

Surphaser 3D Laser Scanners

Deep submillimeter range noise on distances up to 30 m, practical scanning range up to 70 m, easy portability, known Surphaser accuracy and reliability. Ideal for any application where longer range, high accuracy and low noise are needed: reverse engineering, large article dimensional control, BIM, historical preservation, architecture, forensics, entertainment.

Surphaser® 410HSX

- 3D hemispherical scanner with sub-millimeter accuracy and practical work range up to 70 m
- Weighs in at 5.8 kg (12 lb) with battery, compact and easily portable
- Class 1 laser , wavelength 1550 nm
- Built-in scan controller and battery
- Two fully integrated 5 megapixel cameras; software for automatic color data mapping is included
- WiFi connectivity
- Designed to work 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
- Software allows 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 400 units)	410 HQ 208,000 pps	410 HS 208,000 pps	410 HP 832,000 pps
Recommended Work Range (m)	0.4-70	0.4-70	0.4-70
Ambiguity Range (m)	180	360	180
Angular Uncertainty (arc sec)	25	25	25
Range Noise, mm; 90% reflectivity	0.06@0.4m-30m	0.09@0.4m-30m	0.15@0.4m-30m
Range Noise, mm; 10% reflectivity	0.15@0.4m-15m	0.15@0.4m-15m	0.3@1m-15m
Range Uncertainty, mm	<0.7@15m	<0.9@15m	<0.9@15m

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Surphaser® 410

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, software selectable(points/second)	208,000/ 832,000 pps
Internal Coordinate Representation Unit	0.001 mm
Angular position data	
Beam diameter at Aperture	3 mm
Internal Vertical Angular Representation Unit	1 arc sec
Internal Horizontal Angular Representation Unit	1 arc sec
Scan density control: software selectable	
Min. Vertical Point Density (points/degree)	12 ppd
Min. Horizontal Point Density (lines/degree)	7 lpd
Max Vertical Point Density (points/degree)	360 ppd
Max Horizontal Point Density (lines/degree)	78 lpd
360° Scan Time, HP mode (832,000 pps at 7200x7200 density)	1.2 min
360° Scan Time, HQ, HS modes (208,000 pps at 7200x7200 density)	4.5 min
Field-of-view (per scan, software selectable)	
Horizontal (maximum)	360°
Vertical (maximum)	270°
Physical dimensions and weight	
Weight with battery	5.8 kg
Dimensions 299mm L x 200mm H x 118mm W	

**CLASS 1
LASER PRODUCT**

STANDARD ACCESSORIES, MODEL 410

- Built-in scan controller, allows direct scanner control and data collection without a laptop
- Wi-Fi connectivity
- Two 5MPix built-in cameras; software for automatic color data mapping is included
- Tilt sensor, dual axis
- Shipping container
- Surphaser USB 2.0 cable
- AC Adapter 110/240 AC, 15-21V DC, 4.5A
- Surphaser DC power cable
- Tripod Adapter
- Two Li-Ion 14V, 49Wh batteries, each provides about 1 hour of operation
- 2-bay charger
- 1 year Limited Warranty and Basic Support contract

OPTIONAL ACCESSORIES

- SMR-compatible B&W targets and targets case
- Scanner carrying case, size approved for most domestic airlines cabin requirements, weight restrictions vary, please check with airline(s) for up-to-date regulations
- Tripod
- External hot-swappable extended battery, each provides about 2 hours of operation
- Extended Warranty contract

HOST COMPUTER REQUIREMENTS

Optional, minimum configuration

- Processor: 2.4 GHz or greater Pentium-compatible;
- System memory RAM 8GB or greater, 16GB recommended for processing
- OS: Windows 7, 8 or 10; 32-bit or 64-bit editions
- USB 2.0 port or fully compliant USB 3.0 port

ENVIRONMENTAL

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

POWER REQUIREMENT

- 15-21V DC, 90W

Surphaser® 410 System Performance

Configuration (software selectable, available on all Surphaser 410 units)	410_HQ ⁴ 208,000 pps	410_HS ⁴ 208,000 pps	410_HP ⁴ 832,000 pps
Recommended Work Range (m)	0.4-70	0.4-70	0.4-70
Ambiguity Range (m)	180	360	180
Angular Uncertainty ^{1,3} (arc sec)	25	25	25
Range Noise ^{1,2} , mm; 90% reflectivity	0.06@0.4m-30m	0.09@0.4m-30m	0.15@0.4m-30m
Range Noise ^{1,2} , mm; 10% reflectivity	0.15@0.4m-15m	0.15@0.4m-15m	0.3@1m-15m
Range Uncertainty ³ , mm	<0.7@15m	<0.9@15m	<0.9@15m

¹ All noise and uncertainty figures are for 1 sigma level

² Range noise -- local (short term) range variation, Lambertian surface

³ Evaluated with contrast target best fit

⁴ 410_HQ, 410_HS and 410_HP are software selectable options, all three are available on all Surphaser 410 units. System parameters may be changed without notice; parameters are rated independently