Importing Total Station Data

TRIMBLE BUSINESS CENTER TUTORIAL

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About this tutorial

In this tutorial, you will import total station data into a project that already contains GNSS and level data. Then you will delete an incorrect setup, change the prism type for an observation, and view the mean angle residuals.

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

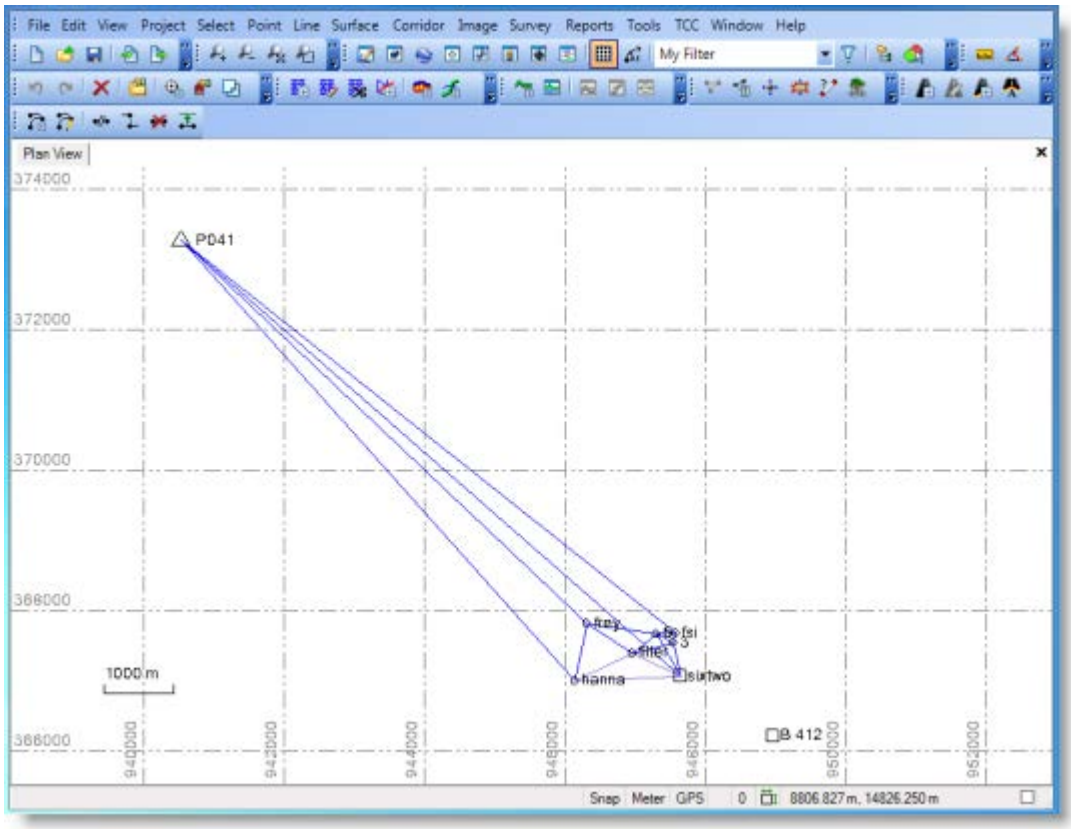
Step 1. Open the project

For this tutorial, you will use the project file *Importing Total Station Data.vce*. GNSS and digital level data has already been imported into the project, and GNSS baselines have been processed.

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 Total Station 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.



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.

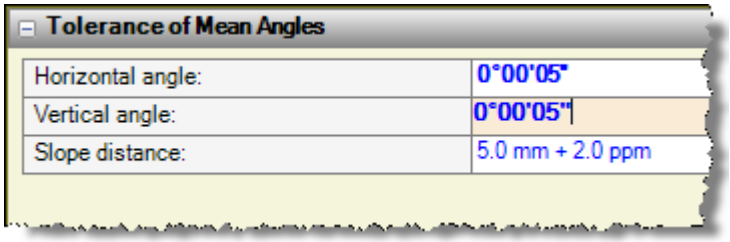
You are now ready to import total station data into your project.

Step 2. Import the total station data

For this tutorial, you will import a data file containing traverse data collected with a total station. However, because of the accuracy of the equipment used to collect data for this survey, you will increase the default tolerance specified for mean angles in your project before you import the data.

1. To increase the default tolerance specified for mean angles, do the following:
   a. Select **Project > Project Settings**.
   b. In the **Project Settings** dialog, select **Computations > Mean Angles** in the navigation pane.

c. In the **Tolerance of Mean Angles** section, enter *0°00'05"* in the **Horizontal angle** and **Vertical angle** fields.



d. Click **OK**.

You are now ready to import data.

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

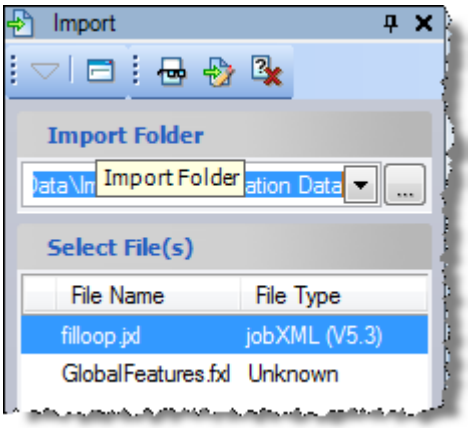
   The **Import** pane displays in the right side of the **Trimble Business Center** window.

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

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

   The *Importing Total Station Data* folder contains the JXL data file that will be used in this project.

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



5. In the **Select File(s)** list, select *filloop.jxl* and click the **Import** button.

   Since the software detects a difference between the coordinate system specified in the project and the coordinate system specified in the imported file, the **Project Coordinate System** message dialog displays.

6. In the **Project Coordinate System** message dialog, click the **Details** button.

   The *Coordinate System Comparison Report* displays in a browser window where project values and imported values are shown side-by-side. Differences are highlighted. For this tutorial, you will use the project values.

7. Close the report and select the **Keep the existing project definition** option in the **Project Coordinate System** message dialog. Then click **OK**.

An **Import Errors** message dialog displays stating there is a warning associated with the import and asking if you want to review the *Import Summary*.

8. In the **Import Errors** dialog, click **Yes**.

   The *Import Summary* opens in your browser window.

9. Scroll to the end of the report where the warning is displayed.

   The warning indicates that a station setup is incomplete. For this survey, the surveyors in the field mistakenly started by using Station Setup Plus for the setup type, which is represented by *filter (S1)*. Instead, they should have started with a Single Backsight and Rounds setup type, which is represented by *filter (S2)*. To resolve this issue, you will delete the first setup.

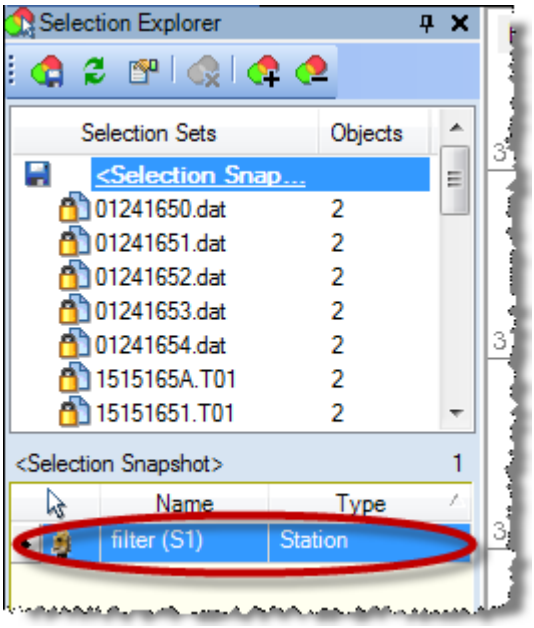
10. To delete the setup, do the following:

    a. Click the warning link in the *Import Summary* report to select the station setup.

    b. In the **Trimble Business Center** window, right-click on the **Plan View** and select **Selection Explorer**.

Note: If you click anywhere else in the window before right-clicking on the **Plan View**, the station setup will no longer be selected. In addition, if you reselect the warning in the report, the setup number will be different than what is shown below.

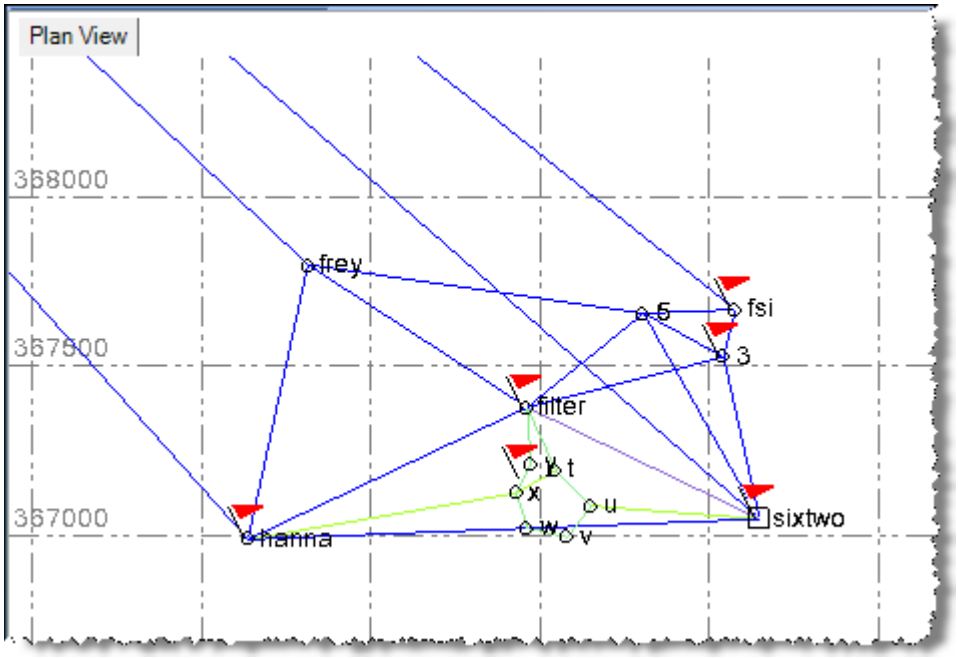
The **Selection Explorer** pane displays. The setup you are deleting is selected in the **Selection Snapshot** list.



    c. Right-click *filter (S1)* in the **Selection Snapshot** list and select **Delete**.

11. Select **Project > Computer Project**, or press **F4** to re-compute the project.

12. Click the **Zoom In** icon on the toolbar to enlarge the display on the **Plan View** as shown here. Or, click on the **Plan View** and use your mouse wheel to zoom in. Press the mouse wheel and move the mouse to center the points.

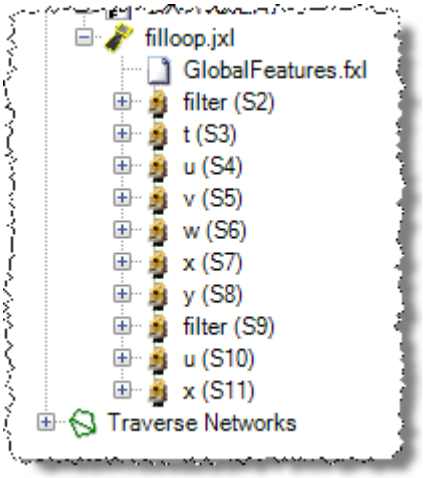


With the view enlarged, you can more easily see the newly imported data.

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

14. In the **Project Explorer** pane, click the plus symbol preceding the **Imported Files** icon. Then click the plus sign preceding the newly imported *filloop.jxl* file to view the imported data.

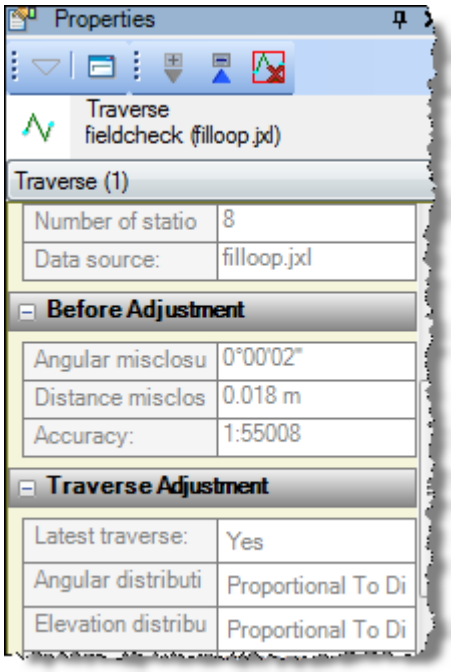
    The **Traverse Networks** node indicates the surveyor completed a traverse adjustment in Survey Controller.



Step 3. View properties for a traverse adjustment

1. In the **Project Explorer** pane, right-click **Traverse Networks >** *fieldcheck (filloop.jxl)* and select **Properties**.

   The **Properties** pane displays pre-adjustment and adjusted misclosure and accuracy values, along with error distribution methods, starting/ending/intermediate points, and the adjustment type. It also shows whether this adjustment is the latest adjustment made to these point coordinates.



   Since an adjustment can be made multiple times with Trimble Access/Survey Controller software, only one adjustment is used in the solution of these points. There can be multiple traverses in a job file that adjust other points.

   The points that are adjusted by a traverse adjustment are in a "fixed" state. They will not be re-computed by a change to the coordinates of the starting or ending points unless you perform a least-squares network adjustment (select **Survey > Adjust Network**).

   To view this state, you will take a look at the *Point Derivations Report* for point *w*. This point is of interest because you know that the surveyors in the field entered the incorrect prism type for observations used to determine this point.

2. To view the *Point Derivations Report,* do the following:

   a. Select the **Zoom In** icon on the toolbar or use the mouse wheel to zoom in on point *w* in the **Plan View**.

   b. Click point *w* and select *Point w* in the list.

   c. Right-click in the **Plan View** and select **Point Derivations Report** in the list.

The report displays in a browser window. You can see that the **Used to calc.** indicators are on the **Traverse Adjusted** line of the report. You can also see the large differences between the point and the mean angle *w-x-w (M11)*. This is the mean angle for which the prism type was incorrectly entered in the field. You will correct this mistake in the next step.

Data	Used to calc.	Status	ΔNorth (Meter)	ΔEast (Meter)
Traverse Adjusted (filloop.jxl)	NEeh	Enabled	0.000 m	0.000 m
u-v-w (M8)		Enabled	-0.001 m	-0.001 m
w-x-w (M11)		Enabled	-0.020 m	0.006 m

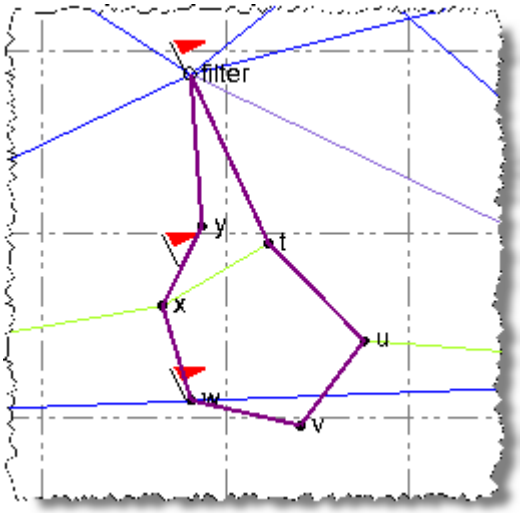
Step 4. Correct a prism type error made in the field

Because the surveyors in the field entered the incorrect prism type for observations within the mean angle *w-x-w (M11)*, you must correct the error before proceeding. This error was also included in the traverse adjustment made in the field software. Because correcting this error will nullify the results of the traverse adjustment, you will go ahead and clear the traverse adjustment results before correcting the prism type.

Note: Although the software does not support the performance of a traverse adjustment within the project (it can only import traverse adjustment results from Survey Controller or Trimble Access), it does support a least-squares network adjustment (see the ***Adjusting the Network*** tutorial). If this was a standalone job and you were basing the project on the traverse adjusted coordinates, you would need to correct the prism type and readjust the traverse in the field software. Then, you could re-import the file into your project.

1. In the **Project Explorer** pane, right-click **Traverse Networks >** *fieldcheck (filloop.jxl)* and select **Clear Traverse Adjustment Results**.

   An error flag now displays on point *w* in the **Plan View** indicating the point exceeds tolerances specified for points in the project.

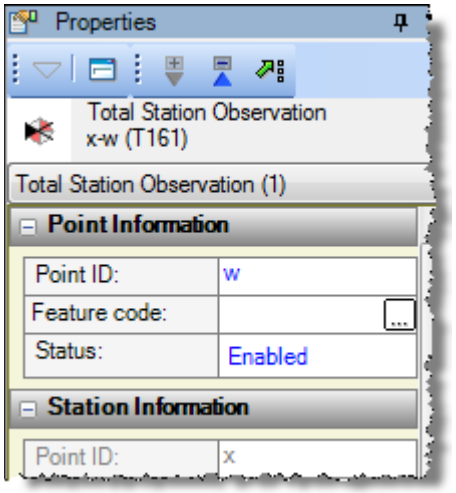


2. Select point *w* in the **Plan View** and select *Point: w* in the list. Then right-click and select **Point Derivations Report.**

   The traverse adjusted values are no longer displayed in the report. The mean angle *w-x-w (M11)* is displayed with red text indicating the point exceeds tolerances you specified for mean angles earlier in the tutorial. With the traverse adjustment results cleared, you are now ready to fix the incorrect prism type.

3. In the **Project Explorer**, expand **Imported Files >** *filloop.jxl* > *x (S7)* > *Rounds* > *Set 1*. Then right-click *x-w (T161)* and select **Properties** in the context menu.

   The properties for the observation are displayed in the **Properties** pane.



   Note that you could have selected any of the observations within the mean angle *w-x-w (M11)* since you will be prompted to change them all.

4. In the **Properties** pane, select *Large 63.5mm tiltable* in the **Prism type** drop-down list in the **Target Information** section.

5. When the message displays asking if you want to extend the prism change to all other observations within this mean angle, click **Yes.**

   The prism change is made to all observation within the mean angle. You must now re-compute the project.

6. Select **Project > Compute Project** or press **F4** to re-compute the project.

   A flag is no longer displayed for point *w* in the **Plan View**.

7. Open another *Point Derivations Report* for point *w* and review the changes.

You are now ready to view residuals for a mean angle in the project.

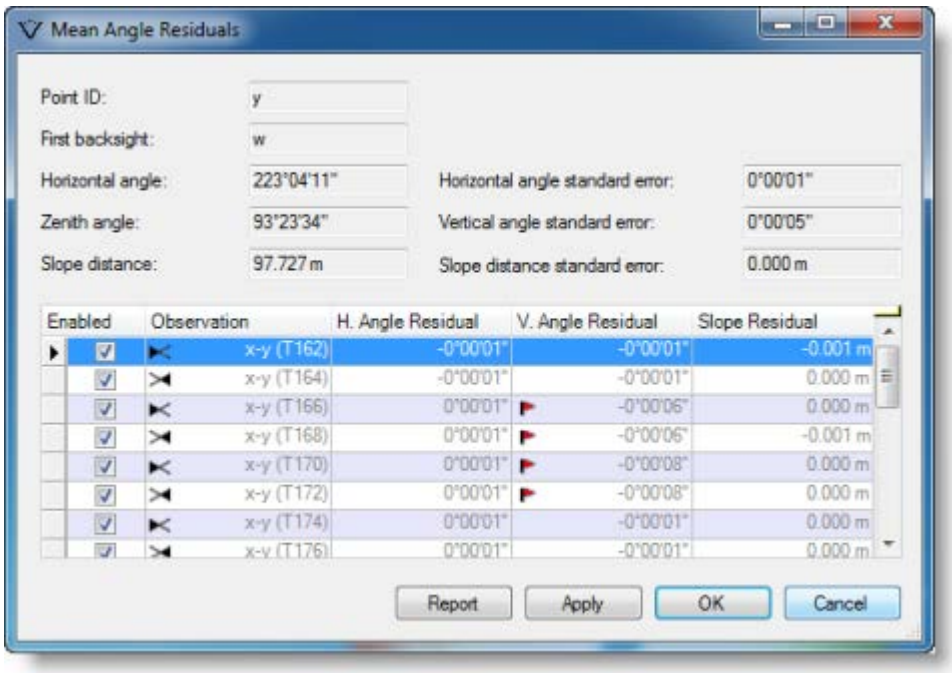
Step 5. View mean angle residuals

A mean angle represents the combining and averaging of redundant observations to the same point. You can view residuals for any mean angle and, if you want, disable any outlying observations.

For this tutorial, you will view residuals for the mean angle *w-x-y (M12).* This mean angle is flagged in the **Plan View** because there are observations within it that exceed tolerances you set for mean angles earlier in this tutorial.

1. In the **Project Explorer**, expand *filloop.jxl* > *x (S7)* > *Rounds.* Then, right-click *w-x-y (M12)* and select **Mean Angle Residuals** in the context menu.

   The **Mean Angle Residuals** dialog displays.



   Flags are displayed for four observations within the mean angle. You will disable the observations with the largest residuals first to see if this corrects the other flagged observations.

2. Deselect the checkbox for observation *x-y (T170)*.

   Note that as you enable or disable observations, the means and residuals are re-calculated so you can immediately see the effects of the change. However, these changes are temporary and do not apply to the project until you click **OK.**

   You can **c**lick the **Report** button to view the *Mean Angle Report*, which provides additional information about each observation.

3. In the **Change Observation Status** dialog, click **Yes** to apply the same change to *x-y (T172)*.

   Note that flags still display for *x-y (T166)* and *x-y (T168)*, so you will need to disable them as well.

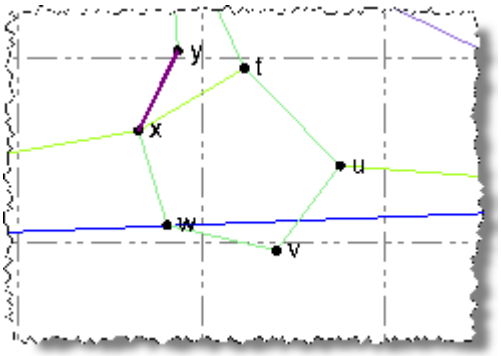
4. Deselect the checkbox for observation *x-y (T168)*.

5. In the **Change Observation Status** dialog, click **Yes** to apply the same change to *x-y (T166)*.

6. Click **OK**.

7. Select **Project > Compute Project** or press **F4** to re-compute the project.

Mean angle *w-x-y (M12)* is no longer flagged in the **Plan View**.



You are done importing total station 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**.