OFFSET CALIBRATION

OBJECTIVE
To improve the offset accuracy of inclinometers at room temperature.

DESCRIPTION OF THE PROBLEM
A: After component mounting and final instrument assembly, zero deviation from factory calibration settings in component type inclinometers cannot be guaranteed. This is because during each assembly stage a small angular misalignment is added, which will cause an offset shift.

B: The factory trimming of the offset is done digitally. The accuracy is approx. 0.1° for SCA61T-FAHH1G, and 0.2° for SCA61T-FA1H1G. This is the offset accuracy for the analogue output. Output noise density, 15µg/√Hz (1s int.), determines the resolution of 0.001° ((15µg/√Hz) * √1Hz => 15µg ≈ 0.001°).

The digital output has an 11bit resolution over FS (+/-30° => resolution ≈ 0.03°), which is added to B. The total offset trimming accuracy for the digital output is approx. 0.13° for SCA61T-FAHH1G and 0.26° for SCA61T-FA1H1G respectively.

SOLUTION
To compensate for A and B, a final adjustment is recommended after the product is assembled (or mounted, if possible).

PROCEDURE
1: After power is switched on wait 2 min. Place the product in a calibrated horizontal position. Memorise the output in the micro controller as the 0° value.
2: If you do not have an accurately horizontal plane, use any stable plane. Measure the output in positions A and B (Figure 1), calculate the average {V(outA)+ V(outB)}/2 and memorise as the 0° value.

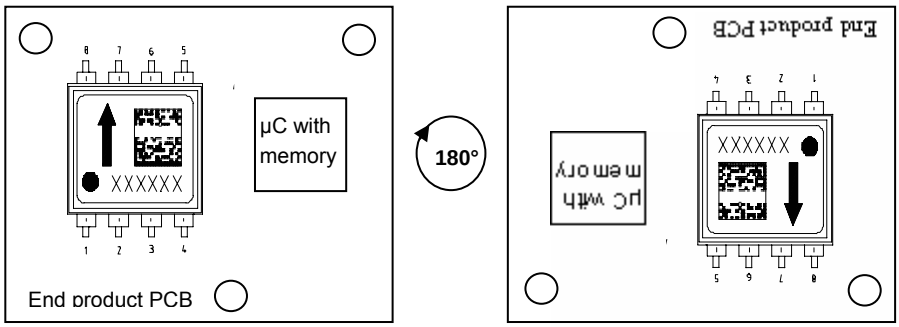

Figure 1: Top view, position A position B

APPLICATION EXAMPLES
- horizontal calibration of measuring instruments (spirit level, theodolite, distometer, etc)
- tilt measurement for height measuring instruments (hypsometer, etc)
- angle measurement for tilt protection (cranes, load lifters, lift platforms, etc)
- vertical alignment for elevators, pile-drivers etc.
- tilt compensation in weighing machines

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