

# Surphaser 3D Laser Scanners

Class 1 Ultra Short Range - scanning envelope from 25 cm to 3 m, deep submillimeter range noise across all distances, easy portability, known Surphaser accuracy and reliability. Ideal for tight environment applications where high accuracy/ultra low noise full volume scans are needed, for example inside car body or instrument bay of an aircraft.

## Surphaser® 80HSX

- Ultra Short Range (0.25m - 3 m) hemispherical scanner
- Unique combination of deep sub-millimeter accuracy, depth of field, and scanning speed in Class 1 laser safety
- Weight is 6.2 kg (14 lb) with battery, compact and easily portable
- Built-in scan controller and battery
- Two fully integrated 5 megapixel cameras; software for automatic color data mapping is included
- WiFi connectivity
- Designed to operate in industrial and outdoors environments, can be operated in direct sunlight
- Automatic target extraction and target-based scan registration
- Rapid Preview Scan and on-screen areas of interest selection for high density scans
- Export of clean and accurate data sets into PolyWorks®, Geomagic®, Cyclone®, RealWorks® and other applications for processing
- Extensive set of filters to isolate areas of interest and eliminate unreliable data



Configuration (software selectable, included with all model 80 units )	80_HQ	80_HP
	208,000 pps	832,000 pps
Recommended Work Range (m)	0.25 -3	0.25 -3
Ambiguity Range (m)	180	180
Angular Uncertainty (arc sec)	25	25
Range Noise, mm; 90% reflectivity	0.045mm @ 0.3m-4m	0.11mm @ 0.3m-4m
Range Noise, mm; 10% reflectivity	0.14mm @ 0.3m-4m	0.30mm @ 0.3m-4m
Range Uncertainty, mm	<0.25 @1.5m	<0.25 @1.5m

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# Surphaser® 80HSX – Class 1 Ultra Short Range

Preliminary

Scanner Type	Phase Shift, Hemispherical Scanner with 360° x 270° field of view
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## SYSTEM SPECIFICATIONS

Distance Measurement Method	Phase-shift
Laser Wavelength	1550 nm
Laser Type	CW
Laser Class: (IEC EN60825-1:2007)	Class 1
Scan Rate (points/second)	208,000, 832,000
Internal Coordinate Representation Unit (mm)	0.001
<b>Angular position data</b>	
Beam diameter, mm	1.4mm @1.1 m 2.5mm @2.5 m
Beam diameter at aperture, mm	2mm
Internal Vertical Angular Representation Unit	1 arc sec
Internal Horizontal Angular Representation Unit	1 arc sec
<b>Scan density control: software selectable</b>	
Min. Vertical Point Density (points/degree)	12 ppd
Min. Horizontal Point Density (lines/degree)	2 lpd
Max Vertical Point Density (points/degree)	360 ppd
Max Horizontal Point Density (lines/degree)	60 lpd
Full Volume Scan Time (minutes, at 20 ppd x 20 lpd density)	4.5
<b>Field-of-view, per scan, software selectable</b>	
Horizontal (maximum)	360°
Vertical (maximum)	270°
<b>Physical dimensions and weight</b>	
Weight with battery (kg)	6.2
Dimensions	278mm L x 250mm H x 118mm W

**CLASS 1  
LASER PRODUCT**

## STANDARD ACCESSORIES, MODEL 80HSX

- Built-in scan controller, allows scanner control, operation, and data collection without a laptop
- WiFi connectivity
- Two 5MPix built-in color cameras; includes software for automatic color data mapping and dynamic exposure adjustment
- Surphaser USB 2.0 cable
- AC Adapter 110/240 AC, 14-24V DC, 3.5A
- Surphaser DC power cable
- Tripod Adapter
- Two Li-Ion 14V, 49Wh batteries, each provides 1 to 1.5 hours of operation
- 2-Bay Battery Charger
- Shipping case
- 1 year Limited Warranty and Basic Support contract

## OPTIONAL ACCESSORIES

- Scanner carrying bag, size approved for most domestic airlines' cabin requirements, weight restrictions vary, please check with airline(s) for up-to-date regulations
- Tripod
- SMR-compatible B&W targets and targets case
- Tilt sensor, dual axis
- Extended Warranty contract

## HOST COMPUTER REQUIREMENTS

### Optional, minimum configuration

- Processor: 1.8 GHz or greater Pentium-compatible;
- System memory RAM 1GB or greater, 4GB recommended
- OS: Windows XP, Vista, Windows 7, 8 or 10; 32-bit or 64-bit editions
- USB 2.0 port

## ENVIRONMENTAL

- Calibrated Operating Temperature: 5°C to 40 °C, non-condensing humidity

## POWER REQUIREMENT

- 14-24V DC, 30W

## Surphaser® 80HSX System Performance

Configuration (software selectable, available on all Surphaser 80HSX units)	80_HQ <sup>4</sup> 208,000 pps	80_HP <sup>4</sup> 832,000 pps
Recommended Work Range (m)	0.25-3	0.25-3
Ambiguity Range (m)	180	180
Angular Uncertainty <sup>1,3</sup> (arc sec)	25	25
Range Noise <sup>1,2</sup> , mm; 90% reflectivity	0.045mm @ 0.3m-4m	0.11mm @ 0.3m-4m
Range Noise <sup>1,2</sup> , mm; 10% reflectivity	0.14mm @ 0.3m-4m	0.30mm @ 0.3m-4m
Range Uncertainty <sup>3</sup> , mm	<0.25 @ 1.5m	<0.25 @ 1.5m

<sup>1</sup> All noise and uncertainty figures are for 1 sigma level

<sup>2</sup> Range noise -- local (short term) range variation, Lambertian surface

<sup>3</sup> Evaluated with contrast target best fit

<sup>4</sup> 80\_HQ and 80\_HP are software selectable options, both are available on all Surphaser 80HSX units  
System parameters may be changed without notice; parameters are rated independently