SURVEY PRODUCT: Topcon Link™

TOPCON

Topcon Link™

Topcon Data Compatibility Software

Quick Reference Guide

Topcon Link
Quick Reference Guide

Part Number 7040-0027
Rev B

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Contents

Chapter 1

Introduction

This manual is designed to provide the quickest way to begin using the Topcon Link software.

The manual is organized into three sections, according to the application of Topcon Link for different measuring equipment and applications, specifically:

- Total Stations
- TPS Receivers
- TopSURV

More detailed information about Topcon Link can be found in the *Topcon Link Reference Manual*.

Notes:

Total Stations

This chapter describes using Topcon Link with a Total Station.

Examples used here are for the following surveying scheme (Figure 2-1):

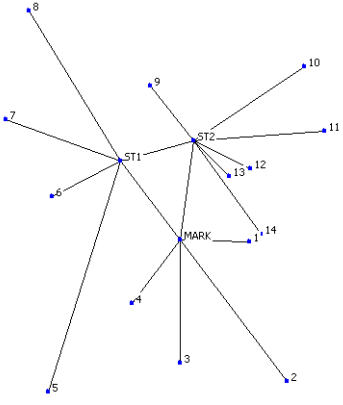


Fig 2-1. Surveying Scheme Used

Creating Coordinate Files

1. Use a text editor (e.g., Microsoft Notepad) to create a coordinate file for export to a Total Station (Figure 2-2).
2. Use the format Name of Point, Northing, Easting, Height when entering data to make the file compatible with Topcon Link (Figure 2-2).

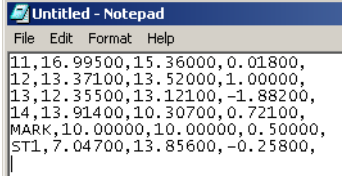


Fig 2-2. Coordinate File

3. Save the file as Control_data1.csv.

Preparing a Control Data File

1. Open Topcon Link, then click **File->Open File** or the **Open** icon on the toolbar (Figure 2-3).

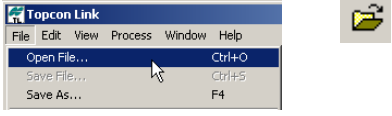


Fig 2-3. Open File

2. On the Open dialog box, select the Format name as Name,N,E,Z,Code (*.csv) from the Coordinate File collapsible list, then select the Control_data1.csv file and click **Open** (Figure 2-4).

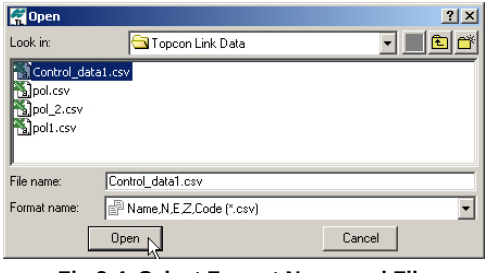


Fig 2-4. Select Format Name and File

The file opens in Topcon Link (Figure 2-5).

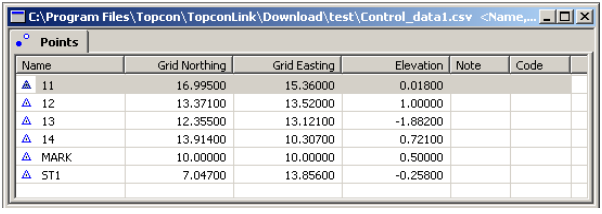


Fig 2-5. File Display in Topcon Link

Editing Points

1. Right-click within a point's data area to display a pop-up menu (Figure 2-6).

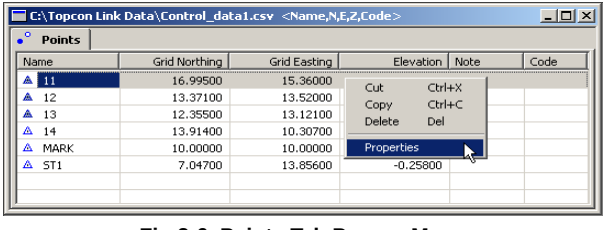


Fig 2-6. Points Tab Pop-up Menu

2. Click **Properties** to display the properties dialog box (Figure 2-7).

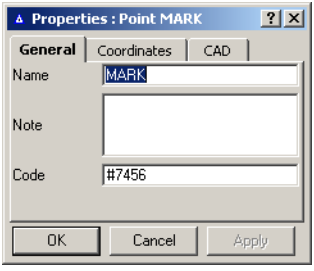


Fig 2-7. Point Properties Dialog Box

Use this dialog box to edit a point's Name and Notes, Coordinates, or CAD files.

Renaming Points

To rename a point, do one of the following:

- Click, pause, click a point's name and type a new name, then press **Enter**.
- Use the "Editing Points" on page 6 procedure to display the Points Properties dialog box (Figure 2-7).

Cutting, Copying, Deleting Points

Right-click within a point's data area, or press Shift and click several points then right-click, to display a pop-up menu (Figure 2-8).

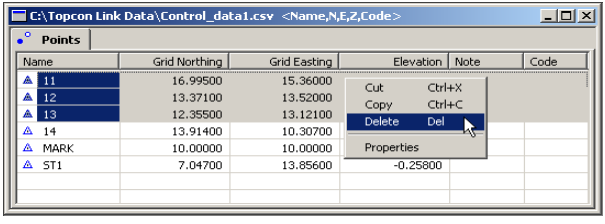


Fig 2-8. Points Tab Pop-up Menu

- Cut – clears the highlighted point(s) without removing them from the file.
- Copy – copies the hightlighted point(s) for pasting somewhere else.
- Delete – removes the highlighted point(s) from the coordinate file (in Figure 2-8, these are points 11, 12, 13).

Saving Files in GTS-7 Format

To save edited coordinate files in the GTS-7 Points file format (Figure 2-9):

1. Click **File->Save As**.
2. On the Save As dialog box, select the GTS-7 Points format from the Format name drop-down list
3. Enter a File name and click **Save**.

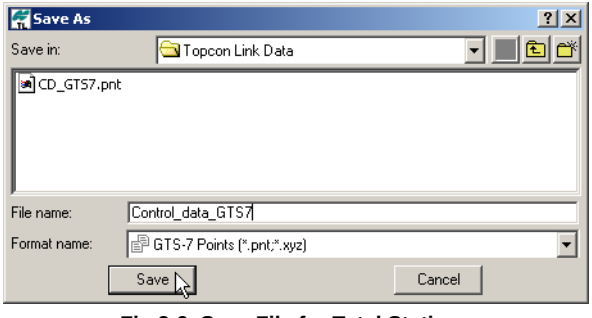


Fig 2-9. Save File for Total Stations

Exporting Control Data Files

1. Click the **Export** icon on the toolbar to display the Export to Device dialog box (Figure 2-10).

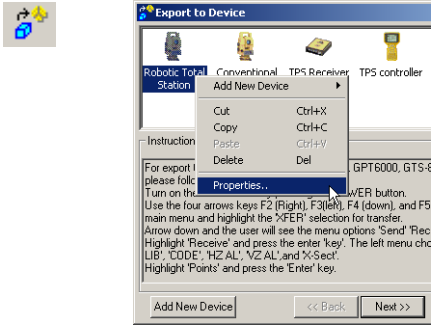


Fig 2-10. Export Icon and Export to Device Dialog Box

2. Right-click the desired Total Station icon (either Robotic Total Station or Conventional Total Station) and click **Properties** on the pop-up menu (Figure 2-10).
3. Using the Properties dialog box and the General and Advanced tabs, set the following information (Figure 2-11 on page 11):

- General tab – select the computer serial port of communication with a Total Station from the Port listbox; specify the model of the Total Station from the Model listbox.
- Advanced tab – select communication parameters identical to those set in the Total Station: Baud Rate, Data Bits, Parity, Stop Bits, and Protocol.

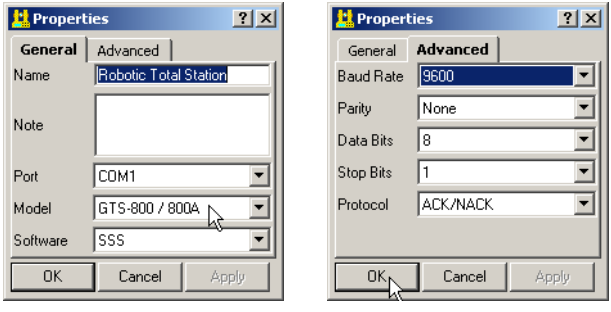


Fig 2-11. Set Total Station Properties

4. When finished, click **OK** to apply the values and close the Properties dialog box.

5. Follow the steps shown in the Instruction field of the Export to Device dialog box, preparing the Total Station to accept the control data file.
6. Click **Next** on the Export to Device window to display the Export to Total Station from dialog box (Figure 2-12).
7. Specify the name of the Control Data file to download and click **Open** (Figure 2-12).

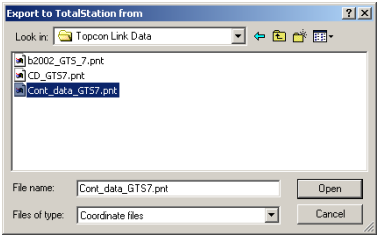


Fig 2-12. Export Control Data File

8. Check that the file downloaded from the computer to the Total Station (refer to the Total Station's operational manual for this information).

Importing Raw Data Files

1. Click the **Import** icon on the toolbar. On the Import from Device dialog box, click the icon of the Total Station type used and click **Next** (Figure 2-13).

Fig 2-13. Select Import From Device

Topcon Link applies the communication parameters defined earlier during the Export to device process.

2. Follow the instructions listed in the Instruction field and click **Next** (Figure 2-13).

3. On the Save file imported from TotalStation to dialog box, specify the folder in which to store the file and the name of the Raw Data file in the File name field.
4. Click **Save**. The content of the Raw Data file displays in Topcon Link's work area.

Viewing and Editing Raw Data Files

For a Raw Data file, the information displays in two tabs: Points and TS Obs.

- The Points tab lists all points and stations in the file.

  –Point icon: 

  –Station icon: 

  The Northing, Easting, Elevation coordinates display only for the points with coordinates measured and computed, and then stored in the raw data file (ST2 station in the example), or were exported to the Total Station from the computer (MARK and ST1 in the example).

- The TS Obs tab has two panels (Figure 2-14):

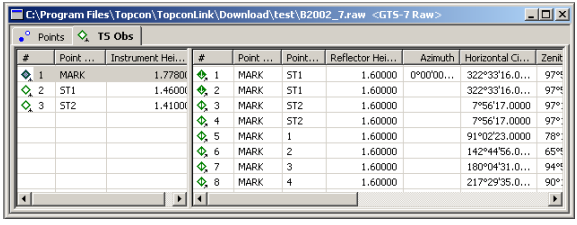


Fig 2-14. TS Obs Tab

–The left panel contains information on the station/points with known positions where the Total Station was placed.

To edit the height of an instrument:

1. Click, pause, click a station's height.
2. Type a new height value (e.g., 1.778m)
3. Press **Enter** on the keyboard.

–The right panel contains information on the points relevant to the station selected in the left panel. These points have unknown positions where the Reflector was placed.

To edit the height of instrument for the Reflector data for multiple points:

1. Highlight multiple points heights using the **Shift** key and clicking the points.
2. Enter the necessary height in one of the highlighted lines.
3. Press **Enter** on the keyboard.

Computing and Adjusting Points Coordinates

By default, Topcon Link obtains coordinates without adjusting them. But it is possible to compute the positions by performing adjustment of points.

1. Click **Process->Process Properties** to display the Process Properties box, select an adjustment type (Least Squares for this example of a network) and click **OK** (Figure 2-15 on page 17).

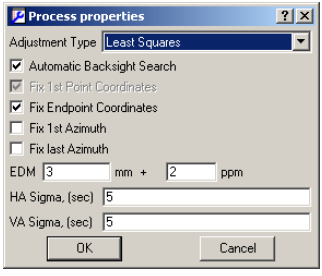
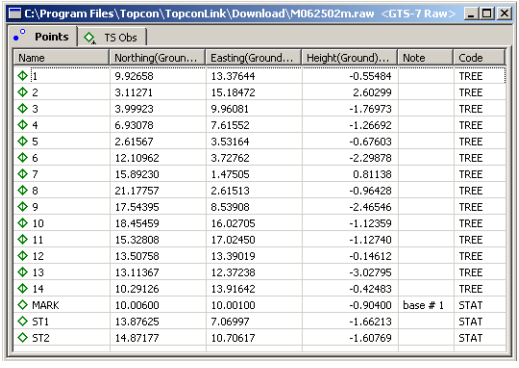


Fig 2-15. Process Properties

2. Click the **Compute coordinates of points** icon on the toolbar (Figure 2-16).

Fig 2-16. Compute Coordinates of Points Icon

The Points tab displays the adjusted coordinates (Figure 2-17 on page 18).



Name	Northing(Groun...	Easting(Ground...	Height(Ground)...	Note	Code
1	9.92658	13.37644	-0.55484		TREE
2	3.11271	15.18472	2.60299		TREE
3	3.99923	9.96081	-1.76973		TREE
4	6.93078	7.61552	-1.26692		TREE
5	2.61567	3.53164	-0.67603		TREE
6	12.10962	3.72762	-2.29878		TREE
7	15.89230	1.47505	0.81138		TREE
8	21.17757	2.61513	-0.96428		TREE
9	17.54395	8.53908	-2.46546		TREE
10	18.45459	16.02705	-1.12359		TREE
11	15.32808	17.02450	-1.12740		TREE
12	13.50758	13.39019	-0.14612		TREE
13	13.11367	12.37238	-3.02795		TREE
14	10.29126	13.91642	-0.42483		TREE
MARK	10.00600	10.00100	-0.90400	base # 1	STAT
ST1	13.87625	7.06997	-1.66213		STAT
ST2	14.87177	10.70617	-1.60769		STAT

Fig 2-17. Adjusted Coordinates

3. Click the **Save** icon on the toolbar to save the coordinates obtained (Figure 2-18).

Fig 2-18. Save Icon

Converting Raw Data Files to GIS Format

1. Click **Convert** on the toolbar to display the Convert File dialog box (Figure 2-19).

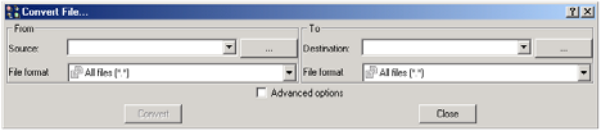


Fig 2-19. Click Convert Icon

2. In the From panel, select the File format of the raw data file (Figure 2-20).

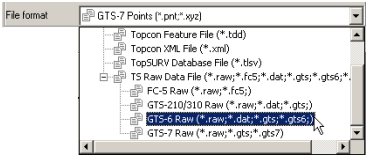


Fig 2-20. Select Raw Data File Format

3. Click the **Browse** (“**...**”) button, select the raw data file using the Open for Convert dialog

box, and click **Open**; the full path of the file displays (Figure 2-21).

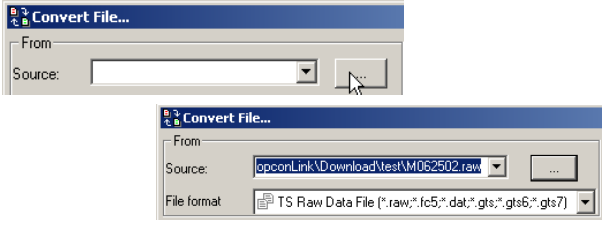


Fig 2-21. Click Browse and Select File

4. In the To panel, press the **Browse** (“**...**”) button.
5. Using the Select a file dialog box, define a folder in which to store the file, select the DXF format and name the file M_GIS. Click **Select**. The full path of the file displays in the Destination field (Figure 2-22).

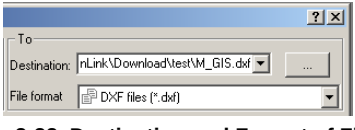


Fig 2-22. Destination and Format of File

6. Click **Advanced options** to display further conversion parameters (Figure 2-23).

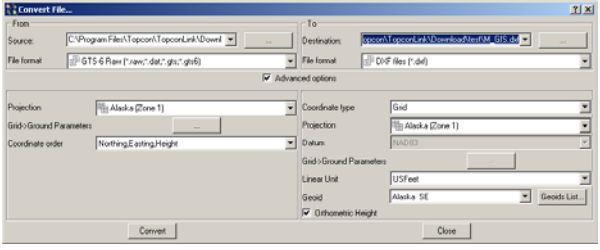


Fig 2-23. Advanced Options

7. In the left panel, enter the parameters used when surveying in the field:
   - Specify the Projection type (Figure 2-24).

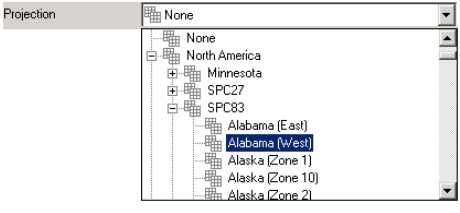


Fig 2-24. Specify Projection

- Click **Grid->Ground Parameters**. Enter the parameters of the relation between the Grid and Ground coordinate types (Figure 2-26). Click **OK**.

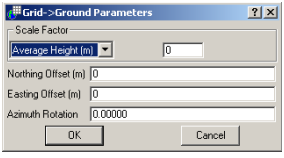


Fig 2-25. Enter Grid->Ground Parameters

- Define the sequence of positions in the Raw Data file (Figure 2-26).

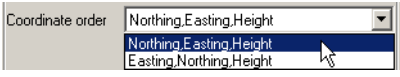


Fig 2-26. Define Coordinate Order

8. In the right panel, enter the parameters required after the conversion:
   - Select the Coordinate type, either Ground, Grid, or Lat,Lon,h.
   - Select either the Projection or Datum type.

- Select the Linear Unit for horizontal and vertical positions; either IFeet, Meters, or USFeet.
- Select the Geoid type (Figure 2-27) (when Orthometric Height is enabled).

  To set up a geoid model, click **Geoid List** and click **Add** in the Geoid List dialog box. In the Open dialog box, select the necessary geoid file and click **Open**.

  NOTE: This version of Topcon Link supports only Geoid 99.

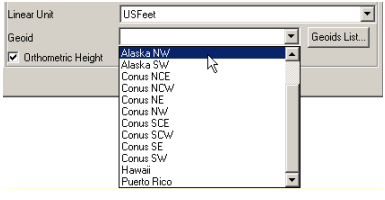


Fig 2-27. Select a Geoid Type

9. Click **Convert** to begin converting the Raw Data file to the GIS format.

Notes:

TPS Receivers

This chapter describes using Topcon Link with a TPS GPS+ receiver.

Downloading TPS Receiver Files

1. Click the **Import** button on the toolbar to import a raw data file from the receiver to the computer; the Import from Device dialog displays (Figure 3-1).

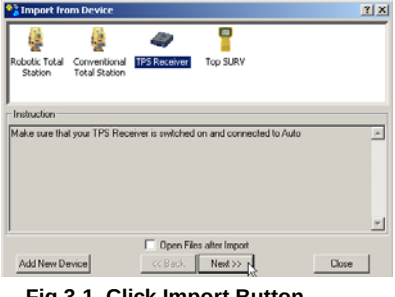


Fig 3-1. Click Import Button

2. Right-click the TPS receiver icon. From the pop-up menu, click **Properties**.
3. Select the computer serial port of communication with the TPS receiver, either Auto, COM1, or COM2, then click **OK** (Figure 3-2).

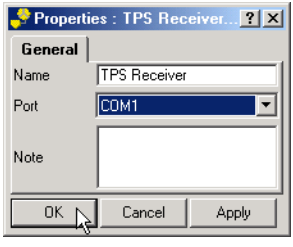


Fig 3-2. Receiver Properties

4. Click **Next** on the Import from Device dialog box. The next window displays Device files and the Topcon Link Download folder (Figure 3-3 on page 27).

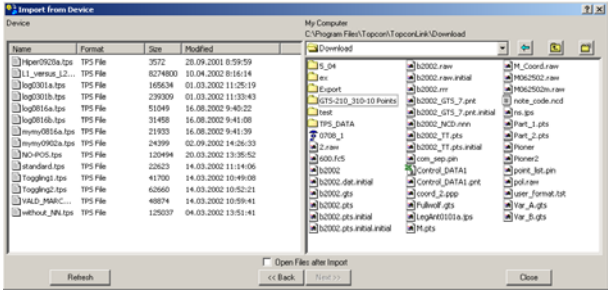


Fig 3-3. Device and System Files

5. In the left panel, press the **Shift** key and highlight the desired files (in Figure 3-4 these are mymy0902.tps, NO_POS.tps, and standard.tps).

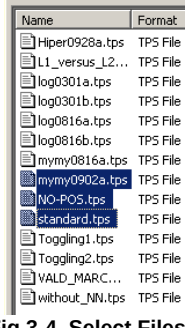


Fig 3-4. Select Files

6. In the right panel, create and name a new folder using the New Folder button. Open the newly created folder.
7. On the Import from Device window, click **Next** to begin downloading the highlighted files into the folder created on the computer.

When downloaded, the TPS files display in the right panel of the Import from Device window.

Converting Raw Data Files to RINEX Format

1. Click the **Convert** icon on the toolbar to display the Convert File dialog box (Figure 3-5).

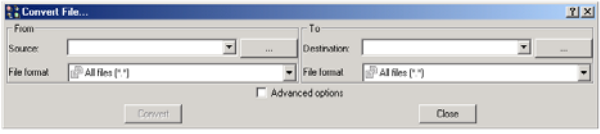


Fig 3-5. Click Convert Icon

2. In the From panel, select the File format of the raw data file (Figure 3-6).

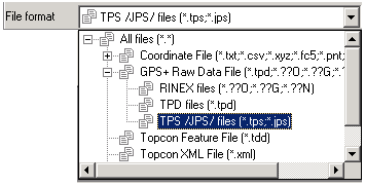


Fig 3-6. Select Raw Data File Format

3. Click the **Browse** (“**...**”) button select the raw data file using the Open for Convert dialog box, and click **Open** (Figure 3-7).

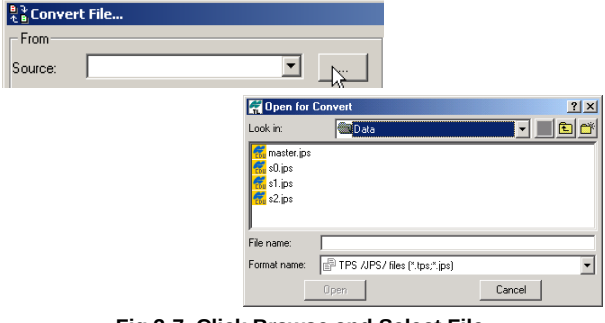


Fig 3-7. Click Browse and Select File

The full path of the file displays in the Source field (Figure 3-8).

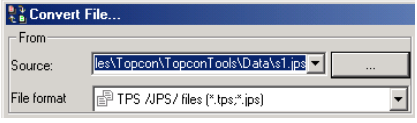


Fig 3-8. Click Browse and Select File

4. In the right panel, press the **Browse** ("**...**") button.
5. In the Select a file dialog box, create a folder in which to store the file, select the RINEX format and enter the name of the file (e.g., standard).

   Click **Select**. The full path of the file displays in the Destination field (Figure 3-9).

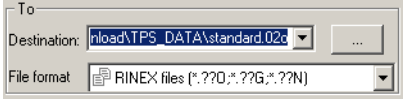


Fig 3-9. Converted File Destination

6. Click **Convert** to begin the conversion of the selected file into RINEX.

TopSURV Files

This chapter describes using Topcon Link with a TPS controller and TopSURV.

Preparing TPS Controller Files for Import

TPS controllers store information in the *.tsv file format. When importing *.tsv files:

- Use only Topcon Link to guarantee against data loss.
- Topcon Link transforms the file to a *.tlsv file that can be read on a computer.

Before importing data from a TPS controller into Topcon Link, install ActiveSync® from Microsoft® onto the computer. This software connects a computer to a device running the Windows CE system. ActiveSync is available for free download from the Microsoft website (http://www.microsoft.com).

To connect the TPS controller and computer for the first time:

1. Connect the serial ports of the two devices with the RS-232 cable. Turn on the TPS controller and computer.
2. Run ActiveSync on the computer (Figure 4-1).

Fig 4-1. ActiveSync

3. Click **Next**. ActiveSync will search the computer ports for a device operated with Windows CE and connected to the computer.

   ActiveSync displays “Connected” if the computer and TPS controller connect successfully (Figure 4-2 on page 33). The

system tray also displays a green circle, indicating a TPS controller-computer connection.

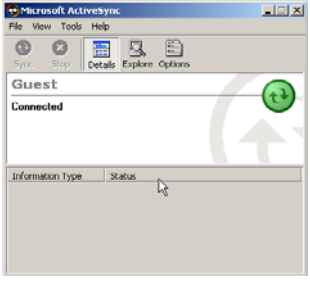


Fig 4-2. Controller and Computer Connected

To connect the TPS controller (as well as a TPS receiver or Total Station) to a computer with one serial port:

1. On the ActiveSync main window click **File->Connection Settings**.
2. Enable the following fields on the Connection Settings dialog box (Figure 4-3 on page 34):

- Allow network (Ethernet) and Remote Access Service (RAS) server connection with this desktop computer
- Show status icon in Taskbar

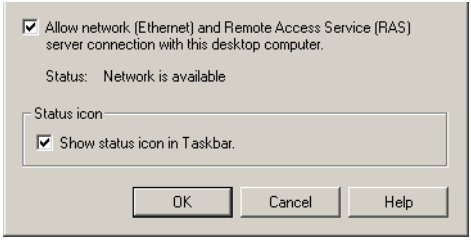


Fig 4-3. Connection Settings

If these settings are fixed, then on subsequent TPS controller-computer connections:

1. Run ActiveSync on the computer.
2. Click **File->Get Connected**.
3. Click **Next** to connect the TPS controller and computer.

Importing TopSURV Jobs

1. Click **Import** on the toolbar. The Import from Device dialog box displays (Figure 4-4).

Fig 4-4. Click Import From Device

2. Click the TPS controller icon and click **Next** to connect the computer and controller.

   Once connected the second Import from Device dialog box displays (Figure 4-5 on page 36).

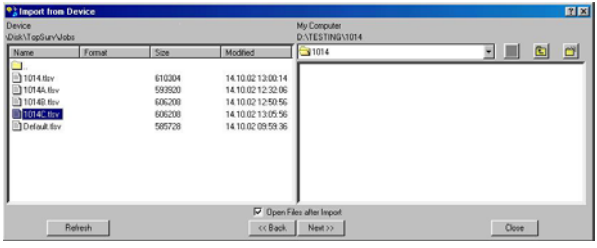


Fig 4-5. Import From Device – Device Files

3. In the left panel, highlight a TopSURV GPS file (e.g., 1014.tlsv). Press **Shift** and click several jobs to import them at once.
4. In the right panel, click the **New Folder** button and create and name a new folder. Open the newly created folder.
5. Click **Next** to begin downloading the highlighted jobs to the folder on the computer.

Downloaded jobs display in the right panel of the Import from Device dialog box.

Viewing and Editing TopSURV GPS Files

TopSURV GPS files display information in five tabs (Figure 4-6), described in the following sections.

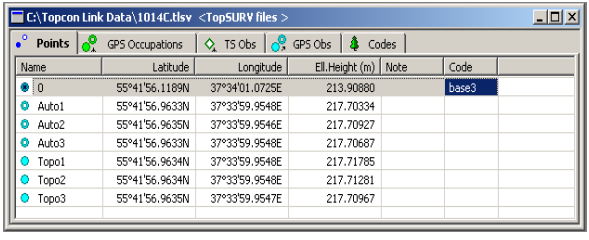


Fig 4-6. GPS File Tabs

Viewing Points and Stations

The Points tab (Figure 4-6) lists all points and stations stored in the file. Autotopo (kinematic) and topo (static) points positions, obtained from the GPS solution with TopSURV, display as a set of Lat,Lon,H or N,E,Elevation coordinates, based on the user-specified coordinate system in TopSURV.

The Points tab displays coordinates for:

- Base points:
- Static points:
- Kinematic points:

Editing Base Coordinates

1. Right-click a Base and click **Properties** in the pop-up menu that displays.
2. Enter new Lat, Lon, H or N, E, Elevation coordinates in the applicable fields on the Coordinates tab (Figure 4-7).

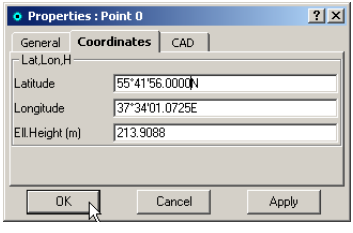


Fig 4-7. Enter New Coordinates

3. Click **OK**.

Editing GPS Antenna Height

Use the GPS Occupations tab to edit the GPS antenna height for Static and Kinematic points.

1. Press **Shift** and highlight the desired antenna heights (Figure 4-8).
2. Click one of the hightlighted heights and type in the antenna's height (Figure 4-8).

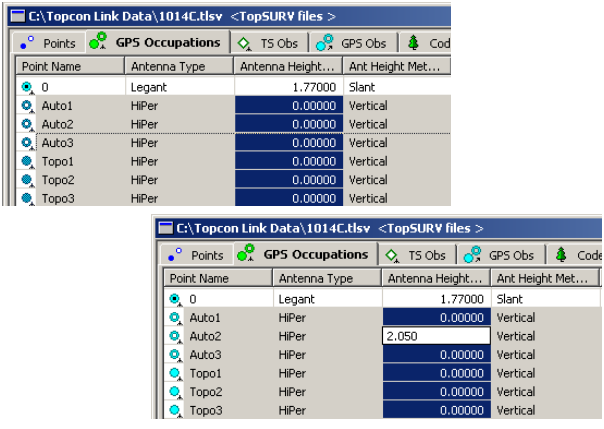


Fig 4-8. Edit Antenna Heights

3. Press **Enter**.

Editing Offsets

Use the Properties dialog box to enter different horizontal and vertical offsets between a survey point and sub-antenna point.

1. On the GPS Occupations tab, right-click a point and click **Properties** on the pop-up menu that displays.
2. On the Properties dialog box, click the **Offset** tab and enter the desired values (Figure 4-9).

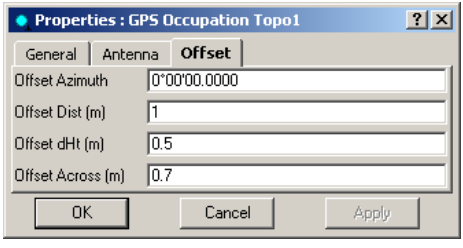


Fig 4-9. Enter Offsets

3. Click **OK**.

Viewing Vectors

The GPS Obs tab displays information about vectors contained in the TopSURV GPS file.

1. To display the vectors errors, right-click the vector and click **Properties** from the pop-up menu that displays.
2. The horizontal and vertical accuracies of the vector display in the Observation tab of the Properties dialog box (Figure 4-10).

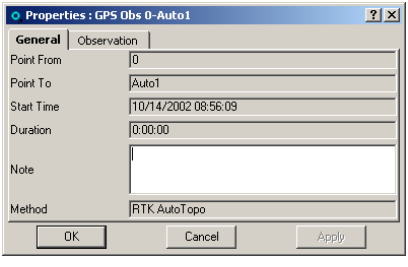


Fig 4-10. Horizontal and Vertical Accuracies

3. Click **OK** to confirm the settings.

Computing Coordinates

1. To calculate (or re-calculate with new settings) coordinates, click **Compute coordinates of points** on the toolbar. The updated coordinates display in the Points tab (Figure 4-11).

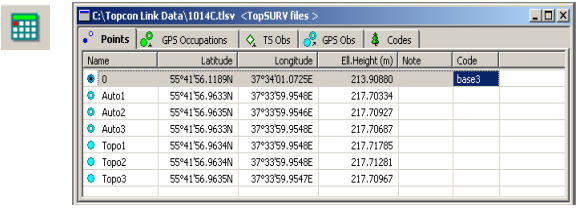


Fig 4-11. Compute Coordinates of Points

2. Click **Save** on the toolbar.

Topcon Link creates a backup of the original file with an additional extension (*.initial; e.g., 1014?.tlsv.initial). This backup file remains in the same folder as the *.tlsv file (1014?.tlsv). Any further changes are made to the *.tlsv file.

Converting Raw Data Files to Coordinate Files (ASCII/TSV/Files)

This section describes modifying the type of point coordinates (i.e., from Lat,Lon,H to UTM).

1. Click **Convert** on the toolbar to display the Convert File dialog box (Figure 4-12).

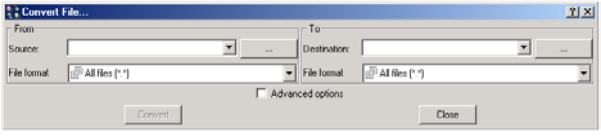


Fig 4-12. Click Convert Icon

2. In the From panel, select the File format of the raw data file—TSV files (*.tlsv).
3. Click the **Browse** ("**...**") button, select the *.tlsv raw data file using the Open for Convert dialog box, and click **Open**; the full path of the file displays (Figure 4-13 on page 44).

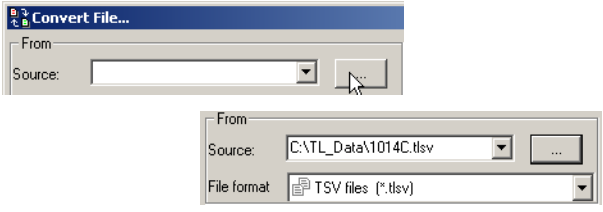


Fig 4-13. Click Browse and Select File

4. In the To panel, click the **Browse** ("**...**") button.
5. In the Select a file dialog box, define a folder in which to store the file, select the Name,N,E,Z,Code format and enter the rtk_1014c_UTM name of the file.
6. Click **Select** to display the full path of the file to be created in the Destination field of the Convert File window (Figure 4-14).

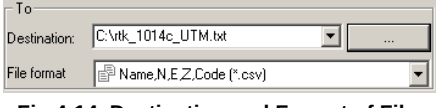


Fig 4-14. Destination and Format of File

7. Click **Advanced options** to display further conversion parameters (Figure 4-15).

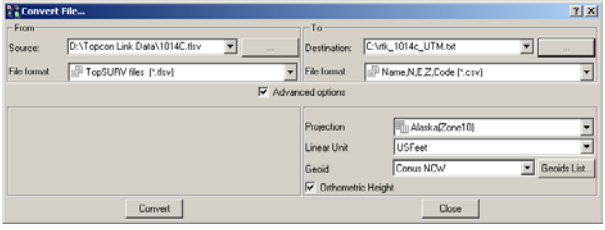


Fig 4-15. Advanced Options

8. Enter the parameters required after the conversion (Figure 4-15):
   - Select the Projection type.
   - Select the Linear Unit for horizontal and vertical positions; either IFeet, Meters, or USFeet.
   - Select the Geoid type (when the Orthometric Height checkbox is enabled).
9. Click **Convert** to begin converting the TopSURV GPS file to the defined format.

Viewing Converted Files

1. Click **Open** on the toolbar.
2. In the Open dialog box, select the file format, select the file, and click **Open**.

   The file's content displays in the Topcon Link work area (Figure 4-16).

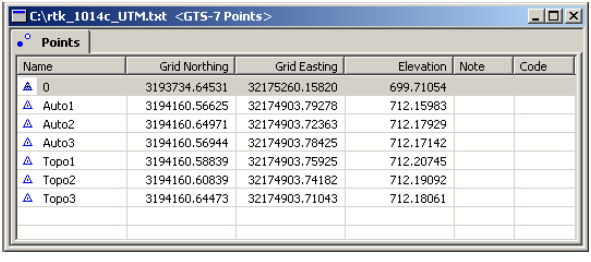


Fig 4-16. Converted File's Content

TOPCON

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