

SURVEYOR[®] TS-SERIES

www.laserdesign.com

The Leader in 3D Laser Scanning Since 1987



Surveyor TS-Series 3D Laser Scanners

- **Portable system using tripod.**
- **Very easy to use. Only requires a few hours training.**
- **Inexpensive – fits any budget.**
- **Ideal for reverse engineering applications.**

Laser Design Inc, the leader in 3D laser scanning since 1987, introduces the TS-2000, the first model in a line of Tripod-mounted 3D laser scanners. Both affordable and easy to use, the TS-2000 scanner enables users to quickly scan complex textures and geometric shape coordinate data from any object. The system creates a 3D digital coordinate point cloud, which can be easily processed into .STL or even NURBS Surface CAD models with optional scan processing software from Raindrop Geomagic. The Geomagic software performs editing and model-building functions including scaling, smoothing, point cloud editing, STL model generation, surface modeling, to efficiently and accurately create 3D CAD models output via IGES or STEP formats to any CAD/CAM environment.

The TS-Series scanners use Laser Triangulation, an active stereoscopic technique where the distance of the object is computed by means of a directional light source and two video CMOS cameras. A laser beam is deflected from a mirror onto a scanning object. The object scatters the light, which is then collected by a video camera located at a known triangulation distance from the laser. Using trigonometry, the 3D spacial (X-Y-Z) coordinates of a surface point are calculated. The TS -2000's multiple CMOS 2D arrays, captures the surface profile's image from two opposing angles simultaneously and digitizes all data points along the laser. Generating approximately 50,000 coordinates per second, the TS-Series scans millions of coordinates into a single coordinate system for fast and easy CAD modeling using the Raindrop Geomagic STUDIO Software modules.

The TS-2000 system is designed for Tripod mounted (or Desktop) operation requiring only 3 cable connections and can be used with a laptop computer or a more powerful desktop PC. The built-in scanning mechanism sweeps the laser beam over the object in order to generate highly accurate 3D surface coordinate point cloud information. The narrow-bandpass filter in the video camera removes ambient light to maintain detected laser stripe integrity.

The TS-2000 includes a high accuracy integrated rotary stage for laser line scanning motion over the part. The TS-2000 probe is designed for use with a Tripod Mount and can be used with an integrated Rotary Stage for Part Rotation for Automated Scanning applications (See SURVEYOR Model DT-Series Systems).

The TS-2000 is easy to operate and ideal for scanning complicated shaped parts from 1" up to 40" (cubed) in size using a progressive, stitch-together scanning process. Combination of multiple scans into a single coordinate point cloud is provided by either the scanner's own Surveyor Scan Control software using tooling ball reference targets (supply provided with scanner) or Raindrop Geomagic CAPTURE software module (optional).

Surveyor® TS-Series Specifications

TS-2000	
General Properties:	
Adjustments	Software exposure video-gain for material being scanned sensitivity and scan-limits control. Software limits number-of-scan lines control.
Mount	Tripod
Size (in)	12"L, 7"L, 7"H
Size (mm)	300mm L, 175mm W, 175mm H
Weight	10 lbs. / 4.5 Kg.
Geometry acquisition	50,000 pts. / second
Laser:	
Laser-Line generator	40 degree fan-out angle
Laser power/Class at 20 cm distance according to CDRH (Laser Diode)	<1Mw- Class 2, 670 nm
Standoff	9" / 225 mm to 20" / 508mm
Depth of Field	13" / 330 mm
Laser Line Length	225mm @ 225mm (9" @ 9") 365 mm @ 365 mm (14.6" @ 14.6") 510mm @ 510mm (20" @ 20")
Point Density	TS = 480 pts. / line
Scan Sweep (Left to Right)	1" to 16" Operator Programmable
Hardware and software limits for laser exposure time	Yes
Video System:	
High-sensitivity Sony B/W CCD with 8.4 x 9.8 micron pixel size	No
Digital Color Function Option	No
Scan Sweep Field of View	CMOS or B/W CCD field-of-view fan-out angle 33 degrees in vertical direction, 44 degrees in horizontal direction
Video Digital Signal Processing	Advanced non-lossy Video Compressor
Geometry Sampling Grid:	
Vertical direction	494 steps (high resolution) , 262 steps (low resolution)
Horizontal direction	Sub-pixel resolution (< than 1/10 pixel)
Resolution and Accuracy:	
Standard deviation of points from the ideal plane position	±100 µm @ 300 mm
	±.004" @ 12"
Scan Line Coordinate Density	625 µm @ 300 mm (0.030" @ 12") per scan line, Distance between coordinates along line
	Distance between Scan Lines = Operator Determined / Programmable to 0.1 degree increments.
Camera Software:	
Features	Scanner Active-X controls. Preview fast/slow video window for BW/Color images. Fast pre-scan window showing scan data and min/max distances in real time.
Output formats	XYZ ASCII point file output from SSC scanning control software . SSC native scanner data formats are readable by Geomagic software.
PC Information:	
Interface and Operating System	Standard plug and play USB. Windows 2000 or Windows XP.



* TS Specifications are based upon pre published performance specifications and may be changed without notice.

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