

# SURVEYOR<sup>®</sup> DS-SERIES

www.laserdesign.com

The Leader in 3D Laser Scanning Since 1987



## Surveyor<sup>®</sup> DS-Series 3D Laser Scanners

*DS-Series scanners in conjunction with optional software from our Solutions Partners can solve the most demanding challenges:*

- **Automated Scanning** Customized software and hardware allows automated 3D scanning and data processing.
- **Rapid Inspection** Compare scan data from actual parts to 3D CAD models for computer aided verification.
- **Quality Control** Obtain discrete dimension information directly from 3D scan data.
- **Reverse Engineering** Apply surfaces to scan data for 3D CAD model creation.
- **Meshes** 3D Scan data can be converted into STL triangular meshes for RP output.
- **Toolpaths** Generate high-quality CNC toolpaths directly from 3D scan data.
- **CMM Capability** Optional CMM software for touch probe measurements is available along with the full line of Renishaw touch probes.

Laser Design Inc., the world leader in 3D laser scanning, introduces next-generation scanning technology with the dual-scan, Surveyor DS-Series systems. Now more accurate, faster, and easier to use than ever before, these CMM-based systems offer the ultimate capabilities for scanning difficult shapes. Available in a broad array of system sizes, the DS-Series features full CMM capability as an option. Using its patented laser line technology, Surveyor DS-Series scans parts from all orientations, and then easily rotates the data back into a common coordinate system. Operators can quickly and easily scan free form surfaces and parts of all sizes, especially those with complex geometry. Typical parts include plastic and rubber components, EDM electrodes, extrusions, molds, dies, and castings.

Our unique technology dramatically reduces scanning time by collecting data significantly faster than conventional non-contact measuring technologies. Laser Design offers a wide variety of laser probe options which use a direct encoder interface to maximize scan data throughput. Surveyor Scan Control software adds versatility and functionality to the DS-Series systems. It controls scanning motion and laser probe settings, and contains advanced data-editing and automation features. The 3D scan data point cloud can then be processed further with optional software from Raindrop Geomagic and other CAD programs designed for use with laser scan data.

DS-Series systems are built on a substantial granite base and use non-contact optical steel scales on steel members for dimensional and thermal stability. All ways, bearings, scales and motors are enclosed or protected against harsh environments. The DS-Series design emphasizes powerful bearing ratios and precision pre-loaded mechanical bearings on hardened and ground steel ways. Its straight and square construction using a dual-beam steel bridge ensures mechanical accuracy making calibrations simple and saving you money. The DS-Series features the ultimate drive system eliminating the heat, vibration, wear, backlash and cogging of other CMM-type systems. The programmable multi-axis, PC-based controller is from one of the world's leading provider of PC-based motion-control technology.

The system package includes Surveyor Scan Control software, choice of laser probes, deluxe joystick controller, training and a one-year parts and labor warranty. Options include rotary stages and specialized fixturing used for automated scanning.

# Surveyor DS-SERIES Machine Specifications

Common Information						
Laser probes	A complete line of RPS laser line-sensor probes is available. Single point laser sensors available as an option. Refer to separate laser specification sheet for additional information.					
Laser indexing	A 4/5 axis manually indexed head for laser scanning at compound angles is included.					
Software - Laser Scanning	Advanced Surveyor Scan Control software. Supports point-to-point and continuous scanning. Refer to separate software specification sheet for					
Software - CMM (Optional)	Geomat for classic CMM geometry with touch probe.					
Touch Probes - CMM (Optional)	Renishaw CMM probing products					
Computer	High-end, PC with Open GL video					
Controller	PMAC multi-axis motion controller from Delta Tau. 3-4 axis joystick included.					
Drive system	Brushless, non-contact linear motors (x,y,z) or belt-drive rotary motors with digital servo amplifiers					
Power requirements	120V AC, 60 Hz, 15A, clean grounded AC outlet (Optional: 220 VAC, 50 Hz or other requirements as specified by customer) Uninterruptible Power Supply (UPS) suggested					
Environmental requirements	Temperature: 68° F ± 3° F / 20° C ± 1.8° C Humidity: 50% ± 15%					
Machine structure	Steel dual-beam bridge					
Axes	X,Y,Z, optional rotary					
Bearing system	Hardened and ground steel ways, recirculating bearings					
Measuring table	Granite plate with clamping inserts					
Measuring system	Steel scales on steel member, optical non-contact					
Warranty	One year parts and labor. Technician's travel expenses not included.					
Miscellaneous	Ways, bearings, scales and motors fully covered or enclosed. Installation provided by supplier. Assistance provided by customer as needed.					
General Information	2000 Series	3000 Series	4000 Series	5000 Series	4500 Series	6000 Series *
Linear accuracy (B89.4)-µin	220 µin + 10 µin / in.	250 µin + 12 µin / in.	280 µin + 12 µin / in.	300 µin + 12 µin / in.	300 µin + 12 µin / in.	320 µin + 13 µin / in.
Linear accuracy (B89.4)-µm	5.6 µm + L (mm) / 150	6.4 µm + L (mm) / 100	7.1 µm + L (mm) / 100	7.6 µm + L (mm) / 100	7.6 µm + L (mm) / 100	8.1 µm + L (mm) / 100
Repeatability	.00024" / .006 mm	.00024" / .006 mm	.00024" / .006 mm	.00028" / .007 mm	.00028" / .007 mm	.00028" / .007 mm
Scale resolution - standard	.00004" / .001 mm	.00004" / .001 mm	.00004" / .001 mm	.00004" / .001 mm	.00004" / .001 mm	.00004" / .001 mm
Scale resolution - optional	.00002" / .0005 mm	.00002" / .0005 mm	.00002" / .0005 mm	.00002" / .0005 mm	.00002" / .0005 mm	.00002" / .0005 mm
Acceleration per second <sup>2</sup>	60" / 2000 mm	60" / 1500 mm	60" / 1500 mm	60" / 1500 mm	40" / 1000 mm	40" / 1000 mm
Maximum speed per second	24" / 610 mm	24" / 610 mm	24" / 610 mm	24" / 610 mm	10" / 250 mm	10" / 250 mm
Clearance under bridge	28.5" / 720 mm (2016/30) 32.5" / 825 mm (2530)	34" / 860 mm	34" / 860 mm	34" / 860 mm	45" / 1140 mm	45" / 1140 mm
Maximum part height with laser sensor in vertical position and beam parallel to table	13.5" / 345 mm (2016/30) 17.5" / 445 mm (2530)	19" / 485 mm	19" / 485 mm	19" / 485 mm	30" / 760 mm	30" / 760 mm
Maximum part height with laser sensor positioned at an angle	1" to 3" (25 mm to 75 mm) of extra part height is gained when laser sensor is positioned at an angle using manual index head.					
Maximum part height with rotary stage option	Maximum part height is reduced by an amount equal to the height of the rotary stage (typically about 4" / 100 mm).					
Machine Information	DS - 2020	DS - 3040	DS - 4060	DS - 5080	DS - 4560	DS - 6060
Travel (X,Y,Z) - in.	20 x 20 x 16	30 x 40 x 25	40 x 60 x 25	50 x 80 x 25	45 x 60 x 40	60 x 60 x 40
Travel (X,Y,Z) - mm	500 x 500 x 400	750 x 1000 x 635	1000 x 1500 x 635	1270 x 2000 x 635	1140 x 1500 x 1000	1500 x 1500 x 1000
Machine weight	1050 lbs / 475 kg	3000 lbs / 1365 kg	7000 lbs / 3185 kg	14,000 lbs / 6365 kg	11,900 / 5410 kg	14,300 / 6500 kg
Table size - in. / mm	26 x 40 / 660 x 1010	36 x 65 / 914 x 1651	46 x 91 / 1168 x 2311	56 x 115 / 1422 x 2921	55 x 85 / 1400 x 2160	70 x 85 / 1775 x 2160
Maximum Part Weight	640 lbs / 291 kg	1845 lbs / 840 kg	3270 lbs / 1485 kg	4960 lbs / 2255 kg	3900 lbs / 1775 kg	4700 lbs / 2135 kg
Dimensions (w,d,h) - in.	40 x 44 x 95	51 x 70 x 113	61 x 96 x 113	71 x 118 x 114	78 x 95 x 156	93 x 105 x 156
Dimensions (w,d,h) - mm	1016 x 1117 x 2416	1296 x 1778 x 2870	1549 x 2439 x 2870	1803 x 2998 x 2896	1985 x 2415 x 3965	2365 x 2670 x 3965
3D volumetric accuracy	.00060" / .015 mm	.00076" / .020 mm	.00088" / .022 mm	.00096" / .024 mm	.00084" / .021 mm	.00108" / .027 mm
Machine Information	DS - 2030	DS - 3060	DS - 4080	DS - 50100	DS - 4580	DS - 6080
Travel (X,Y,Z) - in.	20 x 30 x 16	30 x 60 x 25	40 x 80 x 25	50 x 100 x 25	45 x 80 x 40	60 x 80 x 40
Travel (X,Y,Z) - mm	500 x 750 x 400	750 x 1500 x 635	1000 x 2000 x 635	1270 x 2500 x 635	1140 x 2000 x 1000	1500 x 2000 x 1000
Machine weight	1200 lbs / 545 kg	6500 lbs / 2955 kg	11,000 lbs / 5000 kg	16,000 lbs / 7275 kg	14,500 lbs / 6595 kg	17,400 lbs / 7910 kg
Table size - in. / mm	26 x 43 / 685 x 1092	36 x 85 / 914 x 2159	46 x 115 / 1168 x 2921	56 x 134 / 1422 x 3404	55 x 105 / 1395 x 2665	70 x 105 / 1775 x 2665
Maximum Part Weight	1000 lbs / 455 kg	3000 lbs / 1365 kg	3390 lbs / 1540 kg	5750 lbs / 2610 kg	4900 lbs / 2230 kg	5900 lbs / 2680 kg
Dimensions (w,d,h) - in.	40 x 55 x 95	51 x 90 x 113	61 x 118 x 113	71 x 136 x 114	78 x 115 x 156	93 x 125 x 156
Dimensions (w,d,h) - mm	1016 x 1397 x 2413	1296 x 2286 x 2870	1549 x 2997 x 2896	1803 x 3454 x 2896	1985 x 2925 x 3965	2365 x 3175 x 3965
3D volumetric accuracy	.00064" / .016 mm	.00084" / .021 mm	.00088" / .022 mm	.00100" / .025 mm	.00092" / .023 mm	.00116" / .029 mm
Machine Information	DS - 2530	This space was intentionally left blank.	DS - 60120 *	DS - 50120	DS - 45100	DS - 60100
Travel (X,Y,Z) - in.	25 x 30 x 20		60 x 120 x 40	50 x 120 x 25	45 x 100 x 40	60 x 100 x 40
Travel (X,Y,Z) - mm	625 x 750 x 500		1500 x 3050 x 1000	1270 x 3050 x 635	1140 x 2500 x 1000	1500 x 2500 x 1000
Machine weight	1800 lbs / 815 kg		23,600 lbs / 10730 kg	20,000 lbs / 9095 kg	17,000 lbs / 7730 kg	20,500 lbs / 9320 kg
Table size - in. / mm	31 x 49 / 775 x 1240		70 x 145 / 1780 x 3685	56 x 153 / 1422 x 3886	55 x 125 / 1395 x 3175	70 x 125 / 1775 x 3175
Maximum Part Weight	1100 lbs / 500 kg		8500 lbs / 3865 kg	6560 lbs / 2980 kg	5800 lbs / 2635 kg	7000 lbs / 3180 kg
Dimensions (w,d,h) - in.	46 x 55 x 113		93 x 165 x 156	71 x 155 x 114	78 x 135 x 156	93 x 145 x 156
Dimensions (w,d,h) - mm	1168 x 1397 x 2870	2365 x 4195 x 3965	1803 x 3937 x 2896	1985 x 3430 x 3965	2365 x 3685 x 3965	
3D volumetric accuracy	.00066" / .017 mm	.00132" / .034 mm	.00108" / .027 mm	.00096" / .024 mm	.00124" / .031 mm	
* DS - 60120 model is part of 6000 series						
Specifications subject to change without prior notice. Specifications based on Renishaw touch probe measurement. For measurement accuracy with laser sensor, refer to laser specifications.						
Specifications subject to machine installation by authorized LDI technician only. February 8, 2008						

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