

SMplus

3D Measurement Machine with Conopoint Preliminary specifications

Gijón, Spain, July 2017



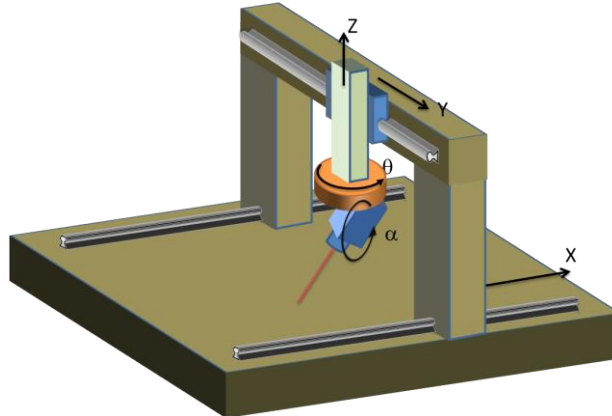
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SMplus: 3D Measurement Machine with Conopoint



What's it

SMplus is a precision 4 Degrees of Freedom (X, Y, Z, θ) movement system equipped with Optimet Conopoint non-contact measurement sensor.

The sensor is able to obtain measurements with high precision (see <http://www.optimet.com>) at high speed (up to 20 KHz).

The user selects the features to measure (planes, cylinders, lines, spheres, etc.) from a 3D CAD drawing by means of an easy-to-use interactive edition program.

The software inside SMplus generates movements in the 4 axis, synchronizes with the sensor acquisition, and provides measurements of the required features.

Key advantages

Compared with CMMs equipped with contact probes, SMplus has the following advantages:

- Accurate parts positioning and fixation is not required. The user selects in the CAD model the features that must be used to define the axis of the piece, indicates the approximate position where they must be found, and they are automatically located in the measurement cycle.
- Fast measurement of complex pieces features; features like planes, cylinders, etc. are easily selected from the CAD model. The system automatically generates and optimizes the required movements.
- Interpolation: thanks to the high speed of the sensor, each feature (distance, diameter, parallelism, etc.) is measured from a cloud of hundreds or thousands of points, increasing accuracy and robustness of the measurements obtained.
- Adaptable to almost any type of pieces.
- Usable in shop floor by plant operators without specific metrological knowledge.
- Automatic recalibration cycle with simple calibration pieces.
- Easy automation of repetitive tasks, including communication with process computers, PLCs or robots.
- Adaptable to user specific needs.
- Open software framework for addition of new features.
- Movements and measurements specification in editable XML text file.



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Specifications

- ❑ Movement specifications per axis (other specifications on request):

Axis	Stroke	Speed	Flatness / straightness / perpend	Motor driver &	Encoder step
X,Y	500 mm	≥ 150 mm/s	≤ 2 μm	Panasonic AC	0.1 μm
Z	150 mm	≥ 100 mm/s	≤ 2 μm	Panasonic AC	0.1 μm
θ	0 - 360°	≥ 0.5 rev/s	≤ 2 μm	Panasonic AC	≤ 100 arcsec
α	-45 - 90°	Future enhancement			

- ❑ Sensor specifications (Optimet Conopoint 20 with 75mm lens, other lenses can be integrated):
 - Range: 18 mm
 - Stand-off: 70 mm
 - Repeatability 3σ: 3 μm
 - Angular coverage: up to 170°
 - Laser spot size: 35 μm
 - Acquisition speed: up to 20000 points/sec
- ❑ Overall accuracy ¹: ±2 μm with 75mm lens

Video

See video at <https://drive.google.com/open?id=0B8Qw0J8RiDfhVzB6d3lsWDdRUHM> (80 Mb mp4 file).

Contact

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¹ Features measured in several pieces with changing conditions (standardized tests pending)