

# RefSet Controller

## Automatic Reference Line and Stakeout Program for Leica 1200 TPS

### Main Program Features:

- RefSet Controller is a program that is used to control a Leica 1200 Total Station to automatically set out most types of underground mining survey mark-ups by reference line or stakeout
- The program can be used by a single person to complete underground mark-ups without the need to return to the Total Station to 'point' the instrument at the next setout point as the program automatically sets out the current feature and then proceeds to setout the next feature
- The program runs on either a Leica CS15 or CS20 controller or a PDA or similar device that is running Windows Mobile and the program connects to the Total Station using a Bluetooth or serial cable connection
- The program communicates with the Total Station using the Leica Geocom program commands and a Leica key for this program needs to be installed on the Total Station
- RefSet Controller is based on the RefSet program for the Leica 1100 TPS which is used by many underground surveyors throughout Australia
- The program is divided into a number of functions according to the job being performed including staking out rings, blast holes, reference lines, grade lines and points and checking drill rig setups

### Program Screenshots:

RefSet Controller			RefSet - Configuration			Survey - 181203.str					
1 Stakeout Rings	2 Stakeout Holes	3 Stakeout Refline	Data File Type:	STR	Point ID:	12					
4 Stakeout Gradeline	5 Stakeout Laser	6 Stakeout Points	Data Folder:	SD Card	Code:	1					
7 Stakeout Profile	8 Survey	9 Survey Rig/ Holes	Use Common Data File:	No	Target Height:	0.000					
			Log Staked Points:	No	Horiz Angle:	53° 32' 53"					
			Log File Type:	STR	Vert Angle:	103° 34' 05"					
			Grade Display:	V:H	Slope Distance:	11.634					
			Data Input Method:	Function Keys	Northing:	106.720					
					Easting:	109.097					
					Elevation:	97.271					
About	Config	TPS Connection	Exit	Fn	OK	Meas	Dist	Store	Start Auto	Offsets	Map

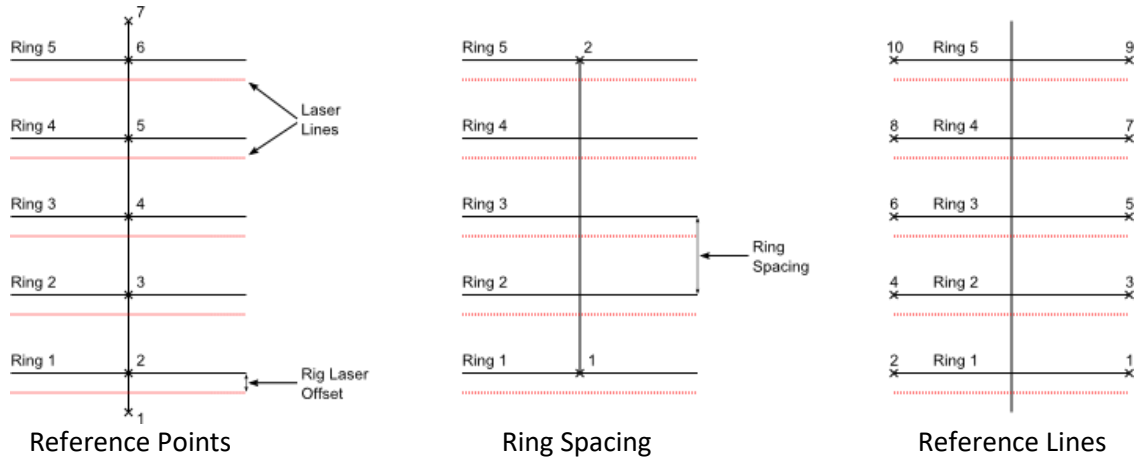
Main Menu                      Main Configuration                      Measure Point

### Stakeout Rings Screenshots:

Stakeout Rings - Job Selection			Stake Rings By Ref Lines - Setup			Stake Rings By Ref Lines						
Control Job:	refset_test		First Point On Ring:	1	Auto Stake Pattern:	LRLR....						
			Second Point On Ring:	2	Ring Reference Line:	1 - 2						
			Rig Laser Offset:	1.000	Auto Stakeout Side:	Left						
			Auto Height Offset:	1.500	Offset from Laser Line:	0.761						
					Height from Ring:	1.566						
OK	Config	Create New Job	OK	Config	Enter New Point	Measure New Point	Map	Stop	Start Auto	Previous Ring	Next Ring	New Ring

Control Job Selection                      Point Selection                      Stakeout Rings

## Stakeout Rings Methods: (Showing upload points needed)



- **Stakeout Rings** is used to stakeout the rig laser lines for longhole drill rigs and has three methods for defining the ring positions, including by reference points, ring spacing and reference lines
- **Stakeout Holes** is used to automatically stakeout blast hole collar positions using a reference line to define the blast hole trace (points for the hole collar and toe positions)
- **Stakeout Refline** can be used to automatically set out the reference line or a specified offset from the reference line across the backs and/or down the drive walls. This mode can be used to setout a ring reference line for longhole rigs that use a pivot point or for marking up paintlines for the start of development drives and stripping
- **Stakeout Gradeline** is used to automatically stakeout a grade paintline down the development drive walls at a specified height above the drive design
- **Stakeout Laser** is used to stakeout and install alignment lasers on curved and straight development drives
- **Stakeout Points** is used to automatically stakeout point coordinates and can be used to set out vertical hole positions (eg: for a longhole rise mark-ups)
- **Stakeout Profile** is used to check an as-built drive versus a design drive profile and also to stakeout development drive profiles on the drive face
- **Survey Rig** can be used to check the alignment (azimuth and dip) of a drill rig setup (raise bore, blasthole rig, diamond drill rig, etc). It can also check the alignment and deviation of the drill rig setup compared to a design hole

Stakeout Holes	Stakeout Gradeline	Survey Rig/Holes - Hole Info
<b>Hole Reference:</b> 1 - 2 <b>Slope Line from Collar:</b> 0.224 <b>Offset from Hole:</b> 0.278 <b>Perp Height from Hole:</b> -0.091	<b>Auto Stake Interval:</b> 1.000 <b>Auto Height Offset:</b> 1.500 <b>At End of Gradeline:</b> Continue <b>Gradeline Reference:</b> 1 - 2 <b>Hx Line from Start Pt:</b> 2.548 <b>Offset from Gradeline:</b> -1.278 <b>Height from Gradeline:</b> 1.439	<b>Hole ID:</b> 1 <b>Measured Azimuth:</b> 182° 40' 55" <b>Measured Dip:</b> 13° 35' 08" <b>Collar Northing:</b> 103.221 <b>Collar Easting:</b> 97.573 <b>Collar Elevation:</b> 99.890
Dist Start Auto Previous Hole Next Hole New Hole	Stop Start Auto Previous Gradeline Next Gradeline New Gradeline	OK
Stakeout Holes	Stakeout Gradeline	Survey Rig

For more information visit [www.refset.com.au](http://www.refset.com.au)