

Leica HDS6000

A new generation of ultra-high speed laser scanner

See also
HDS6000
brochure!



Compact design and high-performance scanning optimize field productivity

Leica HDS6000: new standard for phase-based scanners

The "next-generation" Leica HDS6000 significantly reduces field costs and increases phase-based data quality for many types of as-built and site surveys where users want to take advantage of ultra-high speed, phase-based laser scanning.

Up to 500,000 points per second

The Leica HDS6000 features the fastest scan rates available for high-accuracy, as-built surveys, making it the ideal instrument when very short time windows are available for capturing High-Definition Survey™ data.

Highly portable and field-efficient

By integrating the scanner, data storage, scanner control, and batteries into a single unit, the Leica HDS6000 is easy to

setup and carry for fast project execution. In addition, its increased range (up to 79m for 90% surface reflectivity), improved accuracy, and dual-axis (tilt) sensing capability can reduce the number of instrument and target setups needed, further cutting field time. These same features also increase the versatility of phase-based scanning.

Flexible scan control & registration options

Users can choose from three scanner control options. A side touch panel allows simple control. An optional wireless PDA allows "touch-free" control, plus visual inspection of jpeg scan images. For full 3D viewing, scan measurement, and rigorous quality assurance (QA), users can opt for powerful laptop control with Leica Cyclone™ SCAN, the industry's most popular and versatile scanner control software. For accurately registering (or stitching) multiple scans together, Leica Cyclone REGISTER software lets Leica HDS6000 users take advantage of either scan targets or "cloud-to-cloud" registration methods that don't require targets.

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Leica
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Leica HDS6000

Product Specifications

General

Instrument type	Compact, phase-based, dual-axis sensing, ultra high-speed laser scanner, with survey-grade accuracy and full field-of-view
User interface	Onboard touch panel, or external notebook or Tablet PC, or PDA
Scanner drive	Servo motor
Data storage	Integrated hard drive
Camera	No integrated camera; Cyclone SCAN supports use of external camera

System Performance

Accuracy of single measurement

Position*	6mm, 1m to 25m range; 10mm to 50m range
Distance*	≤4mm at 90% albedo up to 25m; ≤5mm at 18% albedo up to 25m ≤5mm at 90% albedo up to 50m; ≤6mm at 18% albedo up to 50m
Angle (horizontal/vertical)	125 µrad/125 µrad, one sigma
Modeled surface precision**/noise	2mm at 25m; 4mm at 50m for 90% albedo, one sigma; 3mm at 25m; 7mm at 50m, for 18% albedo, one sigma

Target acquisition***	2mm std. deviation
Dual-axis sensor	Selectable on/off; 3.6" resolution
Data integrity monitoring	Self-check at start-up; optional checks using Cyclone-SCAN

Laser Scanning System

Type	Phase-shift
Laser Class	3R (IEC 60825-1)
Range	79m ambiguity interval 79m @90%; 50m @18% albedo
Scan rate	Up to 500,000 points/sec, maximum instantaneous rate; Average time: see "Selectability Table" below

Scan resolution

Spot size	3mm at exit (based on Gaussian definition) + 0.22mrad divergence; 8mm @25m; 14mm @50m
Selectability	5 pre-set spacings per table

	Pts/360° (vert., horiz.)	Scan time (full dome)
"Preview"	1250	25 sec
Middle (4x)	5000	1 min 40 sec
High (8x)	10000	3 min 22 sec
Super High (16x)	20000	6 min 44 sec
Ultra High (32x)	40000	26 min 40 sec

Point spacing at range	@10m	@50m
"Preview"	50.6x50.6mm	250x250mm
Middle (4x)	12.6x12.6mm	62x62mm
High (8x)	6.3x6.3mm	31.4x31.4mm
Super High (16x)	3.1x3.1mm	15.8x15.8mm
Ultra High (32x)	1.6x1.6mm	7.9x7.9mm

Field-of-view (per scan)

Horizontal	360° (maximum)
Vertical	310° (maximum)
Aiming/Sighting	Optical horizontal sighting using QuickScan™ feature

Scanning Optics	Vertically rotating mirror on horizontally rotating base; Environmentally protected by shield
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Scan motors	Direct drive, brushless; proprietary
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Power transfer	Onboard rotating turret or external to non-rotating base
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Data transfer	Ethernet or USB 2.0 device (two ports)
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Data storage

capacity (onboard)	60 GB, min
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Communications	DHCP client/server; Ethernet or Bluetooth
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Status indicators	4-line alphanumeric display for laser status, system power & status 1 LED for laser status
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Level indicator	External bubble; digital readout on touch panel or via laptop
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Electrical

Power supply	24V DC; 90 - 260V AC
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Power Consumption	50 W
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Battery Type	Integrated: Li-ion
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	External: sealed lead acid
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Duration	Internal: 1.5 hrs, typical
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	External: 4 hrs, typical
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Power status indicators	LEDs indicate charging status and capacity levels
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Environmental

Operating temp.	0° C to +40° C
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Storage temp.	-20°C to +50°C
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Lighting	Fully operational between bright sunlight and complete darkness
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Humidity	Non-condensing
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Physical

Scanner	
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Dimensions	7.5"D x 11.5" W x 13.8" H
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	190mm D x 244mm W x 351.5mm
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Weight	14 kg, nominal (includes integrated battery)
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Battery (external)

Dimensions	9.5" D x 10" W x 12" H
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	240mm D x 260 mm W x 300mm H
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Weight	16 kg, nominal
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AC Power Supply

Dimensions	9.5" D x 5" W x 6" H
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	240mm D x 127 mm W x 152mm H
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Weight	2.5 kg, nominal
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Standard Accessories

	Scanner and accessory carrying case
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	Additional rechargeable integrated battery
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	Charging/power cable, ethernet cable, A/C cable
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	Battery charger / A/C power supply
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	Battery charging cradle for internal battery
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	Cyclone™-SCAN software
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	Cleaning kit
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Hardware Options

	Notebook PC, Tablet PC, or PDA
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	HDS6000 scan targets and target accessories
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	Service agreement for Leica HDS6000
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	Extended warranty for Leica HDS6000
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	Tribach (Leica Professional Series)
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	Survey tripod (Leica Professional Series)
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	External battery
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Notebook PC for scanning ^Δ

Component	required (minimum)
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Processor	1.7 GHz Pentium M or similar
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RAM	1024MB SDRAM
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Network card	Ethernet
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Display	SXGA+ (64 MB or greater video RAM rec.)
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Operating system	Windows XP Professional (SP1 Or higher)
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	Windows 2000 (SP3 or higher with up to date security patches)
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PDA for scanning (rec.)

	HP iPAQ Pocket PC Series
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	Windows Mobile 5.0 for Pocket PC; iPAQ Wireless application;
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	Bluetooth wireless technology
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Cyclone-SCAN

	Scan density control from five (5) pre-sets
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	Scan filters: range, intensity ¹
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	Scan speed control (default or low)
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	Laser power control (normal or low/close-in)
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	Selection of scan area via scribed rectangle or pre-sets ¹
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	Customizable longitude/latitude grid lines
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	Pre-scan range probe
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	Script management for auto scan sequencing ¹
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	View scanner locations and field-of-view
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	Level of detail (LOD) for fast visualization
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	Auto rechecking (re-acquisition) of targets ¹
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	Target identification
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	Traverse ¹ ; traverse & resection reports
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	Field Setup - Resection; Known Backsight; Known Azimuth ¹
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	Direct coordinate/station entry ¹
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	Dual-axis sensor on/off
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	Stakeout and ID point
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	Target and instrument height input
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	Support of external digital images
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	Fly-around, pan & zoom, rotate clouds, meshes, models in 3D
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	View point clouds with intensity or true-color mapping
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	Point-and-scan QuickScan to set horizontal FoV ¹
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	User-defined quality-of-fit checks
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	Measure & dimension: slope dist., Δx, Δy, Δz
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	Create, manage annotations and layers
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	Save/restore views; save screen images; undo/redo support
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Onboard touch panel control

	Vertical, horizontal FOV
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	Scan density: 5 levels
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	Dual-axis sensor on/off
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	Laser power setting for normal or close-in mode
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PDA control

	Vertical, horizontal FOV
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	Scan density: 5 levels
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	Dual-axis sensor on/off
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	Laser power setting for normal or close-in mode
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	Display jpeg thumbnail of scan image
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Direct Import Formats

	Cyclone native IMP object database format, Cyclone Object
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	ASCII point data (XYZ, SVY, PTS, PTX, TXT);
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	Leica's X-Function DBX format, LandXML, ZFS, ZFC, 3DD
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Direct Export Formats

	ASCII point data (XYZ, SVY, PTS, PTX, TXT);
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	Leica's X-Function DBX format, LandXML, PTX
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Indirect Export Formats

	AutoCAD (via COE for AutoCAD plug-in)
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	MicroStation (via COE for MicroStation plug-in)
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	PDS (via MicroStation, COE for MicroStation plug-in)
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	AutoPLANT (via AutoCAD, COE for MicroStation plug-in)
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Ordering Information

	Contact Leica Geosystems or authorized representatives
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All specifications are subject to change without notice.

All +/- accuracy specifications are one sigma unless otherwise noted.

¹ SmartScan™ technology feature

^Δ Minimum requirements for modeling operations are different. Refer to Cyclone data sheet specifications.

* At 1m - 50m range, one sigma

** One sigma; subject to modeling methodology for modeled surface

*** Algorithmic fit to planar HDS gray & white targets

Laser class 3R in accordance with IEC 60825-1 resp. EN 60825-1

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