PicoScale Angular Measurement Assembly - Specification Sheet

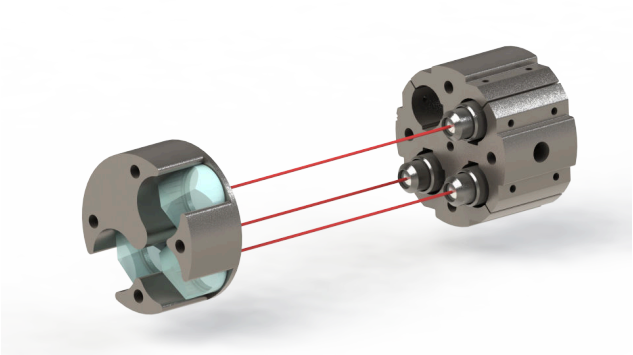

Figure 1. *Sensor Head Assembly.*

The **PICO**SCALE Angular Measurement Assembly (AMA) consists of a sensor head holder with three **PICO**SCALE C03 sensor heads in an L-shaped configuration (Figure 1). The three sensor heads are pre-aligned for maximum parallelism. In order to allow a large angular working range, a matching target assembly consisting of three retro reflectors is supplied. Optionally a fourth sensor head can be mounted to the sensor head assembly and a flat surface mirror to the retro reflector assembly, in order to allow a reliable zeroing by adjusting to the maximum intensity of the fourth beam. The sensor and the retro reflector assembly can be mounted using standard opto-mechanical equipment.

1. OPTICAL PROPERTIES

The AMA features an angular working range of ± 10° for one angle and ± 7° simultaneously for both angles. As the sensor heads measure the displacement of their individual targets with picometer resolution, the AMA allows angular measurements with a resolution of single nano-radians. The position stability under thermally controlled conditions is better than 0.5 µrad per hour, as can be seen from the measurement data in Figure 2. For this measurement, the sensor head was mounted with the help of the included M4 thread, whereas the retro reflector holder was mounted in a 1" optics holder and fastened by a retaining ring.

2. SOFTWARE SUPPORT

In the small-angle approximation, the angle can be calculated straightforwardly by subtracting the signals of two adjacent sensor heads and dividing by their distance. Using the **PICO**SCALE Calculation System firmware module (PS-SP-CS) allows real-time calculation of angles directly. Thus, the angle data can be displayed or streamed into a data file without the need

Table 1. *Summary of specifications.*

Property	Value
Angular range (pitch/yaw)	>±10° (pitch or yaw)
	>±7° (pitch and yaw)
Resolution	≈1 nrad
Stability	<0.5 µrad/h
Sensor head separation	10.5 mm
Outer diameter	25.4 mm (1")

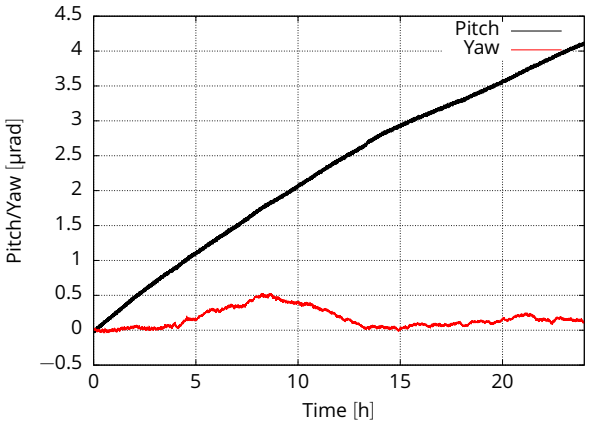

Figure 2. *Angular stability data of the AMA measured over 24 hours in a temperature-controlled chamber.*

for post-processing. The look-up table function of the Calculation System allows to calculate the precise angles even outside the range of the small-angle approximation. The correct configuration of the look-up table with the necessary trigonometric functions is supplied as a pre-set configuration ready to load into the **PICO**SCALE software. The distance of the laser beams is given in the data sheets.

3. ORDER CODE

Please contact SmarAct to find the optimal sensor head assembly for your application.

Sales partner / Contacts

Headquarters

SmarAct GmbH

Schuette-Lanz-Strasse 9
26135 Oldenburg
Germany

T: +49 441 – 800 87 90
Email: info-de@smaract.com
www.smaract.com

France

SmarAct GmbH

Schuette-Lanz-Strasse 9
26135 Oldenburg
Germany

T: +49 441 – 80 08 79 956
Email: info-fr@smaract.com
www.smaract.com

Israel

Trico Israel Ltd.

P.O.Box 6172
46150 Herzeliya
Israel

T: +972 9 – 950 60 74
Email: info-il@smaract.com
www.trico.co.il

Japan

Physix Technology Inc.

Ichikawa-Business-Plaza
4-2-5 Minami-yawata,
Ichikawa-shi
272-0023 Chiba
Japan
T/F: +81 47 – 370 86 00
Email: info-jp@smaract.com
www.physix-tech.com

South Korea

SEUM Tronics

801, 1, Gasan digital 1-ro
Geumcheon-gu
Seoul, 08594,
Korea

T: +82 2 868 – 10 02
Email: info-kr@smaract.com
www.seumtronics.com

USA

SmarAct Inc.

2140 Shattuck Ave., Suite 1103
Berkeley, CA 94704
United States of America

T: +1 415 – 766 9006
Email: info-us@smaract.com
www.smaract.com