

IMAGER
5016

Z+F IMAGER® 5016

Data Sheet

The new Z+F IMAGER® 5016 combines compact and lightweight design with state-of-the-art laser scanning technology - allowing the user to reach new levels. The scanner comes with an integrated HDR camera including a LED spot as well as a positioning system for automatic registration in the field.

Laser system			
Laser class	1		
Beam diameter / divergence	~ 3.5 mm @ 1m / ~ 0.3 mrad (1/e ² , half angle)		
Measurement Range	0.3 m ... 365 m (ambiguity interval) / 1 ft ... 1,220 ft		
Distance resolution	0.1 mm / 0.0038 inch		
Data acquisition rate	Max. 1.094 million pixel/sec.		
Linearity error ¹	≤ 1 mm + 10ppm/m		
Range noise	black 14 %	grey 37 %	white 80 %
Range noise, 10 m ¹²	0.23 mm rms	0.19 mm rms	0.14 mm rms
Range noise, 25 m ¹²	0.38 mm rms	0.25 mm rms	0.19 mm rms
Range noise, 50 m ¹²	1.0 mm rms	0.6 mm rms	0.3 mm rms
Range noise, 100 m ¹²³	3.7 mm rms	1.7 mm rms	0.9 mm rms
Range noise, 160 m ¹²³	7.8 mm rms	3.2 mm rms	1.8 mm rms
Temperature drift	negligible		

Deflection unit	
Deflection system	completely encapsulated rotating mirror with integrated HDR camera and LED spotlights
Vertical field of view	320°
Horizontal field of view	360°
Angular resolution, vertically	0.00026° (0.93 arcsec)
Angular resolution, horizontally	0.00018° (0.65 arcsec)
Vertical accuracy ¹	0.004° (14.4 arcsec) rms
Horizontal accuracy ¹	0.004° (14.4 arcsec) rms
Rotation speed	max. 50 rps (3,000 rpm)

Resolution					
	pixel/360° horizontal & vertical	Scan duration			
		"less quality" ⁶	"normal quality" ⁶	"high quality" ⁶	"premium quality" ⁶
Angle resolution					
"preview" ⁴	1,375	---	0:28 min	---	---
"low"	2,750	0:26 min	0:56 min	1:52 min	---
"middle"	5,500	0:52 min	1:52 min	3:44 min	7:28 min
"high"	11,000	1:44 min	3:44 min	7:28 min	14:56 min
"super high"	22,000	3:28 min	7:28 min	14:56 min	29:52 min
"ultra high" ⁵	44,000	---	14:56 min	29:52 min	59:44 min
"extremely high" ⁵	88,000	---	---	59:44 min	119:28 min

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Miscellaneous	
Dynamic Compensator	resolution: 0.001° measurement range: +/- 0.5° accuracy: < 0.004° The Dynamic Compensator will correct angular tilt for each pixel during scan acquisition.
Laser plummet	laser class: 2 accuracy of plummet: 0.5 mm/1m laser spot diameter: < 1.5 mm at 1.5 m
Levelling display	electronic level in onboard display and Z+F LaserControl® Scout
WiFi link	802.11 a/n/g standard, dual band, up to 240 Mbits/s
Ethernet link	1GB ethernet (scanner socket)
Data storage	internal 128 GB SATA, additional 64 GB SD flash card
Integrated control panel	5.7" touch screen, multi-touch color display for browsing scan data and color images, data measuring / navigation features implemented
Interfaces	Micro D-Sub connector for external T-Cam and synchronization purposes (PPS pulse, odometer, line sync).

Power supply	
Input voltage	24 V DC (scanner) ; 100 – 240 V AC / 12 - 24 V DC (power unit)
Power consumption	~ 45 W (scanning) / ~ 75 W (scanning and battery charging)
Operating time	~ 4 h ⁷ (high/normal scans, 5 minutes intermission)

Ambient conditions	
Operating temperature	-10 °C ... +45 °C
Storage temperature	-20 °C ... +50 °C
Lighting conditions	operational in all conditions, from bright sunlight to darkness
Humidity	non-condensing
Protection class	IP 54

Dimensions and weights	
Scanner	
Dimensions (w x d x h)	150 x 258 x 328 mm
Weight	6.8 kg
Two Batteries, each	
Dimensions (w x d x h)	150 x 80 x 45 mm
Weight	0.5 kg
AC power unit	
Dimensions	35 x 67 x 167 mm
Weight	0.54 kg

HDR camera	
focus area	1 m - ∞
panorama compilation	
image count for panorama	42
recording time (dependent on ambient illumination)	ca. 4:00 min (standard mode: 5 - 11 exposures) ca. 2:30 min (fast mode: 4 exposures)
panorama resolution	ca. 80 MPixel

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Navigation System	
Task	The navigation system estimates the position and the orientation of the scanner to support the registration
Integrated sensors	Barometer
	Acceleration sensor
	Gyroscope
	Compass
	GPS

GPS	
Receiver	L1 (1575,42 MHz)
	56 channels
Horizontal position accuracy	2,5 m (autonomous)
	2,0 m (SBAS)
	<1,0 m (PPP Precise Point Positioning with WAAS)

Together with Z+F LaserControl® Scout, the Z+F IMAGER® 5016 lets you discover all advantages of the Blue Workflow on site.

- Automatic registration
- Check data quality
- Check target quality
- Find & fill gaps with more scans

System Requirements of Z+F LaserControl® Scout

Minimum System Requirements	Recommended System Requirements
Windows 8.1 (64 Bit)	Windows 8.1 (64 Bit)
Intel i5 CPU	Intel i7 CPU
64 GB SSD	512 GB SSD
4 GB RAM	8 GB RAM
10" Full HD	12" Full HD
	Dualband-WLAN
	USB 3.0

1. Detailed explanation on request – please contact info@zf-laser.com
2. Data rate 136,719 pixel/sec (equivalent to "high resolution / high quality" scan), 1 Sigma range noise, unfiltered raw data on Z+F targets
3. Not fully production tested, only verified for a small number of specimens
4. Settings not recommended for measurement purposes, for data preview only
5. Only recommended for partial scans because of the vast amount of data
6. Doubling acquisition time (higher quality setting) theoretically will reduce range noise by a factor of 1.41. Depending on the object's surface roughness the actual factor may be smaller. In general the range noise of the Z+F IMAGER® 5016 "less quality" setting is smaller than the Z+F IMAGER® 5010X's "normal quality" range noise, hence the Z+F IMAGER® 5016 will acquire better quality data than the 5010X in only half the time
7. Stated for 20°C ambient temperature and new batteries. Actual scanning time very much depends on ambient temperature and battery condition

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