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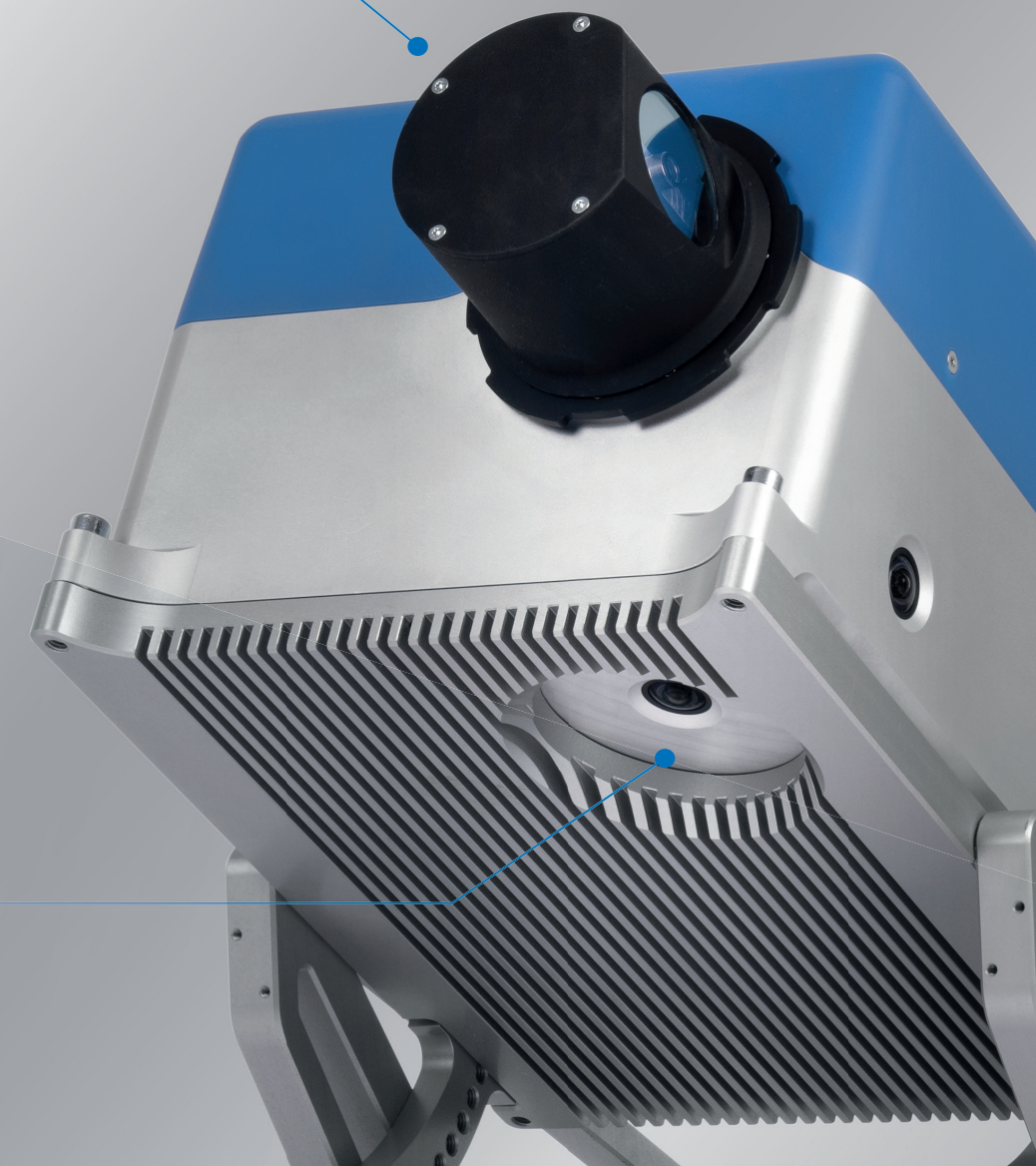
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Z+F PROFILER® 9020C

Mobile Mapping
2D Laser Scanner



Integrated
camera system

Data sheet

Camera system	
Number of cameras	4
Sensor	IMX264
CMOS size	2456 x 2054 px
Pixel size	3.5 µm
Resolution	5.05 MPx
Lens	1.8/4.41 mm
Field of view	each camera 120° x 67°
Calibration	Fully calibrated system

Laser system			
Laser class	1 (according to EN60825-1 / ANSI Z136.1)		
Beam divergence	< 0.5 mrad (half angle, 1/e ²)		
Beam diameter	Approx. 1.9 mm (at 0.1 m distance)		
Ambiguity distance	182 m (above, range reading restarts at zero)		
Minimum distance	0.3 m		
Range resolution	0.1 mm		
Data acquisition rate	Max. 1.094 million pixel/sec.		
Accuracy / Precision			
Linearity error	≤ 1 mm		
Range drift (full -10° C ... +50° C)	< 0.3 mm (with internal reference), < 2 mm (without ref.)		
Target Distance	White (80%) ¹	Grey (37%) ¹	Black (14%) ¹
1 Sigma Range Noise, 1 m	0.2 mm	0.3 mm	0.4 mm
1 Sigma Range Noise, 2 m	0.2 mm	0.2 mm	0.3 mm
1 Sigma Range Noise, 5 m	0.2 mm	0.2 mm	0.3 mm
1 Sigma Range Noise, 10 m	0.2 mm	0.2 mm	0.3 mm
1 Sigma Range Noise, 25 m	0.2 mm	0.3 mm	0.5 mm
1 Sigma Range Noise, 50 m	0.4 mm	0.6 mm	1.2 mm

Deflection unit	
Deflection system	Completely encapsulated, rotating mirror
Vertical field of view	360° un-obstructed
Angular resolution	0.0088°
Angular accuracy	0.007° rms ² (122 µrad)
Rotation speed	50 Hz up to 267 Hz (max. 16,020 rpm)

Available Settings (Resolution [Pixel/360°] / Rotor speed [rps] / Pixel rate [kHz])				
Data rate Resolution	1094 kHz (x 2.8) ³	547 kHz (x 2) ³	274 kHz (x 1.4) ³	137 kHz (x 1) ³
20,480 / 360°	53 rps	---	---	---
10,240 / 360°	107 rps	53 rps	---	---
8,192 / 360°	134 rps	67 rps	---	---
6,827 / 360°	160 rps	80 rps	---	---
5,120 / 360°	214 rps	107 rps	53 rps	---
4,096 / 360°	267 rps	134 rps	67 rps	---
3,413 / 360°	---	160 rps	80 rps	---
2,048 / 360°	---	267 rps	134 rps	67 rps
1,024 / 360°	---	---	267 rps	134 rps

Interfaces	
Data storage scanner	Internal 128 GB SATA
Sata storage cameras	external in host-PC
Data interface scanner	1 x GBit Ethernet
Data interface cameras	1x USB 3.1
Data recording time ⁴	6h ... 12h in total for internal 128 GB memory ⁵
Synchronization interface	<ul style="list-style-type: none"> • External encoder input for wheel sensor (Odometer) • GPS input (PPS pulse + NMEA message over RS232) • Linesync output (TTL pulse per profile) • Rotor sync in / out (angular movement of two parallel devices can be synchronized) • External camera-trigger

Power supply			
Input voltage	PROFILER: 20 - 30 V DC (24 V DC typ.), Inrush < 12A (@ 24 V) AC-Power supply: 100 – 240 V AC		
Power consumption Current @ 24 V / Speed	100 Hz	200 Hz	267 Hz
+20°C, speed up	2.8 A	5.6 A	7.9 A
+20°C, scanning	1.9 A	3.5 A	5.0 A
-10°C, speed up	3.1 A	6.3 A	9.7 A
-10°C, scanning	2.2 A	4.5 A	6.6 A

Ambient conditions	
Operating temperature	-10 °C ... +50 °C
Storage temperature	-20 °C ... +70 °C
Humidity	Non-condensing
Protection class	IP 65 IP 66 with protection cover
Shock (either side)	70g max (shock sensor inside)

Dimensions and weight	
Dimensions (l x w x h)	314 x 200 x 155 mm
Weight	6.5 kg
Mounting flanges ⁶	Only bottom flange 2 x 6.02 mm / H7 register pins 4 x 6.6 mm holes for M6 x 25 mm mounting screws

1. Range Noise (1-Sigma interval) is specified at 136 KHz data rate, which is the standard data rate for Z+F noise specs.
2. RMS (Root Mean Squared): mean value of squared errors.
3. The actual data rate in KHz (1,000 xec.) is stated for each available setting. The Range Noise specs have to be multiplied by the stated factors, yielding the actual 1-Sigma range noise for a particular setting.
4. Continuous data recording at max. data rate of 1.094 million pixel/sec.
5. Data compression factor depends on scanned scene.
6. See manual for drawings.