Leica HDS4500

Leica Geosystems HDS ultra high-speed phase-based 3D laser scanner

HDS4500 sets the standard - With a visible laser and two output power modes, the Leica HDS4500 increases productivity, maximizes data collection, and minimizes field time while setting the industry standard. The HDS4500 is for professionals who demand the highest standards when considering quality, accuracy and precision, and must trust the tools they use to get it right.

Mission-critical engineering - When projects require the best results, owners, project managers, surveyors and engineers demand the HDS4500 on the most critical projects and trust Leica Geosystems HDS when it has to be right.

100,000 to 500,000 points per second - The Leica HDS4500 is a short range scanner for ultra-high speed data collection on demanding projects. With its eye-safe class 3R continuous laser, the HDS4500 minimizes plant down-time or interruption to ongoing operations.

Speed advantage for fast on-site execution - The speed advantage and the full 360 x 310 degrees field-of-view makes the HDS4500 ideal for projects with very short time windows for collecting High-Definition Survey data.

The right tool for the job - Phase-based scanning is beneficial for tight-access, intricate interior work including automotive, manufacturing, nuclear, process and power plants, tunnels, and other industrial facilities as well as architectual heritage and restoration projects.

Get more information, or contact Leica Geosystems HDS for a demonstration at: www.hds.leica-geosystems.com.

Leica Geosystems

Leica HDS4500
Product Specifications

GENERAL

INSTRUMENT TYPE	Ultra high-speed, high-accuracy laser scanner with 360° x 310° field of view
USER INTERFACE	Notebook PC
SCANNER DRIVE	Servo motor

SYSTEM PERFORMANCE (25M AMBIGUITY RANGE MODEL)

SINGLE POINT ACCURACY***

POSITION	**AT 10M**	**AT 25M**
20% reflectivity (dark grey)	≤ 6mm	≤ 13.5mm
100% reflectivity (white)	≤ 6mm	≤ 12.8mm
DISTANCE		
20% reflectivity (dark grey)	≤ 3mm +180ppm*	
100% reflectivity (white)	≤ 3mm +64ppm*	
ANGLE		
Horizontal	350 micro-radians	
Vertical	350 micro-radians	
MODELED SURFACE PRECISION**	**AT 10M**	**AT 25M**
20% reflectivity (dark grey)	≤ 1.6mm	≤ 4.4mm
100% reflectivity (white)	≤ 1.0mm	≤ 1.8mm
TARGET ACQUISITION ACCURACYϕ**	≤ 2mm	≤ 3.5mm

** PPM value equals the range noise standard deviation*
*** Data acquired in default mode, subject to modeling methodology*
**** at 125 KHz data rate*
ϕ Algorithmic fit to black and white HDS targets

SYSTEM PERFORMANCE (53M AMBIGUITY RANGE MODEL)

SINGLE POINT ACCURACY***

POSITION	**AT 10M**	**AT 25M**
20% reflectivity (dark grey)	≤ 7.6mm	≤ 16.1mm
100% reflectivity (white)	≤ 7.2mm	≤ 13.7mm
DISTANCE		
20% reflectivity (dark grey)	≤ 5mm +360ppm*	
100% reflectivity (white)	≤ 5mm +120ppm*	
ANGLE		
Horizontal	350 micro-radians	
Vertical	350 micro-radians	
MODELED SURFACE PRECISION**	**AT 10M**	**AT 25M**
20% reflectivity (dark grey)	≤ 1.6mm	≤ 4.4mm
100% reflectivity (white)	≤ 1.0mm	≤ 1.8mm
TARGET ACQUISITION ACCURACYϕ**	≤ 2mm	≤ 3.5mm

** PPM value equals the range noise standard deviation*
*** Data acquired in default mode, subject to modeling methodology*
**** at 125 KHz data rate*

ϕ Algorithmic fit to black and white HDS targets

LASER SCANNING SYSTEM

TYPE	Phase-shift
COLOR	Red (visible)
LASER CLASS	Class 3R (IEC EN60825-1)
RANGE (optimal effective)	1m to 25m
MINIMAL RANGE	0.1m (low output power mode)
MAXIMUM RANGE (25M MODEL)	25.2m (default output power mode)
MAXIMUM RANGE (53M MODEL)	53.5m (default output power mode)
SCAN RATE	Up to 500,000 points/second*
SCAN DENSITY (RESOLUTION)	
Spot size	5mm at 10 meters, 8.5mm at 25 meters
Selectability/Point Spacing	Selection of preset resolution settings †
Scan row (horizontal)	20,000 points/row, maximum †
Scan column (vertical)	20,000 points/column, maximum †
FIELD-OF-VIEW (PER SCAN)	
Horizontal	360° (maximum) †
Vertical	310° (maximum) †
COMMUNICATIONS	IEEE 1394 "FireWire" / "I-link"
STATUS INDICATORS	3 LEDs indicate laser status, system power and system status

* Maximum scan rate dependent on scan resolution

ELECTRICAL

POWER SUPPLY	24V DC power supply (battery) 90 - 260V AC power supply
POWER CONSUMPTION	50 - 70W
BATTERY TYPE	Sealed lead acid
TYPICAL DURATION	6 hours per power supply (nominal temp.)
BATTERY STATUS INDICATORS	LEDs indicate charging status and capacity levels

ENVIRONMENTAL

OPERATING TEMP.	0°C to 40°C
LIGHTING	Fully operational from bright sunlight to complete darkness
TARGET REFLECTIVITY	No retro-reflectors
HUMIDITY	Non-condensing atmosphere

PHYSICAL

	DIMENSIONS	**WEIGHT**
SCANNER	7D" x 12" W x 13.5" H 180mm D x 300mm W x 350mm H	13 kg (28lbs),
SCANNER BASE	6" H (150mm H)	3kg (6.5lbs)
BATTERY / DC POWER SUPPLY	9.5" D x 10" W x 12" H 240mm D x 260mm W x 300mm H	16 kg (35lbs)
CHARGER / AC POWER SUPPLY	9.5" D x 5" W x 6" H 240mm D x 130mm W x 160mm H	2.5 kg (5.5lbs)

STANDARD ACCESSORIES

Scanner transport case
Tripod and dolly, includes transport case
Notebook PC
FireWire cable and PCMCIA FireWire card for connection of scanner to Notebook PC
Power supply components:
- Two rechargeable DC power suppplies (batteries)
- Power supply charger, includes AC power supply
- Power supply cables

Cyclone™-SCAN software

HARDWARE OPTIONS

HDS4500 scan targets and target accessories
Service agreement for HDS4500

NOTEBOOK PC FOR SCANNING Δ

COMPONENT	**REQUIRED (minimum)**
Processor	1.7 GHz Pentium M or greater
Sytem memory RAM	1024MB or greater (SDRAM)
Hard Disk	40GB or greater, (5400RPM or faster)
Network connection	Ethernet/modem combination
Data connection	FireWire / I-link (IEEE 1394)
Display	SXGA+(64MB or greater video RAM recommended)
Operating system	Windows XP Professional (SP1 or higher) Windows 2000 (SP3 or higher with up to date security patches)
File System	NTFS
Power	Additional battery, 2 preferred

Δ Minimum requirements for modeling operations are different. Please refer to Cyclone datasheet for specifications.

CYCLONE – SCAN

"Fly-around," pan & zoom, and freely rotate point clouds, intensity mapped clouds and models in 3D
Point cloud and 3D model Level of Detail (LOD) for fast visualization
Decimation of point clouds (Nth point)
View point clouds with intensity color mapping
Limit box for efficient viewing and interaction of selected regions
Targeted, single-shot pre-scan ranging †
Target height input during data capture †
Scan filtering to optionally exclude data based on:
- Area of interest via rectangular areas †
- Range †
- Return intensity †
- Pre-set drop-down list or custom settings †

User-defined quality-of-fit checks
Measure & dimension point clouds and models
- Slope distances
- △X, △Y, △Z distances

Create and manage annotations
Create and manage layers
Assign colors & materials to objects
View scanner locations and field-of-view
Environmental lighting
Save/restore views
Save screen image as image file
Undo/redo support
Scanner command scripting †

DIRECT IMPORT FORMATS

ASCII point data (XYZ, SVY, PTS, PTX, TXT) customized format
Zoller+Fröhlich ZFS, ZFC
RIEGL 3DD
COE (*Cyclone* Object Exchange)
- AutoCAD, MicroStation via COE Data Transfer plug-in

BMP, JPEG, TIFF
CGP

DIRECT EXPORT FORMATS

ASCII point data (XYZ, SVY, PTS, PTX, TXT) customized format
DXF
COE (*Cyclone* Object Exchange)
- AutoCAD, MicroStation via COE Data Transfer plugin

BMP, JPEG, TIFF
Zoller+Fröhlich ZFS

ORDERING INFORMATION

Contact Leica Geosystems HDS LLC or authorized manufacturer's representatives.

All specifications are subject to change without notice.
All ± accuracy specifications at 1 sigma unless indicated otherwise.
† SmartScan™ Technology feature.

Leica Geosystems

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Leica Geosystems HDS LLC
4550 Norris Canyon Road
San Ramon, CA 94583
www.hds.leica-geosystems.com