. Other tiles are adjusted accordingly as per the movement.


Chapter 2 Install NovAtel Connect

The latest NovAtel Connect software is available from the NovAtel web page. To install NovAtel Connect:

1. Download the installation file from the NovAtel web page: www.novatel.com/novatel-connect.
2. Once downloaded, open the NovAtelConnect_Setup file to start the installation wizard.
3. Follow the wizard to install NovAtel Connect.

Chapter 3 Launch NovAtel Connect

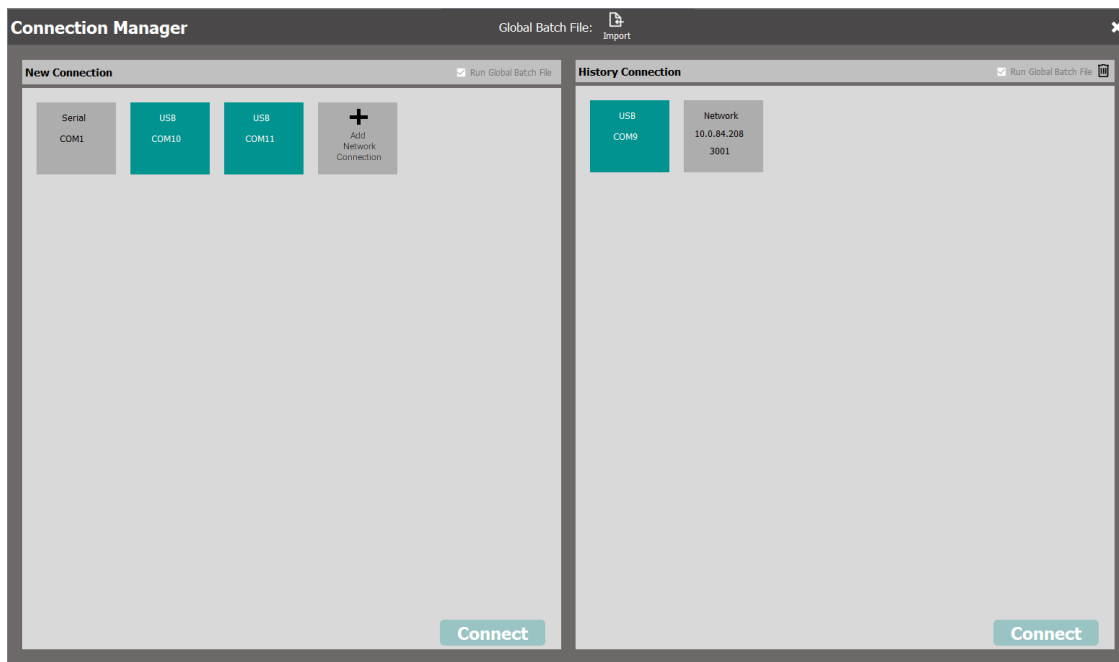
When NovAtel Connect is installed, a NovAtel Connect icon is added to the desktop and the Windows Start menu (NovAtel Inc\Connect).

To launch NovAtel Connect, click the NovAtel Connect  icon. The *Connection Manager* window displays by default when NovAtel Connect is opened.

Chapter 4 Connection Manager

The *Connection Manager* window is used to:

- Create new serial connections to receivers connected to the NovAtel Connect computer
- Create new USB connections to receivers connected to the NovAtel Connect computer
- Create new network connections for receivers on the network
- View connections that were previously created (History)
- Change the connection settings of serial and network connections
- Delete connections previously made (History)
- Establish a connection to a receiver shown in the *New Connection* or *History Connection* windows
- View the status of the available connections



4.1 Open the Connection Manager



When NovAtel Connect is launched, the *Connection Manager* window is automatically opened.

To open the *Connection Manager* window:

1. Click the **Connection** menu on the NovAtel Connect main window.
2. Click **New**.

4.2 Close the Connection Manager

The *Connection Manager* window is automatically closed when a connection to a receiver is made.

To close the *Connection Manager* window without starting a connection, click the **X** button in the top right corner of the *Connection Manager* window.

4.3 Connection Manager Tiles


Connection tiles are representations of available/created connections.



4.3.1 Connection Types

- **Serial**
A Serial tile represents a connection to a receiver using one of the serial COM ports on the receiver. The receiver must be connected to a serial communication port (RS-232) on the NovAtel Connect computer to use this type of connection.
- **USB**
A USB tile represents a connection to a receiver using the USB port on the receiver. The receiver must be connected to a USB port on the NovAtel Connect computer to use this type of connection. Also, USB tiles do not appear in the *New Connection* window until a receiver is connected to the NovAtel Connect computer using a USB cable.
- **Network**
A Network tile represents a connection to a receiver accessible through a network to the NovAtel Connect computer.

4.3.2 Connection Settings

The settings button () appears when hovering over a Serial or Network tile. Clicking on the settings button shows the settings that can be modified for that connection.

Serial Connection Settings

On Serial connections, the following settings can be changed

- **Baud Rate**
Selects the baud rate used to communicate with the receiver.
When the AUTO setting (default) is used, NovAtel Connect automatically establishes a connection at the highest available baud rate.
- **Passive**

Enables or disables Passive mode.

Passive mode is used to avoid disruptions to logging or port configurations.

If Passive is selected, NovAtel Connect attempts to communicate with the receiver at the specified baud rate. The baud rate selected must match the baud rate configured on the receiver COM port. AUTO can not be used when Passive is selected.

If Passive is not selected, signal breaks are sent over the COM port and the receiver is configured to communicate at the specified baud rate.

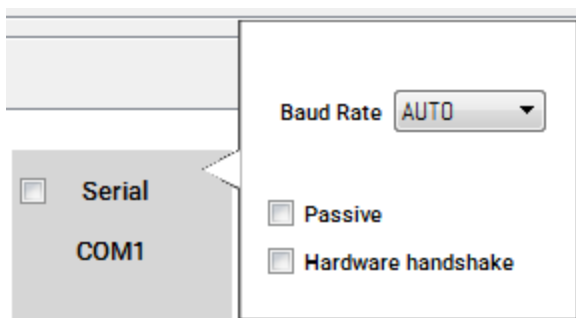


If Passive is not selected, all previously requested logs on that port will be stopped.

- Hardware Handshaking

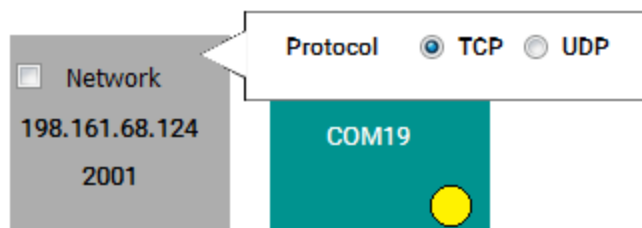
Enables or disables hardware handshaking.

Hardware Handshaking is a protocol that uses hardware signals to control data flow.



Network Connection Settings

For Network connections, the settings button is available only on Network tiles in the *History Connection* window.



From the Network tile settings button, the network protocol can be set to TCP or UDP.

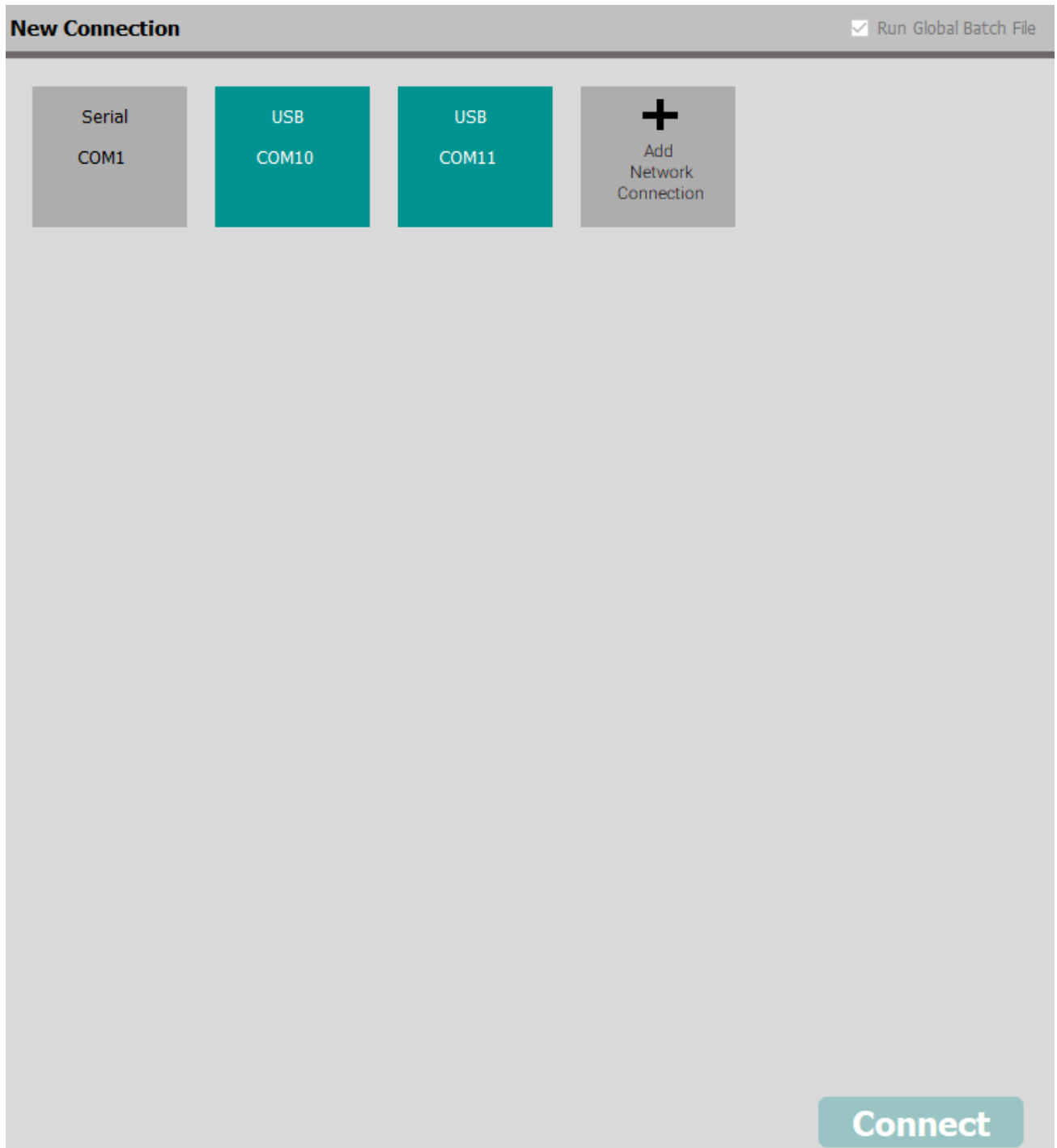
Other network settings can be configured only when creating a new Network connection. For information about creating a new Network connection, see the "Create a Network Connection" on page 15.



Settings for connections on the *History Connection* window are preserved within and across the different sessions of NovAtel Connect.

4.4 New Connection Window

The *New Connection* window, on the left hand side of the *Connection Manager* window, displays tiles of connections that are available for opening. All detected Serial (COM) ports on the computer are automatically displayed in this window. USB port tiles are added to the *New Connection* window when a receiver is connected to the computer using a USB cable.




4.4.1 Tile Color Code

The tiles in the *New Connection* window are color coded to indicate the status of the connection.

- **Grey**
Port status is unknown or not applicable.
- **Green**
A receiver is connected to the port and powered on.
- **Red**
An error has been detected.

4.4.2 Create a Serial Connection

A receiver must be connected to the NovAtel Connect computer through a serial port to use a Serial connection.

1. Click the settings button () and set the communication parameters to use for this Serial connection.

See "Serial Connection Settings" on page 11 for information about the Serial connection settings.
2. Double click the Serial tile.

NovAtel Connect closes the *Connection Manager* window and starts a connection to the receiver. When the connection is complete, the main window displays.

4.4.3 Create a USB Connection

A receiver must be connected to the NovAtel Connect computer through a USB port to use a USB connection. Three USB tiles are added to the *Connection Manager* window for each USB connection between the computer and a receiver.

1. Double click the USB tile.

NovAtel Connect starts a connection to the receiver. When the connection is complete, the main window displays.

4.4.4 Create Multiple Connections

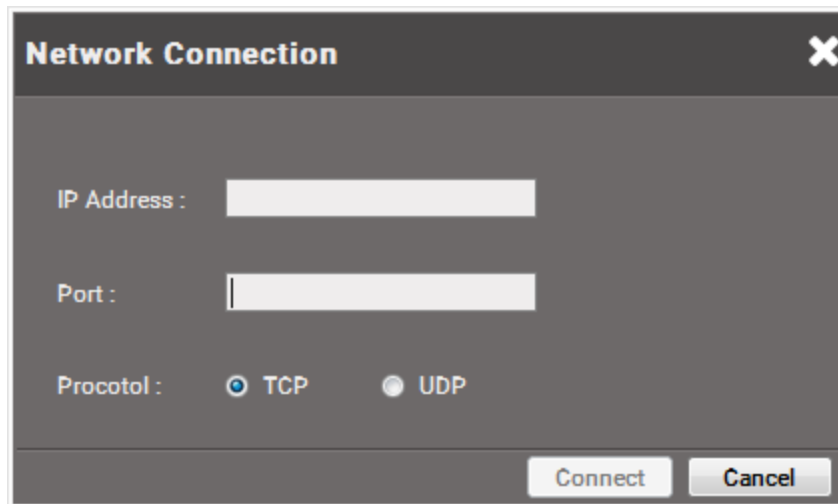
1. Move the cursor over the connection tile. A checkbox appears in the top left corner of the tile.
2. Click the connection tile to select the checkbox.
3. Repeat steps 1 and 2 for each connection in the *New Connection* window you want to create.
4. Click the **Connect** button.

NovAtel Connect closes the *Connection Manager* window and starts a connection to each of the selected receivers. When the connections are complete, a main window displays for each receiver connection.

4.4.5 Create a Network Connection

1. Click the **Add Network Connection** tile.

The *Network Connection* dialog box appears.

The image shows a 'Network Connection' dialog box with a dark gray background. It has a title bar with the text 'Network Connection' and a close button (X). Inside the dialog, there are three input fields: 'IP Address' with a text box, 'Port' with a text box, and 'Protocol' with two radio buttons labeled 'TCP' and 'UDP'. The 'TCP' radio button is selected. At the bottom right, there are two buttons: 'Connect' and 'Cancel'.

2. Enter the IP address of the receiver in the **IP Address** text box.
3. Enter the Ethernet port used to connect to the receiver in **Port** text box.
The default ports are 3001 to 3007.
4. Select the network protocol (TCP or UCP) to use.



TCP is the default for ICOM ports.

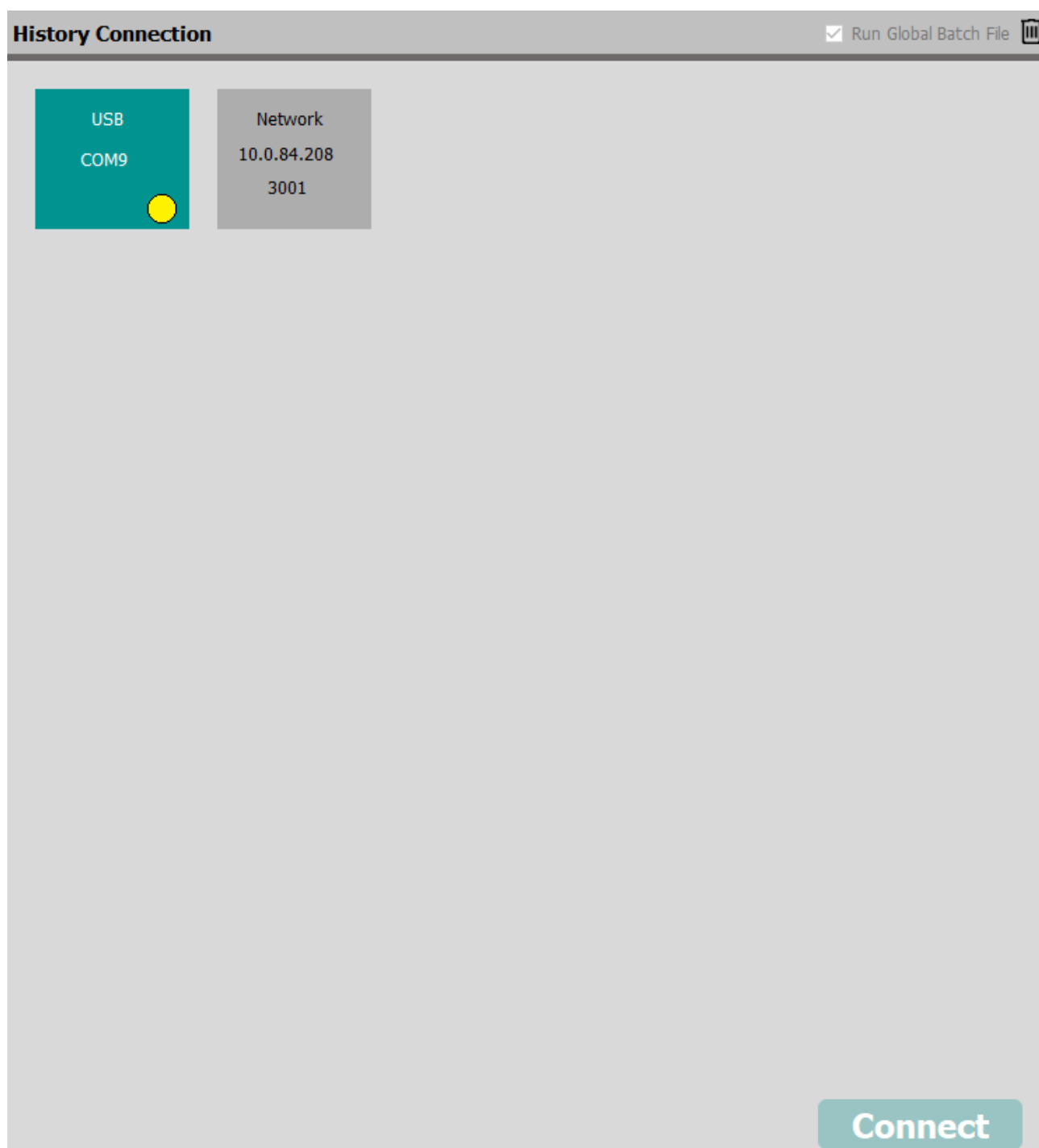
5. Click the **Connect** button.

NovAtel Connect closes the Network Connection dialog box and the Connection Manager window and starts a connection to the receiver. When the connection is complete, the main window displays.

4.5 History Connection Window

The *History Connection* window, on the right hand side of the *Connection Manager* window, displays tiles of connections that were previously opened.

The list of history connections are preserved within and across sessions of NovAtel Connect until the connection is deleted.



4.5.1 Tile Color Code

The tiles in the *History Connection* window are color coded to indicate the status of the connection.

- **Grey**
A previous connection.

- **Green**
A previous connection that NovAtel Connect knows is available.
- **Red**
A previous connection that NovAtel Connect knows is not available (USB only).
- **Yellow Dot**
Indicates an active connection.

4.5.2 Open a Connection

Connections in the *History Connection* window are made using the parameters set when the connection was last made.

1. Double click the connection tile.

NovAtel Connect closes the *Connection Manager* window and starts a connection to the receiver. When the connection is complete, the main window displays.

4.5.3 Open Multiple Connections

1. Move the cursor over the connection tile. A checkbox appears in the top left corner of the tile.
2. Click the connection tile to select the checkbox.
3. Repeat steps 1 and 2 for each connection in the *History Connection* window you want to open.
4. Click the **Connect** button.

NovAtel Connect closes the *Connection Manager* window and starts a connection to each of the selected receivers. When the connections are complete, a main window displays for each receiver connection.

4.5.4 Change the Connection Settings

The connection settings for a serial connection and some of the settings for a network connection can be changed on the *History Connection* window.

1. Move the cursor over the connection tile. A settings icon appears in the tile.

2. Click the settings icon () .

A pop up appears with the settings available to change.

3. Change the settings as necessary.


For a Network connection, the *Protocol* can be changed.

For a Serial connection, the *Baud Rate* can be changed and the *Passive* and *Hardware handshake* options can be enabled or disabled.

4. Click outside of the pop up to close it.

The new settings will be used the next time this connection is started from the *History Connection* window.


4.5.5 Delete a Connection

1. Move the cursor over the connection tile. A delete icon appears on the right side of the tile.
2. Click the Delete icon ().



Active connections, indicated with a yellow dot, cannot be deleted from the *History Connection* window.

4.5.6 Delete All Connections

1. Click the Delete icon () in the top right corner of the *History Connection* window. All non-active connections are deleted from the *History Connection* window.

4.6 Global Batch File

The Global Batch File option allows you to specify a file that contains a set of commands for common configurations. The contents of this file is sent to all connections when they are first established.

The Global Batch File controls are in the title bar of the *Connection Manager* window.

To select a Global Batch File:

1. Click the **Import** button.
The *Select File* dialog box opens.
2. Locate and select the batch file and then click the **Open** button.

The selected file name is displayed beside Global Batch File.



To use the Global Batch File, the **Run Global Batch File** checkbox must be selected. If the **Run Global Batch File** checkbox is cleared, the selected batch file is not run when the connection is opened.

To remove a batch file, click the red **X** next to the file name.



An imported file is not preserved when NovAtel Connect is closed.

4.6.1 Creating a Batch File

A batch file is a text file that contains a set of NovAtel receiver commands. When a connection to a receiver is made, NovAtel Connect will send all of the commands in the batch file to the receiver. The commands are sent sequentially in the order they appear in the batch file.

To create a batch file:

1. Create an empty file in any plain text editor.
2. Enter the commands in the order in which NovAtel Connect should send the files to the receiver.



For information about the NovAtel receivers commands, refer to the following.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal docs.novatel.com/OEM7.

For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

3. Save the file as a plain text file.

4.6.2 Batch File Examples

Batch files can contain any valid NovAtel command. The batch files below are examples only.

Example 1:

Example 1 shows a batch file for configuring a receiver as an RTCMv3 rover:

```
SERIALCONFIG com2 9600 n 8 1 n off
INTERFACEMODE com2 rtcmv3 none off
RTKSOURCE rtcmv3 any
LOG com1 versiona once
LOG com1 bestposb ontime 1
LOG com1 bestvelb ontime 1
LOG com1 rangeb ontime 1
LOG com1 rawephemb unchanged
LOG com1 glorawephemb unchanged
```

Example 2:

Example 2 shows a batch file that starts logging a set of logs recommended by NovAtel Customer Support for troubleshooting purposes.

```
LOG com1 rxstatusa once
LOG com1 rawephema unchanged
LOG com1 rangea ontime 1
LOG com1 bestposa ontime 1
LOG com1 rxconfiga once
LOG com1 versiona once
LOG com1 gloephemerisa unchanged
```

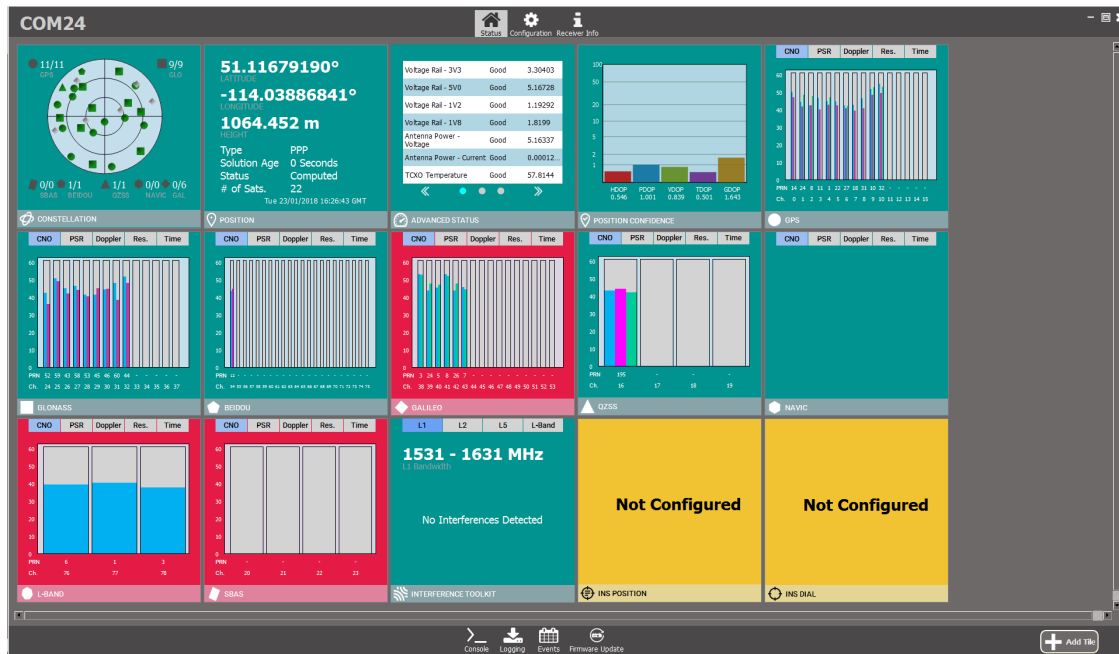
4.7 Connection Menu

The Connection menu provides the following options:

- **New**
Opens the *Connection Manager* window.
- **Open Playback**
Opens a new playback file. See *Playback Files* on page 61.
- **Close**
Closes the connection or playback file that is currently being viewed on the main window.
- **Close All**
Closes all open connections and playback files.

Chapter 5 Connection Window Overview

After opening a connection from the *Connection Manager* window, a Connection window opens. The Connection window displays several tiles that provide information about the connected receiver or playback file. If multiple connections are opened, there is a Connection window for each established connection.



Within the Connection window are a variety of tiles. These tiles provide information about the connected receiver or information stored in the playback file. The number and type of tiles shown depends on the receiver model.

Hover over any of the tiles to show the display options for the tile.



Changes the tile to a small tile.



Changes the tile to a medium sized tile.



Changes the tile to a full size tile.



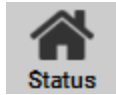
Opens the window associated with the tile



Removes the tile from Connection window. To display the tile again, click the **Add Tile** button at the bottom right of the Connection window and select the tile name from the menu.

5.1 Status and Configuration Buttons

The Status and Configuration buttons are at the top of the Connection window. Use the Status and Configuration buttons to select the type of tiles shown on the Connection window.



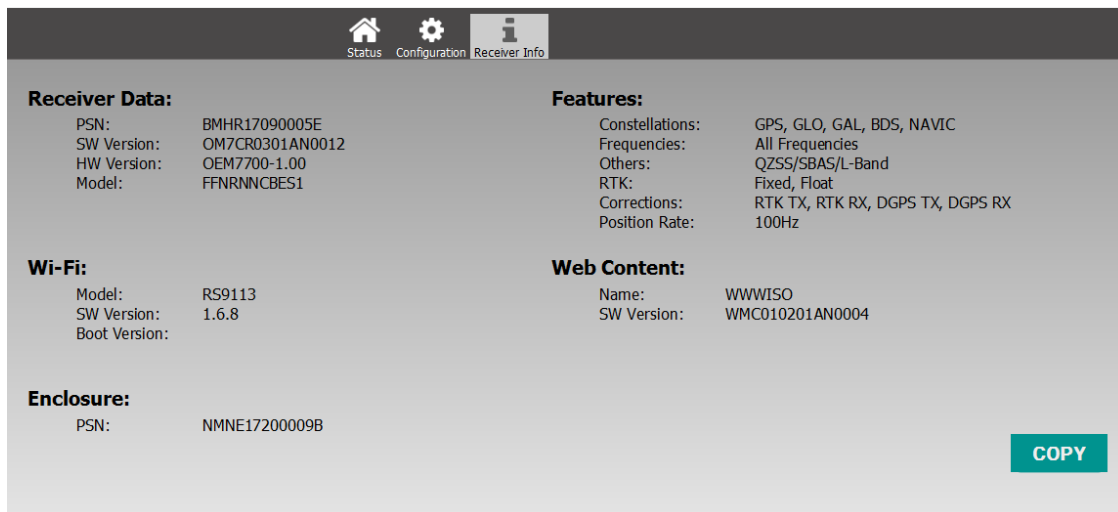
When the **Status** button is selected, the Connection window shows the Status tiles for the connection. For information about Status tiles, refer to "Status Tiles" on page 26.



When the **Configuration** button is selected, the Connection window shows the Configuration tiles for the connection. For information about Configuration tiles, refer to "Configuration Tiles" on page 63.

5.2 Display Receiver Data

Click the **Receiver Info** button to display information about the receiver such as version numbers and features enabled.



Click the **COPY** button to copy a VERSION log for this receiver into your computer's clipboard. This log can then be pasted into any text editor. The VERSION log contains additional version information about the receiver.

Click the **Receiver Info** button again to hide the receiver information.

5.3 Minimize, Restore Down and Close Buttons

The top right of Connection window has the following buttons.

- Minimize (☐)
Click this button to minimize the current Connection window. To view this Connection window again, click the connection in *Connections* bar at the bottom of the main window.
- Maximize (☐)
Click this button to maximize the Connection window. Click this button again to return to the original Connection window size.
- Close (✕)
Click this button to close the Connection window.

5.4 Connections Bar

The *Connections* bar, at the bottom of the main window, shows the connections and play-back files open in NovAtel Connect. Each connection or playback file is represented as a button on the *Connections* bar.



The buttons in the *Connections* bar are color coded to indicate the status of the connection.

- **Blue**
Blue indicates the active connection.
- **White**
Indicates an open connection, but not the active connection.
- **Red**
Indicates a failed or lost connection.

The connection or playback file open in the Connection window is highlighted in blue. To view a different connection or playback file, click the button for the connection or playback file to view.

5.5 View Menu

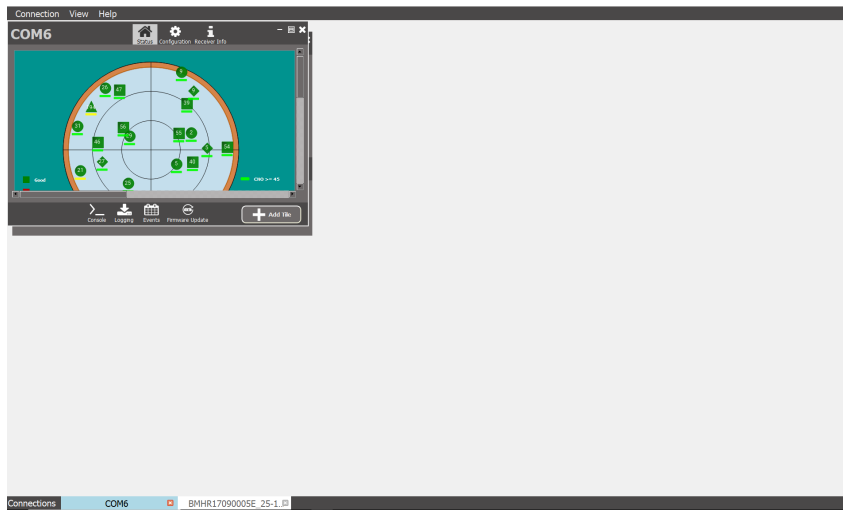
When multiple connections are open, the **View** menu is used to organize the open Connection windows. Click the **View** menu and select one of the following options.

- **Side by Side**
The open Connection windows are resized and arranged so that all connections are visible.



- **Cascade**

The open Connection windows are stacked with the active Connection window on top.

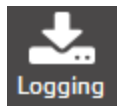


5.6 Tools Buttons

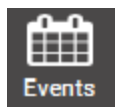
At the bottom of the Connection window are the Tools buttons. The Tools buttons provide access to additional features and information available in NovAtel Connect.



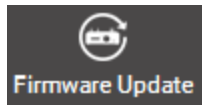
Opens the *Console* window for viewing logs and issuing commands. For information about using the *Console* window, refer to "Console Window" on page 83.



Opens the *Logging Control* window for recording logs. For information about using the *Logging Control* window, refer to "Logging Control Window" on page 86.

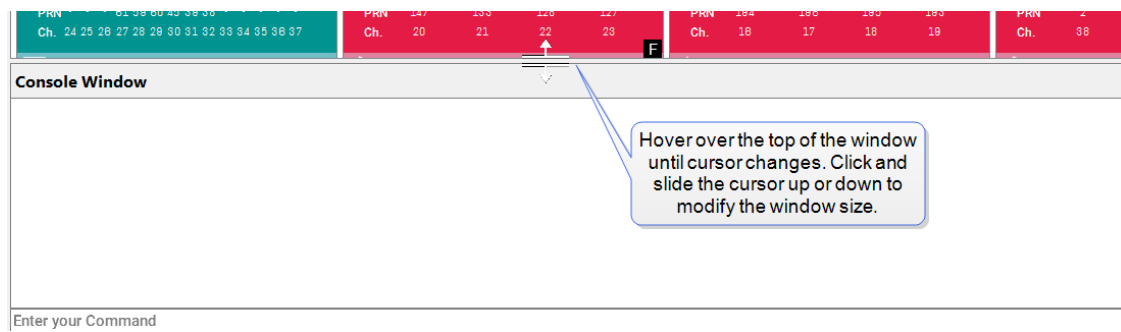


Opens the *Event History* window to display and track events. For information about the *Event History* window, refer to "Event History Window" on page 90.



Opens the *Update* window to update the firmware on the receiver. For information about using the *Update* window, refer to "Firmware Update" on page 92.

Using the *Console* window as an example, click the **Console** button. The *Console* window opens and appears over the Status tiles. Use the slider at the top of the *Console* window (hover until cursor changes) to slide the *Console* window up or down and change the window size.



Chapter 6 Status Tiles

The Status tiles display information about the open connection or playback file. Each type of Status tile provides a different selection of information. The following topics provide detailed information about the available Status tiles.

6.1 Constellation Tile

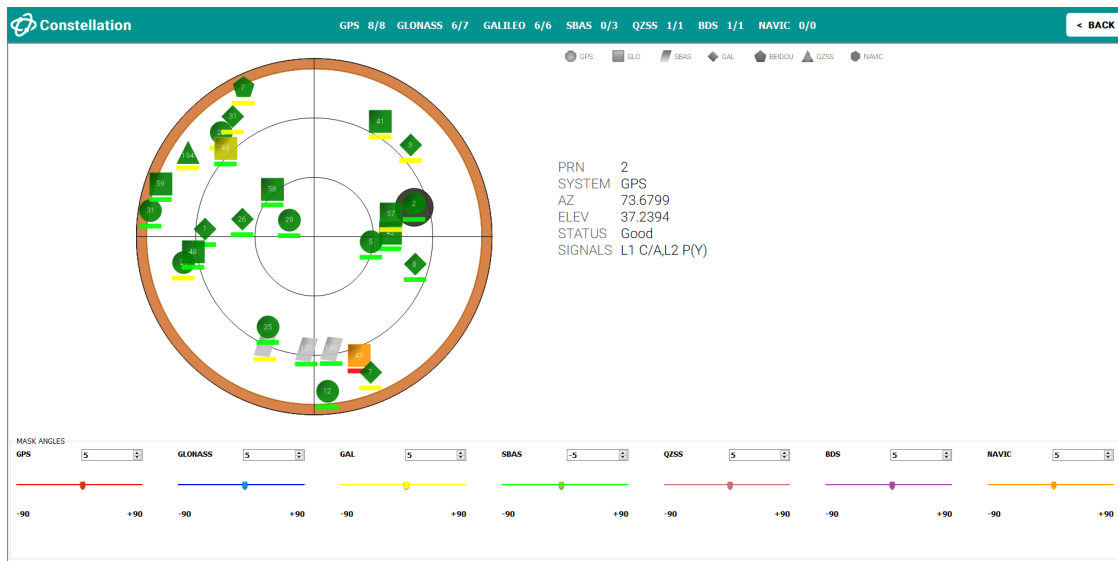
The *Constellation* tile displays each satellite the receiver is tracking. Concentric circles from 0° to 90° represent elevations from the horizon to directly overhead. The azimuth is mapped on a compass relative to true North.



Click  to open the *Constellation* full size tile.



Double click the *Constellation* tile or click  to open the *Constellation* window.



The satellites being tracked are represented with the following icons according to their satellite system:



The color of the icon indicates the status of satellite. For more details on the color code for the satellite channel, see "Satellite Color Codes" on the next page. In addition, the signal strength appears as a color-coded bar below the satellite icon on the *Constellation* window and full size tile.

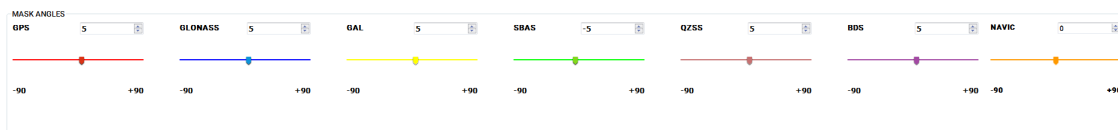
The PRN of the satellite tracked appears on the Satellite icon on the *Constellation* window and full size tile.

The PRN, System, Azimuth (AZ), Elevation (ELEV), Status and the Signals being tracked can also be view on the *Constellation* window and full size tile. To view this information on the *Constellation* window, click on the Satellite icon. To view this information on the *Constellation* full size tile, hover the mouse pointer over the Satellite icon.

6.1.1 Mask Angle Details

The mask angles are shown as colored rings on the *Constellation* window and full size tile. Satellites below the mask angle are not tracked.

Details about the elevation mask angles are shown at the bottom of the *Constellation* window.















The elevation mask angles can be adjusted for the various satellite systems by either adjusting the colored slider associated with the satellite system, clicking the up and down arrows beside the cutoff angle indicator or entering a mask angle value in the input box.

On the *Constellation* full size tile, the mask angles can be viewed and adjusted from the drop menus at the bottom of the tile. To view a mask angle, click the **Constellation** drop menu and select the constellation. The elevation mask angles can be adjusted by either clicking the up and down arrows beside the cutoff angle indicator or entering a mask angle value in the input box.

6.1.2 Satellite Color Codes

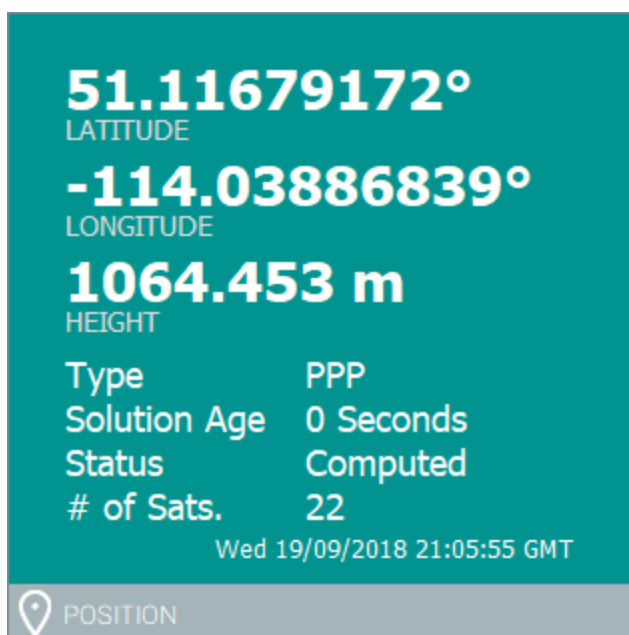
The status of the channels being used and the satellites being tracked is shown by color-coding in the Constellation window.

Name	Color Code	Description
Dark Gray		The channel is idle.
Black		The channel is searching for a satellite or there is an unknown error.
Magenta		The channel is in wide frequency band pull-in state.
Red		The channel is in frequency lock loop or narrow frequency band pull-in state or the channel is locked to a satellite but the ephemeris data indicates the satellite is unhealthy.
Blue		The channel is in alignment mode or the channel is locked to a satellite but the ephemeris data is old (not updated within the last 3 hours) or the channel is locked to a satellite but ephemeris data for the satellite has not yet been received.
Dark Green		The channel is locked to a satellite and the observations are good.
Light Green		The channel is attempting to re-acquire the satellite.
Green Yellow		The channel is attempting a fast re-aquisition or steering or the channel is locked to a satellite but no compatible ionospheric or differential correction is available for the satellite.
Yellow		The channel is locked to a satellite but there was an anomaly during computation of the satellite's position.
Cyan		The channel is locked to a satellite but an error has occurred. Possible errors include a satellite coordinate error, an elevation error due to the satellite being below the cut off angle, large misclosure due to an excessive gap between the estimated and actual positions or an invalid IODE (Issue of Data Ephemeris).

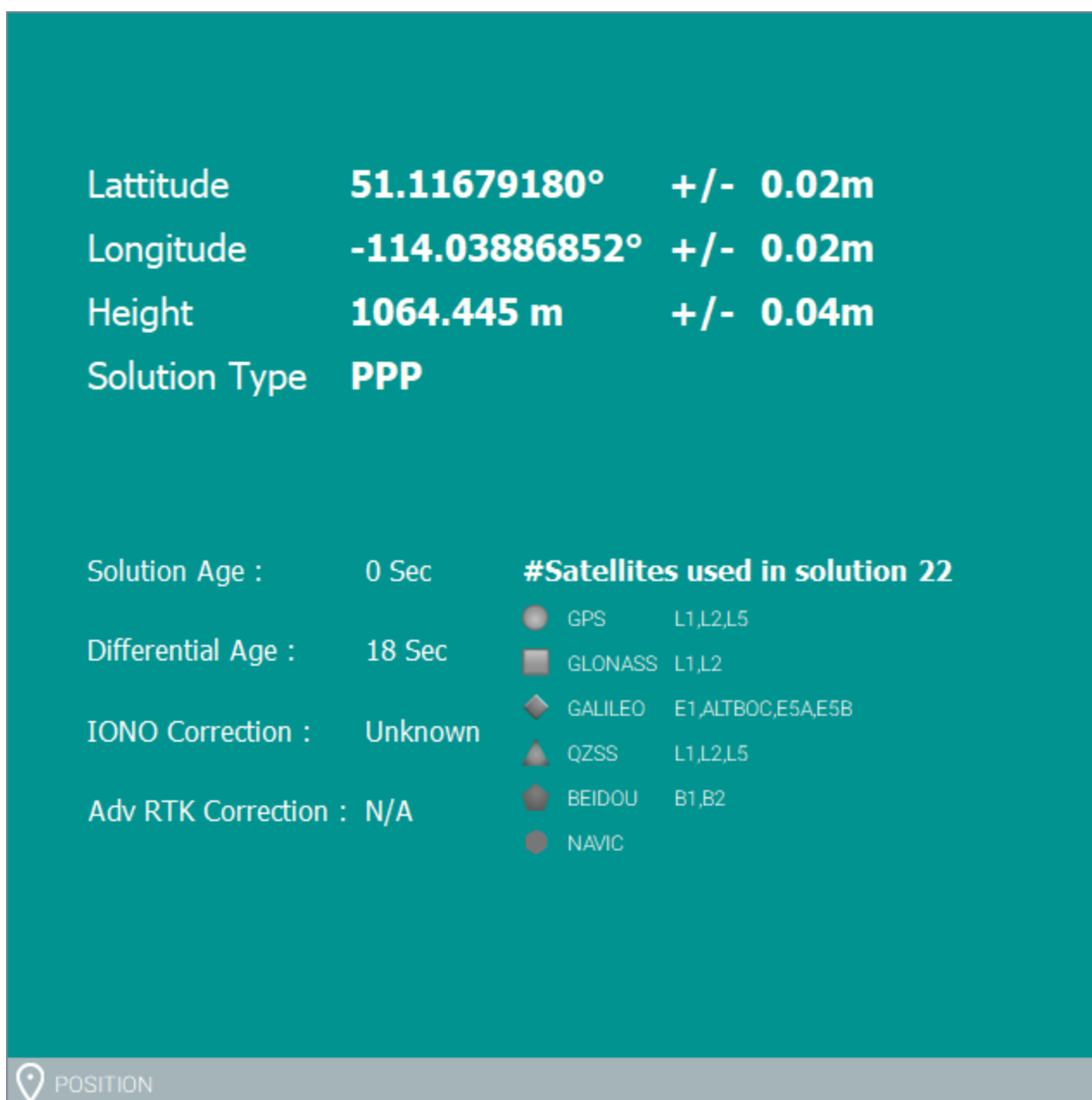
Light Gray		The channel is locked to a satellite but the satellite has been locked out by the user.
Orange		The channel is locked to a satellite but there is no observation.

6.2 Position Tile

The *Position* tile displays position and time information.



Click  to open the *Position* full size tile.



Double click the *Position* tile or click  to open the *Position* window.

Position

Solution : Computed

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Latitude 51.11679163° +/- 0.02m
Longitude -114.03886850° +/- 0.02m
Height 1064.456 m +/- 0.04m

Solution Type : PPP

IONO Correction : Unknown
Adv RTK Correction : N/A

Solution Age : 0 Sec
Differential Age : 16 Sec

of Satellites Used in Solution 22

Time
Wed 19/09/2018 21:11:58 GMT
Wed 19/09/2018 15:11:58 Local

GPS L1 L2 L5
GLONASS L1 L2 L3
GALILEO E1 E5A E5B E6B E6C
QZSS L1 L2 L5
BEIDOU B1 B2 B3
NAVIC L5

6.2.1 Position Information

- Latitude, longitude and height and their estimated accuracy to one standard deviation (+/-)
- Position/Solution type and status
- Ionospheric Correction
- RTK Correction status
- Solution Age - age of computed solution
- Differential Age - age of differential corrections
- # of Satellites used in solution - total number of satellites used in computation of solution



For details about the information provided on this window, refer to the BESTPOS log in the documentation.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal docs.novatel.com/OEM7.

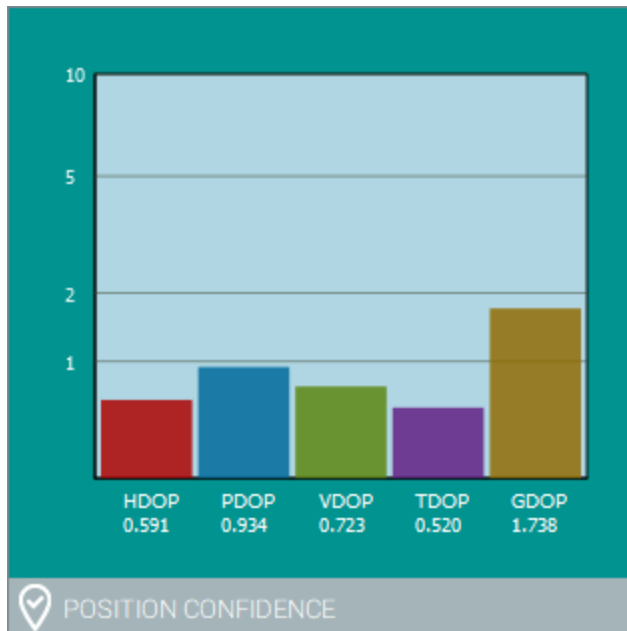
For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

6.3 Position Confidence Tile

The *Position Confidence* tile displays all DOP (Dilution of Precision) values in graphical and text format.

- HDOP: Horizontal DOP
- PDOP: Position DOP

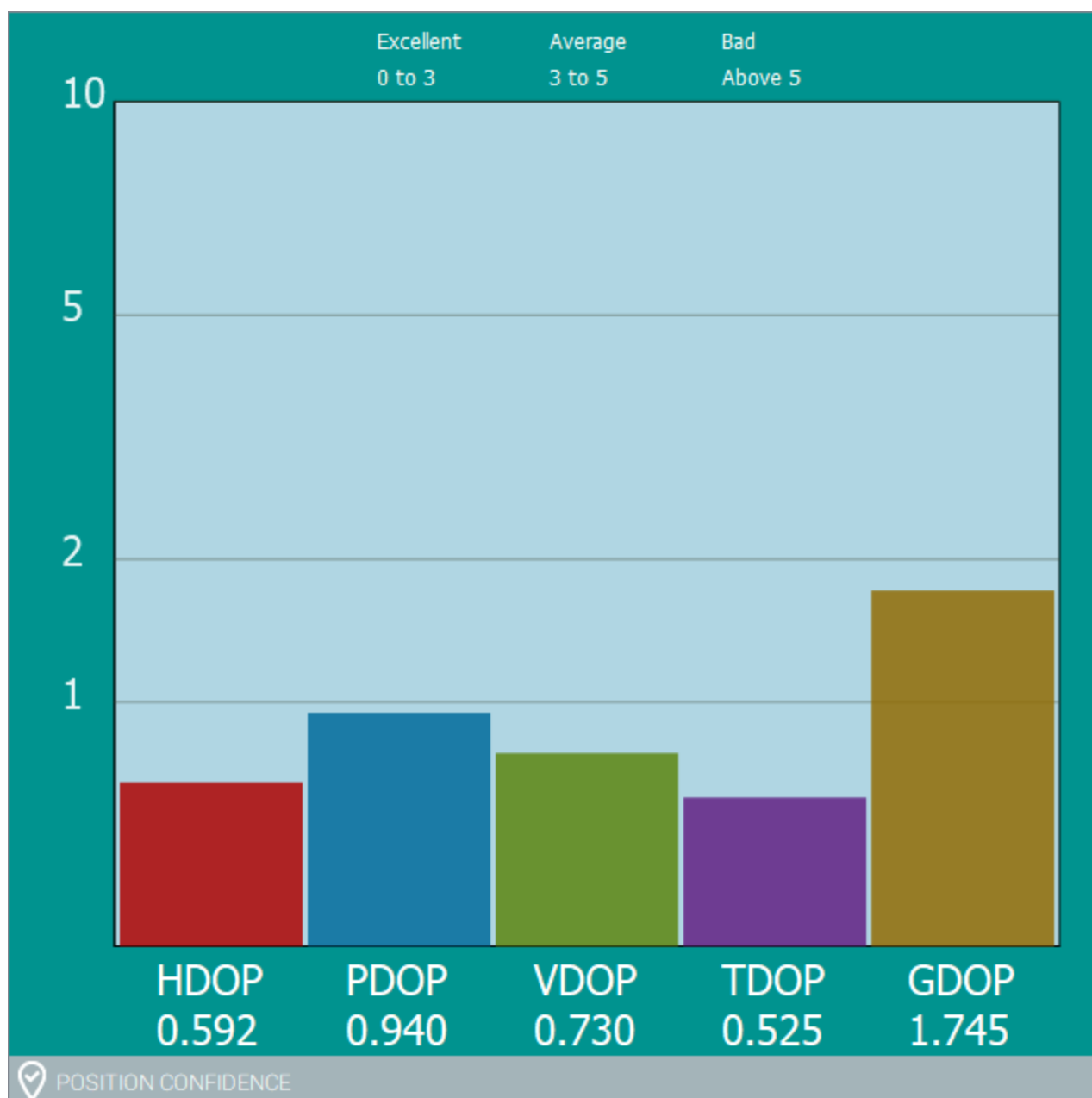
- VDOP: Vertical DOP
- TDOP: Time DOP
- GDOP: Geometric DOP




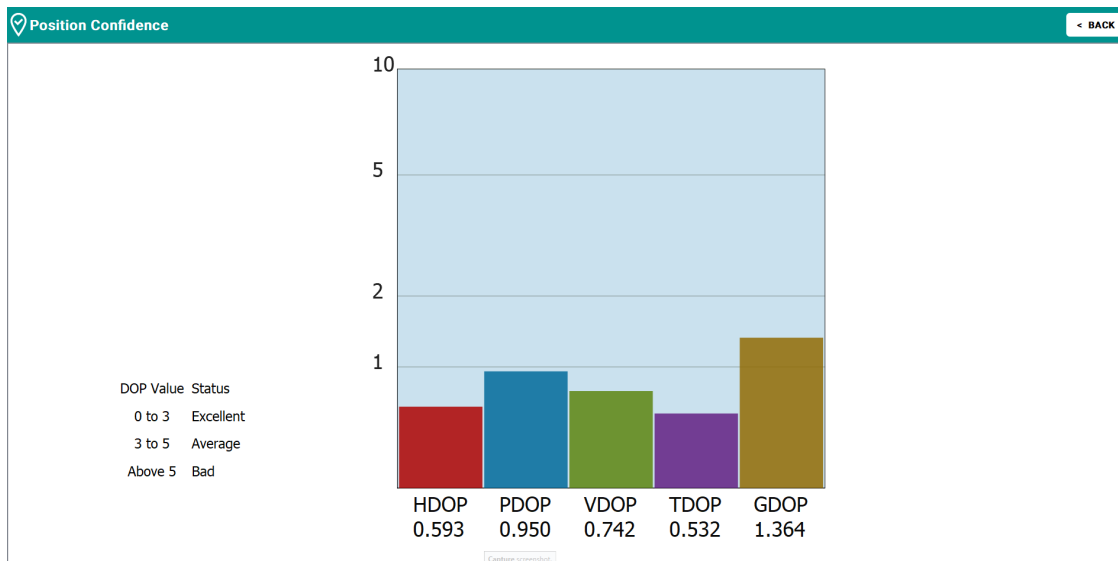
The color of the *Position Confidence* tile indicates the status of PDOP.

- Green: if PDOP ≤ 3
- Yellow: if PDOP > 3 to ≤ 5
- Red: if PDOP > 5

Click  to open the *Position Confidence* full tile.



Double click the *Position Confidence* tile or click  to open the *Position Confidence* window.



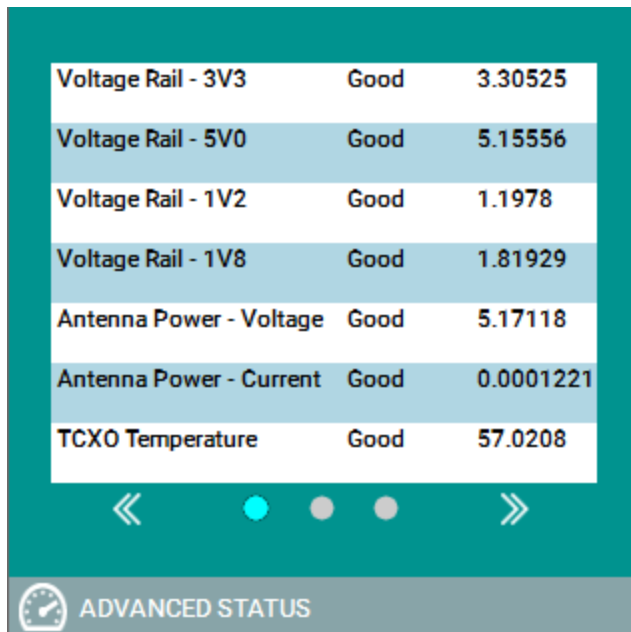
For details about the information provided on this window, refer to the PSRDOP log in the documentation.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal docs.novatel.com/OEM7.

For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

6.4 Advanced Status Tile

The *Advanced Status* tile displays the status and value for various receiver parameters. This data is updated in real time. There are more parameters available than can be shown on a single tile. Click on « or » to cycle through the various parameters being monitored.



Voltage Rail - 3V3	Good	3.30525
Voltage Rail - 5V0	Good	5.15556
Voltage Rail - 1V2	Good	1.1978
Voltage Rail - 1V8	Good	1.81929
Antenna Power - Voltage	Good	5.17118
Antenna Power - Current	Good	0.0001221
TCXO Temperature	Good	57.0208

Navigation icons: << (left arrow), ● (red dot), ● (grey dot), >> (right arrow)

ADVANCED STATUS


Any parameter with a warning status is highlighted in red.

Click  to open *Advanced Status* full size tile.


	PARAMETER	STATUS	VALUE
X	Voltage Rail - 3V3	Good	3.30281
X	Voltage Rail - 5V0	Good	5.15556
X	Voltage Rail - 1V2	Good	1.19109
X	Voltage Rail - 1V8	Good	1.83639
X	Antenna Power - Voltage	Good	5.16142
X	Antenna Power - Current	Good	0.0001221
X	TCXO Temperature	Good	58.3028
X	DDR Temperature	Good	58.4249
X	Tracking Satellites - GPS	Good	9
X	Tracking Satellites - GLO	Good	9
X	Tracking Satellites - GAL	Good	5
X	Tracking Satellites - BDS	Warning	0
X	Tracking Satellites - NAVIC	Warning	0
X	Tracking Satellites - SBAS	Warning	0
X	Tracking Satellites - LBAND	Good	3
X	Position Std.Dev	Good	0.02m 0.02m 0.03m
X	INS Std. Dev	Good	1.15m 1.04m 2.02m
X	Position Type	Good	PPP
X	RTK Differential Age	Good	9
X	Idle Time	Good	70

Good : 17/20 Warnings : 3/20

ADVANCED STATUS

Double click the *Advanced Status* tile or click  to open the *Adv Status* window.

Adv Status Good : 16/20 Warnings : 4/20 < BACK		
PARAMETER	STATUS	VALUE
X Voltage Ref - 3V3	Good	3.2967
X Voltage Ref - 5V0	Good	5.15556
X Voltage Ref - 1V2	Good	1.19231
X Voltage Ref - 1V8	Good	1.83944
X Antenna Power - Voltage	Good	5.17118
X Antenna Power - Current	Good	0.001321
X TDD Temperature	Good	58.3639
X DDR Temperature	Good	58.4249
X Tracking Satellites - GPS	Good	9
X Tracking Satellites - GLO	Good	9
X Tracking Satellites - GAL	Good	4
X Tracking Satellites - BDS	Warning	0
X Tracking Satellites - NAVIC	Warning	0
X Tracking Satellites - SBAS	Warning	0
X Tracking Satellites - LBRAND	Good	3
X Position Std.Dev	Good	0.02m 0.02m 0.03m
X INS Std.Dev	Good	1.22m 1.05m 2.07m
X Position Type	Good	PPP
X RTK Differential Age	Warning	14
X Idle Time	Good	71

 Add Parameter

The list of parameters shown on the *Advanced Status* tile and window can be changed.

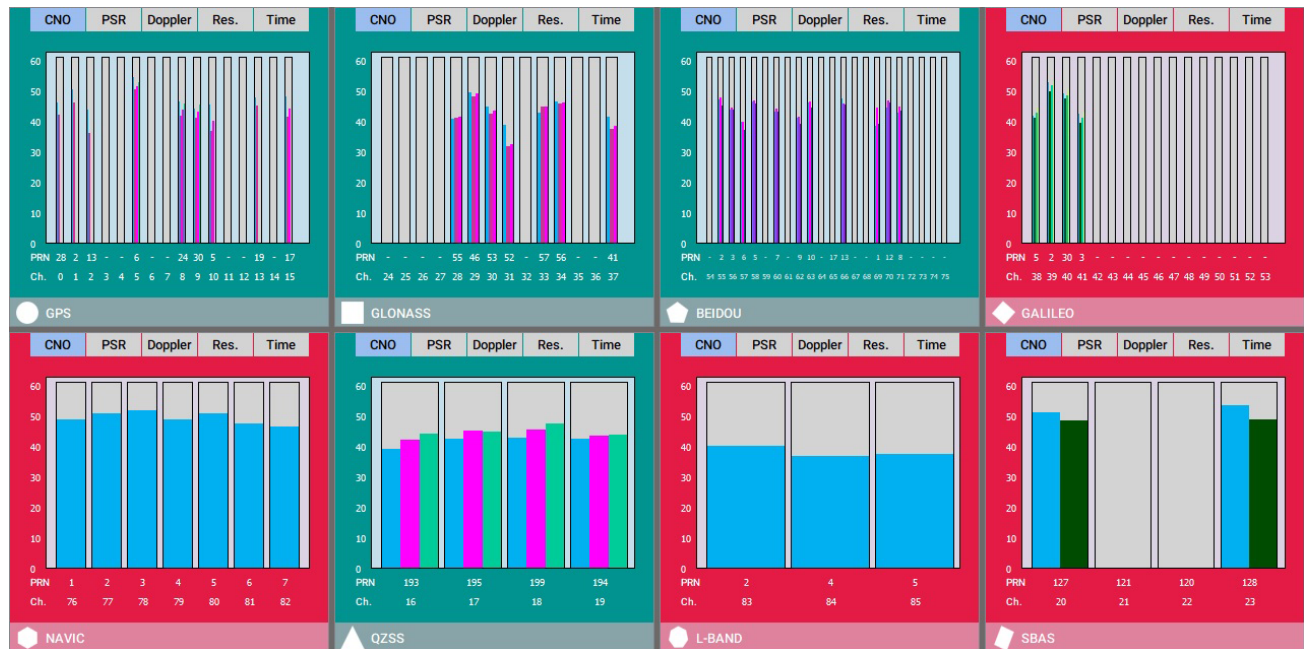
- To remove a parameter from the window, click the red **X** next to the parameter.
- To add a parameter to the window, click the **+ Add Parameter** button and select the parameter from the menu.
- The list of parameters can be sorted by selecting a parameter and dragging it into position.



A sorted list returns to the default order when the connection to the receiver is closed.

6.5 Signal Status Tiles

The Signal Status tiles display tracking information for the GNSS signals available to the receiver.




NovAtel Connect displays one Signal Status tile for each GNSS constellation that the receiver is capable of tracking. The GNSS constellations available vary based on the receiver model.

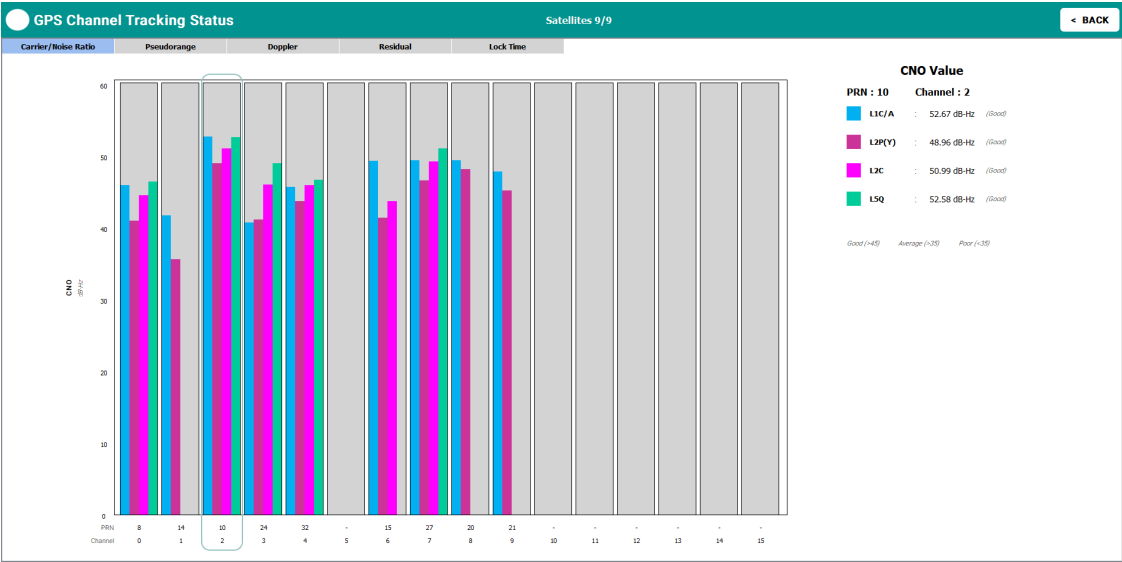
Tracking information about the signals is displayed on several tabs:

- Carrier/Noise Ratio (CNO)
- Pseudorange (PSR)
- Doppler
- Residual (Res.)
- Lock Time (Time)

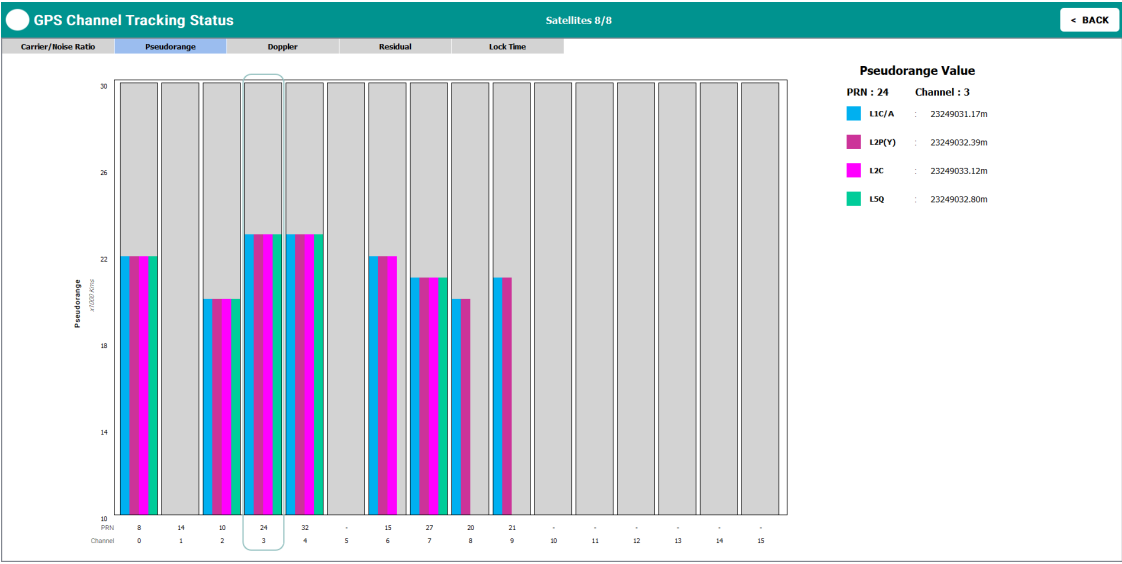
The color of the tile indicates if signals from that constellation are used in the solution:

- Green: When at least one tracked satellite is used in solution
- Red: When no tracked satellites are used in solution

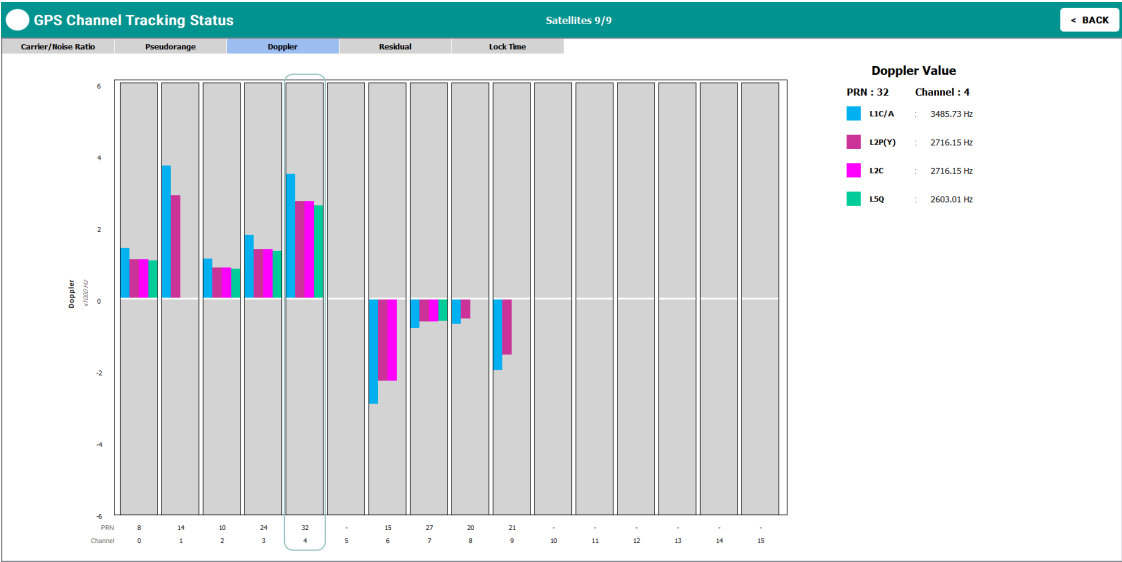
Double click a Signal Status tile, or click , to open the *Channel Tracking Status* window for a constellation.



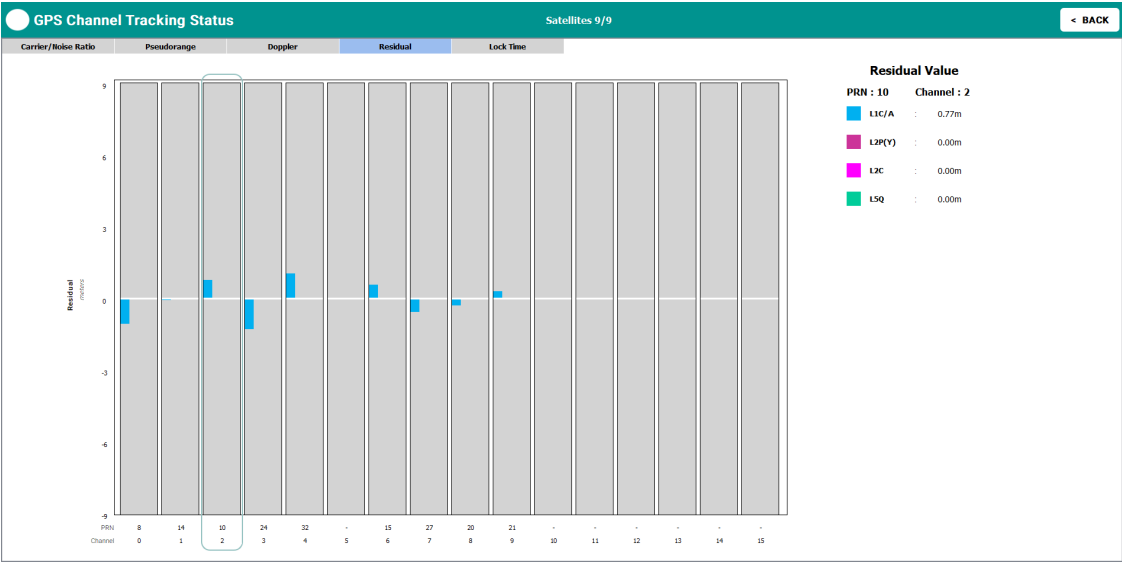
Carrier to noise density ratio (dB-Hz) values are displayed in this window. These values indicate the strength of the signal.



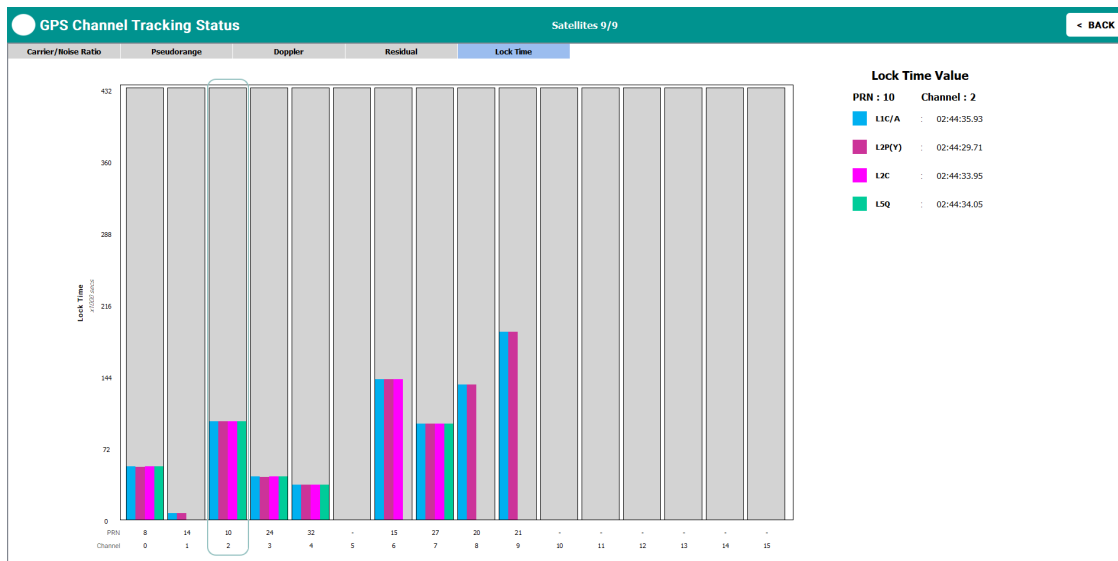
Pseudorange (km) values are displayed in this window. These values indicate the distance to the Satellite from the Antenna.



Doppler values are displayed in this window.



Pseudorange residual values are displayed in this window.



Lock Time values are displayed in this window. The lock time indicates the time the receiver has continuously tracked the signal.

6.5.1 Graph Details

- Each vertical bar represents a Satellite Vehicle (SV) Channel. Each of them has unique number which is displayed beside the heading *Channel*
- A channel may or may not be tracking a Satellite at any given moment
- The PRN of a tracked satellite is displayed beside the heading *PRN*
- Each channel may have single or multiple sub-channels corresponding to multiple frequencies



For details about the information provided on this window, refer to the TRACKSTAT log in the documentation.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal docs.novatel.com/OEM7.

For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

6.6 Interference Toolkit

The Interference Toolkit (ITK) monitors, quantifies and mitigates interference sources to prevent interference from impacting receiver performance.

Use the Interference Toolkit to monitor the Radio Frequency (RF) spectrum in a range of frequencies around the GNSS signals that are being received by the OEM7 receiver. By plotting the information obtained, it can be determined if there is an interference signal within the GNSS signal band.

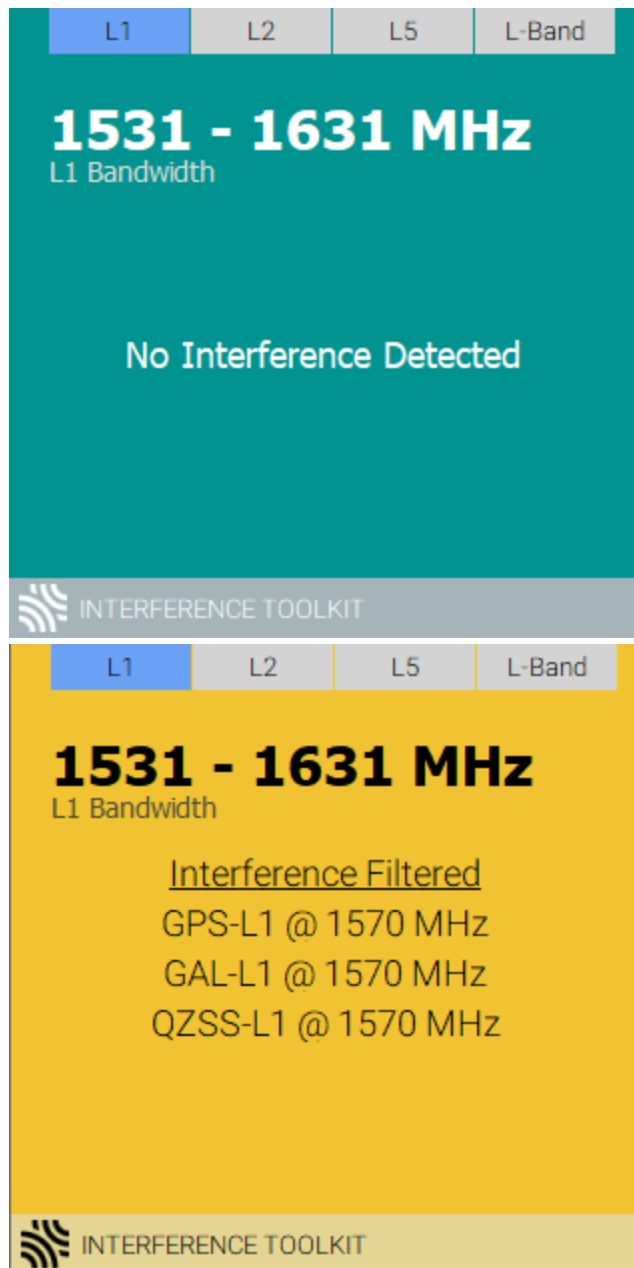


Auto-detect functionality applies to in-band interference only. It does not detect out-of-band interference.

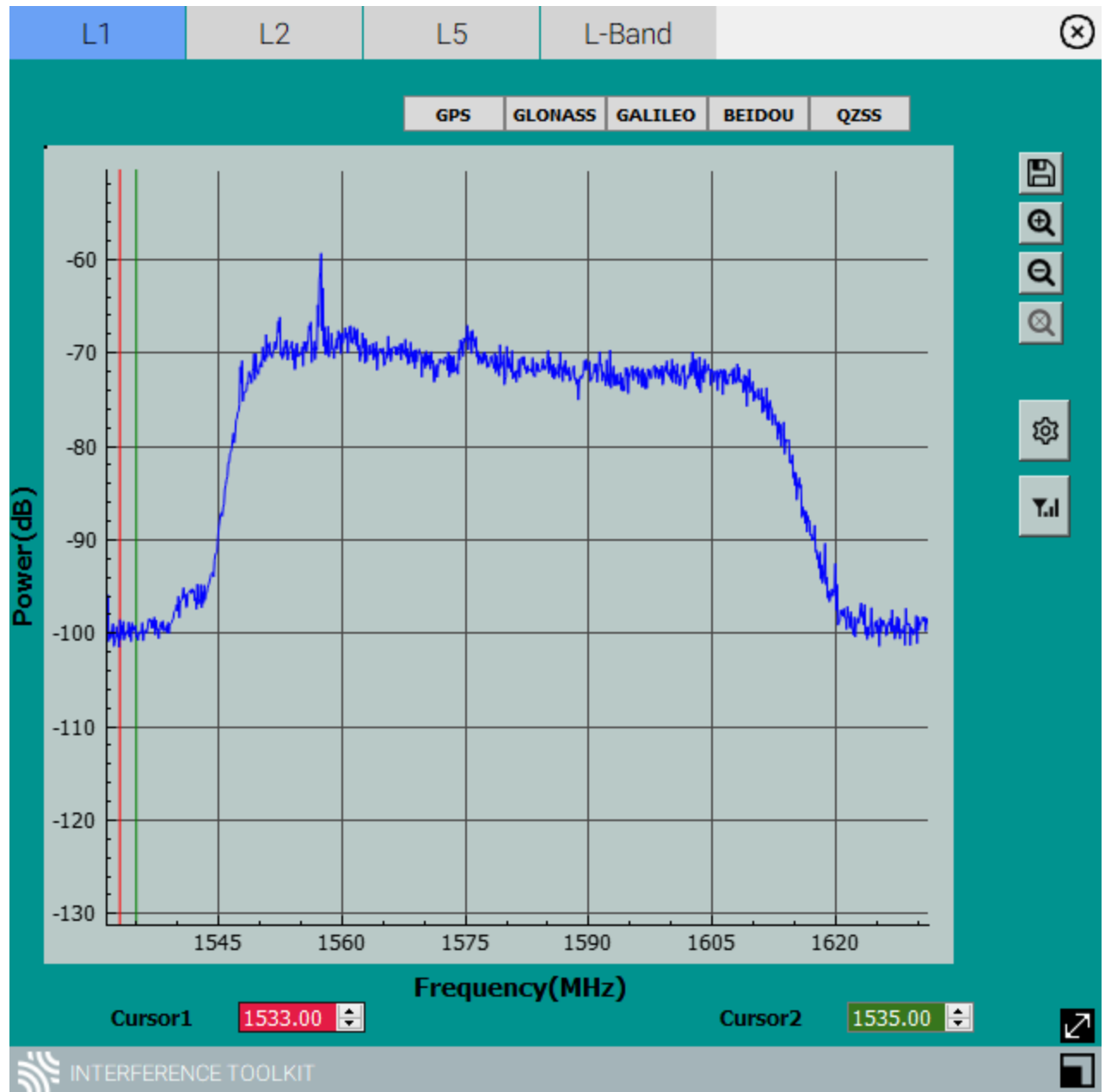
On the *Interference Toolkit* tile, click on a frequency band tab to view the interference status of the different signals.


The tile displays:

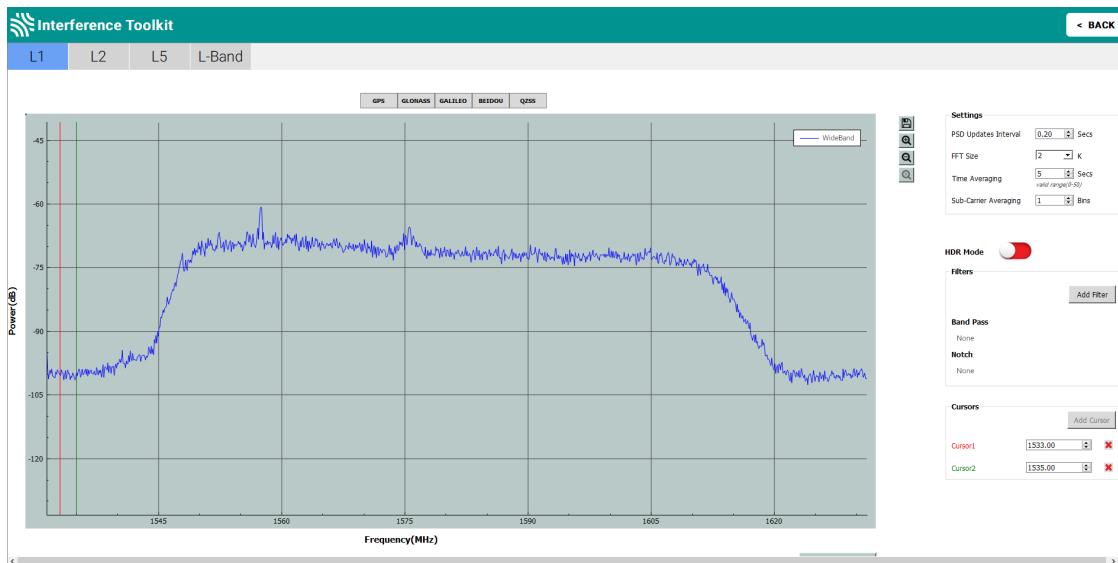
- Green: When there is no interference for the selected GNSS frequency band
- Red: If any one signal frequency has interference
- Yellow: If interference has been filtered



Click  to open the *Interference Toolkit* full size tile.



Double click the tile, or click , to open the *Interference Toolkit* window.

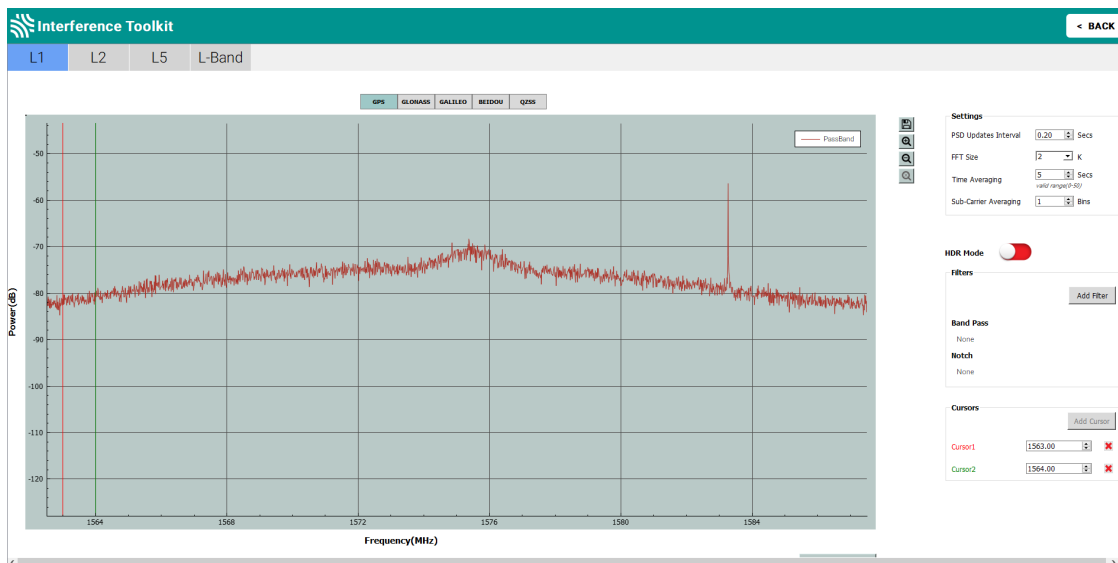


The *Interference Toolkit* window and full size tile are synchronized. Changes to settings and signals viewed on the window are also made on the full size tile and vice versa.

6.6.1 Changing the Signals Displayed

When first opened, the Interference Toolkit displays the wide band plot for the L1 frequency band. To view other wide band plots, click one of the frequency band tabs (e.g. L2) at the top of the window.

To view the pass band for a constellation, click the button for that constellation (e.g. GPS). The button for the constellation is highlighted to indicate the pass band being viewed.

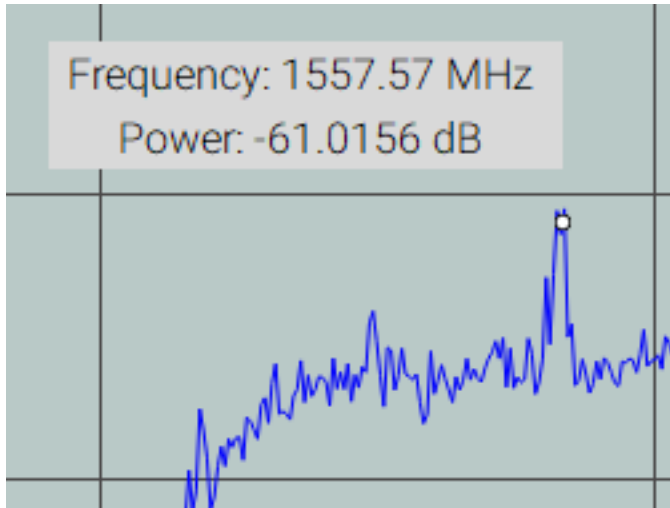


To return to the wide band plot, click the highlighted constellation button.

The available pass band and wide band plots are:

- L1 – GPS, GLONASS, Galileo, BeiDou, QZSS
- L2 – GPS, GLONASS, BeiDou, QZSS
- L5 – GPS, Galileo, QZSS
- L-Band – LBAND

Hover over any point on a signal to display the frequency and power for that specific location in the signal.



6.6.2 Zoom In and Out

Use the buttons on the right side of the signal plot to zoom the display in and out.



Click to zoom in on the signal plot.




Click to zoom out.




Click to return to the default zoom level.

To zoom in on a specific portion of the signal plot, click and drag to highlight a portion of the signal. When the mouse button is released, the zoom level changes to show the portion of the signal highlighted.

Click  to return to the default zoom level.

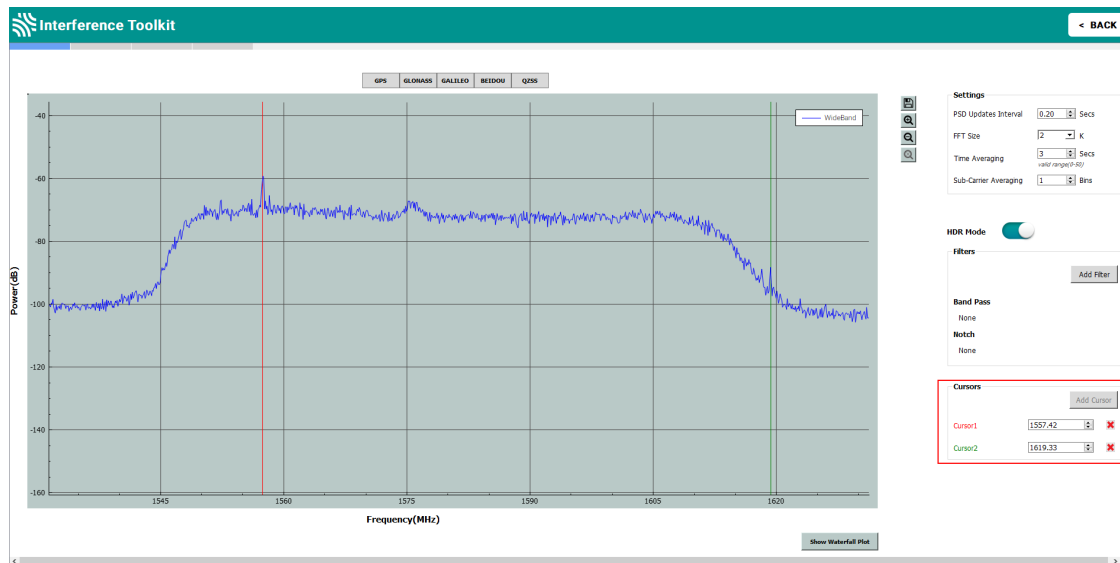
6.6.3 Saving a Signal Plot

To save a copy of the signal plot image currently being viewed, including zoom level, click the  button.

The saved signal plot can be viewed using any graphic viewing or editing software.

6.6.4 Display Cursors

The signal plot has two vertical cursors. One is green and the other is red. These cursors are used to identify the frequency of a location on the signal plot. The current location of the cursors are shown in the text boxes in **Cursors** box.



To identify the frequency of a location on the plot, move the cursor to the location. The frequency of the location, in MHz, is shown in the text box for that cursor. Move the cursor by clicking the cursor and dragging it to the location of interest or use the up and down next to the text box. If a value is entered into the text box, the cursor will move to that location.

The cursors can be removed from the display by clicking the red **X** next to the cursor text box. If a cursor has been removed, it can be added back by clicking the **Add Cursor** button.

6.6.5 Settings

The parameters in the Settings panel configure the spectral analysis used to generate the signal plot.

Settings

PSD Updates Interval Secs

FFT Size K

Time Averaging Secs
valid range(0-50)

Sub-Carrier Averaging Bins

- PSD Updates Interval** The spectrum update rate.
- FFT Size** The frequency resolution of the spectrum.
- Time Averaging** Time averaging window.
- Sub-Carrier Averaging** Sliding window average over a number of FFT samples.

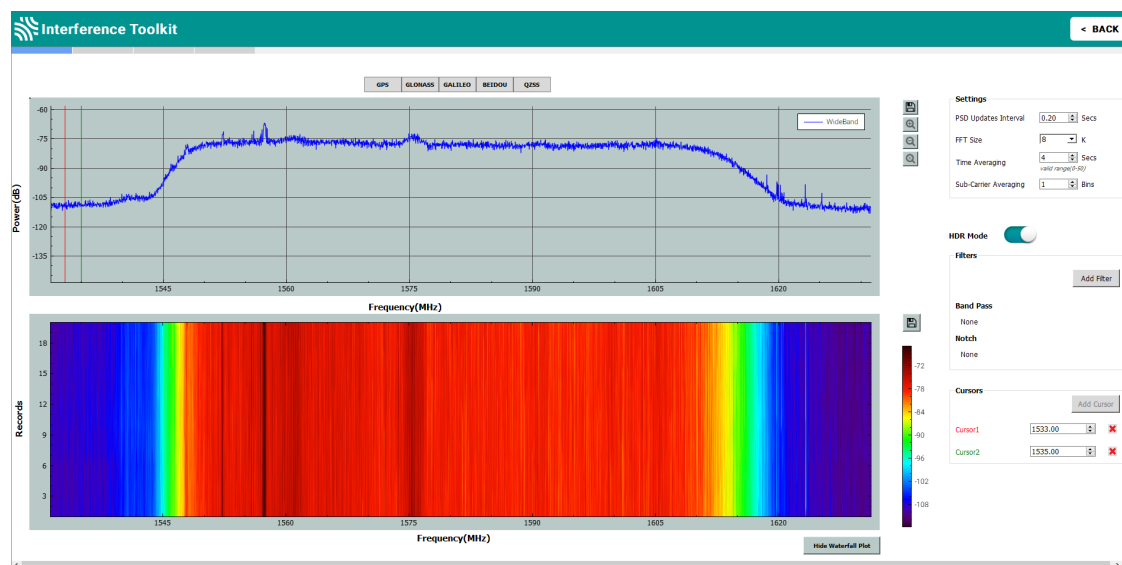
Refer to the [ITSPECTRALANALYSIS](#) command for more information about these parameters.



If the update rate settings of the plot are set too high, the receiver or Connect may become unresponsive.

6.6.6 Waterfall Plot

Click the **Show Waterfall Plot** button to display the waterfall plot for the current signal plot.



The waterfall plot shows a brief history of the signal plot. Hover the mouse pointer over any spot on the waterfall plot to display the frequency and power for that spot.

6.6.7 Remove Interference Signals

If an interference signal is present, the Interference Toolkit can reduce or eliminate the impact on GNSS tracking using the programmable High Dynamic Range (HDR), band pass filters or notch filters.



The feature to remove interference signals is model controlled. Contact www.novatel.com/where-to-buy/sales-offices to obtain full mitigation functionality.

High Dynamic Range (HDR) Mode

The High Dynamic Range (HDR) mode enables special signal processing to remove distortions from the spectrum, providing a cleaner signal. This optimizes the Automatic Gain Control (AGC) to prevent interfering signals from drowning out the GNSS signals. HDR mode works well against wide band and out-of-band interferers. HDR mode can be combined with bandpass and notch filters but does draw more power.

Simply slide the HDR slide right or left to adjust.

HDR Mode  HDR mode off

HDR Mode  HDR mode on

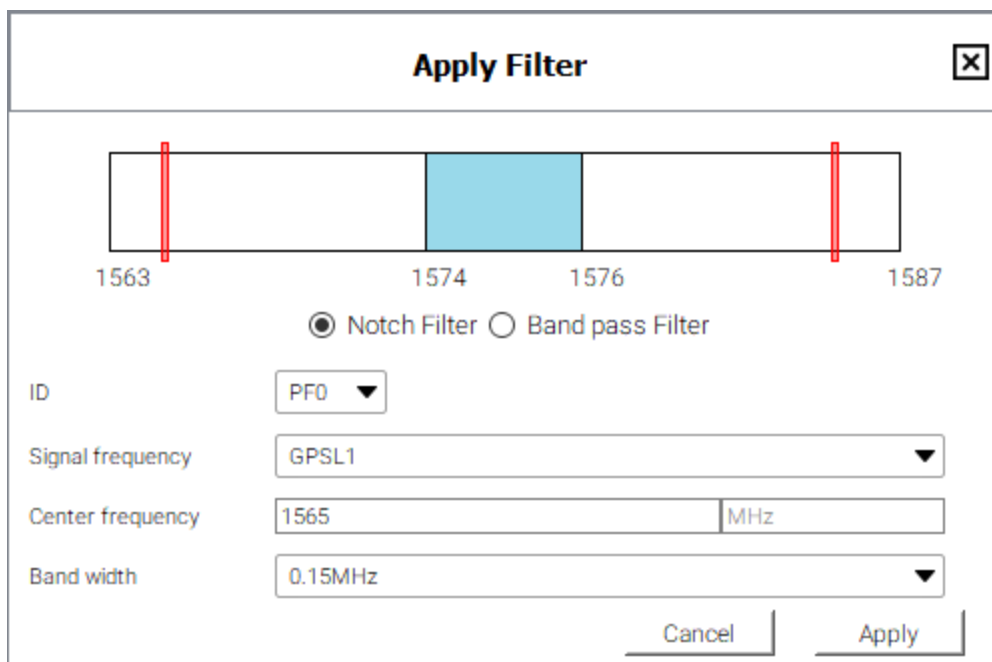
Band Pass Filter

The Interference Toolkit band pass filter reduces the signal power of all incoming signals at the upper and lower end of the GNSS signal band starting at the requested cut-off frequency. This type of filter is good for reducing single or multiple interference signals at the edges of the signal band.

When a band pass filter is applied to this signal, the upper and lower ends of the signal band are filtered out to reduce the signal power of the interference signal.

To configure a band pass filter:

1. Click the tab of the frequency band (L1, L2, L5 or L-Band) that requires a filter.
2. Click the **Add filter** button. The *Apply Filter* window appears.



Apply Filter ✕

1563 1574 1576 1587

☒ Notch Filter ☐ Band pass Filter

ID: PF0 ▼

Signal frequency: GPSL1 ▼

Center frequency: 1565 MHz

Band width: 0.15MHz ▼

Cancel Apply

3. Click the **Band pass Filter** option.

Apply Filter [X]

1563.75 1572.5 1577.5 1586.25

☐ Notch Filter ☒ Band pass Filter

ID PF0 ▼

Frequency GPSL1 ▼

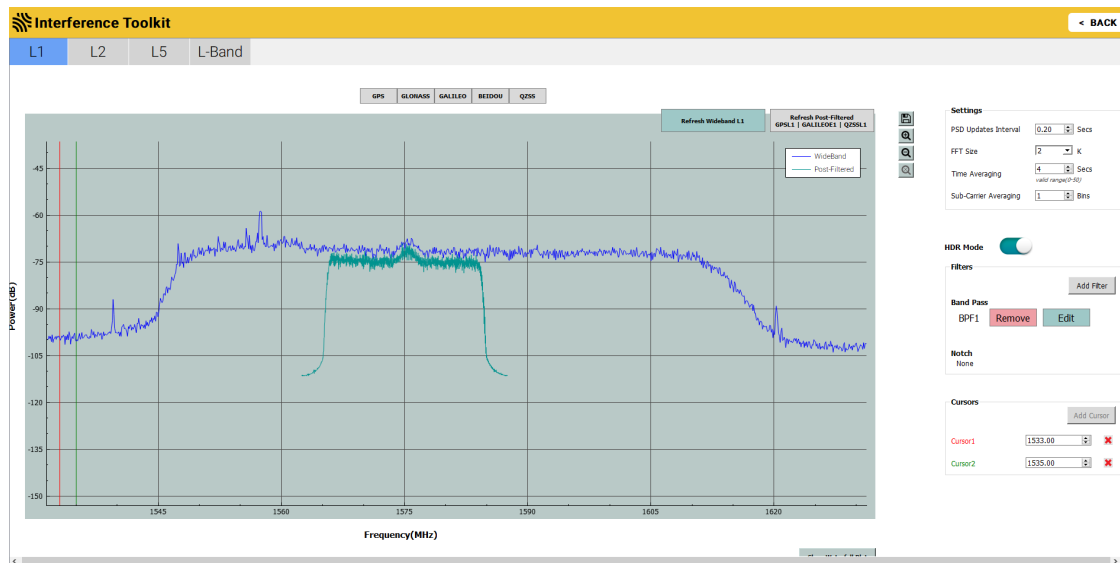
Cut-Off Frequency 1565 MHz

Cancel Apply

4. Click the **ID** drop menu and select an ID for this filter.
5. Click the **Frequency** drop menu and select the GNSS signal to which the filter will be applied.

The frequency bar at the top of the *Apply Filter* window changes to show the frequency range of the selected signal.

6. Enter the cut-off frequency for the filter in the *Cut-Off Frequency* text box.
 - The frequency selected must be in the range shown on the frequency bar. For the example shown above, the value must be between 1563.75 and 1586.25 MHz.
 - The selected frequency can not be within the central frequencies, represented by the blue bar. In this example, the frequency cannot be between 1572.5 and 1577.5 Mhz.
 - Two band pass filters are added which are equal distance from the center frequency. The configured filter is represented by red bars at the upper and lower end of the frequency band.
7. Click the **Apply** button. The *Interference Toolkit* window appears with the post filtered signal shown on top of signal plot.



The post filtered signal can also be viewed on the Passband signal plot by clicking the one of the constellation buttons. Note that when viewing the passband signal plot, the post filtered signal will only be shown if the filtered signal falls within the passband selected.

The Interference Toolkit updates either the post-filtered signal or the wideband/passband signal, not both. The two buttons at the top right of the signal plot represent the two signals being displayed. The button highlighted in blue is the signal currently being refreshed. To change the signal that is being refreshed, click the button for the signal.

Notch Filter

The Interference Toolkit notch filter reduces the signal power in a narrow frequency band. This type of filter is useful for reducing the signal power of a single, narrow band interference signal. Note that the narrowest possible filter should be used to maintain the maximum amount of overall signal power.

To configure a notch filter:

1. Click the tab of the frequency band (L1, L2, L5 or L-Band) that requires a filter.
2. Click the **Add filter** button. The *Apply Filter* window appears.

Apply Filter [X]

1563 1574 1576 1587

☒ Notch Filter ☐ Band pass Filter

ID PF0 ▼

Signal frequency GPSL1 ▼

Center frequency 1565 MHz

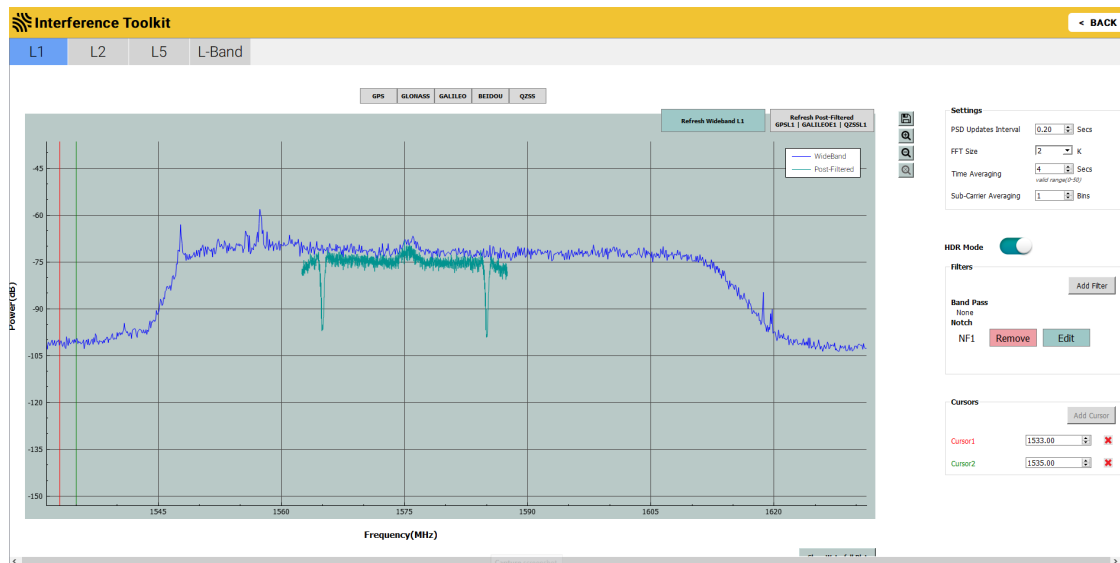
Band width 0.15MHz ▼

Cancel Apply

3. Click the **ID** drop menu and select an ID for this filter.
4. Click the **Signal frequency** drop menu and select the GNSS signal to which the filter will be applied.

The frequency bar at the top of the *Apply Filter* window changes to show the frequency range of the selected signal.

5. Enter the center frequency for the filter in the **Center Frequency** text box.
 - The frequency selected must be in the range shown on the frequency bar. For the example shown above, the value must be between 1563 and 1587 MHz.
 - The selected frequency can not be within the central frequencies, represented by the blue bar. In this example, the frequency cannot be between 1574 and 1576 Mhz.
 - The configured filter is represented by red bars at the upper and lower end of the frequency band.
6. Click the **Band width** drop menu and select the band width for the notch filter.
 - Select the narrowest band width that will remove the interference signal.
 - Two notch filters are added which are equal distance from the center frequency. The configured filter is represented by red bars on the frequency band.
7. Click the **Apply** button. The *Interference Toolkit* window appears with the post filtered signal shown on top of signal plot.

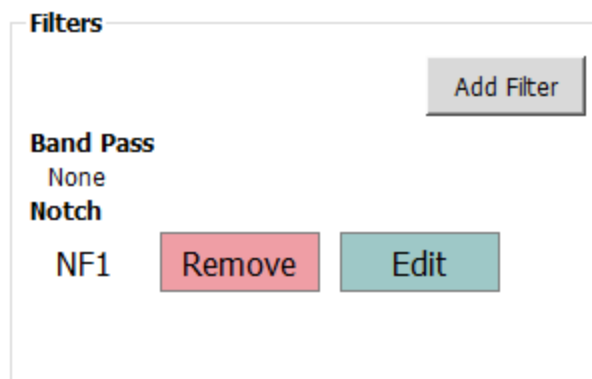


The post filtered signal can also be viewed on the Passband signal plot by clicking the one of the constellation buttons. Note that when viewing the passband signal plot, the post filtered signal will only be shown if the filtered signal falls within the passband selected.

The Interference Toolkit updates either the post-filtered signal or the wideband/passband signal, not both. The two buttons at the top right of the signal plot represent the two signals being displayed. The button highlighted in blue is the signal currently being refreshed. To change the signal that is being refreshed, click the button for the signal.

Edit a Filter

Configured filters are shown in the *Filters* panel.



To edit filter:

1. Click the **Edit** button beside the filter to edit. The *Apply Notch Filter* window appears.

Apply Notch Filter

Command Summary

ITPROGFILTCONFIG GPSL1 1565 0.15MHz

Apply Cancel

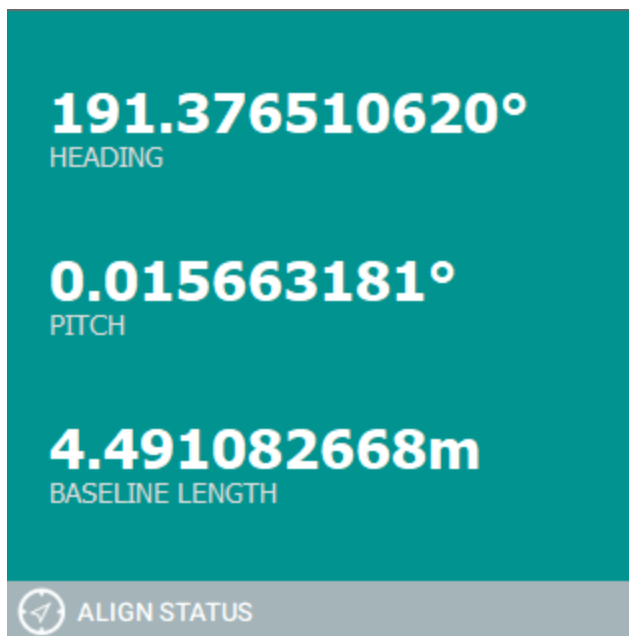
2. Change the filter parameters.
3. Click the **Apply** button.

Delete a Filter

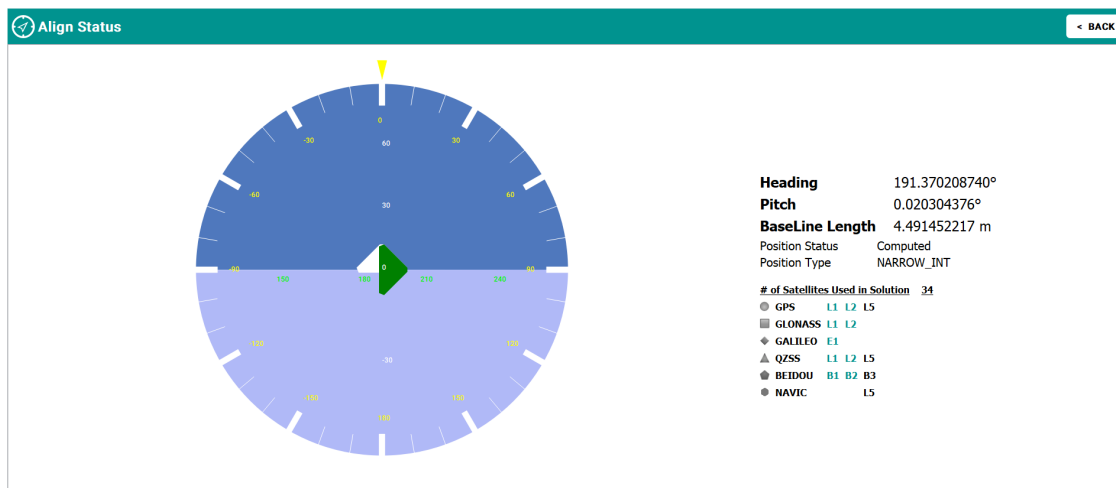
In the *Filters* panel, click the **Remove** button beside the filter to delete.

6.7 ALIGN Status Tile

The *ALIGN Status* tile displays the ALIGN heading and pitch information.



Double click the *ALIGN Status* tile or click  to open the *ALIGN Status* window.



6.7.1 *ALIGN Information*

The dial is a graphical display of the Heading and Pitch values. These values appear to the right of the dial.

Also to the right of the dial are the Position Status and Position Type.



For details about the information provided on this window, refer to the HEADING2 log in the documentation.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal [doc-s.novatel.com/OEM7](https://docs.novatel.com/OEM7).

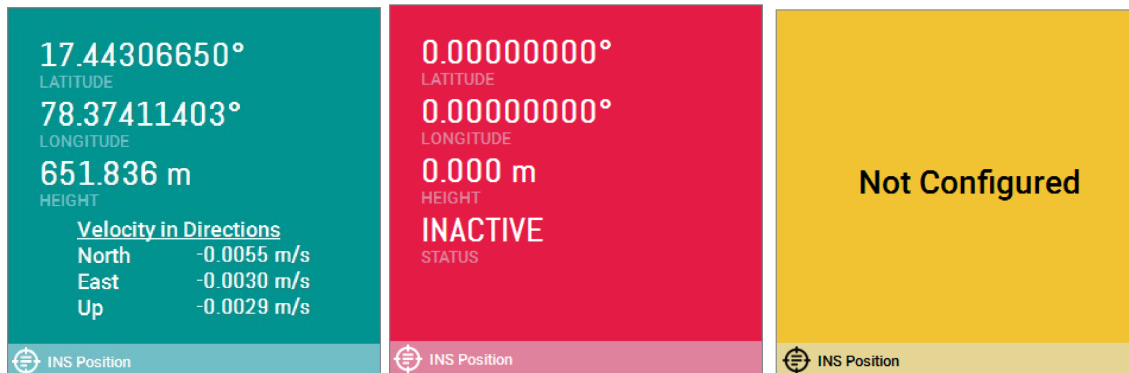
For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and



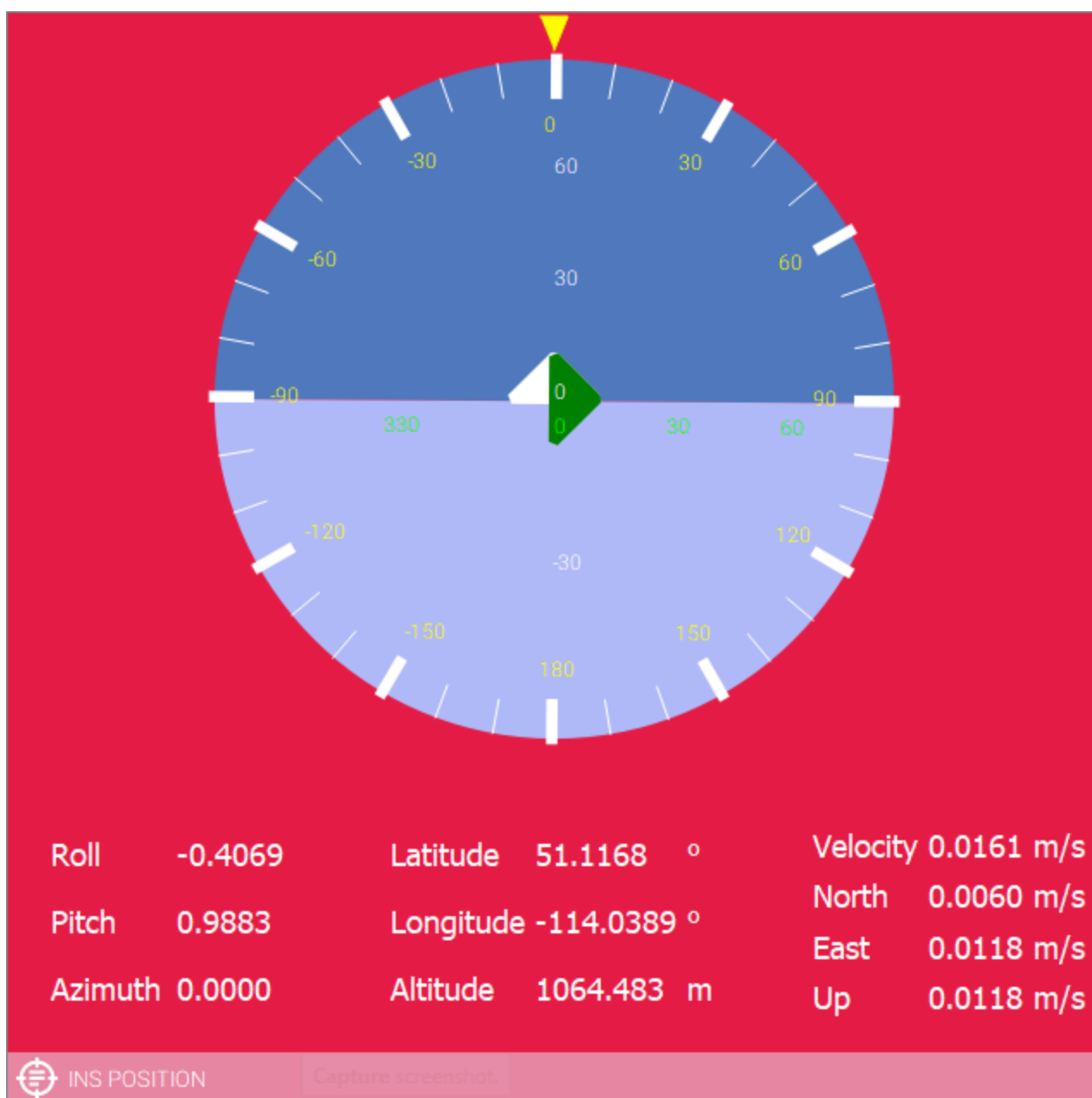
download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

6.8 INS Position Tile

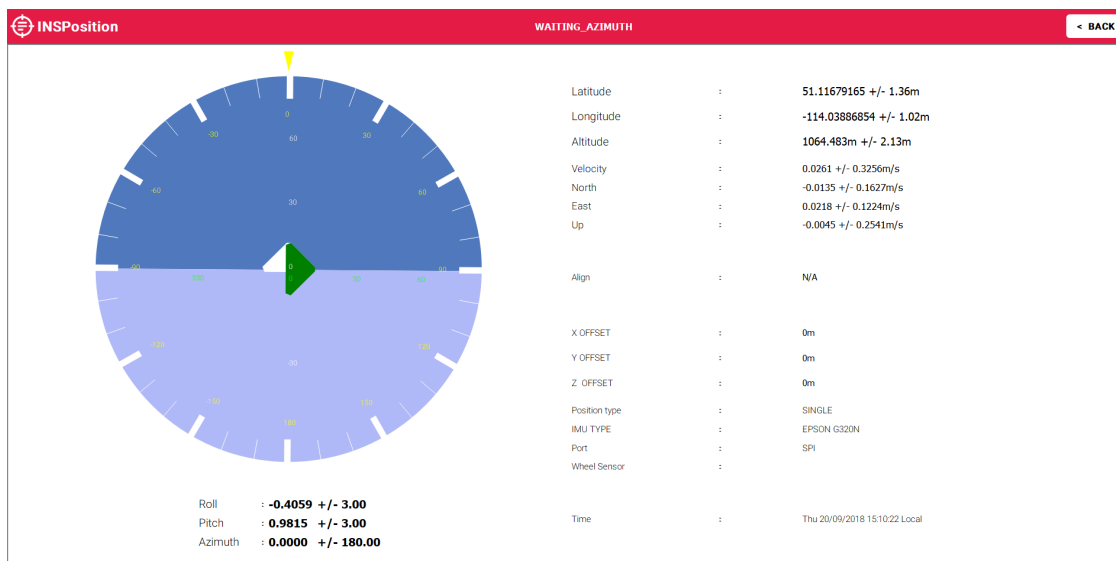
The *INS Position* tile displays green when INS Status is GOOD, red when INS Position is not available and yellow when not configured.



Click  to open the *INS Position* full size tile.



Double click the *INS Position* tile or click  to open the *INS Position* window.



The dial is a graphical display of the Roll, Pitch and Azimuth values indicated by an arrow on each axis. These values appear under the dial.

To the right side of the *INS Position* window is the position, velocity and IMU information.

The Position, Velocity and Attitude (roll, pitch and azimuth) sections display data from the [INSPVAX log](#) along with standard deviations calculated from the [INSPVAX log](#).

The X, Y and Z Offset fields are used to specify an offset from the IMU for the output position and velocity of the INS solution as specified by the [SETINSTRANSLOCATION command](#) or the SPAN Wizard.

The Position Type displays data from the [INSPVAX log](#).



For OEM7 receivers, search for specific commands in the NovAtel OEM7 Documentation portal from docs.novatel.com/OEM7.

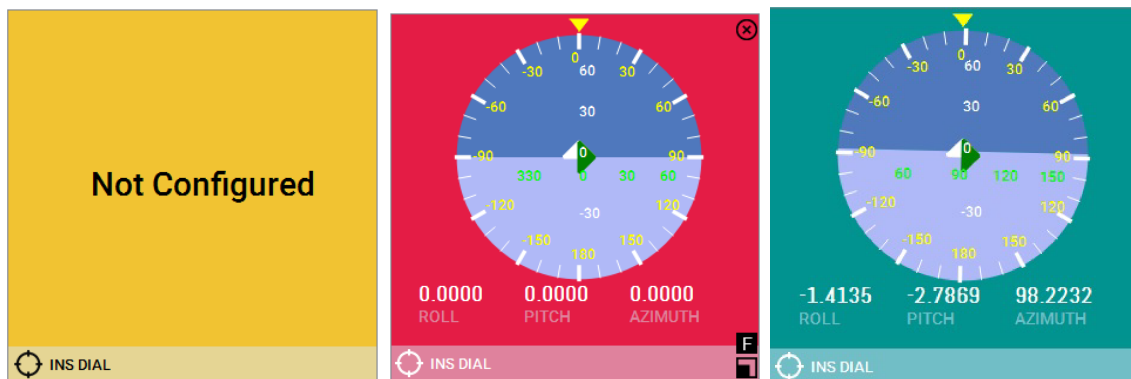
For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [SPAN on OEM6 Firmware Reference Manual \(OM-20000144\)](#).


6.9 SPAN INS Dial

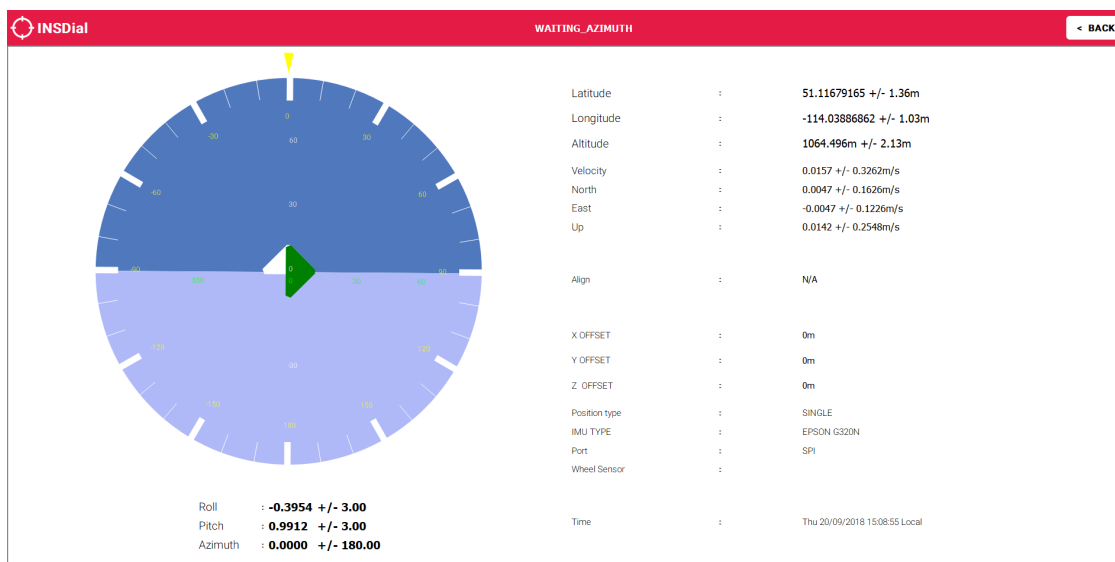


Information in the INS Dial window is only available with INS-capable receiver models.

The *INS Dial* tile displays yellow when not configured, red when INS Status is anything other than GOOD and green when INS Status is GOOD.



Double click on the *INS Dial* tile, or click , to open the *INS Dial* window.



The dial is a graphical display of the Roll, Pitch and Azimuth values indicated by an arrow on each axis. These values appear under the dial.

To the right side of the *INS Dial* window are the sections: Position, Velocity and IMU information.

The Position, Velocity and Attitude (roll, pitch and azimuth) sections display data from the [INSPVAX log](#) along with standard deviations calculated from the [INSPVAX log](#).

The X, Y and Z Offset fields are used to specify an offset from the IMU for the output position and velocity of the INS solution as specified by the [SETINSTRANSATION command](#) or the SPAN Wizard.

The Position Type displays data from the [INSPVAX log](#).



For OEM7 receivers, search for specific commands in the NovAtel OEM7 Documentation portal from docs.novatel.com/OEM7.
For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and



download a PDF file of the [SPAN on OEM6 Firmware Reference Manual \(OM-20000144\)](#).

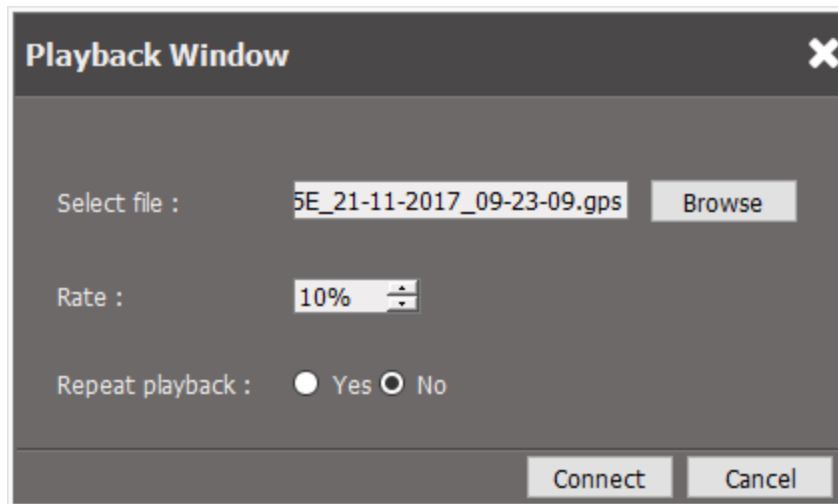
Chapter 7 Playback Files

A playback file contains NovAtel logs. Opening a playback file allows you to view the information stored in the file's logs using the NovAtel Connect interface.



Only binary logs can be played in NovAtel Connect.

1. On the main window, click the **Connection** menu and select **Open Playback**.
The *Playback Window* appears.



2. Click the **Browse** button.
The *Select File* dialog box appears.
3. Locate and select the file to playback and then click the **Open** button.
4. Set the rate at which data is read from the file by entering a value in the **Rate** text box or by using the up and down arrow buttons.
This setting determines how quickly NovAtel Connect displays the information in the logs.
5. Click the **Yes** radio button to have the playback in a continuous loop.
Click the **No** radio button to have playback stop when NovAtel Connect reaches the end of the playback file.
6. Click the **Connect** button.

NovAtel Connect closes the *Playback Window* and starts to display the information in the playback file in the main window. The file name of the playback file appears at the top of the *Connection* window.

7.1 Playback Controls

The controls for viewing the playback file are at the bottom of the screen.

To pause playback, click the Pause button. The Pause button changes to a Play button.

To start playback, click the Play button. The Play button changes to a Pause button.

To move forward or backward in the playback file, click the fast forward (double forward arrows) or the reverse (double back arrows) button. You can also move forward and backwards using the slider bar.



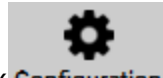
Chapter 8 Configuration Tiles

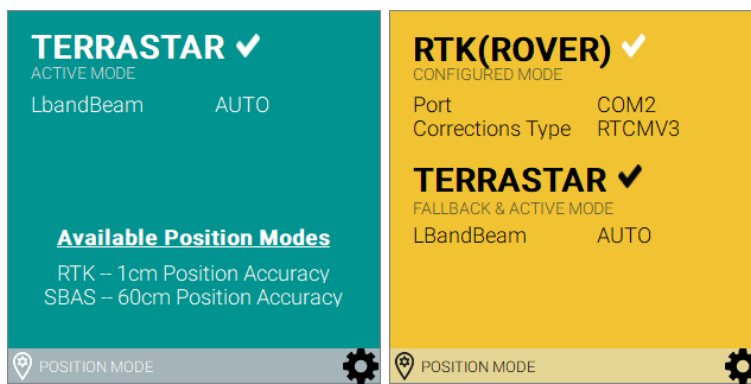
The Configuration tiles are used to change the receiver configuration. Each type of Configuration tile provides access to a different set of configuration parameters. The following topics provide detailed information about the available Configuration tiles.

8.1 Position Mode Configuration

Use the *Position Mode* tile to configure the position mode of the receiver.



Click the **Configuration** button () to open the Configuration tiles and display the available configuration tiles.



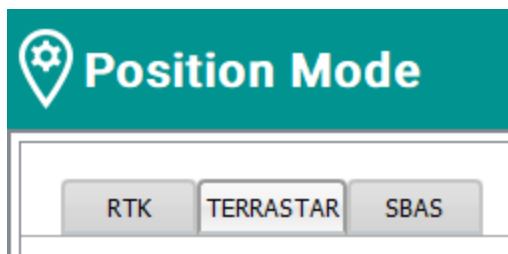
The color of the *Position Mode* tile indicates the position status of the receiver:

- **Green**
A single position mode is configured and it is active or multiple position modes are configured and the most accurate position mode is active.
- **Red**
The position mode is configured, but the position modes are not effective.
- **Yellow**
The position mode is not configured or multiple position modes are configured, but the most accurate mode is not effective.

Double click the *Position Mode* tile, or click , to open the *Position Mode* window.

If the **Save Config** checkbox is selected, the SAVECONFIG command is sent to the receiver and the configuration is saved to the receiver Non-Volatile Memory (NVM).

There are multiple position modes available for configuration. Click on the appropriate tab to configure.



8.1.1 RTK

Corrections can be transmitted from a base station to a rover station to improve the rover's position accuracy. The base station is the GNSS receiver that acts as the stationary reference. The stationary reference has a known position and transmits correction messages to the rover station. The rover station is the GNSS receiver that does not know its exact position and requires correction messages from a base station to calculate differential GNSS positions.

Base

The Base option is used to setup a receiver as an RTK Base. The following options can be configured:

- Correction Type and Port
- Moving Base Station can be enabled or disabled
- Position of the Base when the Fix option is used or the parameters for Auto Survey of the Base

Position Mode TERRASTAR < BACK

RTK TERRASTAR SBAS

Summary Screen

☒ BASE ☐ Rover

Generate RTK Corrections

Correction Type: RTCMV3 Port: COM2

RTCM1004 OUTLINE 1
RTCM1012 OUTLINE 1
RTCM1006 OUTLINE 10
RTCM1008 OUTLINE 10
RTCM1033 OUTLINE 10

Moving Base Station: Disable

Position: ☒ Fix ☐ Auto Survey

Latitude (Degrees): 51.11679077 Longitude (Degrees): -114.03887177 Altitude (Meters): 1064.490

☒ Save Config

Cancel Submit

When configuration is complete, click the **Submit** button.



For OEM7 receivers, [Transmitting and Receiving Corrections](#) in the NovAtel OEM7 Documentation portal docs.novatel.com/OEM7.

For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Installation and Operation User Manual \(OM-20000128\)](#).

Rover

The Rover option is used to setup a receiver as an RTK Rover. The following options can be configured:

- Interface Mode Port and Correction Type
- RTK Timeout Delay, in seconds
- RTK Source Type

When configuration is complete, click the **Submit** button.

8.1.2 TerraStar

Configure the TerraStar solution and select the beam that provides L-Band data.



To use TerraStar positioning, the receiver must have an active TerraStar subscription which can be obtained by contacting NovAtel Support (refer to "NovAtel Customer Support" on page 6 for contact information).

TerraStar Options

- Assign L-Band Beam.
- PPP Timeout sets the maximum age of the corrections used in the PPP filter, in seconds. Corrections older than the specified duration are not applied to the receiver observations and uncorrected observations are not used in the filter.
- PPP Source sets the corrections to use for the PPP filter.
- PPP Converged Criteria sets the threshold that determines if the solution has converged for high-accuracy PPP solutions. These are the PPP solutions reported with the PPP and PPP_CONVERGING position types, both total standard deviation or horizontal standard deviation, in meters.
- PPP Seed controls the seeding of the PPP filter so that accurate position seeding can accelerate PPP convergence.

Position Mode Single Point L1/L2 < BACK

Subscription Details

Type: UNASSIGNED Region: GEOGATED

Date: 0

The subscription for PPP is expired or does not exist. Contact [NovAtel Customer Support](#)

Lband Beams

Beam Name	CNO	Doppler	Lock Time
No Data Available			

Summary Screen

Assign LBand Beam: AUTO (Option)

PPP Timeout: 360 seconds (Delay)

PPP Source: AUTO (Source)

PPP Converged Criteria

Horizontal Std. deviation: 0.32 meters (Criteria Tolerance)

PPP Seed

CLEAR (Option)

Latitude (Degrees): 0 Longitude (Degrees): 0 Height (Meters): 0

0.00 meters 0.00 meters 0.00 meters (northing_std_dev, easting_std_dev, height_std_dev)

☒ Save Config

Cancel Submit

The *Subscription Details* panel provides information about the TerraStar subscription.

The *Lband Beams* panel lists the L-Band beams available.

When configuration is complete, click the **Submit** button.

8.1.3 PSRDIFF

Define the pseudorange differential options to compute the position for a Base or Rover.

Base

Setup a receiver as a base.

- Generated Differential Corrections transmission port and correction type.
- Moving Base Station enable or disable.
- Fix the Latitude, Longitude and Altitude, in meters.
- Configure parameters for the AutoSurvey feature.

Position Mode Single Point L1 < BACK

TERRASTAR | PSRDIFF | SBAS

Summary Screen

☒ BASE ☐ Rover

Generate Diff Corrections

COM2 (Port) RTCM (Correction Type)

RTCM1 ONTIME 1
RTCM31 ONTIME 1
RTCM5 ONTIME 10

Moving Base Station Disable (Switch)

Position ☒ Fix ☐ Auto Survey

Latitude (Degrees): 17.44307327 Longitude (Degrees): 78.37411499 Altitude (Meters): 652.632

☒ Save Config

Cancel Submit

When configuration is complete, click the **Submit** button.

Rover

Setup a receiver as a rover.

- Select the Interface Mode of the receiving port and correction type.
- PSRDIFF Source Timeout sets a time, in seconds, for the receiver to wait before switching to another differential source, if corrections from the original source are lost (when multiple differential correction sources are available).
- PSRDIFF Source sets the base station ID from which the rover accepts differential corrections.
- PSRDIFF Timeout sets the maximum age of pseudorange differential correction data for the rover to use. Received pseudorange differential correction data, older than the specified time, is ignored. The time out period also applies to differential corrections generated from RTK corrections.

The screenshot shows the 'Position Mode' window for 'Single Point L1'. At the top, there are tabs for 'TERRASTAR', 'PSRDIFF', and 'SBAS'. The 'Summary Screen' is displayed with the following settings:

- Interface Mode:** Port is 'COM2' and Correction Type is 'RTCM'.
- PSRDIFF Source Timeout:** The 'Auto' checkbox is checked, and the 'Timeout' is set to '10 Seconds'.
- PSRDIFF Source:** The 'Type' is set to 'AUTO'.
- PSRDIFF Timeout:** The 'Delay' is set to '306 Seconds'.

At the bottom, the 'Save Config' checkbox is checked. There are 'Cancel' and 'Submit' buttons.

When configuration is complete, click the **Submit** button.

8.1.4 SBAS

Select the SBAS settings the receiver will use to determine an SBAS corrected solution.

- SBAS Control sets the SBAS system used for corrections.
- SBAS Timeout sets the amount of time, in seconds, the receiver remains in an SBAS position type if it stops receiving SBAS corrections.
- SBAS Ecutoff sets the SBAS elevation cut-off angle for the SBAS satellites.

Position Mode TERRASTAR < BACK

Summary Screen

SBAS Control

System: **AUTO** PRN: **0** Test Mode: **NONE** ⓘ

SBAS Timeout

Mode: ☒ Auto Delay: **180 Seconds** ⓘ

SBAS Ecutoff

Angle: **-5 Degrees** ⓘ

☒ Save Config

Cancel Submit

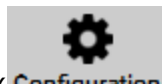
When configuration is complete, click the **Submit** button.

8.2 SPAN Configuration



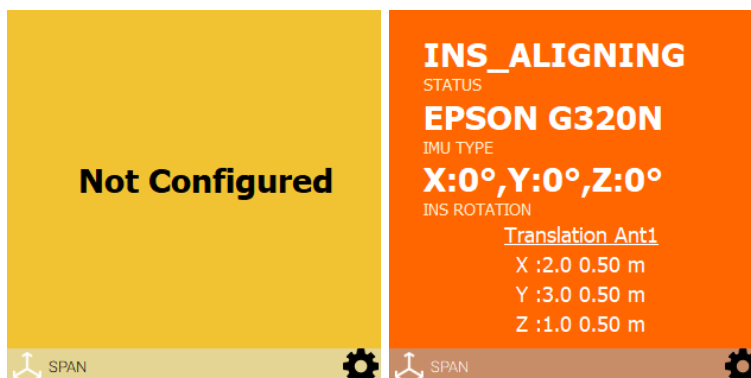
Information in the *SPAN* configuration window is only available with SPAN enabled receiver models.

SPAN provides reliable, continuously available, position, velocity and attitude, even through short periods of time when satellite signals are blocked or unavailable. Use the SPAN wizard to configure the Synchronized Position Attitude Navigation (SPAN) system.



Click the **Configuration** button (Configuration) to open the Configuration window and display the available configuration tiles.

For example:



The color of the tile indicates the status of the SPAN solution:

- **Yellow**
SPAN not configured.
- **Green**
The INS status is *INS_SOLUTION_GOOD*, *INS_HIGH_VARIANCE* or *INS_ALIGNMENT_COMPLETE*.
- **Red**
The INS status is *INS_INACTIVE*.
- **Orange**
The INS status is *INS_ALIGNING*, *DETERMINING_ORIENTATION* or *WAITING_INITIALPOS*.



For OEM7 receivers, search for specific commands in the NovAtel OEM7 Documentation portal and/or download PDFs from docs.novatel.com/OEM7. For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [SPAN on OEM6 Firmware Reference Manual \(OM-20000144\)](#).

8.2.1 SPAN Configuration Wizard

Use the wizard to move through a pre-defined group of windows and make selections on how the SPAN functionality will be implemented.

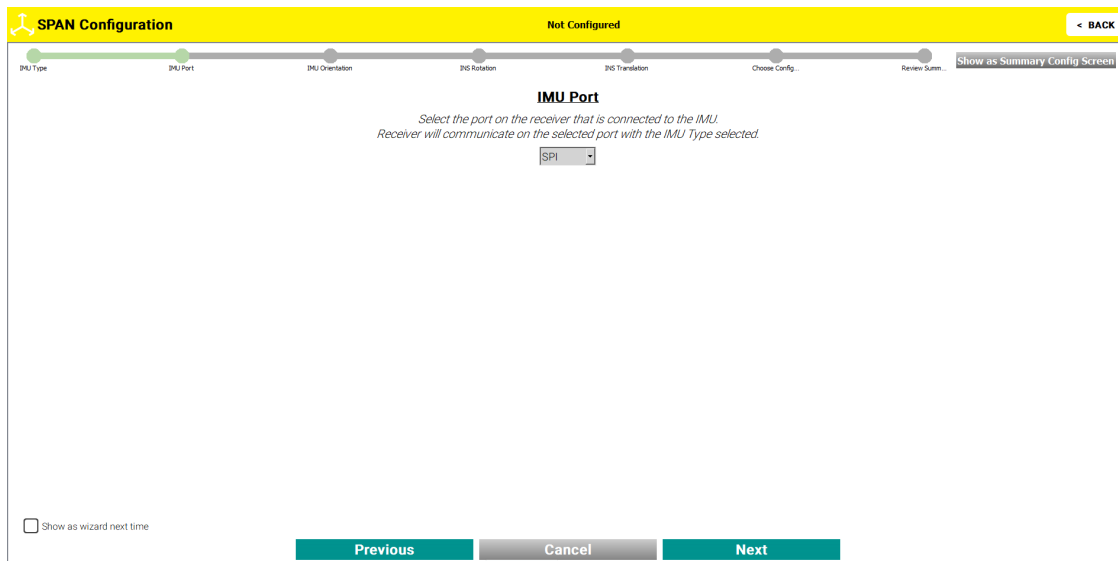


Use the **Next** button to move forward through the wizard; use the **Previous** button to return to a previous window in the wizard.

Select the type of IMU. The IMU Type displayed is based on the IMU grade supported by the connected receiver model. Click the **Next** button.

The screenshot shows the 'SPAN Configuration' wizard with a progress bar at the top. The 'IMU Type' step is selected, and the status is 'Not Configured'. Below the progress bar, the 'IMU Type' section asks the user to 'Select the IMU type connected to the Receiver'. It lists three categories: Commercial, Tactical, and High Grade Tactical. Under Commercial, there are radio buttons for Analog Devices ADIS16488, EPSON G320N (selected), Honeywell HG1930-CA50, Honeywell HG4930-AN01, KVH CPT IMU, and Sensoror STIM300. Under Tactical, there are radio buttons for Honeywell HG1900-CA50, Honeywell HG1700-AG58, Honeywell HG1700-AG62, KVH 1750 IMU, and Lifef μIMU-IC. Under High Grade Tactical, there are radio buttons for IMAR IMU-FSAS and Northrop Grumman LN-200-L. At the bottom, there is a checkbox for 'Show as wizard next time', a 'Cancel' button, and a 'Next' button.

Select the COM port the IMU is connected to from the drop menu. Click the **Next** button.



SPAN Configuration Not Configured < BACK

IMU Type IMU Port IMU Orientation IMU Rotation IMU Translation Choose Config... Review Sum... Show as Summary Config Screen

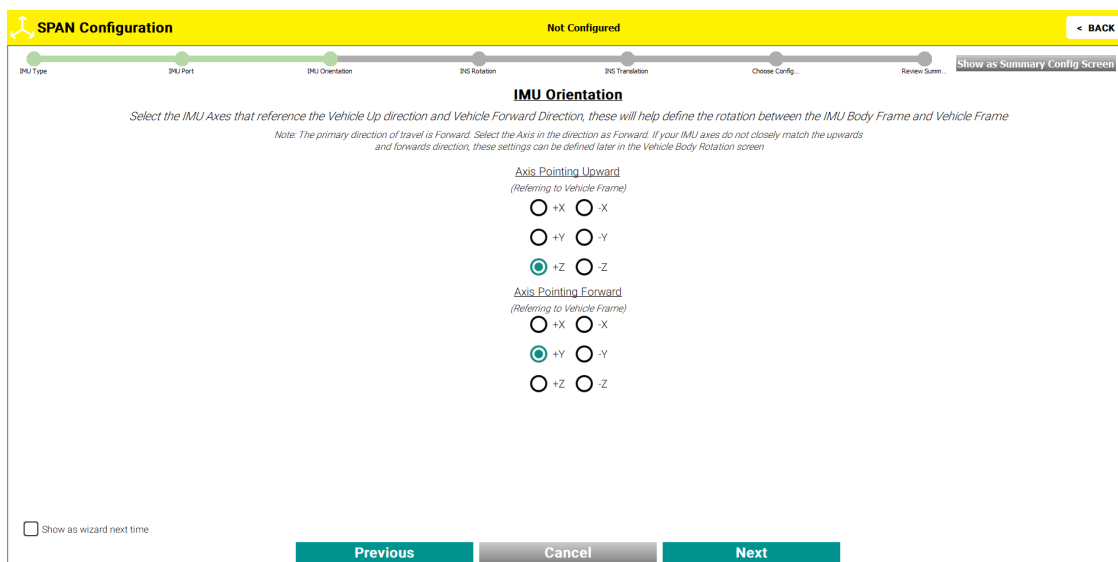
IMU Port
 Select the port on the receiver that is connected to the IMU.
 Receiver will communicate on the selected port with the IMU Type selected.

SPI

☐ Show as wizard next time

Previous Cancel Next

Select the IMU axis pointing upwards (negative for down) and the axis pointing forward (negative for back). Click the **Next** button.



SPAN Configuration Not Configured < BACK

IMU Type IMU Port IMU Orientation IMU Rotation IMU Translation Choose Config... Review Sum... Show as Summary Config Screen

IMU Orientation
 Select the IMU Axes that reference the Vehicle Up direction and Vehicle Forward Direction, these will help define the rotation between the IMU Body Frame and Vehicle Frame
 Note: The primary direction of travel is Forward. Select the Axis in the direction as Forward. If your IMU axes do not closely match the upwards and forwards direction, these settings can be defined later in the Vehicle Body Rotation screen

Axis Pointing Upward
 (Referring to Vehicle Frame)

☐ +X ☐ -X
☐ +Y ☐ -Y
☒ +Z ☐ -Z

Axis Pointing Forward
 (Referring to Vehicle Frame)

☐ +X ☐ -X
☒ +Y ☐ -Y
☐ +Z ☐ -Z

☐ Show as wizard next time

Previous Cancel Next

Enter the rotational values, in degrees, from the IMU enclosure frame to the vehicle frame. Click the **Next** button.

SPAN Configuration Not Configured < BACK

IMU Type IMU Port IMU Orientation **INS Rotation** INS Translation Choose Config... Review Sum... Show as Summary Config Screen

INS Rotation

Enter the angular offsets from the IMU Body Frame, to the Vehicle Frame. The order of rotations is Z-X-Y.
All rotations are right-handed.
The rotations values are required for kinematic alignment and can be used to transform attitude output into the vehicle frame.

	Rotation	Uncertainty
X	0.00	3.00
Y	0.00	3.00
Z	0.00	3.00

Output Attitude is Attitude of the Vehicle

☐ Show as wizard next time

Previous Cancel Next

Enter the three dimensional distance from the IMU center of navigation to the antenna phase center in the IMU enclosure frame. Click the **Next** button.

SPAN Configuration Not Configured < BACK

IMU Type IMU Port IMU Orientation **INS Translation** INS Translation Choose Config... Review Sum... Show as Summary Config Screen

INS Translation

Enter the offset between the IMU and the GNSS antenna
The measurement should be done as accurately as possible, preferably to within millimeters especially for RTK operations
Any error in the lever arm will translate directly into an error in the INS position
The x, y and z fields represent the vector from the IMU to the antenna phase center in the IMU enclosure frame
The uncertainty fields are used to enter any possible errors in the measurements with respect to x, y and z.

	Translation	Uncertainty	
X	2.00	0.50	Meters
Y	3.00	0.50	Meters
Z	1.00	0.50	Meters

☐ Show as wizard next time

Previous Cancel Next

Select as many configuration options as required by clicking the check boxes. Click the **Next** button.

The image shows a screenshot of the 'SPAN Configuration' wizard in NovAtel Connect 2.3. The title bar is yellow and says 'SPAN Configuration' and 'Not Configured'. A progress bar at the top shows steps: IMU Type, IMU Port, IMU Orientation, IMU Rotation, IMU Translation, Choose Config., Review Sum., and a 'Show as Summary Config Screen' button. The 'Choose Config.' step is currently active. The main area is titled 'Choose Configuration' and contains the text: 'Select the configuration options from below. The next screens will contain the selected options for configuration'. Below this are three checkboxes: 'Dual Antenna', 'Output Frame Configuration', and 'Alignment Mode'. At the bottom left, there is a checkbox labeled 'Show as wizard next time'. At the bottom right, there are three buttons: 'Previous', 'Cancel', and 'Next'.

Configuration Options

- Select **Dual Antenna** to enter the offset between the IMU and the secondary GNSS antenna.
- Select **Output Frame Configuration** to enter the offset from IMU to the output position.
- Select **Alignment Mode** to define the Alignment method for the receiver to use.
- Select **Heave** to enable or disable the Heave Filter (display of the option is model dependent).

If any of the above configuration options were selected, they now appear as steps at the top of the *SPAN* configuration wizard window. Skip over the windows for configuration options that were not selected.

Enter the offset between the IMU and the secondary GNSS antenna. Click the **Next** button.

SPAN Configuration Not Configured [< BACK](#)

IMU Type IMU Port IMU Orientation INS Rotation INS Translation Choose Config Dual Antenna Output Frame ... Alignment Mode Review Sum... [Show as Summary Config Screen](#)

Dual Antenna Translation(Antenna 2)

Enter the offset between the IMU and the GNSS antenna 2.
 The measurement should be done as accurately as possible, preferably to within millimeters especially for RTK operations.
 Any error in the lever arm will translate directly into an error in the INS position.
 The x, y and z fields represent the vector from the IMU to the antenna phase center in the IMU enclosure frame.
 The uncertainty fields are used to enter any possible errors in the measurements with respect to x, y and z.

	Translation	Uncertainty	
X	5.00	0.50	Meters
Y	5.00	0.50	Meters
Z	1.00	0.50	Meters

☐ Show as wizard next time

[Previous](#)
[Cancel](#)
[Next](#)

Enter the three dimensional offset from the IMU center of navigation to another location where the INS position will be output. This offset must be entered in the IMU enclosure frame. Click the **Next** button.

SPAN Configuration Not Configured [< BACK](#)

IMU Type IMU Port IMU Orientation INS Rotation INS Translation Choose Config Dual Antenna Output Frame ... Alignment Mode Review Sum... [Show as Summary Config Screen](#)

Output Frame Configuration

Enter the offset from the IMU for the output position and velocity of the INS solution.
 Shifts the position and velocity in all INS logs except MARKPVA logs by the amount specified in meters with respect to the IMU enclosure frame axis.
 The x, y and z fields represent the vector from the IMU to the desired output point, measured in the IMU enclosure frame. Output attitude is the attitude of the vehicle.

Offsets

X	6.00	Meters
Y	7.00	Meters
Z	2.00	Meters

☐ Show as wizard next time

[Previous](#)
[Cancel](#)
[Next](#)

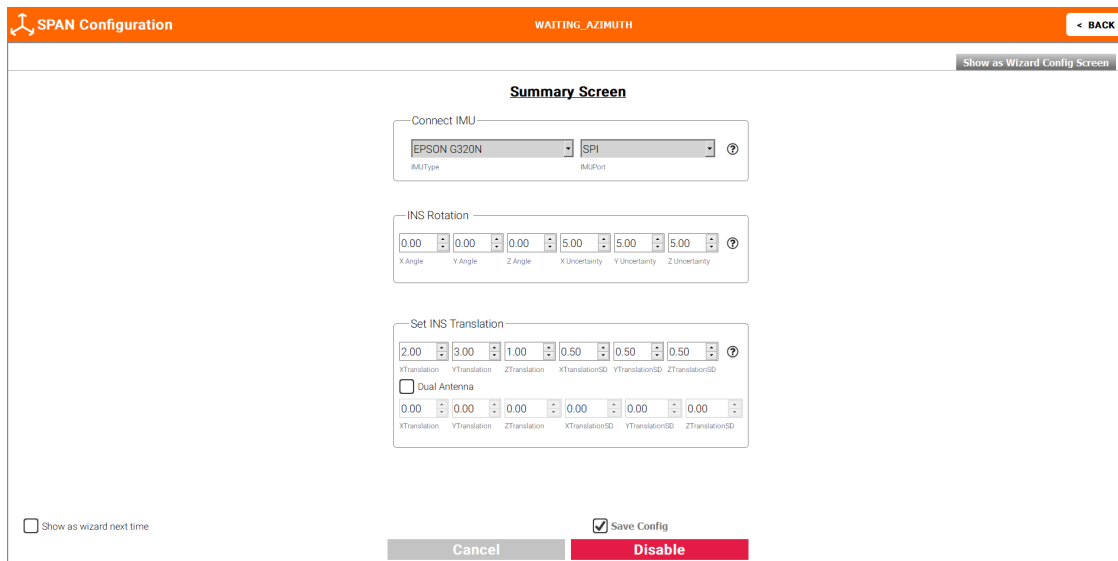
Select the type of alignment that the system performs. Different options are visible based upon the system and options selected. Click the **Next** button.

Alignment Modes

- Select **Automatic Alignment** to seed the alignment with the full attitude from the ALIGN solution and then perform a regular static coarse alignment or perform a kinematic alignment, whichever is possible first.
- Select **Aided Transfer Alignment** to seed the static coarse alignment with an initial azimuth from the ALIGN solution.
- Select **Aided Static Alignment** to use an initial azimuth from the ALIGN solution as a seed for a coarse static alignment for a stationary vehicle.
- Select **Unaided Alignment** to use a static coarse alignment or kinematic alignment.
- Select **Static Alignment** to use a static coarse alignment only.
- Select **Kinematic Alignment** to use a kinematic alignment only.
- Select **Initial Azimuth** to seed a static coarse alignment. Value and Uncertainty inputs must be added, in meters.

Enable or disable the filter used for heave processing as required.

The Summary Config window displays all selected configuration settings selected in the wizard. Click the **Submit** button to apply the configuration settings. By default, the **Save Config** option is checked. Uncheck to not save the Configuration settings.



The image shows the 'Summary Screen' of the SPAN Configuration window. At the top, there's an orange header with 'SPAN Configuration' on the left, 'WAITING_AZIMUTH' in the center, and a '< BACK' button on the right. Below the header, there's a 'Show as Wizard Config Screen' button. The main content area is titled 'Summary Screen' and contains three sections: 'Connect IMU' with a dropdown menu showing 'EPSON G320N' and 'SPI'; 'INS Rotation' with input fields for X Angle, Y Angle, Z Angle, X Uncertainty, Y Uncertainty, and Z Uncertainty; and 'Set INS Translation' with input fields for X Translation, Y Translation, Z Translation, X TranslationSD, Y TranslationSD, and Z TranslationSD. There is also a 'Dual Antenna' checkbox. At the bottom, there are checkboxes for 'Show as wizard next time' and 'Save Config', along with 'Cancel' and 'Disable' buttons.

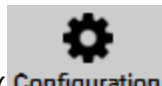
Once submitted, the message SPAN Configuration is completed appears in green. If required, click the red **Disconnect IMU** button to disconnect the IMU and reconfigure.



Clicking the **Show as Summary Config Screen** button displays all options available for configuration (as per the Summary Screen at the end of the wizard).

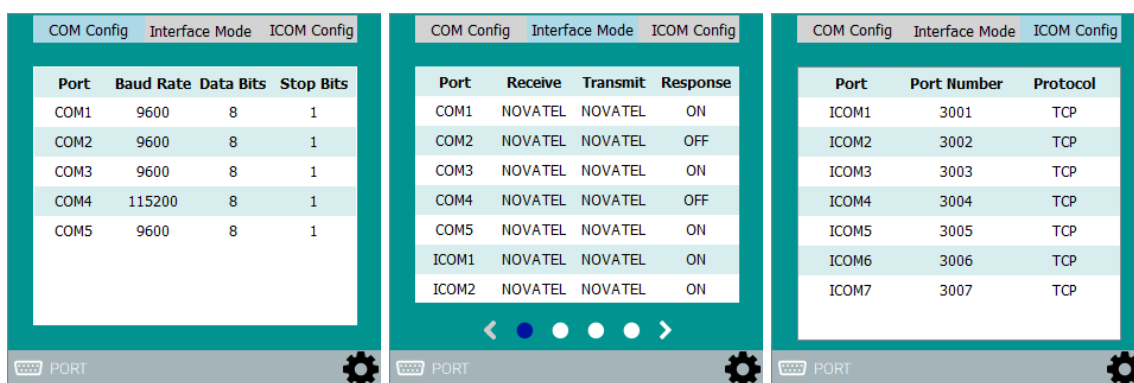
8.3 Port Configuration

Use the *PORTt* configuration tile to view and modify the communication port parameters.




Click the **Configuration** button (Configuration) to open the Configuration window and display the available configuration tiles, including the *PORT* tile. The *PORT* configuration tile has three tabs.

- The *COM Config* tab displays the communication settings for the serial communication (COM) ports.
- The *Interface Mode* tab displays the interface mode used for all of the COM and virtual COM ports on the receiver.
- The *ICOM Config* tab displays the port number and protocol for the ICOM ports available on the receiver.



8.3.1 Configure the Serial Port Parameters

To configure the serial port communication parameters:

1. Double click the *PORT* configuration tile or click . The *Port* configuration window displays.

The screenshot shows the 'Port' configuration window. It has a 'COM Config' tab selected. The table lists COM ports (ALL, COM1, COM2, COM3, COM4, COM5) and their parameters: Baud Rate, Parity, Data Bits, Stop Bits, Handshake, Echo, and Break. The 'Save Config' checkbox is checked, and the 'Submit' button is highlighted.

PORT	BAUD RATE	PARITY	DATA BITS	STOP BITS	HANDSHAKE	ECHO	BREAK
ALL	9600	N	8	1	N	<input type="checkbox"/>	<input type="checkbox"/>
COM1	9600	N	8	1	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COM2	9600	N	8	1	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COM3	9600	N	8	1	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COM4	115200	N	8	1	N	<input type="checkbox"/>	<input type="checkbox"/>
COM5	9600	N	8	1	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The *Port* configuration window shows the current COM port settings for each COM port available on the receiver.

2. Use the drop menus to change the COM port parameters to the desired settings.



Baud rates higher than 115,200 bps are not supported by standard computer hardware. Special hardware may be required to use baud rates higher than 115,200.

3. Click the **Submit** button to change the COM port settings

To save the new settings to the receiver NVM, select the **Save Config** checkbox before clicking the **Submit** button.



The parameters on the COM Config window are described in the SERIALCONFIG command documentation.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal [doc-s.novatel.com/OEM7](https://www.novatel.com/OEM7).

For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

8.3.2 Configure the Port Interface Mode

The interface mode specifies the type of data a particular port on the receiver can transmit and receive. The receive type tells the receiver what type of data to accept on the specified port. The transmit type tells the receiver what kind of data it can generate. For example, to accept RTCM V3 differential corrections, set the receive type on the port to RTCMV3.

It is also possible to disable or enable the generation or transmission of command responses for a particular port. Disabling of responses is important for applications where data is required in a specific form and the introduction of extra bytes may cause problems, i.e., RTCA, RTCM, RTCMV3 or CMR. Disabling a port prompt is also useful when the port is connected to a modem or other device that responds with data the receiver does not recognize.



For applications running in specific interface modes, set the appropriate interface modes before sending or receiving corrections. It is important that the port interface mode matches the data being received on that port. Mismatches between the interface mode and received data can result in CPU overloads.

When the interface mode for a port is set to NONE for Receive and Transmit, the specified port is disabled from interpreting any input or output data. Therefore, no commands or differential corrections are decoded by the specified port. When GENERIC is set for a port, it is also disabled but data can be passed through the disabled port and be output from an alternative port using the pass-through logs PASSCOM, PASSXCOM, PASSAUX and PASSUSB.




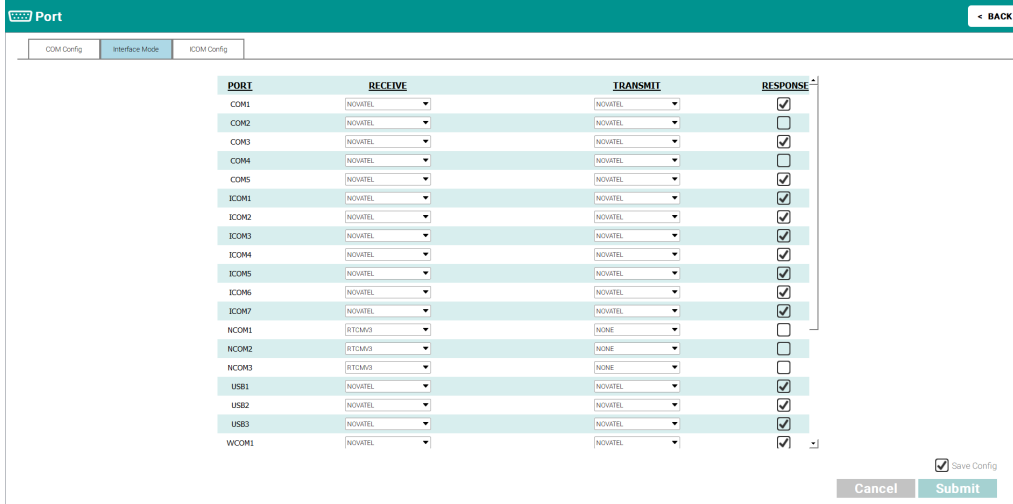
If you intend to change the COM Config parameters, ensure you do so before the setting the interface mode parameters.



On a SPAN system, do not change the interface mode for the COM port connected to the IMU. The correct interface mode is set when SPAN is configured using the SPAN wizard in NovAtel Connect. Changing the IMU port interface mode may result in the loss of IMU communication.

To configure port interface mode:

1. Double click the *PORT* configuration tile or click . The *Port* configuration window displays.
2. Click the *Interface Mode* tab. The *Port* configuration window changes to show the interface mode settings.



PORT	RECEIVE	TRANSMIT	RESPONSE
COM1	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
COM2	NOVATEL	NOVATEL	<input type="checkbox"/>
COM3	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
COM4	NOVATEL	NOVATEL	<input type="checkbox"/>
COM5	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
ICOM1	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
ICOM2	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
ICOM3	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
ICOM4	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
ICOM5	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
ICOM6	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
ICOM7	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
NCOM1	ITCOM3	NONE	<input type="checkbox"/>
NCOM2	ITCOM3	NONE	<input type="checkbox"/>
NCOM3	ITCOM3	NONE	<input type="checkbox"/>
USB1	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
USB2	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
USB3	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>
WCOM1	NOVATEL	NOVATEL	<input checked="" type="checkbox"/>

Save Config ☒ Cancel Submit

The *Port* configuration window shows the current interface mode settings for each COM port and virtual serial port available on the receiver.

3. Use the drop menus and check boxes to change the interface mode parameters to the desired settings.
4. Click the **Submit** button to change the interface mode settings

To save the new settings to the receiver NVM, select the **Save Config** checkbox before clicking the **Submit** button.



The parameters on the Interface Mode window are described in the INTERFACEMODE command documentation.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal docs.novatel.com/OEM7.


For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

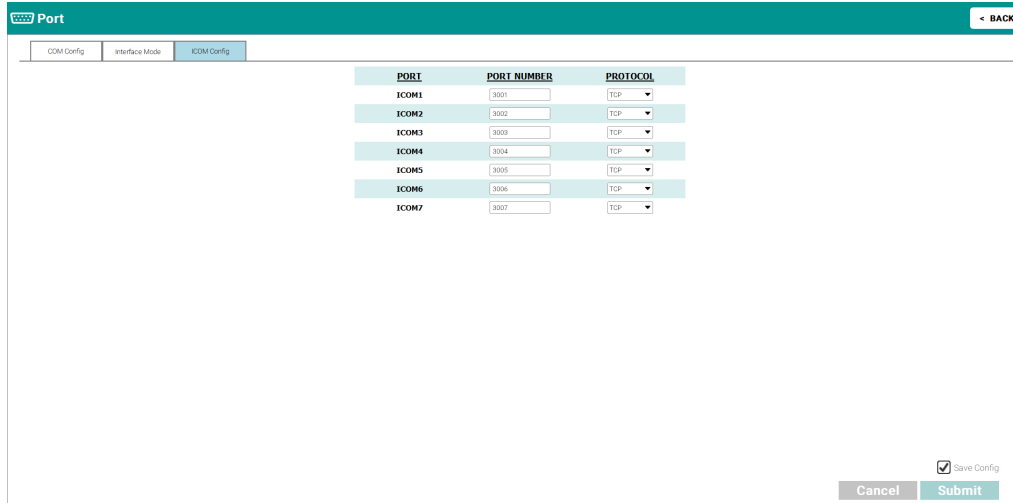
8.3.3 Configure the ICOM Ports

ICOM ports are virtual ports used for Ethernet or Wi-Fi connections. The transport/application layer of the ICOM ports can be configured to use Transmission Control Protocol (TCP) or User Datagram Protocol (UDP). UDP a slower and less reliable Internet Protocol.

Each ICOM port can act as a server (waiting for an external connection to be made) or as a client (actively establishing a connection to a specific port).

To configure the ICOM ports:

1. Double click the *PORT* configuration tile or click . The *Port* configuration window displays.
2. Click the *ICOM Config* tab.



PORT	PORT NUMBER	PROTOCOL
ICOM1	3001	TCP
ICOM2	3002	TCP
ICOM3	3003	TCP
ICOM4	3004	TCP
ICOM5	3005	TCP
ICOM6	3006	TCP
ICOM7	3007	TCP

The *Port* configuration window shows the current ICOM port settings.

3. Use the text boxes and drop menus to configure the port number and protocol for each ICOM port.
4. Click the **Submit** button to change the interface mode settings
To save the new settings to the receiver NVM, select the **Save Config** checkbox before clicking the **Submit** button.



The parameters on the ICOM Config window are described in the ICOMCONFIG command documentation.


For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal [doc-s.novatel.com/OEM7](https://www.novatel.com/OEM7).

For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

8.4 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 tile to configure ALIGN on a receiver.

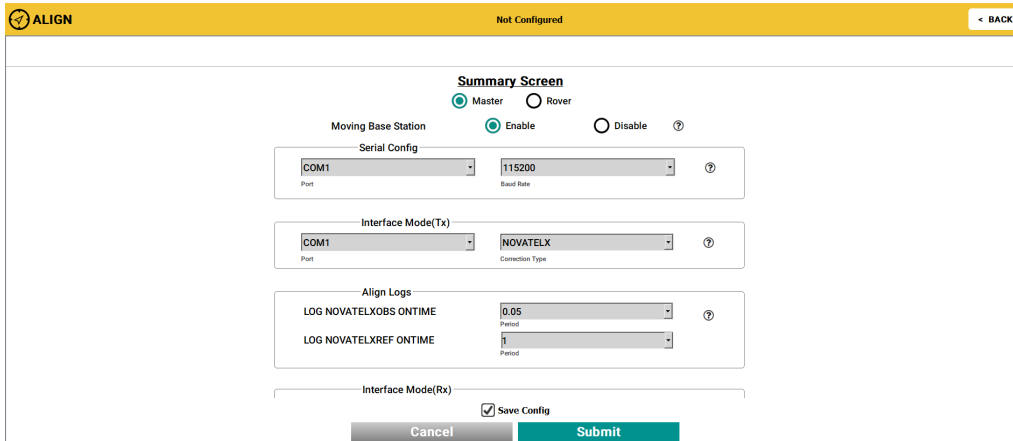


Click the **Configuration** button () to open the Configuration window and display the available configuration tiles, including the *ALIGN* tile.

8.4.1 Configure the ALIGN Master Receiver

To configure the ALIGN Master receiver parameters:

1. Double click the *ALIGN* configuration tile or click . The *ALIGN* configuration window displays.



2. If the Master receiver will be moving, select **Enable** beside Moving Base Station. If the Master receiver will be stationary, select **Disable** beside **Moving Base Station**. The Position settings appear. Enter the position for the Master receiver or select Auto Survey and enter the survey parameters.
 3. In the *Serial Config* section, set the COM port and baud rate the Master receiver will use to communicate with the Rover receiver.
 4. In the *Interface Mode(TX)* section, set the corrections type sent to the Rover receiver.
 5. In the *Align Logs* section, configure the rate at which the ALIGN logs are generated.
 6. In the *Interface Mode(RX)* section, set the corrections type the receiver will accept. (Moving Base Station only)
 7. Click the **Submit** button to apply the ALIGN settings
- To save the new settings to the receiver NVM, select the **Save Config** checkbox before clicking the **Submit** button.



The parameters on the ALIGN configuration window are described in the command documentation.

For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal [doc-s.novatel.com/OEM7](https://www.novatel.com/OEM7).


For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

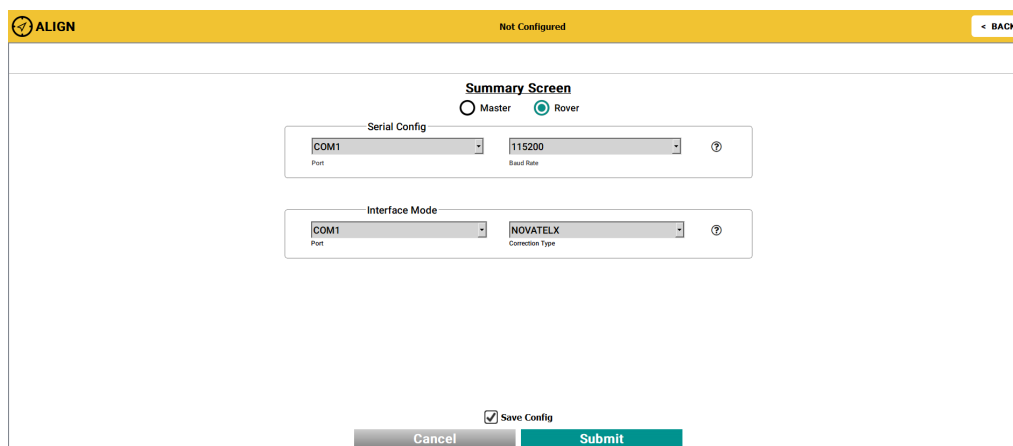
8.4.2 Configure the ALIGN Rover Receiver



An ALIGN Rover model is required to configure a receiver as an ALIGN Rover.

To configure the ALIGN Rover receiver parameters:

1. Double click the *ALIGN* configuration tile or click . The *ALIGN* configuration window displays.
2. Select **Rover**.



The screenshot shows the ALIGN configuration window. At the top, there is a yellow header bar with the ALIGN logo and the text "Not Configured". Below the header, the "Summary Screen" is displayed. It has two radio buttons: "Master" (unselected) and "Rover" (selected). Under the "Serial Config" section, there are two dropdown menus: "Port" (set to COM1) and "Baud Rate" (set to 115200). Under the "Interface Mode" section, there are two dropdown menus: "Port" (set to COM1) and "Correction Type" (set to NOVATELX). At the bottom, there is a "Save Config" checkbox (checked) and two buttons: "Cancel" and "Submit".

3. In the *Serial Config* section, set the COM port and baud the receiver will use to receive corrections.
4. In the *Interface Mode* section, set the correction type the receiver will receive.
5. Click the **Submit** button to apply the ALIGN settings

To save the new settings to the receiver NVM, select the **Save Config** checkbox before clicking the **Submit** button.



The parameters on the ALIGN configuration window are described in the command documentation.

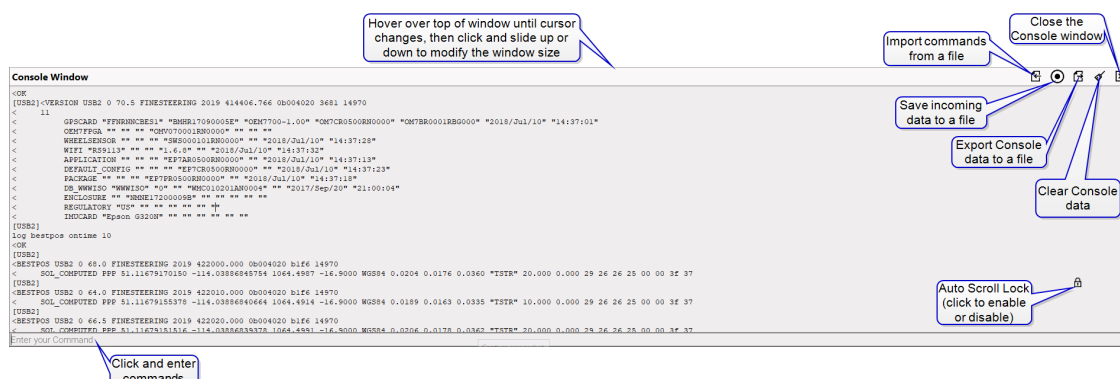
For OEM7 receivers, refer to the NovAtel OEM7 Documentation Portal docs.novatel.com/OEM7.

For OEM6 receivers, go to www.novatel.com/support/search/items/Manual and download a PDF file of the [OEM6 Family Firmware Reference Manual \(OM-20000129\)](#).

Chapter 9 Console Window

The *Console Window* is a terminal interface used to directly send commands to the receiver and display receiver acknowledgments and outputs.

To open the *Console Window*, click .



Refer to "Tools Buttons" on page 24 to resize the *Console Window*.


Click at the bottom left of the window to begin entering a command. Once the command is entered, press the **Enter** key on the keyboard to send the command to the receiver.



For OEM7 receivers, search for specific commands from docs.novatel.com/OEM7.


For OEM6 receivers, go to www.novatel.com/support/download and download a PDF file of the OEM6 Family Firmware Reference Manual (OM-20000129).

9.1 Auto Scroll Lock

If using the scroll bar to scroll up through the window, a lock icon appears . The lock icon indicates automatic scrolling during logging sessions is disabled. Click on the lock icon to enable auto scrolling functionality. This feature is useful during continuous data logging in the Console.

9.2 Import

To import a set of commands from a file:

1. Click .
2. The *Select File* dialog box opens.
3. Browse to the file location.
4. Click the file and then the **Open** button.

All the commands in the file are sent to the receiver.

For information about creating a file to import, see "Creating a Batch File" on page 18 and "Batch File Examples" on page 19.

9.3 Save Incoming Data to File

Use this feature to record all of logs being sent to the communication port used by NovAtel Connect.

To save all incoming messages to a file:

1. Click .

The *Save File* dialog box opens.

2. Navigate to the desired folder.
3. A default file name with the receiver PSN, date and time is entered in the File name text box. The name can be changed by typing in a new name.
4. Click the **Save** button.

The *Save File* dialog box closes and the icon changes to red.

To stop collecting logs:

1. Click .

A confirmation dialog appears.

2. Click the **OK** button.

This feature can be used to save a set of logs to a file. To record a set of logs to a file:

1. Start the Save Incoming Data to File feature as described above.
Any logs currently be sent to the NovAtel Connect port will start to be saved in the file created.
2. If additional log data is needed, use the LOG command to send the desired logs to the communication port used by NovAtel Connect.
If no port is specified in the LOG command, the port defaults to the port from the which the command was sent (NovAtel Connect port in this case).
3. When all of the required log data has been collected, use the UNLOG command to stop the logs.
4. Stop the Save Incoming Data to File feature. This closes the file in which the logs are stored.

9.4 Export

To copy any data currently in the *Console Window* to a file:

1. Click .

The *Save File* dialog box opens


2. Navigate to the desire folder.

A default file name with the current date and time appears in the File name text box.
The name can be changed by typing in a new name.

3. Click the **Save** button.

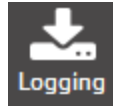
The content of the Console window are saved in a plain text file.

9.5 Clear

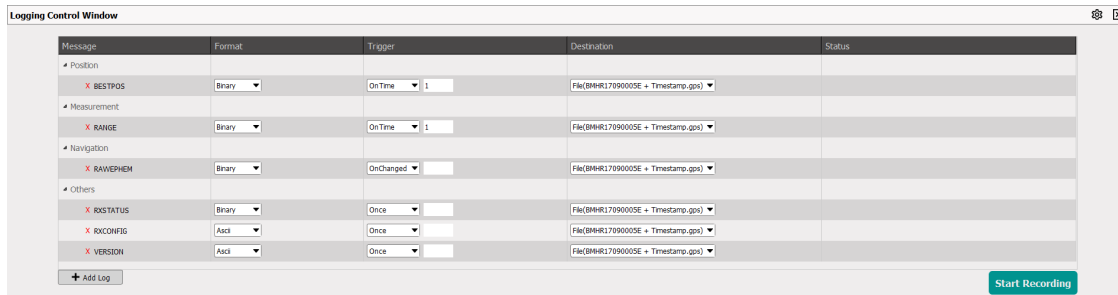
To clear all data currently in the *Console Window*, click .

Chapter 10 Logging Control Window

The *Logging Control Window* is a tool used to initiate a logging session.



To open the *Logging Control Window*, click .



The screenshot shows the 'Logging Control Window' interface. It features a table with columns: Message, Format, Trigger, Destination, and Status. The table is organized into expandable sections: Position, Measurement, Navigation, and Others. Each section contains several log entries with specific messages, formats, triggers, and destinations. At the bottom left, there is an 'Add Log' button, and at the bottom right, there is a 'Start Recording' button.

Message	Format	Trigger	Destination	Status
Position				
X BESTPOS	Binary	OnTime 1	File(BMRL709000SE + Timestamp.gps)	
Measurement				
X RANGE	Binary	OnTime 1	File(BMRL709000SE + Timestamp.gps)	
Navigation				
X RAWEPHEM	Binary	OnChanged	File(BMRL709000SE + Timestamp.gps)	
Others				
X RKSTATUS	Binary	Once	File(BMRL709000SE + Timestamp.gps)	
X RKCONFIG	Ascii	Once	File(BMRL709000SE + Timestamp.gps)	
X VERSION	Ascii	Once	File(BMRL709000SE + Timestamp.gps)	

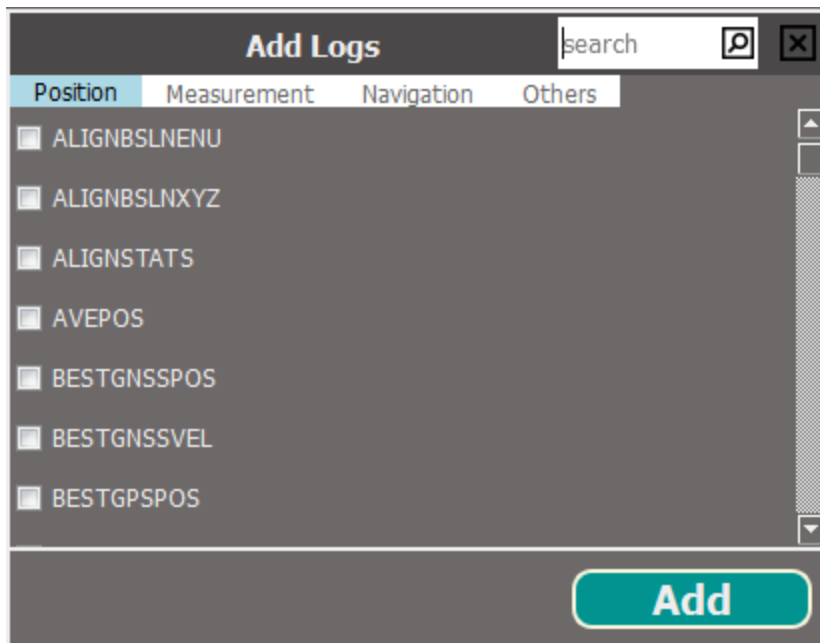
Refer to "Tools Buttons" on page 24 to resize the *Logging Control Window*.

10.1 Add Logs

The logs configured to be recorded are shown on *Logging Control Window*. The logs are sorted by the following categories.

- Position
- Measurement
- Navigation
- Others

Add logs by pressing the **+** **Add Log** button and selecting logs from the list. You can search the list for a particular log using the **search** text box. The search starts as soon as text is entered. The search works within the selected tab, so if the log is not found, click on the other tabs to search those tabs.



10.2 Remove a Log

Click the red **X** beside a log to remove it from the list of logs to record.

10.3 Modify the Logging Parameters

Each log on the *Logging Control Window* has three parameters that affect how the log is collected.

- **Format**

Logs can be generated in Binary or ASCII format.

- **Trigger**

The trigger determines the schedule on which the log is collected. The trigger selected depends on the information required and the type of log. If OnTime is selected, the time period between log recordings, in seconds, must be added in the text box beside the Trigger field.

- **Destination**

The destination determines where the log is sent. The log can be sent to any communication port on the receiver, the memory on board the receiver (not available on all receivers) or a file on the computer running NovAtel Connect.

If a communication port is selected, ensure that a device to receive the log is connected to that port.

The file name and directory used when collecting to a file are configured in the *Settings* dialog box. Refer to "Change the Log File Settings" on the next page.

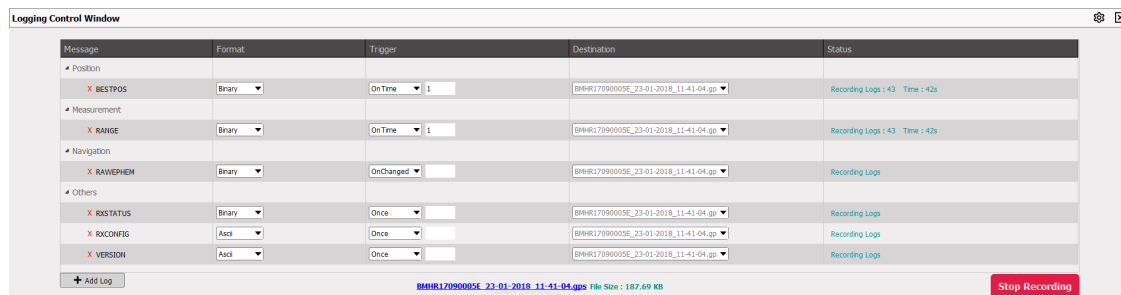
10.4 Recording

To start recording logs:

1. Ensure the logs you want to record are shown on the *Logging Control Window* and the logging parameters have been set.
2. Press the **Start Recording** button to begin recording.

The **Start Recording** button changes to **Stop Recording** once recording begins. If the logs are being saved to a file, the window shows the name of the file in which the logs are being recorded and the file size. The progression of the logging is also shown.

Press the **Stop Recording** button at any time to end log recording.

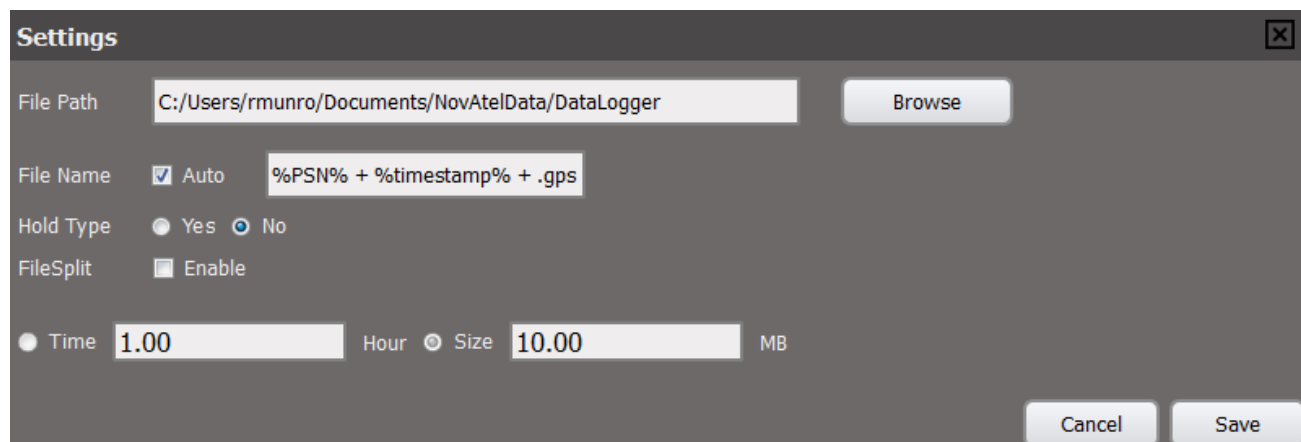


10.5 Change the Log File Settings

When logging to a file on the NovAtel Connect computer, the file used is determined by the log file settings. To change the log file settings:

1. Click the  icon in the *Logging Control Window*.

The *Settings* dialog box appears.



2. Modify the log file settings.

File Path	<p>The path of the directory in which the log files are stored.</p> <p>Enter the path directly in the text box or click the Browse button and use the dialog box to select the directory.</p>
File Name	<p>The file name used for the log file.</p> <p>You can enter a name or allow NovAtel Connect to generate a name.</p> <p>To enter a file name, clear the Auto check box and enter the name in the text box.</p> <p>The next logging session will save the logs using the entered name. For subsequent logging sessions, you will be prompted whether you want to replace the existing file or add the new session to the existing log file.</p> <p>To allow NovAtel Connect to generate a unique name for each logging session, ensure the Auto check box is selected. NovAtel Connect will generate a new file for each logging session. The file is named with the product serial number (PSN) and the time when the logging session started.</p>
Hold Type	<p>Enable or disable Hold on the logs started using the <i>Logging Control Window</i>.</p> <p>When the Hold Type is set to No, the logs started using the <i>Logging Control Window</i> can be unlogged when an UNLOGALL command is sent.</p> <p>When the Hold Type is set to Yes, the logs started using the <i>Logging Control Window</i> can not be unlogged when an UNLOGALL command is sent.</p>
Enable File Split	<p>If a large amount of logging data is being collected, the data can be split into multiple files by collection time or file size.</p> <p>To enable file splitting, select the FileSplit Enable check box and then select Time and enter a value in hours or select Size and enter a value in MB.</p>

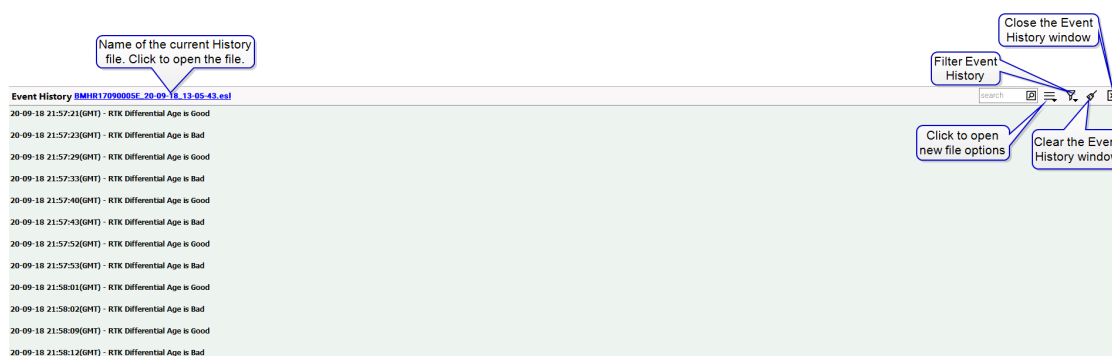
3. Click the **Save** button.

Chapter 11 Event History Window

The *Event History* window is used to track and display any changes of the receiver statuses present in the "Advanced Status Tile" on page 35. Events occurring since the connection was established are captured.



To open the *Event History* window, click



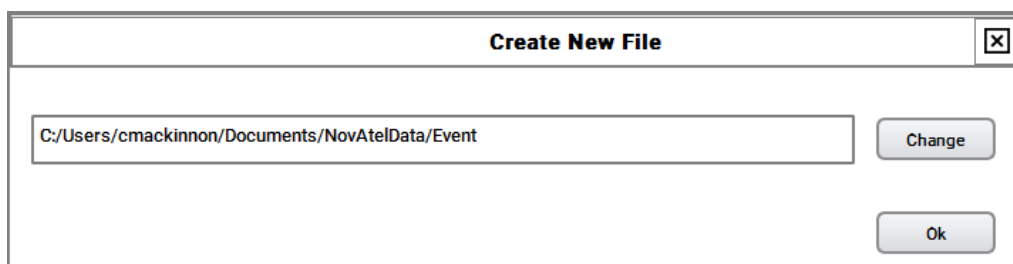
Events record when a monitored status changes state. Bad status events are highlighted. All the events are continuously logged to file. The file name is displayed in the header of the *Event History* window. Clicking on the file name opens the file. Events with a particular word or sentence can be searched by entering key words in the search box in the upper right corner of the *Event History* window.

Refer to "Tools Buttons" on page 24 to resize the *Event History* window.

11.1 New Event History File

A new file to write events to can be created.

1. Click the  button and select **New File** from the drop menu.

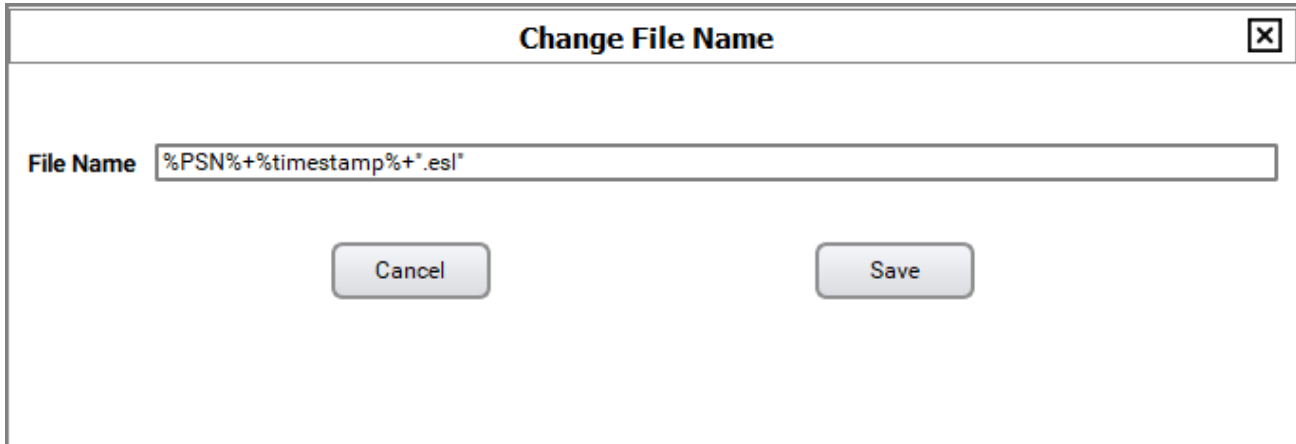


2. Click the **Change** button, enter a name and, if needed, define a new location for the file (defaults to "Computer", My Documents, NovAtelData, Event folder).
3. Click the **Ok** button.

Events will begin to be written to the new file.


An Event History file name can be changed at any time.

1. Click the  button and select **Change file name** from the drop menu.


A screenshot of a 'Change File Name' dialog box. The title bar at the top says 'Change File Name' with a close button (X) on the right. Inside the dialog, there is a label 'File Name' followed by a text input field containing the text '%PSN%+%timestamp%+.esl'. Below the text field, there are two buttons: 'Cancel' on the left and 'Save' on the right.

2. Enter the file name in the **File Name** text box and click the **Save** button.

11.1.1 Clear Event History

The event list can be cleared by clicking on the  button. A new file is opened for writing after clearing the *Event History* window.

11.2 Filter the Display Event History

To filter the statuses to be displayed, click the  button and select the status types to be displayed.

- All
- Good Status
- Warnings Status (currently no warnings are captured)
- Error Status

A check mark beside the status indicates that status will be displayed.

Chapter 12 Firmware Update

The *Update* window is used to load new firmware onto the receiver. Click the **Firmware Update** button to open the *Update* window.

Update [X]

Firmware | Web UI Content

Receiver Model	Product Serial Number	Firmware Version
FFNRNNCBES1	BMHR17090005E	OM7CR0301AN0012

Select New Firmware File

[Text Input Field]

CHOOSE FILE

Auth Code(Optional)

[Text Input Field]

UPLOAD

12.1 Update Firmware

To update the firmware on the receiver:

1. Obtain the new firmware file.

The latest version of receiver firmware is available on the NovAtel website (www.novatel.com/support).



Copy the firmware file to your computer's local drive before uploading the firmware to the receiver.

2. Click the **CHOOSE FILE** button.

The *Select Firmware File* dialog box displays.

3. Navigate to the directory that contains the new firmware file and select the file.
4. If an Auth Code is required, enter the Auth Code in the **Auth Code** text box.
5. Click the **UPLOAD** button.

12.2 Update the Auth Code

An Auth Code is used to enable purchased features on the receiver. Contact NovAtel Sales (www.novatel.com/where-to-buy/sales-offices) or your local NovAtel dealer (www.novatel.com/where-to-buy/dealers) for assistance in selecting and obtaining the features that best suit your GNSS needs.

If the feature being enabled requires a firmware upgrade, refer to *Update Firmware* on the previous page.

If the feature being enabled does not need a firmware upgrade:

1. Obtain the new Auth Code from NovAtel Sales or your local NovAtel dealer.
2. Enter the Auth Code in the **Auth Code** text box.
3. Click the **Upload** button.

12.3 Update the Web UI Content



This section applies only to receivers that support the Web UI (such as the PwrPak7 or Ethernet capable OEM7 receivers).

To update the Web UI on the receiver:

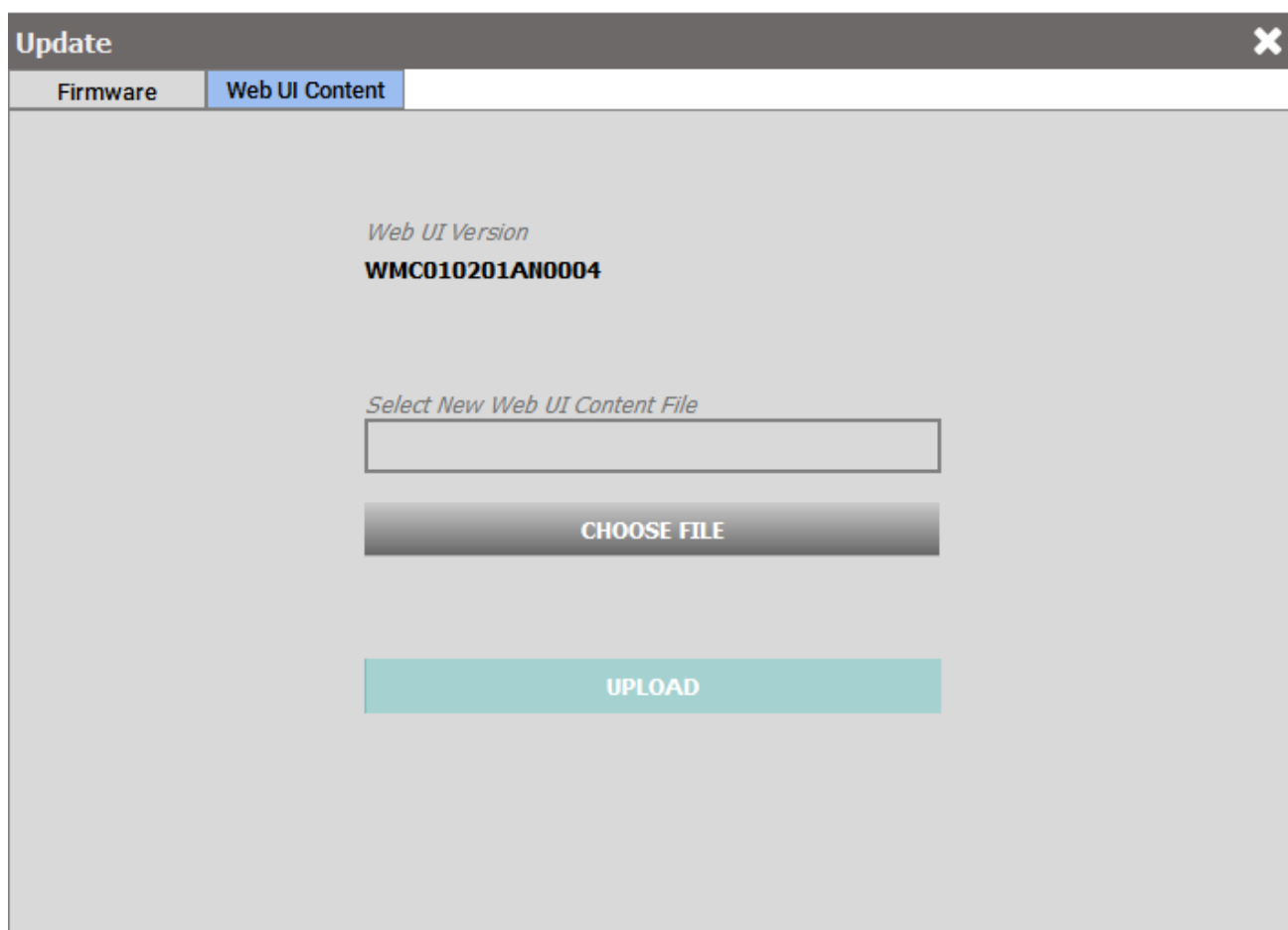
1. Obtain the new Web UI file.

The latest version of Web UI content is available on the NovAtel website (www.novatel.com/support).



Copy the Web UI file to your computer's local drive before uploading.

2. Click the **Web UI Content** tab.



3. Click the **CHOOSE FILE** button.
The *Select Web UI Content* file dialog box displays.
4. Navigate to the directory that contains the new Web UI file and select the file.
5. Click the **UPLOAD** button.

