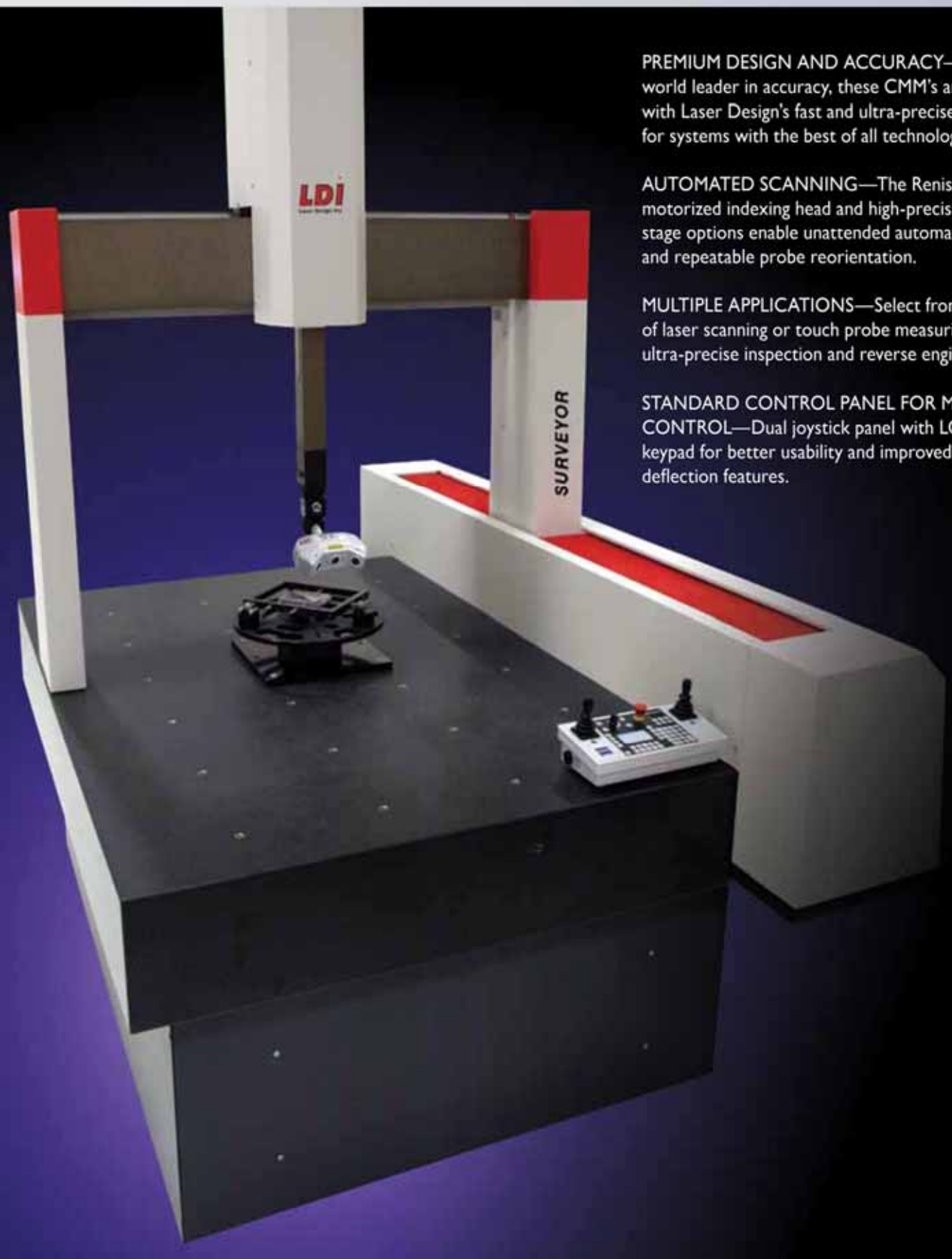
LDI
Laser Design Inc

3D Laser Scanning Systems

SURVEYOR® ZS-Series



PREMIUM DESIGN AND ACCURACY—Known as the world leader in accuracy, these CMM's are integrated with Laser Design's fast and ultra-precise laser scanners for systems with the best of all technologies.

AUTOMATED SCANNING—The Renishaw PH10 motorized indexing head and high-precision rotary stage options enable unattended automated operation and repeatable probe reorientation.

MULTIPLE APPLICATIONS—Select from a wide range of laser scanning or touch probe measuring options for ultra-precise inspection and reverse engineering.

STANDARD CONTROL PANEL FOR MOTORIZED CONTROL—Dual joystick panel with LCD display and keypad for better usability and improved mechanical deflection features.

Machine Specifications

SURVEYOR®

The ZS-Series scanning system offers excellent stability and rigidity through passive anti-vibration technology while scanning at maximum speed and acceleration. The bridge-type CMM has an aluminum crossbeam and spindle with a pneumatically counterbalanced Z axis. The preloaded high-performance air bearings with wrap around guideways in all axes mean support from all four sides, guaranteeing superior measuring capabilities. Hard-coated aluminum guideway elements ensure corrosion resistance, hardness and wear resistance, electrical resistance, temperature resistance, and a low friction coefficient. The protective housing that covers the bridge can be easily removed and remounted for easy access to all parts, facilitating speedy maintenance and repairs. The integrated C99L controller supplies smooth, accurate, high-speed 3-axis movement for all measuring applications.

GENERAL INFORMATION

Design	Bridge-type CMM with stationary machine table and lateral bridge drive.
Operating Mode	Motorized / CNC
Laser / Part Indexing	Fixed / Renishaw
Software - Laser Scanning	Surveyor Scan Control software. Supports point-to-point and continuous dynamic scanning. Refer to separate software specification sheet for details.
Length Measuring System	Reflected light length measuring system, photoelectric 0.2 µm (0.000008 in) resolution.
Special Features	Aluminum crossbeam and spindle. Pneumatically counterbalanced Z axis. Preloaded high-performance air bearings with wrap around guideways in all axes. Passive anti-vibration system.
Drive System	High-performance servo drives. Electronic monitoring of position control in all axes.
Controller	Type: C99L (CNC 3-axis vectorial control) Cooling System: Integrated Fan
Computer	The ZS-Series comes with a fully equipped workstation.
Accessories	Standard control panel: 2 joysticks with progressive characteristics for manual control.
Power Requirements	100-240 V VAC ~ (+10%, -15%); 50-60 Hz (±3.5%), Power consumption: max. 750 VA
Environmental Requirements	+17° to +35°C (63°-95°F)
Compressed Air Supply	Supply pressure 6 - 10 bar, pre-cleaned. Maximum consumption: 25 l/min at 5 bar pressure. Air quality according to ISO 8573 part 1: class 4.
Axes	X, Y, Z, optional rotary stage
Bearing System	Air bearings
Measuring Table	Black granite
Measuring System	Optical linear transducers
Warranty	One-year parts. Technician's travel expenses not included.

ZS-Series

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INCLUDED WITH SYSTEM

Choice of Laser Probe	SLP250 or SLP500
Laser Scanning Software	Surveyor Scan Control Software
Computer	High-end Windows-based PC and monitor
Manual Laser Mount	Adjustable mounts allow for 2 axes of rotation
Test Artifact	Specially designed artifact for validating system accuracy. Includes CMM inspection report and Qualify inspection template

SYSTEM OPTIONS

Rotary Stage	ADRS 150 high accuracy rotary stage
Renishaw PH10	2-axis Renishaw PH10M
7th Axis	LDI automated flip fixture
Manual Fixtures	Manual flip fixture and extra frames
Reverse Engineering Software	Geomagic Studio, Polyworks/Modeler, or Rapidform XOR
Inspection Software	Geomagic control, Polyworks/Inspector, or Geomagic verify

DYNAMICS

			500 and 700		1000	
Travel Speed	*Motorized:*	Axes:	0 to 70 mm/s	(2.8 in/s)	0 to 70 mm/s	(2.8 in/s)
	CNC:	X Axis:	Max. 200 mm/s	(7.9 in/s)	Max. 175 mm/s	(6.9 in/s)
		Y Axis:				
		Z Axis:				
		Vector:	Max. 346 mm/s	(13.6 in/s)	Max. 303 mm/s	(11.9 in/s)
Acceleration		Axes:	Max. 500 mm/s²	(19.7 in/s²)	Max. 500 mm/s²	(19.7 in/s²)
		Vector:	Max. 866 mm/s²	(34.1 in/s²)	Max. 866 mm/s²	(34.1 in/s²)

MEASURING RANGE (MM)

CMM sizes	Measuring range in mm (in)		
	x axis	y axis	z axis
5/5/5	500 (19.7)	500 (19.7)	500 (19.7)
7/7/6	700 (27.6)	700 (27.6)	600 (23.6)
7/10/6		1000 (39.4)	
10/12/6	1000 (39.4)	1200 (47.2)	
10/16/6		1600 (63.0)	

VOLUMETRIC ACCURACY CMM BASE-ISO 10360-2

Model	Renishaw TP200 Probe Standard Accuracy	
	MPEE	MPEP
500 & 700	2.4 + L/250	2.4
1000	2.7 + L/250	2.7

Laser Design also offers system upgrades for the ZS-Series for traditional CMM functionality. For information on adding a wide variety of Renishaw sensors and touch probing cabability to your machine, please contact your Laser Design Sales representative.

SLP LASER PROBE SPECIFICATION

	SPL-250	SLP-500	SLP-2000
Accuracy	≤ 10 µm	≤ 20 µm	75 µm
Standoff	91 mm	105 mm	185 mm
Depth of field	38 mm	63 mm	215 mm
Sample count	752 points / line	752 points / line	752 points / line
Sample Rate	37,500 / sensor 75,000 p/s	37,500 / sensor 75,000 p/s	75,000 p/s
Line Length(MAX)	25 mm	67 mm	240 mm
Laser Power Output	<1mW, Class II	<1mW, Class II	<1mW, Class II
Detectors(dual)	480 x 752 CMOS	480 x 752 CMOS	480 x 752 CMOS

Choose from the various system options shown below:

Renishaw PH10
Add 2 axes of programmable head motion

Laser Probes
Select from our line of SLP laser probes

Automated Flip Fixture
Choose an integrated ADRS rotary for fully automated scanning. Add an automated flip fixture to hold parts, allowing for easy part flipping and data matching.

Software and Applications

Laser Design supports scan data processing software from our solutions partners for reverse engineering and inspection applications.

REVERSE ENGINEERING

Point Cloud

STL Model

Modeling Data

Laser Design offers the world's leading data processing software packages for sale including: Geomagic, PolyWorks, Rapidform, and Verisurf. Our turnkey 3D scanning system solutions include application-specific software for output of:

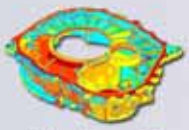
- Inspection / verification reports
- 3D color error maps
- CAD models (parametric, non-parametric, parasolids, surface NURBS, etc.)
- STL meshes
- Isolated key design features
- Many other analytic or geometric formats

INSPECTION

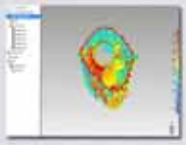
Measure and analyze the variance from CAD nominal with 3D color error mapping.

Point Cloud

CAD Model



Color Error Map



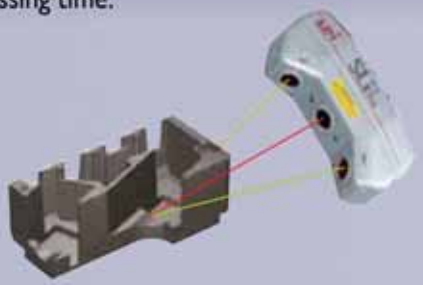
Report

Revolutionize your inspection process by implementing complete part characterization / analysis based upon millions of coordinates defining the part's shape rather than the few hundred coordinates of touch probe measuring. Any part geometry out of compliance with the CAD model is immediately revealed. The color-coded results are graphic and readily understood: green areas are within specifications; red, yellow, and blue areas are not.

Locations of critical datums and full GD&T dimensions are quickly displayed and included in easy-to-read graphic reports. Laser scan data can be combined with touch probe data in the same inspection report. Full dimensional spreadsheets can be output to conventional SPC as desired. Once an inspection report is created, it can be automated for second part output without operator involvement, making multiple part inspections much faster and more thorough than ever before.

Dual-Camera Sensors

SLP lasers feature two cameras that collect data simutaneously. If one camera is occluded, the other most often is not. This capability helps reduce processing time.



System Accuracy

Laboratory tests show overall system accuracy on a ZS-2030 with PHI0M and SLP-250 to be 0.00898mm when performing an ANSI B89 ballbar test.

레이져디자인시스템/주/

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