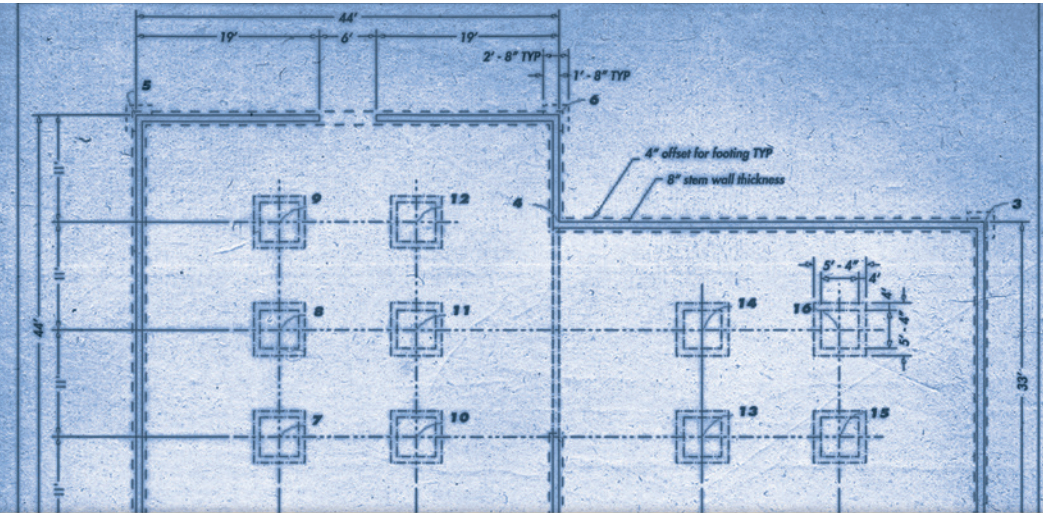


# Layout Pro Field Software



## Quick Start Guide

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## 12.3.Governing Law; Jurisdiction and Venue.

- 12.3.1.Unless you obtained this Software in Canada or the European Union, this Agreement is governed by the laws of the State of California and the United States without regard to conflicts of laws provisions thereof, and without regard to the United Nations Convention on the International Sale of Goods. In such case the jurisdiction and venue for actions related to the subject matter hereof are the State of California and United States federal courts located in Santa Clara County, California, and both parties hereby submit to the personal jurisdiction of such courts.
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**12.4.Attorneys' Fees and Costs.** The prevailing party in any action to enforce this Agreement will be enti-

tled to recover its attorneys' fees and costs in connection with such action.

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**12.6.Amendments; Waivers.** No supplement, modification, or amendment of this Agreement shall be binding, unless executed in writing by a duly authorized representative of each party to this Agreement. No waiver will be implied from conduct or failure to enforce or exercise rights under this Agreement, nor will any waiver be effective unless in a writing signed by a duly authorized representative on behalf of the party claimed to have waived.

**12.7.Entire Agreement.** This Agreement is the complete and exclusive statement of the mutual understanding of the parties and supersedes and cancels all previous written and oral agreements and communications relating to the subject matter of this Agreement. No provision of any purchase order or in any other business form employed by you will supersede the terms and conditions of this Agreement, and any such document issued by a party hereto relating to this Agreement shall be for administrative purposes only and shall have no legal effect. **Notwithstanding the foregoing, if you have entered into a separate written license agreement signed by Licensor for use of the Software, the terms and conditions of such other agreement shall prevail over any conflicting terms or conditions in this Agreement.**

**12.8.Independent Contractors.** The parties to this Agreement are independent contractors. There is no relationship of partnership, joint venture, employment, franchise or agency created hereby between the parties. Neither party will have the power to bind the other or incur obligations on the other party's behalf without the other party's prior written consent.

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*If an executed agreement exists between you and Licensor at any time regarding the Software, the terms of that agreement shall supersede the terms of this Agreement in its entirety. Thus, if you enter into a separate written agreement with Licensor regarding the Software, that agreement (not this one) will control your use of the Software; and further if that agreement is terminated, you will not have the right to use the Software under the terms of this Agreement after termination. Notwithstanding the foregoing, pre-printed terms and conditions on your Order form shall not supersede this Agreement.*

Trimble Navigation Limited d/b/a Spectra Precision  
10355 Westmoor Drive  
Westminster, Colorado 80021

#### **Data Collector Warranty Program**

Spectra Precision would like to make you aware of the warranty program. A new data collector that has been purchased and is still under the one year factory warranty or under an extended warranty will be authorized for software updates. Data collectors that are not currently under a warranty plan are eligible to purchase an extended warranty. There are Layout Pro software only warranties that will authorize the data collector for software updates, and there are warranties that cover both the data collector hardware and Layout Pro software. The extended warranties are a good way to protect your investment in your equipment.

The Layout Pro installation program will use your Internet connection to compare the data collector's serial number against a data base that contains the warranty status on all units. If the unit is under a valid warranty, the installation will proceed. If the unit is not covered under warranty, then a message will be displayed informing you of this and the installation will stop.

To receive Layout Pro minor improvement releases, identified by the version numbering system, you only need to be on the current version of the latest minor update. In other words, if you have version 5.0.x you are authorized for a version 5.0.5 improvement release automatically. For minor updates, 5.0 to 5.1 for example, it is now required that the data collector or Layout Pro software be on a current warranty plan.

The warranty plans are listed on Spectra Precision price lists. Data collector serial numbers are required in order to generate the proper registration codes for your unit and to log the warranty plan into the database.

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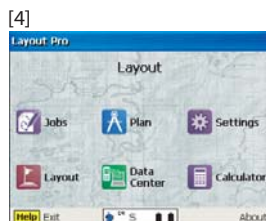
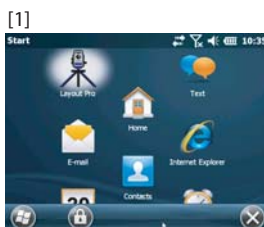
# Getting Started

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Double-tap the Layout Pro icon on the data collector ([1]) or total station ([2]) desktop.

With a data collector, the main menu ([3]) will appear instantly.

With the onboard version, you will first have to level the total station and enter a few parameters (atmospheric, instrument parameters) before the main menu ([4]) displays.



*Note: In this guide, all screenshots showing a blue title bar originate from the onboard version of Layout Pro (i.e. running on the instrument used). All screenshots with black title bar are taken from a data collector connected to a total station.*



## Working With Jobs

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### Starting a New Job

1. Tap Jobs on the main menu. This opens the Jobs menu.

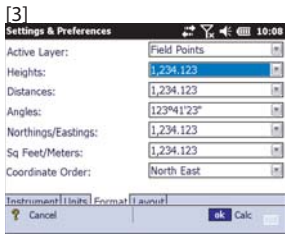
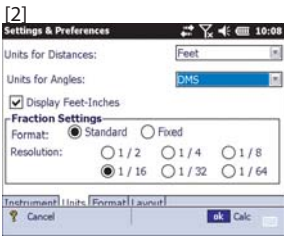
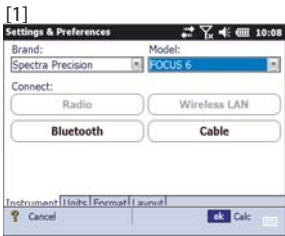


2. Tap Create New Job.
3. Using the keypad, key in a name for the job. The default name is the current date. Change it as you prefer.  
If you are using a data collector:
  - Tap  to show the keypad
  - Tap  to hide it.
4. Tap **ok** at the bottom of the screen.
5. Tap **OK** to continue.

# Settings and Preferences

From the main menu, tap **Settings**. The **Settings & Preferences** window allows you to set:

- The instrument used ([1]) (with a data collector) or some instrument-related parameters (atmospheric parameters, calibration, DR target settings) with an onboard version.
- The distance units used ([2])
- The format used to display values of distances, angles, etc. ([3])
- The layout tolerance and automatic point selection ([4])











Simply tap on the next tab to view the next page of options. Tap **OK** to close the **Settings & Preferences** window.



# Entering a Plan from a Blueprint

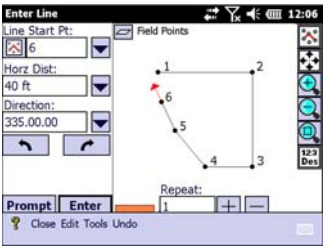
## Entering a Basic Plan

1. From the main menu, tap **Plan**.
  2. Tap **Input Plan** to begin entering your plan.
- The following table shows the tools on the right side of the window that help you work with the display plan.

| Use this tool...  | to...  |
|---|--|
|  | Select from plan                                   |
|  | Show the whole plan                                |
|  | Zoom in on active point                            |
|  | Zoom out from active point                         |
|  | Zoom to select area                                |
|  | Set display options for labels (point names, etc.) |

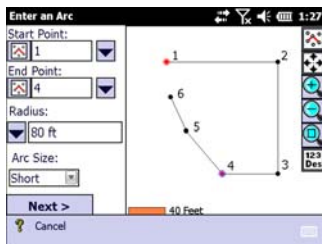
3. Enter or select a line start point.
4. Enter the length of the new segment.
5. Set the direction that the line is to be placed. To do this:
  - Use the rotate buttons   to rotate it by a specified angle.
  - Select an angle from the drop-down list.
  - Manually enter the angle.
6. Multiple segments of the same length and in the same direction can automatically be generated. To do this, key in the number of segments in the **Repeat** field.

The  and  icons can also be used to increase or decrease the number of segments.
7. After your segment, or series of segments, has been defined, tap **Enter** on the screen. The segment, or series of segments, then appears on the map.
8. Define the next segments as explained above, until all the segments have been entered (see example below).

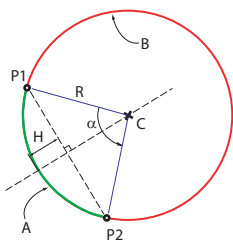


## Adding an Arc to a Plan

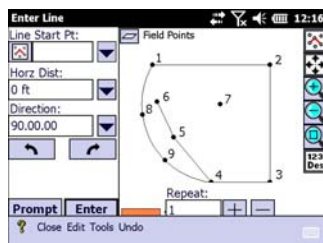
1. Select **Enter an Arc** from the **Tools** menu located at the bottom of the **Enter Line** window.
2. Choose the start point (P1) and end point (P2) of the arc. These points can be selected from the plan, or from the list of points, after selecting the corresponding option through the nearby scroll-down arrow button. You can also key in manually their numbers (if known).  
The selected points will then appear in red on the plan (see below).



3. Select which third parameter you will be using to let Layout Pro build the circle underlying the arc you want to create (this circle intersects the selected start and end points). This parameter can be:
  - **Radius:** The radius (**R**) of the underlying circle (default option).
  - **Segment Height:** The greatest perpendicular distance (**H**) from the chord (P1P2 segment) to the arc.
  - **Center Angle:** The angle ( $\alpha$ ) formed by the start point (**P1**), the center point (**C**) of the underlying circle and the end point (**P2**).
  - **Diameter:** The diameter ( $D=2R$ ) of the underlying circle.
4. Enter the known value for the chosen parameter.
5. Choose whether you wish to define the arc as the short (**A**) or long (**B**) section of the underlying circle (choose **Short** or **Long**).
6. Tap **Next**. The arc appears in red on the plan.
7. Before entering the arc, you can still define the following:
  - **Seg. Number:** Number of segments of equal length you want to create along the arc (Default: 1). Creating two or more segments implies that the corresponding number of points will be created on the arc.
  - **Store Center Pt:** Enable this option to store the center of the underlying circle. When enabled, a name is prompted for this point which you can keep or change.



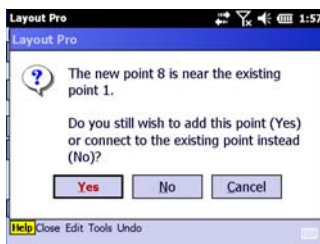
- **Flip** button: Tapping this button provides the other possible orientation for the arc. Tapping again this button will bring the arc back to its initial shape.
8. Tap **Solve** when you agree with the definition of the arc, which then appears on the plan. See example below.



Remember, you can always step back while creating an arc (or a line) using the **Back** button when shown. Once the arc (or line) has been created, it can be deleted by tapping **Undo** at the bottom of the screen.

## Closure Check

As you enter the last point from the blueprint, a dialog box appears and asks whether you want to add the point or connect it to an existing point. See example below.



To perform a closure check at any time, select **Perform Closure Check** from the **Tools** menu.

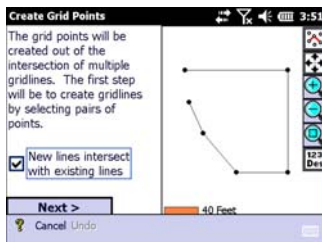
Use the zoom-in tool to see any error which can be caused by a “bust” in the blueprint dimensions or entering the dimensions incorrectly.

If a dialog box does not appear when you enter the last point on your blueprint, your plan does not close or you must select the **Check for Overlapping Points** function by selecting **Options** from the **Tools** menu.

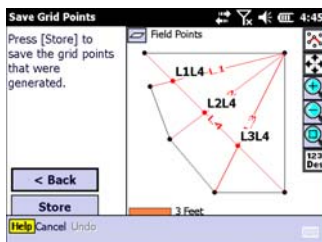
## Creating Grid Points

Additional points may be created on the plan by creating new lines based on existing points. The new points will result from the intersections of these new lines and possibly also with the other existing lines.

1. Tap **Plan** on the main menu.
2. Tap **Create Grid Points**. Below is an example of what you can see on the screen.




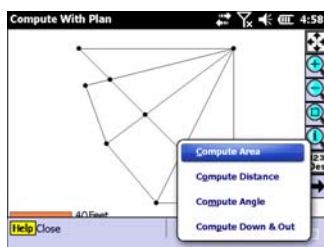
3. Set the **New lines intersect with existing lines** option as follows:
  - Check it on if you want to create points for every intersection.
  - Clear it if you want to create points only at the intersections of the lines you specify.
4. Tap **Next** and define the new lines. For each new line, select the start point and end point directly on the plan. You are then prompted to name the line. The line and resulting new points appear in red on the plan. Create as many lines as necessary. See example below.



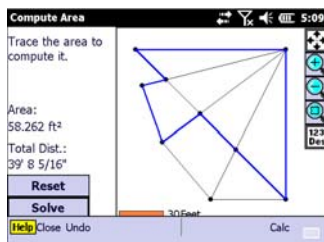
5. When the plan shows all the points you would like to add, tap **Store** to save all of them.

## Making Computations from your Entered Plan

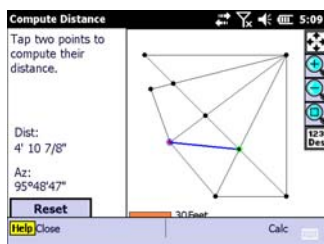
1. Tap **Plan** on the main menu.
2. Tap **Compute with Plan** on the submenu.
3. Tap  in the lower-right corner of the screen. This opens up a menu from which you can perform various computations:



4. Select **Compute Area** to compute the area and perimeter of a group of points:

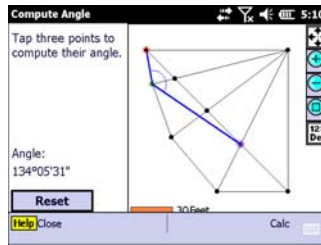


5. Select **Compute Distance** to compute the distance between two points:

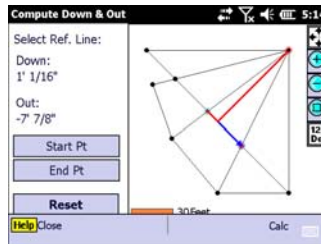




6. Select **Compute Angle** to compute the angle between any three points:



7. Select **Compute Down & Out** to compute a point's down and out distance from a line that you specify:



The blue line is the reference line. The red section that is overlaid on the blue line is the “down” portion. The red perpendicular line is the “out” portion.

## Setting Up a Connected Total Station

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Before using a total station to perform a stakeout or survey, you must set up your total station (in the location you want to shoot from), level it, and turn it on.

If you are using the onboard version of Layout Pro, nothing else needs to be done.

If you are running Layout Pro on a data collector, connect the data collector to the total station using a serial cable or Bluetooth.

### Connection Settings

To set the parameters on the Layout Pro software:

1. From the main menu, tap **Settings**.
2. From the **Layout** tab, enter the desired layout tolerance.
3. From the **Instrument** tab (the first tab), select the brand of the total station from the **Brand** list.
4. Set the parameters on the total station from the recommended settings.

### Recommended Settings for Supported Total Stations

#### **Nikon 300 & 500 Series, Nivo M and DTM-322**

(Tap the menu key on the total station, select Settings, and select Comm.)

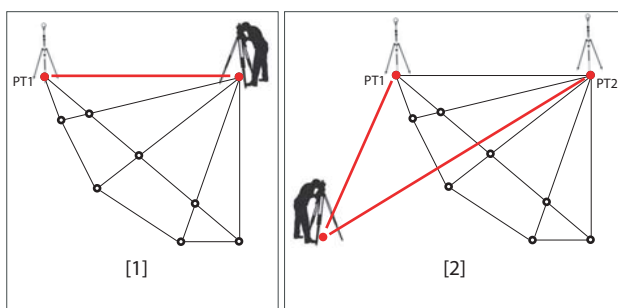
- Ext. Comm (set to NIKON)
- Baud (4800 or match to Layout Pro)
- Length (set to 8)
- Parity (set to none or match Layout Pro)
- Stop Bit (set to 1)

## Station Setup

If you choose to set up the total station over a marked point from the plan (**Setup on a Known Point Location** option, diagram [1] below), you will need to shoot one point.

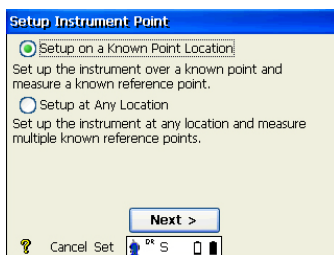
If you choose to set up the total station at a random location (**Setup at Any Location** option, diagram [2] below), you will need to shoot two marked points from the plan for angle and distance measurements, or shoot three points if only angles are to be measured.

In both cases, you can decide to shoot more points for better control.



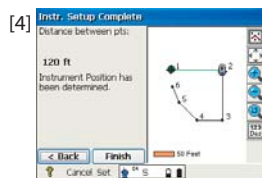
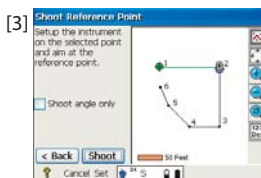
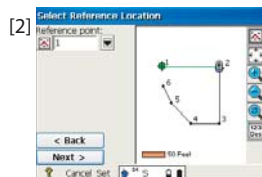
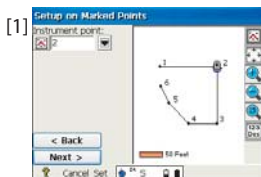
The two possible station setup procedures are described below.

1. Tap **Instrument Setup** from the **Layout** menu.
2. Choose how to set the instrument:

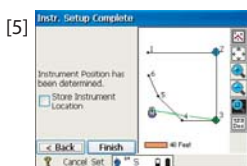
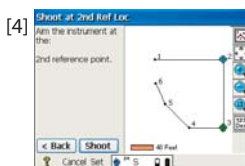
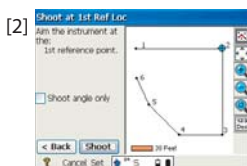
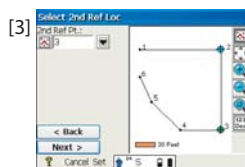
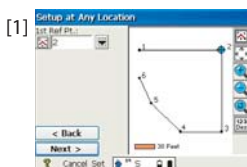


3. Tap **Next**.
4. Tell Layout Pro whether you want to measure elevation (Yes/No) then tap **Next**. If you are setting up on a known point and you want to measure elevation, first enter the instrument height, then tap **Next**.

5. If you chose **Setup on a Known Point Location** (see also diagram below):
- Select the point from the plan where to set up the instrument ([1]). Set up the instrument at this location.
  - Select the reference point from the plan ([2]). Have a target placed over this point.
  - Check that everything is ready for a shot ([3]), aim the instrument at the target and then tap **Shoot**.
  - After Layout Pro has reported a valid measurement ([4]), tap **Finish**. Station setup is now complete.



6. If you chose **Setup at Any Location** (see also diagram below):
  - Set up the instrument at any convenient location from which you have a good view of the two reference points.
  - Select the first reference point from the plan ([1]). Have a target placed over this point. Aim the instrument at this point and shoot it ([2])
  - Repeat the first step for the second reference point used ([3] and [4]). You then get screen [5] on which the instrument position is reported to have been determined. Ensure that the calculated position of the instrument makes sense compared to the plan.
  - Tap **Finish** to complete station setup. If you want to store the point where the instrument is located, first enable the **Store Instrument Location** option, tap **Next**, name the point and tap **Finish**.

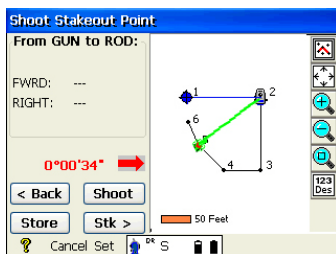


NOTE: If elevation is measured, and because the instrument height cannot be entered in that case, be aware that the measured height will be that of the instrument itself, not that of the point on the ground. If you know exactly the height of the tripod used, and after storing the position of the instrument, you can edit its Z coordinate to make it a point on the ground.

## Performing Stakeout

### Stakeout Using an Entered Plan

1. When everything is set up correctly (see *Station Setup on page 11*), tap **Points** from the **Layout** menu.
2. From the Layout Pro display, select the point you want to stake. The horizontal angle and horizontal distance to that point from the total station are displayed.
3. Tap **Next**. Layout Pro calculates and displays the value and direction of the angle –measured from the last shot– the instrument should be rotated by to be aligned with the stake point.
4. Rotate the instrument in order to zero this angle. When done, you get the direction in which to find the stake point. (angle value shown in bold red on the screen, with right/left direction arrow; see example below).

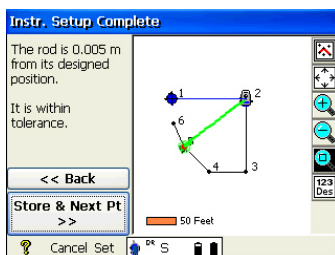


5. Have the rod holder move to where you think the stake point should be. Aim your instrument at the rod holder and tap **Shoot**. The Layout Pro display shows the direction left or right and forward or back in the perspective of the total station operator.



(Green circle and black reticle: rod holder location; red circle and spot: stake point location)

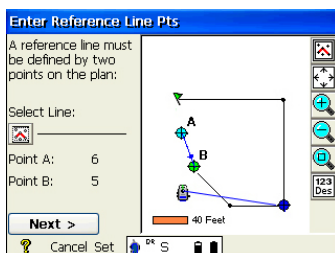
6. Guide the rod holder closer to the stake position and re-shoot. You can re-shoot as many times as necessary until the rod is within an acceptable range of the correct position. Tap **Stk** when an acceptable position is established.



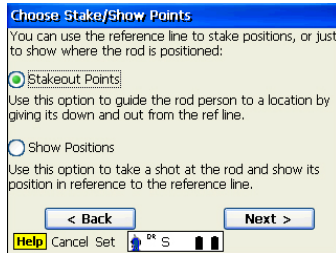
7. Tap **Store & Next Pt** to store the position of the rod holder and to go back to the **Define Stake Point** screen from which you can select the next point you want to stake.

## Stakeout Using a Reference Line

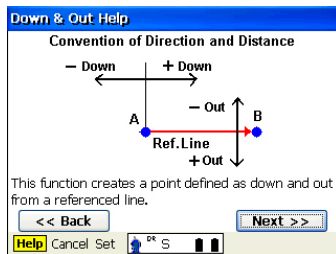
1. When everything is set up correctly (see *Station Setup on page 11*), tap **Line** from the **Layout** menu.
2. Select two points for the reference line on the Layout Pro display.



3. Tap **Next**. Layout Pro calculates the distance between the two points you selected. The **Flip** button can be used to reverse the definition of the reference line (AB or BA)
4. Tap **Next**. You can choose between **Stake Out Points** and **Show Position** (see screen below).



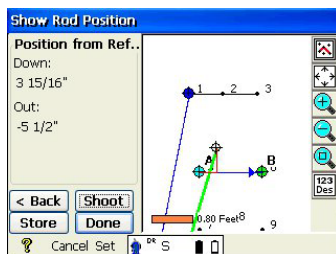
- If you choose **Stake Out Points** and tap **Next**, a screen appears that explains the down and out method of measuring stake points (see screen below).



Key in the down and out positions for the point you want to stake. Tap **Next**.

Have the rod holder move to where you think the stake point should be. Aim your instrument at the person and tap **Shoot**. You can re-shoot as many times as necessary until the rod person is positioned correctly.

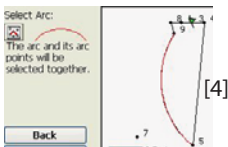
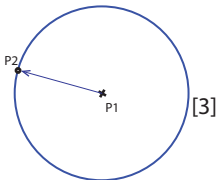
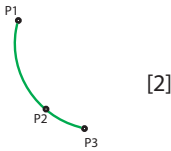
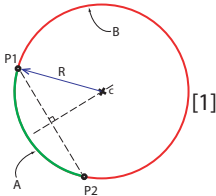
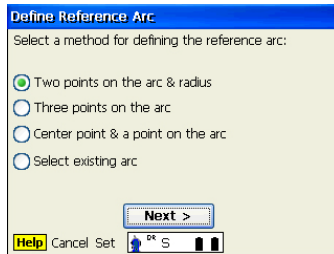
- If you choose **Show Position**, no entries are made. Simply take a shot at the rod and the position is shown in relation to the reference line. See example below.





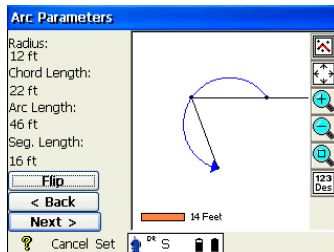
## Stakeout Using a Reference Arc

1. When everything is set up correctly (see *Station Setup* on page 11), tap **Arc** from the **Layout** menu.
2. Define the reference arc or select an existing one from the plan, using one of the four options below.

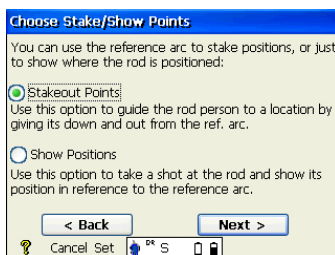


- **Two points on the arc & radius** (see diagram [1]): Select the start (P1) and end (P1) points from the plan, key in the radius (R) and choose the short (A) or long (B) section.
- **Three points on the arc** (see diagram [2]): Select the start (P1), arc (P2) and end (P3) points from the plan.
- **Center point & a point on the arc** (see diagram [3]): Select the center point (P1) and arc point (P2) from the plan. This option defines a full circle. P2 is the start of the arc and the direction of the arc is clockwise.
- **Select existing arc** (see diagram [4]): Select an existing arc from the plan. Both the arc and the points defining the arc will be selected together.

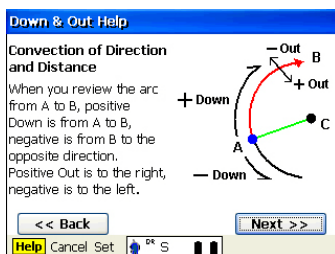
Tap **Next** after making a choice and follow the instructions until the reference arc definition is complete (see example below).



3. Tap Next. You can choose between Stake Out Points and Show Position (see screen below).

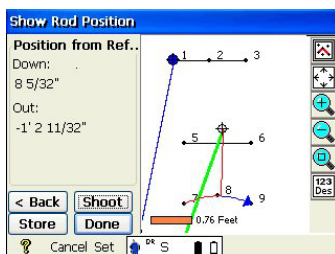


- If you choose Stake Out Points and tap Next, a screen appears that explains the down and out method of measuring stake points (see screen below).



Shoot and adjust as required.

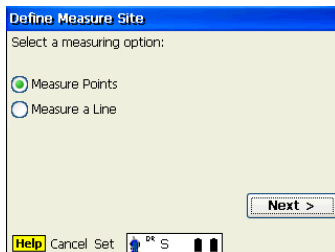
- If you choose Show Position, no entries are made. Simply take a shot at the rod and the position is shown in relation to the reference arc. See example below.



## Measuring Features

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1. When everything is set up correctly (see *Station Setup on page 11*), tap **Measure Features** from the **Layout** menu. You may choose to measure either points or a line.



2. Enter a description (if desired) for the line or point being measured. Tap **Shoot**.
3. Repeat as necessary until all points have been measured.

## Importing/Exporting Data

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Tap **Data Center** on the main menu. From the submenu, you can:

- Import DXF jobs or points. Points will automatically be imported to a new job, not to the currently open job.
- Export jobs to DXF format, or points to customizable text format.
- Export layout data
- Export deviation data
- Generate Out-of-Tolerance reports.

## Quick Start Guide

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