Importing GNSS Data

TRIMBLE BUSINESS CENTER TUTORIAL

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About this tutorial

In this tutorial, you will import control and static GNSS data into a new project, merge points, and download reference and precise orbit data. You will also import a georeferenced image into the project.

Note: If you need additional help at any time you are using the software, press **F1** to display the online help.

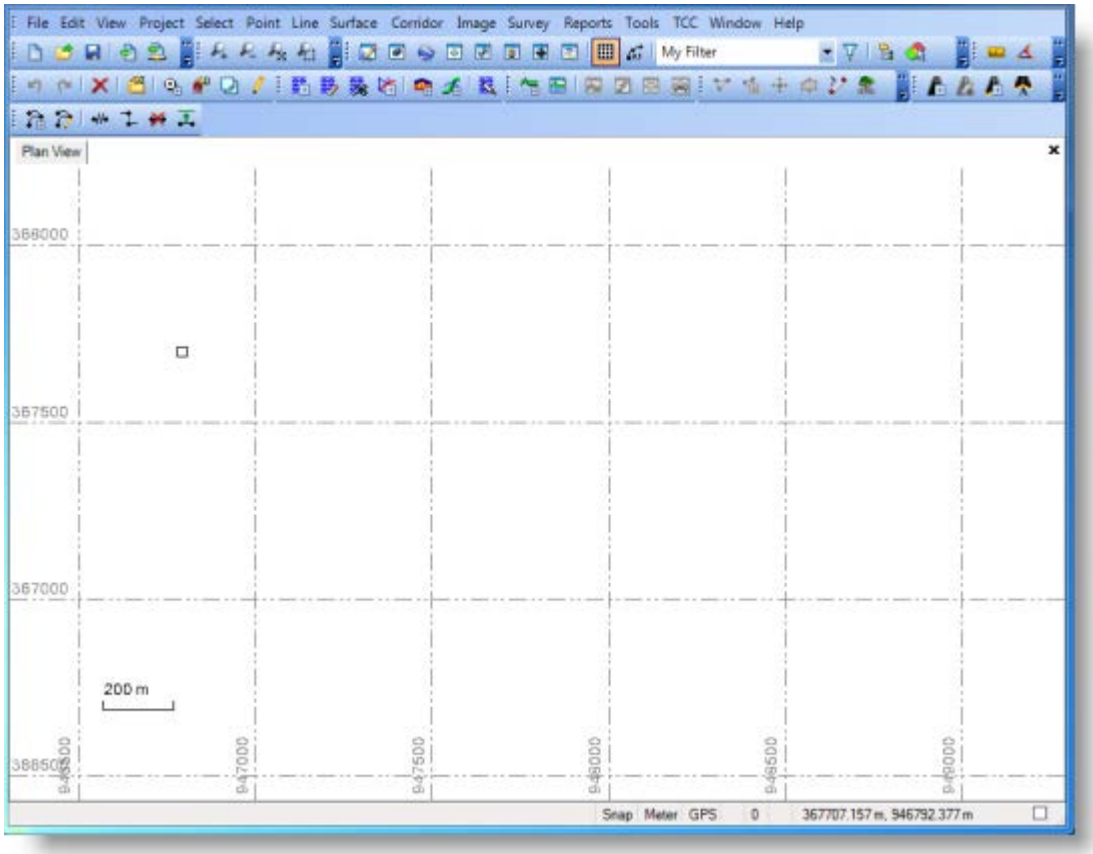
Step 1. Open the project

For this tutorial, you will use the project file *Importing GNSS Data.vce*. Project settings have been specified, but no data has been imported into the project.

1. On the **Trimble Business Center** menu bar, select **File > Open Project**. Or, click the **Open Project** icon on the toolbar.
2. In the **Open File** dialog, browse to ***C:\Trimble Tutorials\TBC\Projects\Importing GNSS Data.vce*** and click **Open**.

   If you installed the tutorial to a location other than the default location shown here, browse to that location.

The project opens in the **Trimble Business Center** window. Since no data has been imported into the project, the **Plan View** is empty.



Note: This figure shows the **Plan View** with a white background. Your background may be black. If you want to change it to white, select **Tools > Options** and select **Background color: White** in the **Options** dialog.

The project file is read-only. You can perform the tutorial steps without saving the project file. However, if you are interrupted while performing the tutorial, you can save it by selecting **File > Save Project As** and saving it to ***..\My Documents\Trimble Business Center***, which is the typical location for storing project files on your computer. Then, you can re-open the project to continue the tutorial at a later time.

You are now ready to import GNSS control data into your project.

Step 2. Import GNSS control data

1. Select **File > Import.** Or, click the **Import** icon on the toolbar.

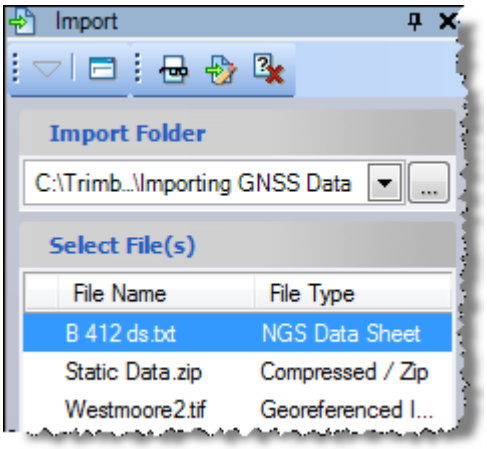
   The **Import** pane opens in the right side of the **Trimble Business Center** window.

2. In the **Import** pane, click the **Browse** button .

3. In the **Browse For Folder** dialog, browse to ***C:\Trimble Tutorials\TBC\Data\Importing GNSS Data*** and click **OK**.

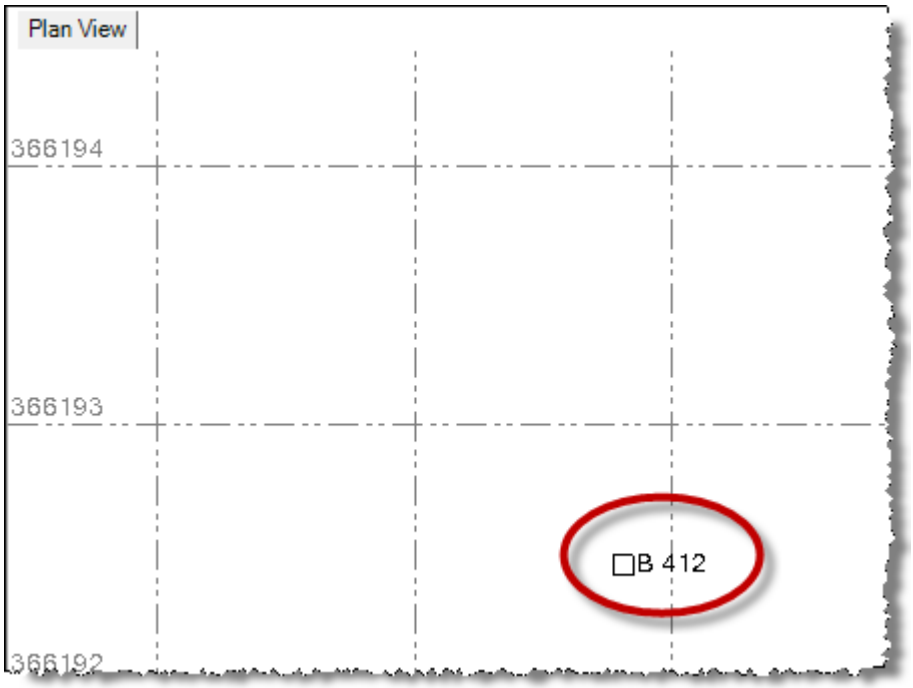
The *Importing GNSS Data* folder contains the NGS Data Sheet file that will be used in this project. It was previously downloaded from the NGS website at http://www.ngs.noaa.gov/cgi-bin/datasheet.prl. Access to this site is available using the **File > Internet Download** menu option.

The content of the *Importing GNSS Data* folder displays in the **Select File(s)** list in the **Import** pane.



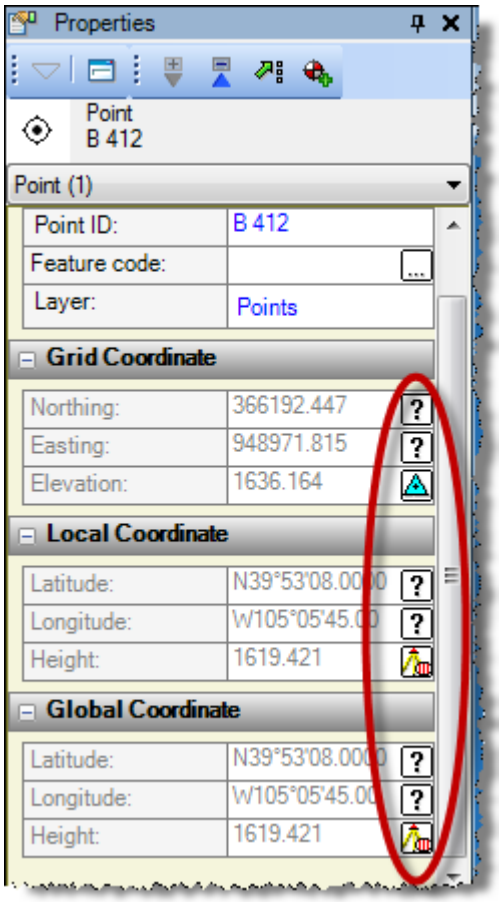
4. In the **Select File(s)** list, select *B 412 ds.txt* and click the **Import** button.

   The selected file is imported into your project and the computed point is displayed on the **Plan View**.



5. Click point *B 412* in the **Plan View** to select it. Then right-click and select **Properties** to display the **Properties** pane for the selected point.

In the **Properties** pane, you can see that the horizontal values are set to *Unknown Control* quality ; the heights are set to *Survey Grade* quality (geoid derived) ; the elevation is set to *Control* quality .

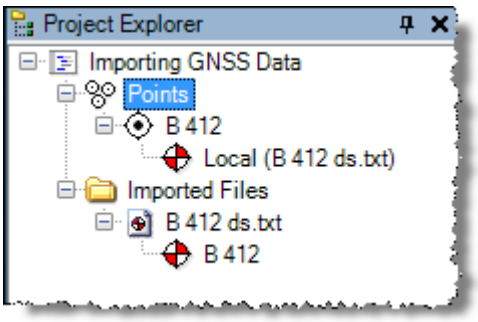


6. Select **View > Project Explorer**. Or, click the **Project Explorer** icon on the toolbar.

   The **Project Explorer** pane displays.

7. In the **Project Explorer** pane, right-click the **Points** icon and select **Expand** in the context menu. Then right-click the **Imported Files** icon and select **Expand**.

   You can now view the newly imported file and the resulting point.



You are ready to import GNSS static data into your project.

Step 3. Import GNSS static data

1. Select **File > Import.** Or, click the **Import** icon on the toolbar.

   The **Import** pane opens in the right side of the **Trimble Business Center** window.

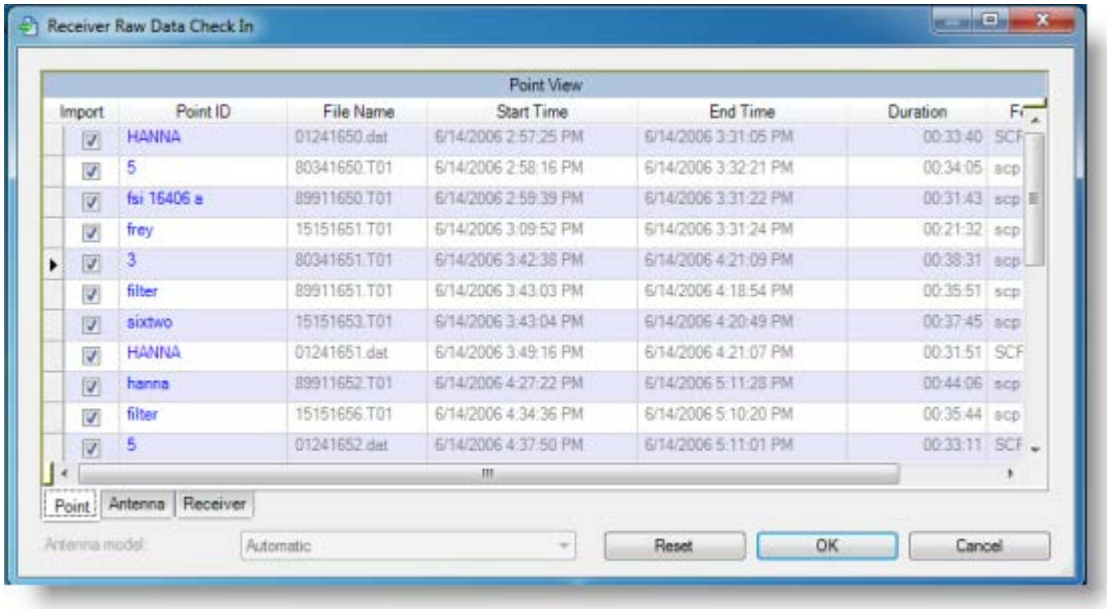
2. In the **Import** pane, click the **Browse** button .

3. In the **Browse for Folder** dialog, browse to ***C:\Trimble Tutorials\TBC\Data\Importing GNSS Data*** and click **OK**.

   The GPS data file (ZIP format) contained in the *Importing GNSS Data* folder is displayed in the **Select File(s**) list in the **Import** pane.

4. Select *Static Data.zip* in the **Select File(s)** list and click the **Import** button.

   The **Receiver Raw Data Check In** dialog displays.



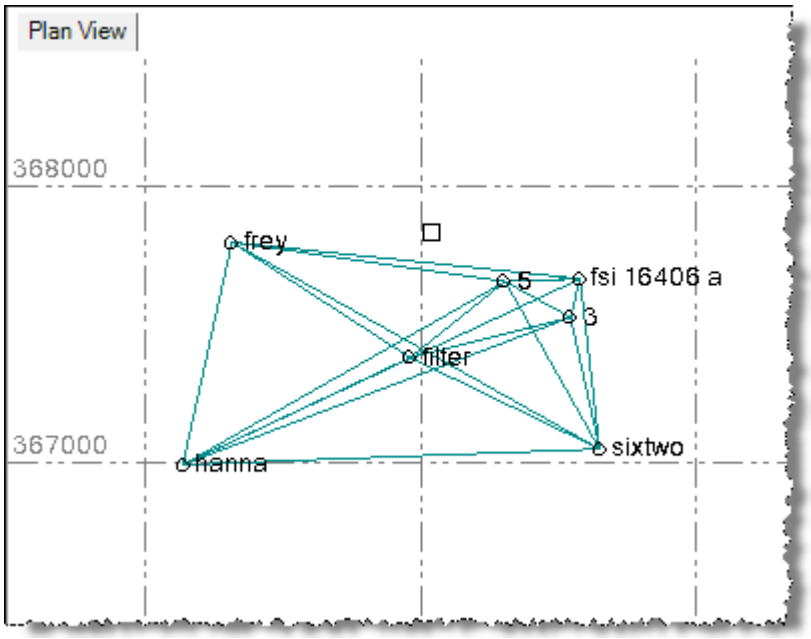
   You can select any of the tabs in the lower-left corner of the dialog to verify information is correct, and make changes as necessary. For example, you could correct a point ID or feature code on the **Point** tab; or, change the antenna height or measurement method on the **Antenna** tab.

   For instructions on editing antenna types, measurement methods, and measured values, press **F1** to display the "Check-In Raw GNSS Data" online Help topic. In step 7 of the topic, click the **Editing Multiple antenna heights** link.

   For this tutorial, this information is correct and does not require changes.

5. In the **Receiver Raw Data Check In** dialog, click **OK**.

The GNSS static data is imported into your project and displayed on the **Plan View**.



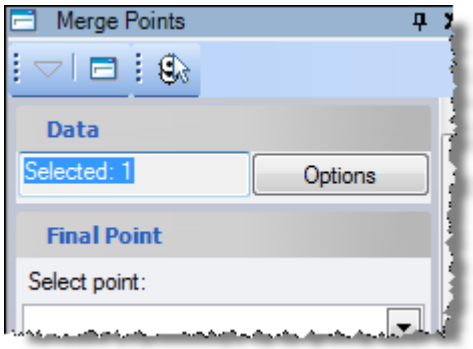
For this project, you will need to merge some points, as explained in the next procedure.

Step 4. Merge points

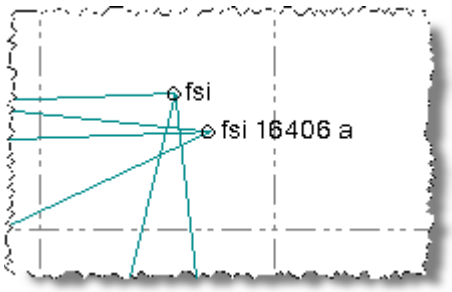
The points *fsi 16406 a* and *fsi* have been imported with slightly different name variations. Therefore, the points must be merged.

1. Select **Point > Merge Points**.

   The **Merge Point** pane displays.



2. Because *fsi* is located close to *fsi 16406 a*, click the **Zoom In** icon on the toolbar to enlarge the display on the **Plan View** to see both points. Or, position the cursor on the **Plan View** and use the mouse wheel to zoom in.



3. In the **Merge Points** pane, click in the **Data** field and then select *fsi* and *fsi 16406 a* on the **Plan View** by drawing a box around them.

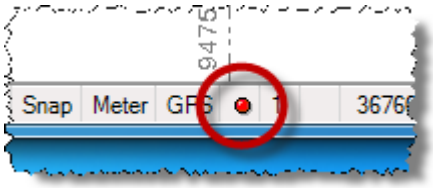
   fsi and *fsi 16406 a* are displayed in the **Selected Points** list.

4. In the **Final Point** area, ensure *fsi* is selected in the **Select point** drop-down list.
5. In the **Selected Points** list, ensure both the *fsi 16406 a* and *fsi* checkboxes are selected.
6. Click the **OK** button.
7. In the **Project Explorer** pane, click the + symbol preceding the **Points** icon to expand the points list. Note how the points have been merged.

   fsi and *fsi 16406 a* before merge:

   fsi after merge:

   Since you have merged points, the red **Compute Project Needed** indicator (located at the bottom of the **Trimble Business Center** window) is lit to indicate you must re-compute the project.



8. Click the red **Compute Project Needed** indicator or press **F4** to re-compute the project.

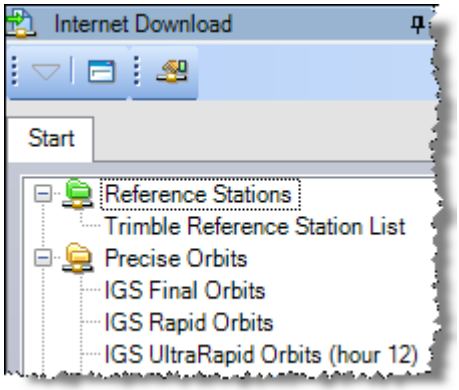
You are now ready to download data for reference stations.

Step 5. Download reference station data

In this procedure, you will use the **Internet Download** command to download reference station data from a local CORS site.

1. Select **File > Internet Download**. Or, click the **Internet Download** icon on the toolbar.

   The **Internet Download** pane displays.

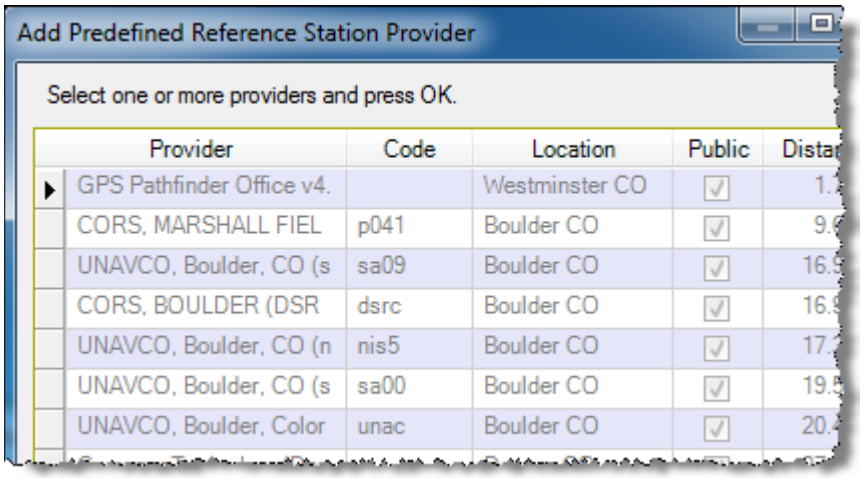


2. Click the **Internet Download Configuration** icon located near the top of the pane.
3. In the **Internet Download Configuration** dialog, click the **New Site** button.

   The **New Site** dialog displays. For this project, you will select from a provider list available from the Trimble website.
4. Select the **Select from a predefined list** option, and ensure the checkbox beneath it is selected. Then click **OK**.

   The **Add Predefined Reference Station Provider** dialog displays showing the current list of reference station data providers from the Trimble website. The providers are listed in sequence, starting with the one that is closest to the center location of the project.

Note that you can click any column heading to sort the rows based on the column.

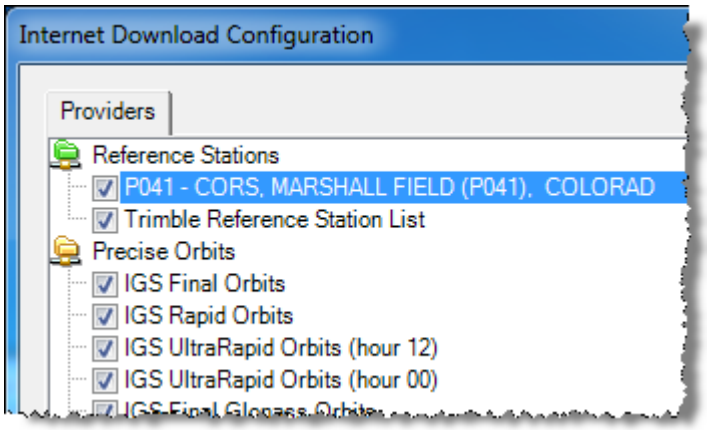


5. In the **Add Predefined Reference Station Provider** dialog, select *CORS, MARSHALL FIELD p041* in the list. Then click **OK.**

   The site properties for this reference station display in the **New Site Properties for Group Reference Stations** dialog. You do not need to make any changes.

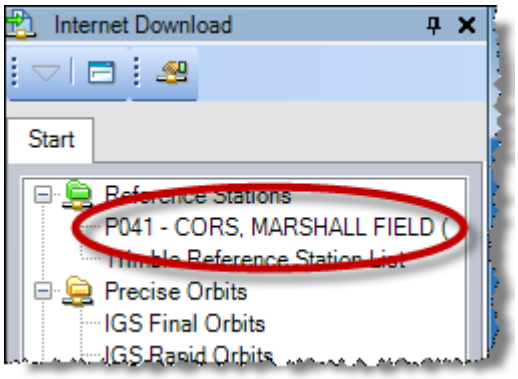
6. Click **OK**.

   The selected provider displays in the **Internet Download Configuration** dialog**.**



7. Click **OK**.

The selected provider displays in the **Internet Download** pane**.**

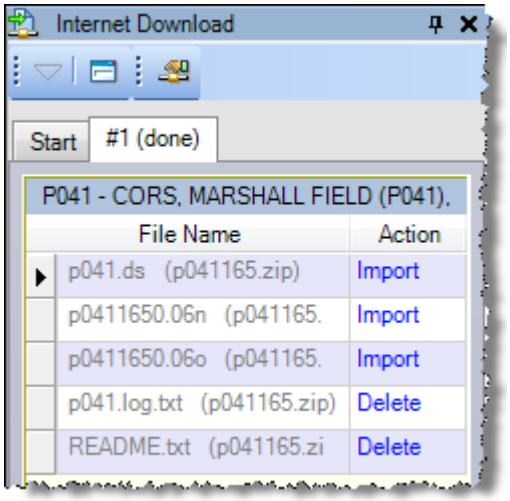


8. Double-click *P041 – CORS, MARSHALL FIELD,* or select the station and click the **Automatic** button at the bottom of the pane.

   The **Download Parameters** dialog displays. If the project included multiple time spans, you could select them in the drop-down list. But, since this project has only one time span, you do not need to make a selection.

9. Click **OK**.

   A new tab **#1** displays in the **Internet Download** pane, showing the files that are being downloaded and the files ready for import. The action associated with each file is predefined and is displayed in the **Action** column. You can change any action by selecting it.



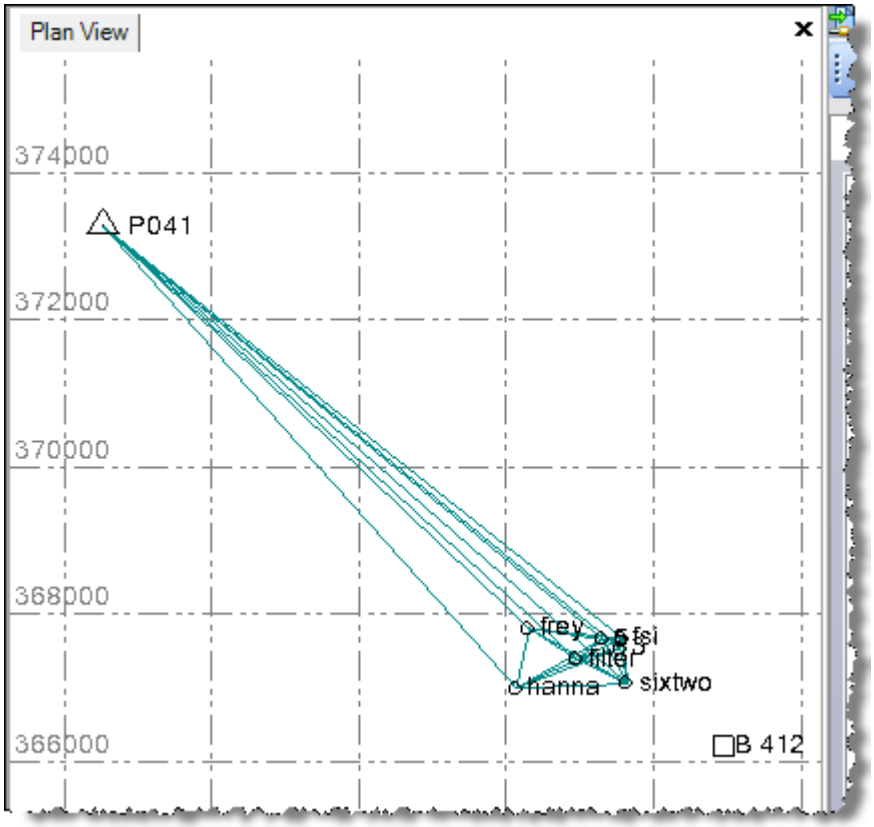
Note: The log and readme text (.txt) files cannot be imported but they can be saved with the project data. To do this, you would change the action from **Delete** to **Save**.

10. Click the **Import** button on tab **#1** to import the time frame.

    The **Receiver Raw Data Check In** dialog displays. Typically, you would review the data on all tabs to ensure it is correct. For this tutorial, everything is correct so there is no need to perform this review.

11. Click **OK**.

The newly imported reference station data is represented in the **Project Explorer** pane and on the **Plan View.**



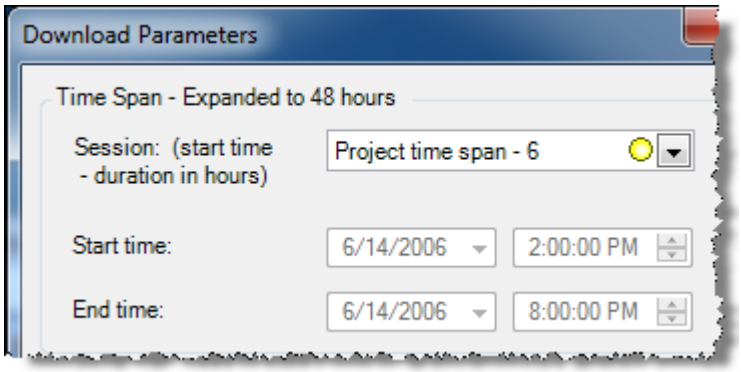
You are now ready to download precise orbit data into your project so that you can process baselines.

Step 6. Download precise orbit data

To process baselines in your project, you can download and import the precise orbits for the timeframe of the GNSS data. Because the data for this project was collected in the past, you can use the final orbit data when you process the baselines.

1. In the **Internet Download** pane, double-click *IGS Final Orbits*.

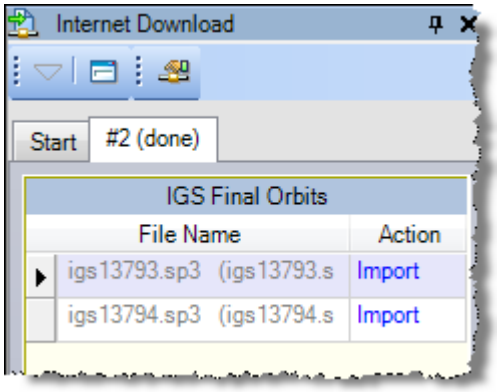
The **Download Parameters** dialog displays.



If the project included multiple time spans, you could select them in the drop-down list. But, since this project has only one time span, you do not need to make a selection.

2. Click **OK**.

   The files are displayed for download on the **#2** tab.



3. Repeat this procedure for *IGS Final Glonass Orbits* on the **Start** tab in the **Internet Download** pane.
4. In the **Internet Download** pane, click the **Import** button on tabs **#2** and **#3** to import each timeframe.

Next, you will import an image that includes georeference data embedded in the image file itself. The image will display in the **Plan View** based on the global coordinates specified in the georeference data.

Note: You can also import an image file that does not include embedded georeference data, but instead uses an associated world georeference data file. The associated file must have the same file name as the georeferenced image, but with a different file extension (for a example, .wld or .ini).

Step 7. Import a georeferenced image

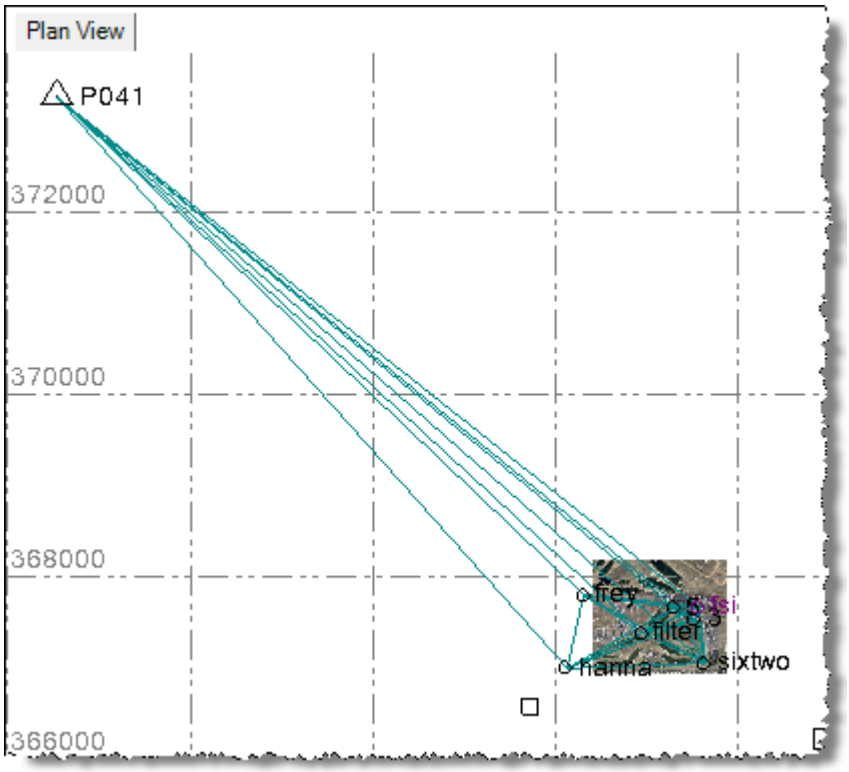
1. Select **File > Import.** Or, click the **Import** icon on the toolbar.

The **Import** pane opens in the right side of the **Trimble Business Center** window.

2. In the **Import** pane, click the **Browse** button .
3. In the **Browse For Folder** dialog, browse to ***C:\Trimble Tutorials\TBC\Data\Importing GNSS Data*** and click **OK**.

   The content of the *Importing GNSS Data* folder displays in the **Select File(s**) list in the **Import** pane.
4. In the **Select File(s**) list, select *Westmoore2.tif* and click **Import**.

   Click **No** in the **Import Errors** message dialog. The photo image displays in the **Plan View**.

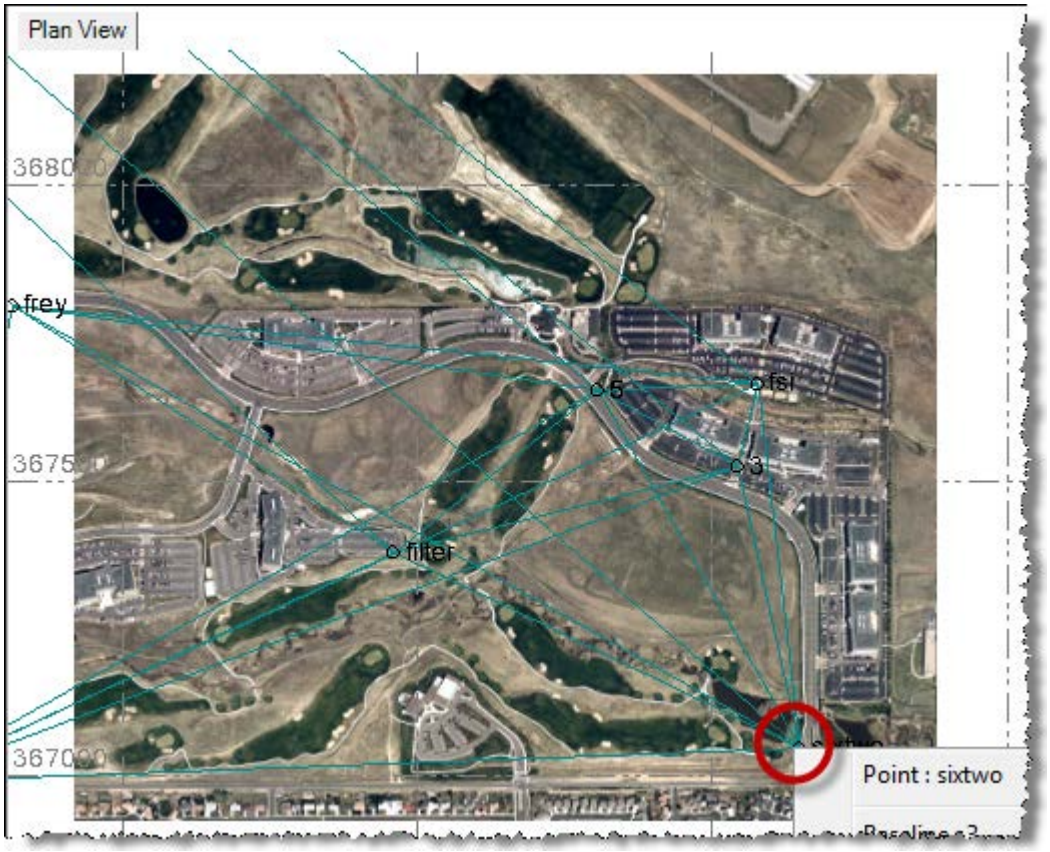


If the image does not display correctly (for example, the image displays as a black box), you may need to change the display resolution for the image to minimize the amount of memory required to display it. Changing to a lower display resolution will degrade the quality of the image, but it will not change its image size in **Plan View**. In many cases, you will not even notice the quality change.

Since *Westmoore2.tif* is a very high resolution image, you can change to a lower resolution without losing appreciable quality. Select **Tools > Options.** In the **Options** dialog, click the **Advanced** button. In the **Advanced Graphics Options** dialog, select the **Down-sampled** option and select **512x512**. Then click **OK** and **OK**.

5. Use your mouse wheel to zoom in on the image as shown here.

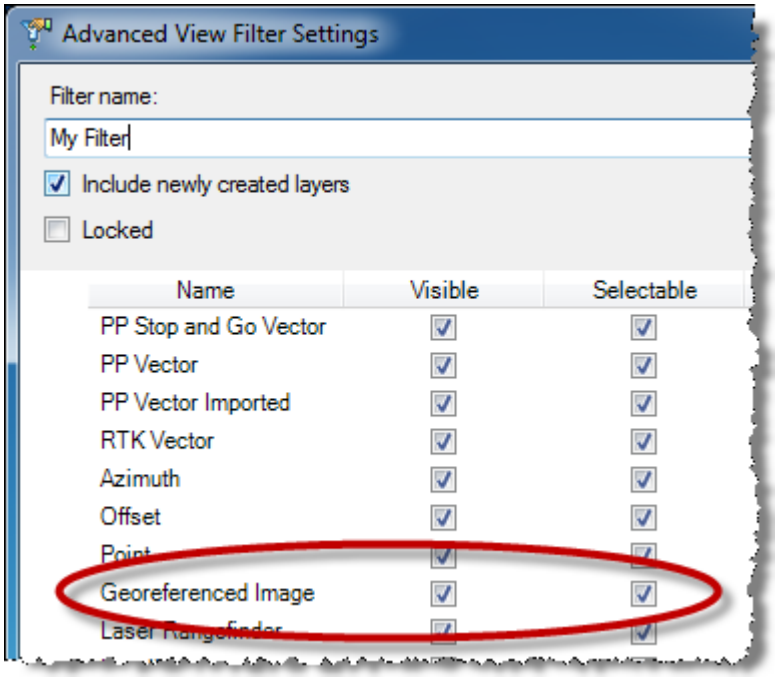
Note that you can select points and baselines, which are now superimposed on the image.



By default, the image itself is not selectable in the **Plan View**.

6. To make the image selectable in the **Plan View**:
   a. Select **View > View Filter Manager**.
   b. In the **View Filter Manager** pane, click the **Advanced View Filter Settings** icon .

c. In the **Advanced View Filter Settings** dialog, select the **Selectable** checkbox for **Georeferenced Image**. Then click **OK**.



7. To view properties for the georeferenced image, click in the upper right corner of the image in the **Plan View** to select it. Then, right-click and select **Properties** in the context menu.

   There are two settings in the **Properties** pane that can be modified:

   - The **View priority** setting allows you to select to move the image forward or backward relative to other images in your project by entering a value of 1 to 5 (1 is the most forward, or visible level; 5 is the most backward, or hidden, level).

     You can also right-click on the image in the **Plan View** and select a menu option to move it forward or backward.

   - The **Visible** setting allows you to display or not display the image in the **Plan View**.

   You are done importing GNSS data into your project.

8. Select **File > Close Project.**

   The **Save Changes** dialog displays. If you saved the project to a new location or with a new name, you can click **Yes**. Otherwise, click **No**.

Now that you have imported GNSS data into your project, you are ready to process GNSS baselines. See the tutorial ***Processing GNSS Baselines*** for instructions.