

RefSet

Automatic Reference Line and Stakeout Program for Leica TPS

Main Program Features:

- RefSet is a program that is used to control a Leica TS15/MS50 or TS16/MS60 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 the instrument as a separate program to the standard Leica SmartWorx or Captivate program. SmartWorx or Captivate is still needed to setup the instrument and complete other survey jobs (Pickups, etc)
- The program communicates with the Total Station using the Leica Geocom program commands and this requires two Leica license keys to be installed on the Total Station. A Leica "Robotic Geocom" license key as well as a Leica "Virtual Geocom" license key are needed
- RefSet 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 Viva			RefSet - Configuration			Measure Start Point of Gradeline		
1 Stakeout Rings	2 Stakeout Holes	3 Stakeout Refline	Data File Type:	STR	New Point ID:	1		
			Data Folder:	SD Card	Horiz Angle:	328° 42' 01"		
4 Stakeout Gradeline	5 Stakeout Laser	6 Stakeout Points	Use Common Data File:	No	Vert Angle:	121° 49' 12"		
			Log Staked Points:	No	Slope Distance:	15.396		
7 Stakeout Profile	8 Survey	9 Survey Rig/ Holes	Log File Type:	STR	Northing:	111.178		
			Grade Display:	V:H	Easting:	93.203		
					Elevation:	91.882		
About	Config		Smart Worx	Exit	OK		Meas	Dist
							Store	Upper
								Alpha

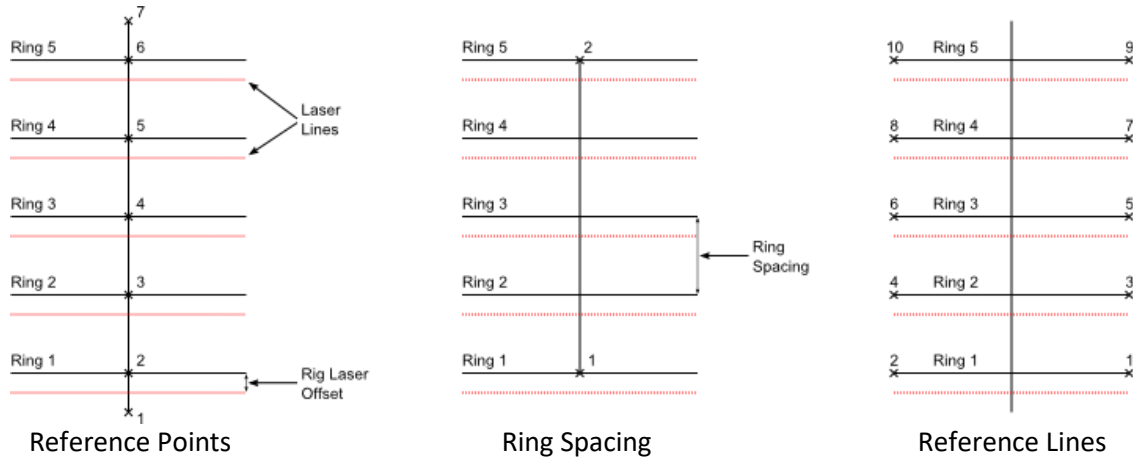
Main Menu Main Configuration Measure Point

Stakeout Rings Screenshots:

Stakeout Rings - Control Job			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:	-1.079		
					Height from Ring:	1.598		
OK	Config	Create New Job	OK	Config	Enter New Point	Measure New Point	Dist	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					Check Rig - Reference Line Info				
0%					0%					0%				
Hole Reference: 1 - 2					Auto Stake Interval: 1.000					Check Rig: 1 - 2				
Slope Line from Collar: 0.342					Auto Height Offset: 1.500					Azimuth: 81° 55' 45"				
Offset from Hole: 0.060					At End of Gradeline: Continue					Dip: 0° 29' 59"				
Perp Height from Hole: -0.129					Gradeline Reference: 1 - 2					Grade: 1 in 114.7				
					Hz Line from Start Pt: 0.075					Slope Length: 3.554				
					Offset from Gradeline: -0.079					Horizontal Length: 3.554				
					Height from Gradeline: 1.598					Height Difference: 0.031				
Dist	Start	Previous	Next	New	Dist	Start	Previous	Next	New	Check			Previous	Next
	Auto	Hole	Hole	Hole		Auto	Gradeline	Gradeline	Gradeline	Rig Again			Page	Page

Stakeout Holes

Stakeout Gradeline

Survey Rig

For more information visit www.refset.com.au