## Leica TDRA6000 and TS30 Total Station



This Quick-start guide can be used for initial configuration, connection and basic operation of the Leica TDRA6000 and TS30 Total Stations within SA. For more details on instrument operation and configuration contact Leica directly.

### Hardware Setup

Set up the unit following the manufacturer's directions. Leica total stations may be connected either with a USB cable, wireless network adapter or Bluetooth connection. Ensure that you have the necessary cables, router or a Bluetooth adapter. Be sure the power is turned on and the battery is charged.

### Software Setup

It is recommended that initial connection and testing be performed using a cable connection to your computer. To connect directly to the PC, you will need to install the instrument drivers. The current drivers SA supports can be downloaded from http://www.kinematics.com/ftp/SA/Install/Driver%20Downloads/TotalStations_Theodolites/Leica/.

**Direct Cable Connection:**

1. On the scope, select **Instrument > Interfaces**

2. Set the GeoCom connection to Port 1 (RS232, RS232 GeoCOM).

3. Set the GSI connection to Port 1 (RS232 GeoCOM, None, GSI GSI Polar2).

4. Connect the USB cable and continue to the *Starting the Inter-*

*face* section…

### Connecting to Bluetooth

1. On the scope, select **Instrument > Interfaces.** The device used needs to be configured as shown (Figure 5-50).



**Figure 5-50.** RS232 Device Configuration

2. Set the GeoCom connection to Port3 (BT) (RS232, RS232 GeoCOM) (Figure 5-51).



**Figure 5-51.** GeoCOM Mode

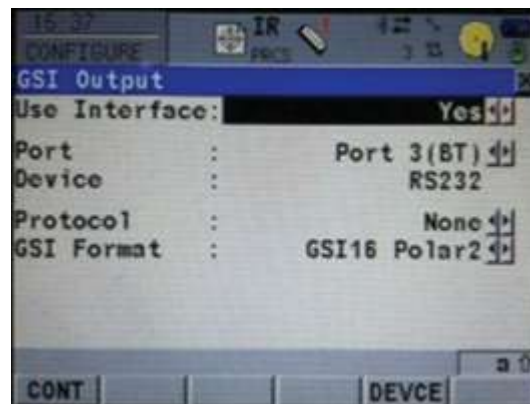3. Set the GSI connection to Port3 (BT) (RS232 GeoCOM, None, GSI GSI Polar2) (Figure 5-52).



**Figure 5-52.** GSI Mode

4. On your PC, go to your Bluetooth adapter and select Add a Device.

5. Select the device from the available Bluetooth connections

and select next.

6. When prompted, enter the pairing code: **0000**. Once connected, a COM port number will be assigned. If you navigate to **More Bluetooth Options** and look for the **Outgoing** COM port this is the port number that SA needs in order to connect (Figure 5-53).



**Figure 5-53.** Com Port
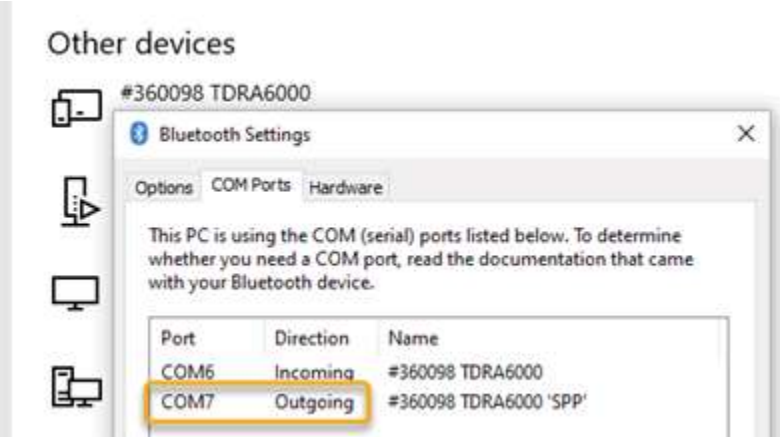
It is also possible to transfer files saved on the scope's internal memory or CF card to a computer over a bluetooth connection. This can be done with the: LEICA Geo Office – Tools – [Data Exchange Manager]. This tool functions much like an FTP connection over a COM port and is available from Leica Geosystems.

### Starting the Interface

1. Select **Instrument > Add** and choose the Leica TDRA6000 (or TS30) Total Station from the **Add Instrument to SA** dialog (Figure 5-54).



**Figure 5-54.** Adding the TDRA to the Job. The default interface to use when connecting can be set under Options.
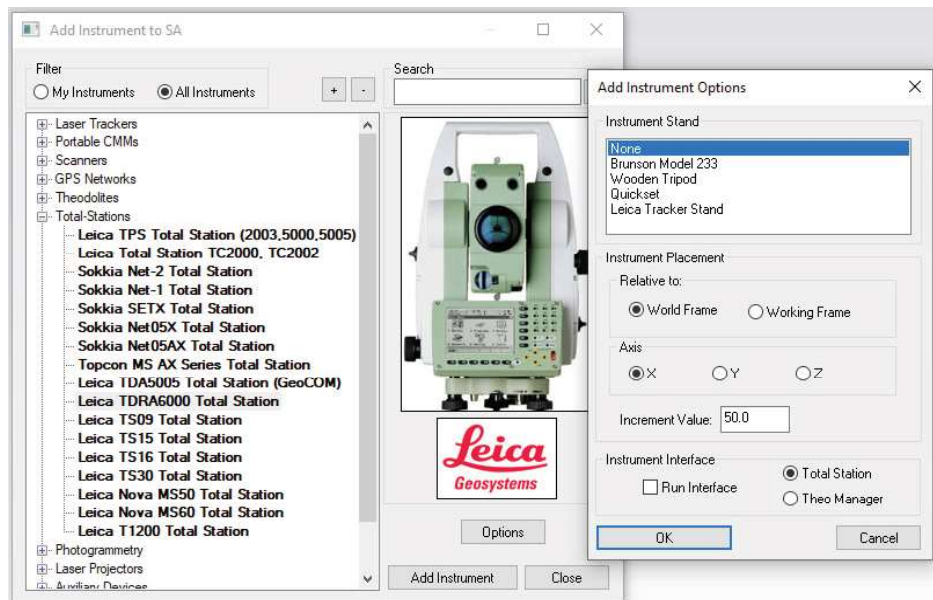
2. Now run the instrument interface module under **Instrument >**

**Run Interface Module** and choose either the traditional **Theodolite Manager** or the new **Total Stations** interface. The Total Stations interface is designed for single station use and will be familiar for laser tracker users (see "Total Stations Interface" on page 268).



**Figure 5-55.** Choose the interface you would like to use.

3. Select New Setup and then Add (Figure 5-56).



**Figure 5-56.** The Theodolite Manager dialog.

4. Select the instrument by name in the *Type* drop down menu.

5. Select the Com Port. The port number was displayed in the Bluetooth manager during the creation and can be found by going to the properties of the device in the Bluetooth manager.

6. Select the instrument station to connect to by clicking in the available Spatial Analyzer Connections job list and press Connect.
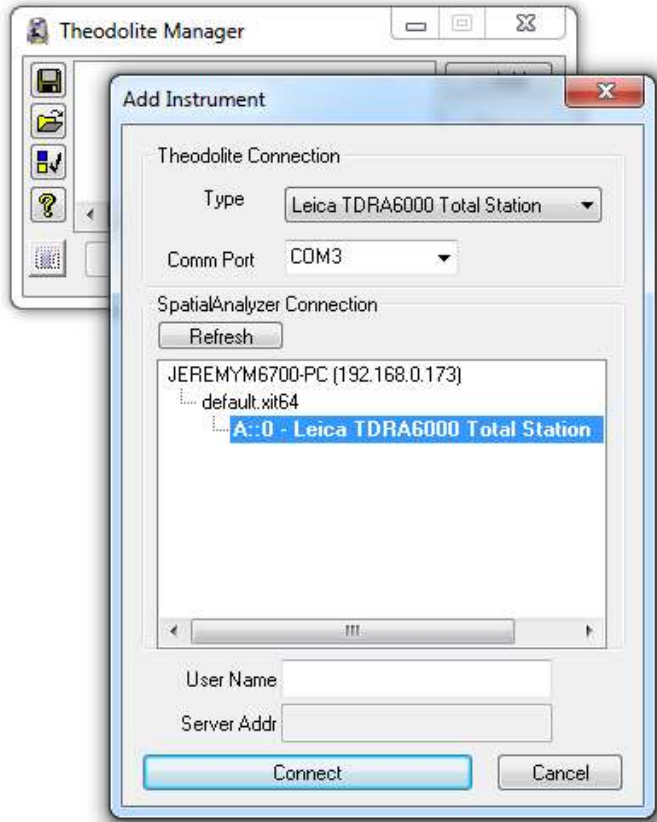
**Figure 5-57.** Connecting to the added instrument model

Once connected the Leica TDRA6000 /TS30 interface will display and you will be ready to begin using the instrument (Figure 5-58).
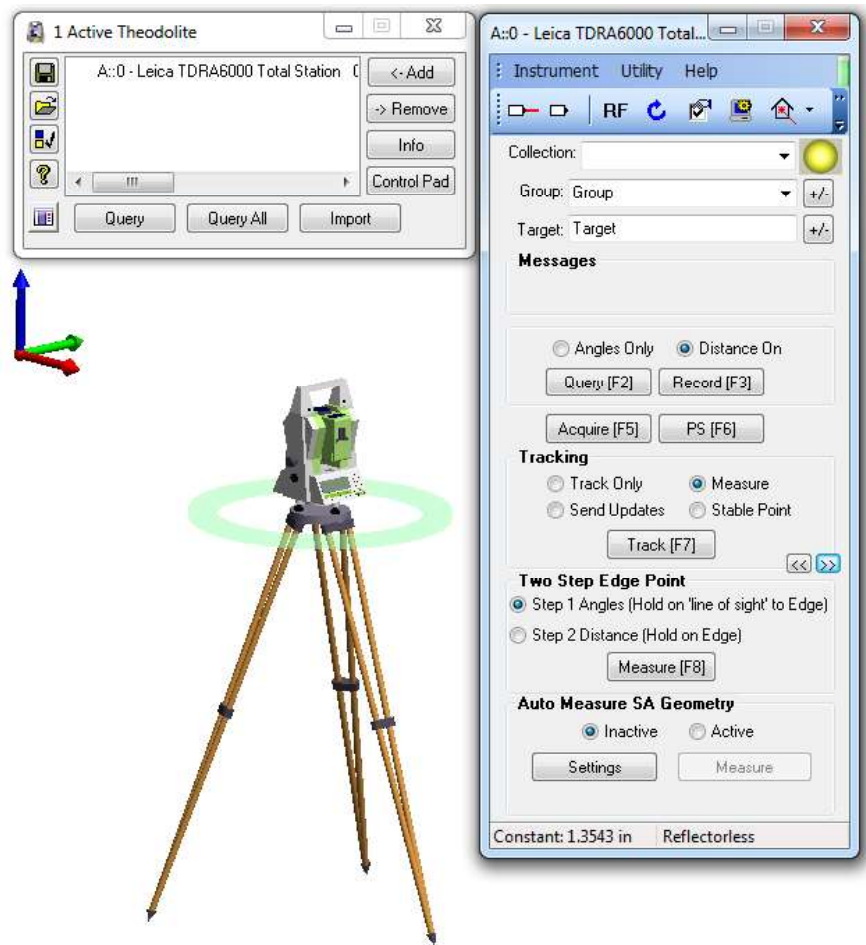
**Figure 5-58.** TDRA Interface

## Instrument Specific Operations

**Tracking with the Leica TDRA6000 /TS30**

The TDRA6000 can track a reflector much like a Laser Tracker.

1. In the Tracking section, Choose a reflector target from the Targets and Reflectors database (ensure that ATR is turned on for that target)

2. Choose the tracking type (Track only, Send Updates, Measure, Stable Point)

3. Press the Track (F7) button to begin tracking the target

**Edge Point Measurement**

The Leica TDRA6000 /TS30 has a built in Edge Point Measure Mode designed to allow precise measurements to be made on the edge of parts.

1. Precisely sight on the edge you wish to measure, then in the Two Step Edge Point section, Press Measure. This will take an angles only measurement of the edge

2. Using an edge nest or other reference target measure the pre-

cise distance to that edge point. The true edge point will then be calculated automatically from these shots and the resulting point passed to SA.

### Precise Point Scan within a Perimeter

The Leica TDRA6000 /TS30 has the ability to scan a predefined region, do to so, start by building a perimeter within SA to define the region within which to perform the scan.

1. Measure Points to define the perimeter of your scan (Perimeters are constructed as a 3D polygons, or a closed region built from straight lines connecting individual point locations).

2. Select *Construct> Perimeter*. You will be prompted to select the points to define the polygon. Choose each point in order to define a closed polygon, the first and last points will be connected automatically to construct the closed perimeter.
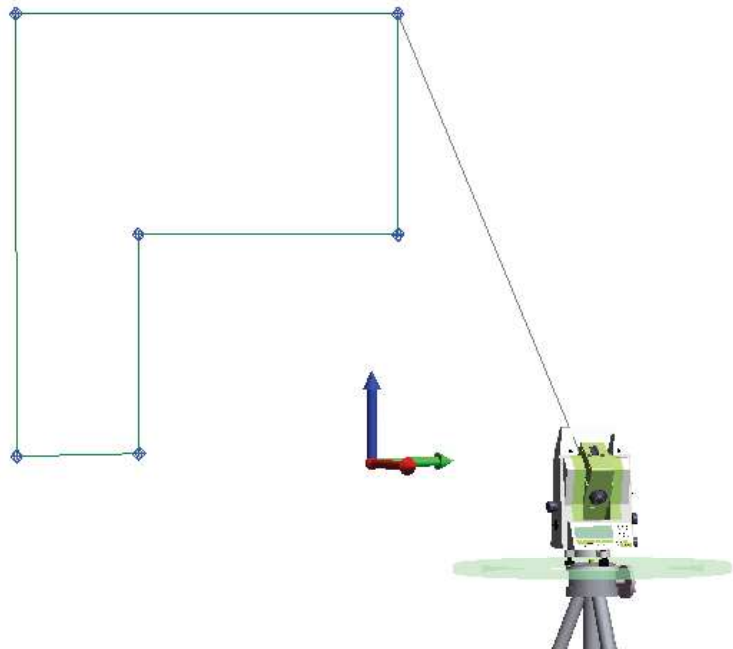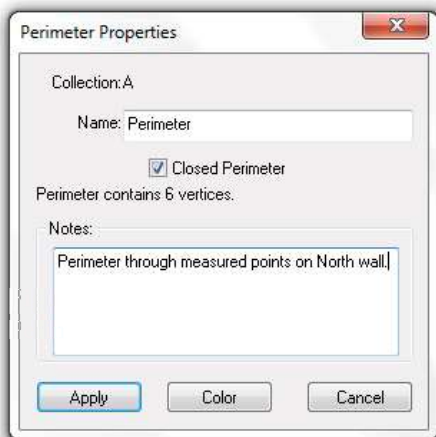


3. Click the Settings button to change the parameters of the scan based on the line and point spacing in the **Auto Scan Properties** dialog (Figure 5-77).

**Figure 5-60.** Auto Scan Properties dialog.
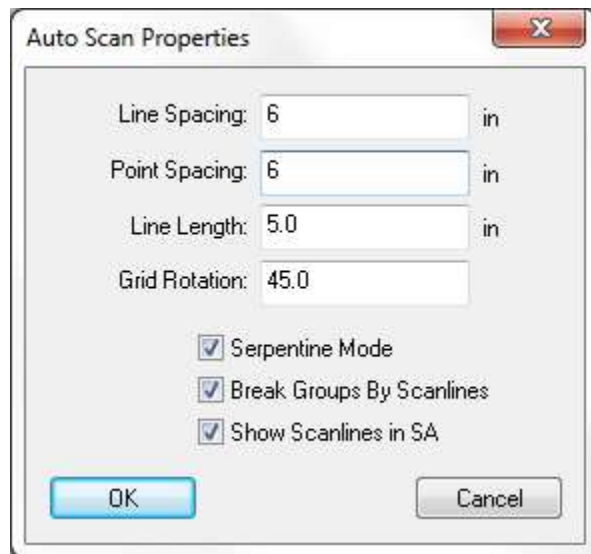
4. Change the *Auto Measure SA Geometry* to *Active* by selecting the radio button. When you do so, a note will be shown at the bottom of the interface that states: *"Awaiting SA Perimeter Selection"* (Figure 5-61).

**Figure 5-61.** Auto Measure SA Geometry
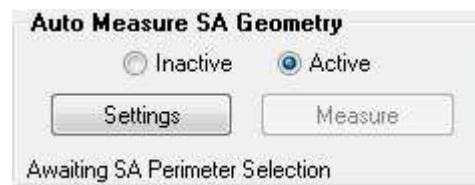
5. Click on the desired perimeter by clicking on double-clicking on it in the tree. When selected, the perimeter *Collection::Name* will be displayed.

6. To begin the scan, click Measure. An example of this type of perimeter scan is pictured in Figure 5-78.

**Figure 5-62.** A point to point auto measure scan.
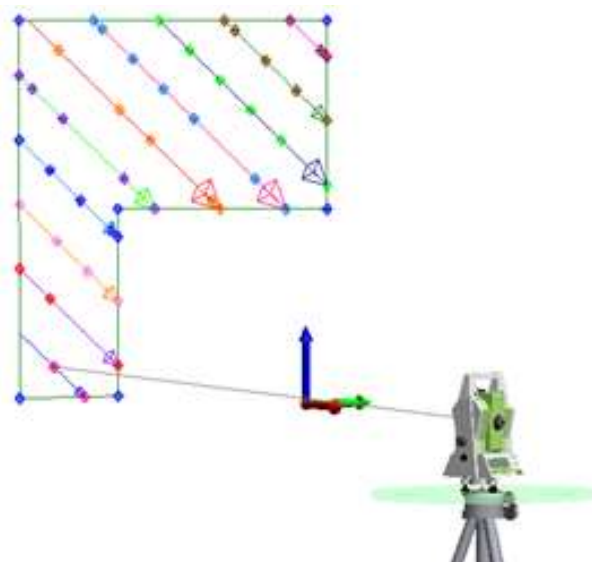
**Measuring Directly from the Scope**

Measurements can be taken on the TDRA directly, while SA is used to passively record the measurements. To do so go into a survey mode and start a job. When the record buttons (All, DIST, REC) are visible you should be able to trigger the measurements from the scope and record them within SA automatically.

- Recorded points will use the point name specified on the scope.

- The group name is composed of the Group Name Prefix specified in the Theodolite Manager Freeform Mode plus any additional numbers or letters from the point name beyond 3 characters.

- As an example, if you have a group prefix set as "Group" and for the point name type  "12345" SA should build a new point group named "Group12" with point "345".

## Point Import Options and Formats

SA provides a number of import options to order to import points measured without SA and then use those points for analysis. There are two ways to import points:

1. Importing points directly through Theodolite Manager. This option provides the ability to link points directly to an instrument model and can be done by connecting in simulation as well as with live instruments (Figure 5-63).
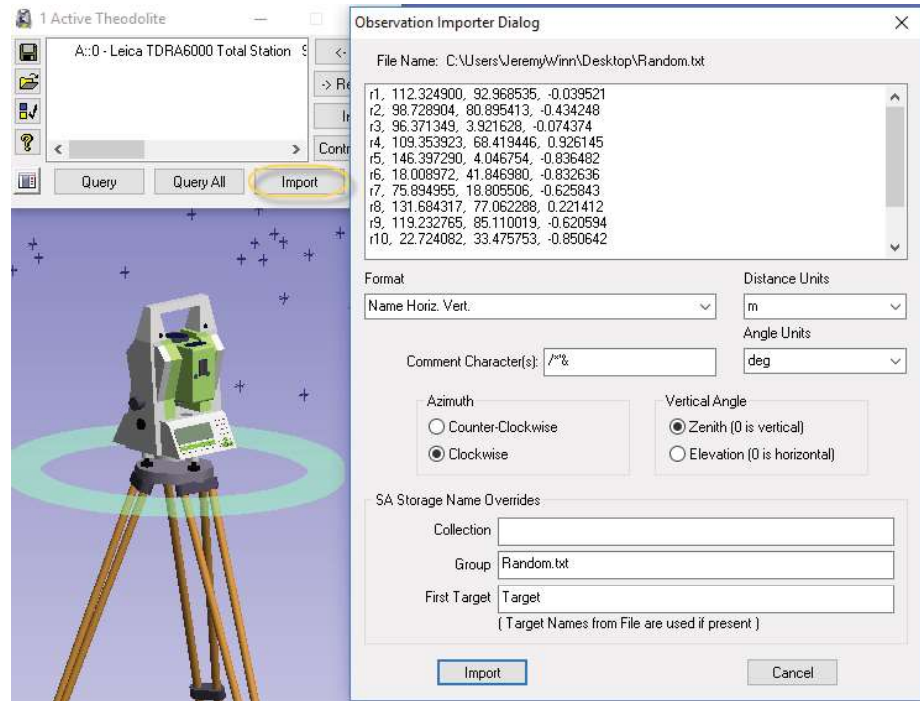


**Figure 5-63.** Import ascii files through theodolite manager

2. Importing through the **File > Import** options. In addition to ascii files there are a number of useful formats available through

**File > Import > Custom Formats** including:

- **Leica GSI8 / GSI16 File.** Which provides import of GSI data containing Name, Hz Angle, Vert Angle, Distance OR Name, Easting, Northing, Elevation.

- **Leica ADF (.adf).** Which provide the ability to import nominal and measured points as separate point groups