PENTAX Scanning System S-2100

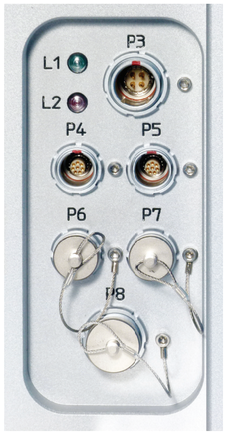
INDUSTRIAL CONNECTIONS

Using industrial connections, GPS, displacement sensors and counters can be attached.
The external timing pulses are directly fed into the scan data stream.

The new 1 GBit Ethernet interface allows the scan data to be streamed directly to an external PC for real-time evaluation

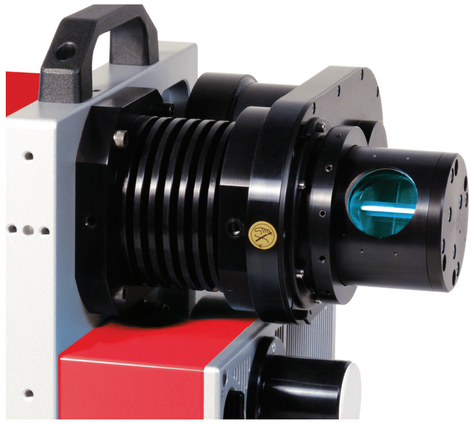
KINEMATIC APPLICATIONS

Due to its high flexibility and the low power consumption the PENTAX Scanning System S-2100 is suitable especially for all kinds of mobile mapping applications. With its high rotation speed of 200Hz, many details are recorded very quickly and accurately.



Sample data of a highway

PENTAX



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PENTAX | Scanning System S-2100

2D laser measurement system

The fastest 2D laser measurement system in the world

119 m range

Scan rate >1 million points/sec

360° vertical field of view

System description

The PENTAX Scanning System S-2100 has a 360° vertical field of view and is the fastest 2D laser measurement system in the world.

With its scan rate of more than 1 million points per second and a maximum scan speed of 200 profiles / sec., very short distances between profiles can be achieved even at high speeds. The high point density ensures that even the smallest objects can be registered and processed by the software.

The new laser measurement system is classified "eyesafe" in laser class 1. The scanner can be used in urban environments without any restrictions. A hardware-assisted pixel-by-pixel synchronization, already used and tested in previous models, makes it possible to process external signals to determine the position of the scan data.

Sample data of the Wangen station captured within a few seconds

PENTAX Scanning System **S-2100**

Technical specifications

The PENTAX Scanning System S-2100, a compact high-speed phase-based laser scanner with great precision, 119 m range and a 360° field of view. With its scan rate of more than 1 million points per second and maximum scan speed of 200 profiles/sec., very short distances between profiles can be achieved even at high platform speeds.

Laser system

Laser class	1 (according to EN60825-1 / ANSI Z136.1)		
Beam divergence	< 0.5 mrad		
Beam diameter	Approx. 1.9 mm (at 0.1 m distance)		
Range	119 m (above, range reading restarts at zero)		
Minimum distance	0.3 m		
Resolution range	0.1 mm		
Data acquisition rate	Max. 1.016 million pixel/sec.		
Linearity error	≤ 1 mm		
Range drift (full -10° C ... +45° C)	< 2 mm (without reference) < 0.3 mm (with ref.)		
Accuracy			
Target Distance	White (80%) [1]	Grey (37%) [1]	Black (14%) [1]
1 Sigma Range Noise, 0.3 m	0.5 mm	0.8 mm	1.3 mm
1 Sigma Range Noise, 2 m	0.3 mm	0.5 mm	0.8 mm
1 Sigma Range Noise, 5 m	0.3 mm	0.4 mm	0.6 mm
1 Sigma Range Noise, 10 m	0.2 mm	0.3 mm	0.5 mm
1 Sigma Range Noise, 25 m	0.4 mm	0.6 mm	1.1 mm
1 Sigma Range Noise, 50 m	0.9 mm	1.4 mm	3.1 mm

Deflection unit

Deflection system	Completely encapsulated rotating mirror
Vertical field of view	360° un-obstructed
Angular resolution	0.0088°
Angular accuracy	0.02° rms[2]
Rotation speed	50 Hz up to 200 Hz (max. 12,000 rpm)

Settings

Spindle Speed	200 Hz (12,000 rpm)	100 Hz (6,000 rpm)	50 Hz (3,000 rpm)
Pixel/360°	Data rate / x noise factor [3]	Data rate / x noise factor [3]	Data rate / x noise factor [3]
20,480	---	---	1016 KHz / x 2.8
10,240	---	1016 KHz / x 2.8	508 KHz / x 2.0
5,120	1016 KHz / x 2.8	508 KHz / x 2.0	254 KHz / x 1.4

PENTAX Scanning System **S-2100**

Interfaces

Data storage	Internal 128 GB SATA, 2 x external 32 GB USB flash drive
Data interface	1 GB Ethernet 2 x USB-2.0 (for removable memory sticks)
Data recording time[4]	1,5h ... 3h for each 32 GB memory [5] 6h ... 12h in total for internal 128 GB memory [6]
Control panel	Remote Controlbox for power on / off, emergency stop and display for status messages
Synchronization interface	• External encoder input for wheel sensor (Odometer) • GPS input (PPS pulse + UTC message over RS232) • Linesync output (TTL pulse per profile) • Rotor sync in / out (angular movement of two parallel devices can be synchronized)

Power supply

Input voltage	Scanning system: 22 - 28 V DC (24 V DC typ.) Power supply: 100 – 240 V AC
Power consumption (24V)	7.0A @ 200Hz; 3.7A @ 100Hz; 3.0A @ 50Hz; 10.5A during rotor speed up

Ambient conditions

Operating temperature	-10 °C ... +45 °C
Storage temperature	-20 °C ... +50 °C
Lighting conditions	All conditions, from bright sunlight to complete darkness
Humidity	Non-condensing
Protection class	IP 54

Dimensions and weights

Dimensions (w x d x h)	320 x 260 x 340 mm
Weight	13.5 kg
Mounting flanges [7]	Flanges on bottom / left / right sides, consisting of: 2 x 6 mm -0.00 / +0.02 mm holes for orientation pins 6 x M6 x 10 mm threaded holes for mounting screws

1. Range Noise (1-Sigma interval) is specified at 127 KHz data rate, which is the standard data rate for any Pentax noise specs. However, these specs have to be converted to the appropriate data rate in KHz (1000 pixel/sec.), see table "settings". Detailed explanation on request – please contact International@tiasahi.com
2. RMS (Root Mean Squared): mean value of squared errors
3. The actual data rate in KHz (1000 pixel/sec.) 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 1,016 million pixel/sec., (i.e. 200 Hz spindle speed, 5120 pixel/360° or 100 Hz spindle speed 10,240 pixel/360°)
5. Data compression factor depends on scanned scene
6. Data stream is automatically routed to empty memory in case the selected memory stick is full – 2 x 32 GB are available in total
7. Drawing provided upon request