

HDS7000 Laser Scanner

Ultra-High Speed with Extended Range

>1 million
points/sec

>180 m
range



Ultra-high speed laser scanner for demanding professionals

Highest overall performance for phase-based scanners

Phase-based scanning is known for ultra-high scan speeds that can fit detailed scene capture into short time windows and increase overall field productivity. The HDS7000 scanner adds key “next level” performance features – important for demanding professionals – to its >1 million points/second ultra-high speed scanning.

Better quality data over longer ranges

Regardless of scan speed, demanding professionals don't compromise on accuracy. Advances in the HDS7000 laser technology now enable users to achieve high quality data at longer range. The HDS7000's maximum range of 187m is best-in-class for phase-based scanners.

Ultra-high speed scanning in more environments

Demanding professionals need their tools to work in demanding environments. The HDS7000 delivers an unmatched 55°C operating temperature range (-10°C to +45°C). Same for operating in dusty or wet locations: HDS7000's IP53 rating and a “encapsulated mirror” design provides further reassurance. HDS7000 even lets you scan on sites where only instruments with a Class 1 laser safety rating are allowed – better than any other phase-based scanner.

All-in-one design includes more control & registration options

Users have three scanner control options. A side panel allows touch control and optional wireless control allows “touch-free” operation. For full 3D viewing, scan measurement, and rigorous quality assurance (QA), demanding users can opt for powerful laptop control with Leica Cyclone SCAN, the industry's most popular control software.

- when it has to be **right**

Leica
Geosystems

HDS7000

Product Specifications

General	
Instrument type	Compact, phase-based, dual-axis compensated, ultra-high speed laser scanner, with survey-grade accuracy, range, field-of-view and laser plummet
User interface	Onboard control, notebook or tablet PC, PDA
Scanner drive	Servo motor
Data storage	Integrated flash drive or external USB flash drive
Camera	No integrated camera; supports use of external camera

Laser Scanning System																																														
Type	Phase-shift																																													
Wavelength	1.5 µm (Invisible)																																													
Laser Class	1 (in accordance with IEC 60825-1 resp. EN 60825-1)																																													
Range	187 m ambiguity interval 0.3 m minimum range 0.1 mm resolution																																													
Linearity error¹	≤ 1 mm																																													
Spot size	~ 3.5 mm @ 0.1 m distance (Gaussian-based)																																													
Beam divergence	< 0.3 mrad																																													
Scan rate	Up to 1,016,727 points/sec, maximum instantaneous rate																																													
Range noise	<table border="1"> <thead> <tr> <th>Range</th> <th>Black 14%</th> <th>Gray 37%</th> <th>White 80%</th> </tr> </thead> <tbody> <tr> <td>10 m¹²</td> <td>0.5 mm rms</td> <td>0.4 mm rms</td> <td>0.3 mm rms</td> </tr> <tr> <td>25 m¹²</td> <td>1.0 mm rms</td> <td>0.6 mm rms</td> <td>0.5 mm rms</td> </tr> <tr> <td>50 m¹²</td> <td>2.7 mm rms</td> <td>1.2 mm rms</td> <td>0.8 mm rms</td> </tr> <tr> <td>100 m¹²³</td> <td>10 mm rms</td> <td>3.8 mm rms</td> <td>2.0 mm rms</td> </tr> </tbody> </table>	Range	Black 14%	Gray 37%	White 80%	10 m ¹²	0.5 mm rms	0.4 mm rms	0.3 mm rms	25 m ¹²	1.0 mm rms	0.6 mm rms	0.5 mm rms	50 m ¹²	2.7 mm rms	1.2 mm rms	0.8 mm rms	100 m ¹²³	10 mm rms	3.8 mm rms	2.0 mm rms																									
Range	Black 14%	Gray 37%	White 80%																																											
10 m ¹²	0.5 mm rms	0.4 mm rms	0.3 mm rms																																											
25 m ¹²	1.0 mm rms	0.6 mm rms	0.5 mm rms																																											
50 m ¹²	2.7 mm rms	1.2 mm rms	0.8 mm rms																																											
100 m ¹²³	10 mm rms	3.8 mm rms	2.0 mm rms																																											
Scan resolution	7 pre-set spacings per table																																													
Selectability	<table border="1"> <thead> <tr> <th>Pts/360°</th> <th>Low quality⁶</th> <th>Normal quality⁶</th> <th>High quality⁶</th> <th>Premium quality⁶</th> </tr> </thead> <tbody> <tr> <td>(vert./horiz.)</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>preview⁴</td> <td>1250</td> <td>0:13 min</td> <td>0:26 min</td> <td>0:52 min</td> </tr> <tr> <td>low</td> <td>2500</td> <td>0:26 min</td> <td>0:52 min</td> <td>1:44 min</td> </tr> <tr> <td>middle</td> <td>5000</td> <td>0:52 min</td> <td>1:44 min</td> <td>3:22 min</td> </tr> <tr> <td>high</td> <td>10000</td> <td>1:44 min</td> <td>3:22 min</td> <td>6:44 min</td> </tr> <tr> <td>super high</td> <td>20000</td> <td>3:28 min</td> <td>6:44 min</td> <td>13:28 min</td> </tr> <tr> <td>ultra high⁵</td> <td>40000</td> <td>---</td> <td>13:28 min</td> <td>26:56 min</td> </tr> <tr> <td>extremely high⁵</td> <td>100000</td> <td>---</td> <td>1:21 h</td> <td>2:42 h</td> </tr> </tbody> </table>	Pts/360°	Low quality ⁶	Normal quality ⁶	High quality ⁶	Premium quality ⁶	(vert./horiz.)					preview ⁴	1250	0:13 min	0:26 min	0:52 min	low	2500	0:26 min	0:52 min	1:44 min	middle	5000	0:52 min	1:44 min	3:22 min	high	10000	1:44 min	3:22 min	6:44 min	super high	20000	3:28 min	6:44 min	13:28 min	ultra high ⁵	40000	---	13:28 min	26:56 min	extremely high ⁵	100000	---	1:21 h	2:42 h
Pts/360°	Low quality ⁶	Normal quality ⁶	High quality ⁶	Premium quality ⁶																																										
(vert./horiz.)																																														
preview ⁴	1250	0:13 min	0:26 min	0:52 min																																										
low	2500	0:26 min	0:52 min	1:44 min																																										
middle	5000	0:52 min	1:44 min	3:22 min																																										
high	10000	1:44 min	3:22 min	6:44 min																																										
super high	20000	3:28 min	6:44 min	13:28 min																																										
ultra high ⁵	40000	---	13:28 min	26:56 min																																										
extremely high ⁵	100000	---	1:21 h	2:42 h																																										
Field-of-View	max. 360° x 320° (horizontal/vertical)																																													
Scanning Optics	Vertically rotating mirror on horizontally rotating base; User selectable vertical rotation speed (6.25 rps, 12.5 rps, 25 rps or 50 rps); Environmentally protected by shield																																													
Scan motors	Direct drive, brushless																																													
Angular accur.	125 µrad / 125 µrad (horizontal/vertical)																																													
Angular resol.	7 µrad / 7 µrad (horizontal/vertical)																																													

Miscellaneous	
Onboard display	Touchscreen control with stylus, full color graphic display, VGA (640 x 320 pixels)
Dual-axis compensator	Selectable on/off, resolution 3.6", measurement range +/- 30", accuracy < 25"
Level indicator	Electronic bubble in onboard control and software
Laser plummet	Laser class 2 (in accordance with IEC 60825-1 resp. EN 60825-1) Centering accuracy: 0.5 mm / 1 m Laser dot diameter: < 1.5 mm @ 1.5 m Selectable on/off
Data transfer	Ethernet or USB 2.0 device (two ports)
Data storage	64 GB flash drive (integrated), 2 x 32 GB USB flash drive (external)
Communications	Ethernet or integrated Wireless LAN (WLAN)
Data integrity monitoring	Self-check at startup

Electrical	
Power supply	24 V DC, 100 -240 V AC
Power Cons.	< 65W (on average)
Battery Type	Internal: Li-Ion
Power ports	Internal: 1, External: 1
Duration	Internal: > 2.5 h, AC power supply: unlimited
Power status	LEDs indicate charging status and capacity level

Environmental	
Temperature	Operating -10°C to +45°C/Storage -20°C to +50°C
Lighting	Fully operational between bright sunlight and complete darkness
Humidity	Non-condensing
Dust/humidity	IP53 (IEC 60529)

Physical	
Scanner	286 mm D x 170 mm W x 395 mm H/9.8 kg, nominal
Battery (internal)	88 mm D x 170 mm W x 61 mm H/1.2 kg
AC Power Supply	167 mm D x 67 mm W x 35 mm H/0.54 kg

Standard Accessories Included	
Scanner and accessory transport case	
2x 32 GB USB memory stick, 1x USB plug	
Additional rechargeable intergrated battery	
Charging/power cable, Ethernet cable, A/C cable	
Battery charger/AC power supply	
Battery charging cradle for internal battery	
Cleaning kit	
Cyclone™ SCAN software	
1 year CCP Basic support agreement	

Hardware Options	
Notebook PC, Tablet PC, or PDA	
HDS scan targets and target accessories	
Service agreement for HDS7000	
Extended warranty for HDS7000	
External camera kit (third party product)	
External battery	
Tripod, tripod star, rolling base	

Notebook PC for scanning with Cyclone software ^Δ	
Component	required (minimum)
Processor	1.7 GHz Pentium M or similar
RAM	1 GB or greater (2 GB for Windows Vista)
Network card	Ethernet
Display	SVGA or OpenGL accelerated graphics card (with latest drivers)
Operating system	Windows XP Professional (SP2 or higher) (32 or 64) Windows Vista (32 or 64), Windows 7 (32 or 64)

Control Options	
Full colour touch screen for onboard scan control	
Leica Cyclone SCAN software (see Cyclone SCAN data sheet for full list of features)	
Web browser	

Ordering Information	
Contact Leica Geosystems or authorized representatives	

All specifications are subject to change without notice.
All accuracy specifications are one sigma unless otherwise noted.

¹ Detailed explanation on request

² Data rate 127000 pts/sec (equivalent to "high resolution, high quality scan"),
1 sigma range noise, unfiltered raw data

³ All values extrapolated

⁴ "Preview" resolution not recommended for exact measurements, only for positioning higher resolution scan selections

⁵ Only recommended for scan selections because of enormous amount of data

⁶ Doubling ("low quality") and halving ("high quality") the data rate (pixel/sec.) theoretically increases the range noise on each pixel by 40% ("low quality") or decreases it by 40% ("high quality") compared to "normal quality". Depending on the roughness of the surface measured, in reality this difference could be less, especially when scanning objects with a bright surface at short distances, e.g. indoors

^Δ Minimum requirements for modeling operations are different.

Refer to Cyclone data sheet specifications

Windows is a registered trademark of Microsoft Corporation. Other trademarks and trade names are those of their respective owners.

Illustrations, descriptions and technical specifications are not binding and may change.
Printed in Switzerland – Copyright Leica Geosystems AG, Heerbrugg, Switzerland 2011.
789094en – III.11 – RDV