The Do's and Don'ts

when using AOSI's DX electrolytic tilt sensors and angle conversion modules.

WARNING: ***Use of DC current can permanently polarize the electrolyte and irreversibly damage the sensor.***

It is important to remember that electrolytic tilt sensors are filled with conductive fluid. This fluid is very sensitive when improper excitation is applied to the sensor. If the excitation waveform is not free of the DC component, the sensor could be irreversibly damaged upon power-up.

Dual axis polymer based electrolytic tilt sensors could be used in two ways:

b. mounted remotely from the angle conversion module with/without outer housing

a. mounted on the PC board of the angle conversion module

When using raw polymer based dual/single axis tilt sensors away from the excitation electronic circuitry, we recommend to secure the sensor inside the tilted object.

The most economical way of securing AOSI polymer based tilt sensors is by inserting a sensor into a pre-drilled hole; partially filled with temperature stable adhesive. The diameter of the mounting hole should be 0.005" to 0.010" larger then the diameter of the sensor in order to allow snug but controllable fit.

When fixturing the sensor inside the mounting hole it is important to remove or minimize the CROSS-AXIS error. This is done by tilting the object in X axis to a random near midrange angle, securing the object in that position, and then slowly rotating the sensor inside the mounting hole while monitoring the output on the non-sensitive Y axis. When the minimum output on the Y axis is detected the sensor should be left to cure. Upon the completion of the curing cycle the sensor is ready for normal operation.

It is required to use shielded cable for sensor connection when the sensor is located further then 30 feet from the angle conversion module. The shield should be grounded on one end, preferably at the module main ground. To avoid noise do not connect the other end of the shield to the sensor housing. If it is grounded, needless ground loops could be created.

When the sensor is mounted on the PC board it is important to note that in order to consistently acquire reliable readings the sensor should be soldered flush to the PC board. The PC board should be secured and stable while located on the tilted object. It is recommended for a minimum of one PC board mounting hole to be located within one inch from the center of the sensor. This extra mounting will minimize the bowing of the PC board, therefore sensors drift will be kept to a minimum. The output of the angle conversion module will not be stable if the PC board is not secured to the tilt surface.