

# PENTAX | Scanning System S-3080

3D laser measurement system



Highly Accurate, Reliable and Flexible



# PENTAX

## Scanning System S-3080



### CONFIGURATION

Maximum mobility is guaranteed with the PENTAX Scanning System S-3080. The scanner follows a 'stand - alone' concept featuring an integrated control panel, a changeable and rechargeable battery, internal hard disk and W-LAN access. Connections for USB-drives are also provided, as well as for an additional power supply and Ethernet. The instrument also includes an electronic tilt sensor, to detect movements during a scan.



### POWER SUPPLY

- A changeable battery pack allows wireless scanning for at least 2,5 hours. This simplifies the scanning process on site and reduces assembly time considerably.
- Where scanning time is expected to exceed the internal battery life, an external battery pack can be used. This provides the user with an additional four hours of battery life. A notebook computer may also be powered via this battery.
- Unlimited scanning time can be achieved by using a cable connection to AC power supply (90 - 260V).



Rotating mirror for 310° vertical scanning



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## Scanning System S-3080



Keypad/Display



Changeable battery pack



External power supply and Ethernet at the non-rotating scanner base

### HANDLING

The PENTAX Scanning System S-3080 has been designed with ease of handling, flexibility and intelligent control in mind.

- The laserscanner can be operated via an integrated keyboard/display combination. The captured data is stored on the internal hard disk.
- For external operation, the Scanning System S-3080 is equipped with W-LAN and Ethernet-interface. A mobile device or Notebook/PC can therefore be used to operate the scanner from a distance if required.
- The user can control the Scanning System S-3080 by 'scan over IP' via a browser.

### QUALITY

- The Scanning System S-3080 can now be used in more applications than ever before due to an extended point density and an ambiguity range of 79 m.
- The scanner provides highly accurate data.
- The data is captured at high speed. The acquisition rate of the IMAGER 5006h is at top performance 1.016 million pixel / sec.
- The laser scanner includes a minimum of 60GB storage capacity. This provides sufficient disk space to allow very intensive scanning over several days.
- Data transfer to a Notebook/PC is possible via W-LAN or Ethernet connection.
- Data transfer to an external hard drive is possible via the USB connection.

## Applications



Fort Konstantin

### CULTURAL HERITAGE

The PENTAX Scanning System sets an impressive record in this field because of its contact-free, and above all rapid measuring ability. This reduces costs tremendously in comparison to traditional measurement systems.

The optional M-Cam enables the whole point cloud to be coloured, which gives a photorealistic impression of a scan with a high level of detail. The low noise level means that despite long distances, a very high data quality and scan resolution can be achieved and even small details can be captured.



3D point cloud of a burnt restaurant

### INSURANCE

The high resolution allow the S-3080 to “freeze” scenes rapidly for later analysis and in extraordinary quality. In this case, the data serves mainly for preserving evidence and documenting damage. This leads to great time savings for accident reconstruction and many other insurance purposes.



Helicopter crash Regional CID Baden-Württemberg

### FORENSIC SCIENCE

The decisive advantage of the PENTAX Scanning System in forensics is the immense speed. The crime scene can be documented holistically without interfering with the running investigation. The optional M-Cam provides colour information in order to create a photorealistic image of the scene. The high resolution enables to capture even inconspicuous details being preserved as evidence.



BubbleView® in LFM

### INDUSTRY

The PENTAX Scanning System's extreme speed reduces downtimes of industrial plants to a minimum. The high level of detail facilitates modeling of extraordinary accuracy. This enables a subsequent comparison between the revamp design and the as-built site. Another advantage is that the scanner can operate in a temperature range of -10 °C to +45 °C.

## Accessories



The hard case ensures the safe storage of the accessories

### A S-3080 laser scanner comprises of the following items:

- S-3080 incl. Integrated battery, controller and harddisk (laser class: 3R)
- Carrying case for S-3080
- Software package LRC Elements
- 1 year warranty including one free re-calibration and technical support

### Accessories Box for S-3080:

- Power Supply and charger for TRAPP 15-24
- Exchangeable internal battery-pack
- Power cable
- Carrying case for accessories (trolley)
- Ethernetcable
- Cleaning set

For the registration of several scans in one project, there are various target types available.



PaperTarget

The typical PaperTargets can also be employed with the PENTAX S-3080.



Profi Target

The PENTAX Profi Targets can be rotated two-axially around the target centre for perfect alignment to the scanner position.



AutoTarget

The PENTAX AutoTargets offer the fastest way of registration since they are automatically recognized in the scan by the software. Numbering also takes place automatically with the integrated code ring.

Whichever target is used, the software automatically recognizes the target centre to an accuracy of less than one pixel.

In addition, it is possible to include tachymetry data for georeferencing, and it is possible to increase accuracy of registration through bundle adjustment.



The M-Cam can easily be mounted

The M-Cam, an industrial colour camera with a resolution of five megapixels takes pictures in order to colour the point clouds (360° x 320°). It can be easily mounted onto the scanner, and is connected via two USB cables and the LEMO cable. The camera and power supply are then controlled by the scanner. The pictures are automatically associated with the respective scan and saved. The camera calibration specifications are included in the bundle.



Aluminium tripod

The aluminium tripod is very light and easy to handle. Its stability gives suitability for various uses-. The quick-release clamps make it very easy to adjust the height and to quickly assemble and dismantle it. A dolly ensures maximum mobility.

# Technical Data

The imaging 3D laser measurement systems are applicable in the fields of digital planning of factories, industrial plants, architecture, protection of historic monuments, landscape and virtual reality. They are based upon the PENTAX spot Laser Measurement System LARA.



**Laser system**

Laser safety class	3R ( ISO EN 60825-1 )		
Beam divergence	0.22 mrad		
Beam diameter	3 mm circular ( 1 m distance )		
Ambiguity interval	79 m		
Min. range	0.4 m		
Resolution range	0.1 mm		
Data acquisition rate	≤ 1,016,027 pixel / sec		
Linearity error up to 50 m <sup>1</sup>	≤ 1 mm		
Range noise	Black 10 %	Grey 20 %	White 100 %
Range noise, 10 m <sup>12</sup>	1.2 mm rms	0.7 mm rms	0.4 mm rms
Range noise, 25 m <sup>12</sup>	2.6 mm rms	1.5 mm rms	0.7 mm rms
Range noise, 50 m <sup>12</sup>	6.8 mm rms	3.5 mm rms	1.8 mm rms

**Deflection unit**

System vertical	Rotating mirror
System horizontal	Rotating device
Field of view vertical	310°
Field of view horizontal	360°
Resolution vertical	0.0018°
Resolution horizontal	0.0018°
Accuracy vertical <sup>1</sup>	0.007° rms
Accuracy horizontal <sup>1</sup>	0.007° rms
Scanning speed	≤ 50 r/s ( 3,000 r / min ) max.

**Resolution**

Resolutions	Scanning time			
	Pixel/360° horizontal & vertical	Low quality 50 rps	Normal quality 25 rps	High quality <sup>5</sup>
"preview" <sup>3</sup>	1,250	13 sec	25 sec	50 sec
"middle"	5,000	50 sec	1:40 min	3:20 min
"high"	10,000	1:41 min	3:22 min	6:44 min
"super high"	20,000	3:22 min	6:44 min	13:28 min
"ultra high" <sup>4</sup>	40,000	---	13:28 min	26:36 min



### General

Tilt measurement	Resolution: 1/1,000° Accuracy ( zero point ): 1/500°
Communication	Ethernet/W-LAN
Data storage	Internal HDD ( 60 GB )
Integrated operation panel	> Keypad: 6 Buttons ; > Display: 4 Lines
Data interface	Ethernet / USB 2.0

### Power supply

Input voltage	24V DC (scanner)/90-260V AC (power unit)
Power consumption	65 W max.
Battery life time	2.5 h typ. (changeable battery pack) 4 h (external battery (TRAPP - 15 - 24))

### Ambient conditions

Calibrated temperature	-10 °C to +45 °C
Storage temperature	-20 °C to 50 °C
Illumination	All conditions from darkness to daylight
Humidity; Dust/air humidity	Non-condensing
Target reflectivity	No retro-reflectors

### Dimensions and weights

Scanner	
Dimensions (w x d x h)	286 x 190 x 412 mm
Weight	14 kg
Bottom of scanner to horizontal axis	242 mm
Tripod:	
Height	Approx. 800 - 1,400 mm
Diameter	Approx. 1,200 mm
Weight	9 kg



1. detailed explanation on request – please contact [Internationaltiasah.com](http://Internationaltiasah.com)
2. data-rate of 127 000 pxl/sec., 1 sigma range noise, unfiltered raw data, in high power mode
3. not recommended for exact measurements, should only be used as an overview
4. only recommended for selection scans, as the data will be too large for further post processing.  
Resolution of 100,000 pxl/360° for selections
5. Doubling ("less quality") and halving ("high quality") of the data rate (pixels / sec), increases the range noise on each pixel theoretically by 40% ("less quality") or decreased it by 40% ("high quality") in comparison the "normal quality". Related to the roughness of the measured surface, the difference in reality can be less, especially when scanning objects with bright surfaces in short distances, e.g. indoor.

## LaserControl Software

**LaserControl provides all necessary tools to manage your scan jobs efficiently. It is a unique software solution with complete workflow from data capturing to delivery. Three different software packages are available for getting the ideal solution according to your needs.**

### Elements

LaserControl **Elements** is the freedom to view and browse your point cloud data without any cost. Besides checking the accuracy status of the device callibration, basic measurement functions are implemented. Furthermore it is the key to access and operate all products of the entire PENTAX Scanning System family.

### Professional

LaserControl **Professional** is the standard solution for common use with every laser scanner of the PENTAX Scanning System. A suite of filters allow differentiated preprocessing of scan data and are the key to a highly accurate registration. By adding colour information with the included colour module the scan data is ready for post-processing through a wide range of export formats. Naturally all LaserControl Element features are included. In addition the Kinematic function gives extended usability for profiling applications.

### Professional PLUS

LaserControl **Professional PLUS** provides extended functions for registration, additional data visualisation and project management tools. Both Cloud-to-Cloud and Plane-to-Plane registration decrease the need for targets dramatically. Saving time in the field and in the office are striking benefits of these future orientated registration tools. Furthermore fly throughs can be generated, simulated and saved. Your static imagery can be rectified and printed to scale. The relocation of misplaced data with the mirror filter is the right tool to bring your point clouds to perfection. Finally the linktool offers you best usability for project management.

### COLOUR

An ideal starting point for visualising objects is obtained by combining 3D data with digital photography. The documentary value of the colour data is important for many applications. The colour images are projected onto the point clouds and provide a photographic impression of the object in 3D.

### FORENSICS

The forensics modul is a clientspecific product design that also equates the high requirements from the German police. Using 3D data enables investigators to visualise the crime scene and adjust the storyline.

### IMPORT/EXPORT

A great variety of import and export formats are supported by LaserControl. As well as many ASCIIbased exchange formats, the new binary stand arnd formats OSF, PTG and ASTM-E57 can also be used for export.



## LFM Software



LFM is hardware and software vendor neutral. It accepts data from all 3D laser scanners and exports to 3D integrated plant design systems CAD and Review platforms.

Whether you are a service provider looking for fast database generation, an owner operator looking for an effective asset management tool, or a designer working on the latest process plant for a major oil and gas multinational company, the use of LFM Software brings business benefits to brownfield and as-built documentation projects.

LFM software users can benefit from an open system without compatibility restriction. LFM aims to be neutral on both ends: neutral with respect to capture devices and neutral with respect to CAD and modelling technologies. Surveyors and service providers can use LFM to create any number of CAD deliverables. Engineering companies and Owners/Operators can work with LFM laser scan data in CAD packages from Autodesk, AVEVA, Bentley, Intergraph or VR Context.

LFM is compatible with the latest PENTAX Scanning System generation and also accepts 3D laser scan data from previous generations and other hardware systems. This has cost saving implications for LFM customers. If the hardware system changes, the software solution does not, avoiding expensive switching costs.

LFM is driven by the BubbleView®. Make annotations and measurements, create 3D models and view clashes in the BubbleView®.



LFM is a powerful 3D laser scanning software package, which is relevant throughout the laser data and asset lifecycle.

### THE LFM SUITE

#### LFM Register

LFM Register™ allows users to take raw data from individual 3D laser scanning positions and bring them together into a fully co-ordinated framework faster and more efficiently than any other package.

#### LFM Server

Bring laser scan data into any number of leading CAD packages. Create a database containing an unlimited number of high resolution scans using Infinite Core™ technology. Automatically detect clashes between a CAD design and as-built laser scan data.

#### LFM NetView

LFM NetView provides users with comprehensive and easy-to-use tools to help projects collaboration even when multiple users are in different part of the world.

#### LFM Modeller

Rapidly produce 3D CAD models from as-built laser scan data with only a few clicks, and export their intelligent 3D model creations into a wide range of target CAD systems.



**PENTAX**



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