

# Operating Manual

## 0729-1723-99

# Microprocessor Based, Dual Axis, Signal Conditioning Assembly



### 1. PRODUCT DESCRIPTION

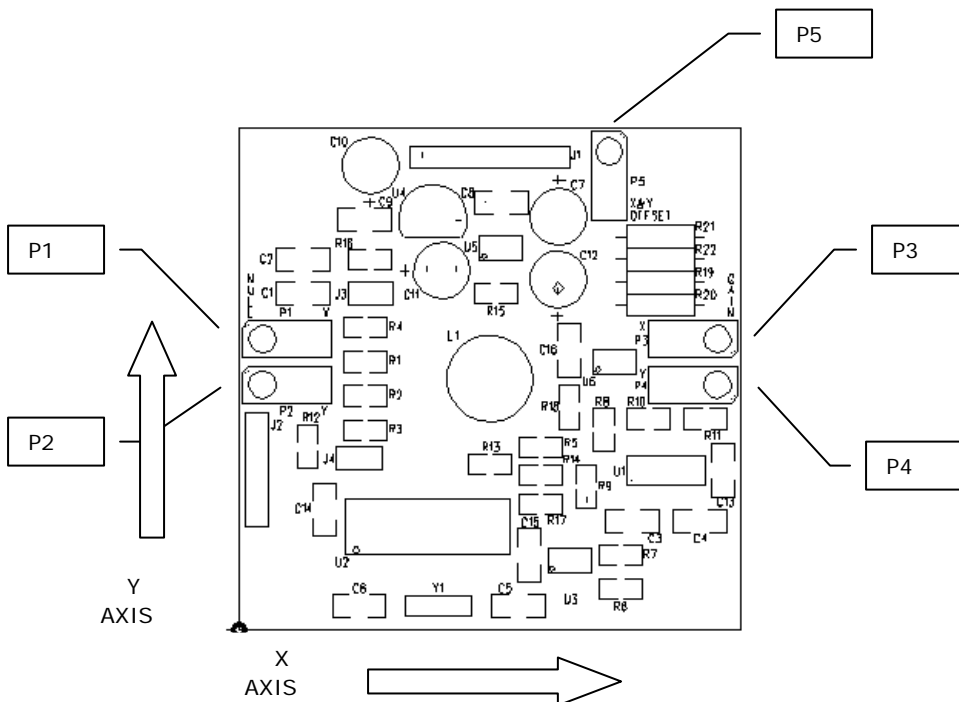
The microprocessor based, dual axis, signal conditioner assembly is designed to operate in the angle range of +/- 45 degrees. It requires a power supply voltage of between 7 to 16 volts dc. The output is 0 to 5 volts relative to the tilt angle for both axis with 2.5 volts indicating a zero angle. The signal conditioner assembly has 2 mounting holes. The spacing is 3.0 inches center to center. Below is diagram of the power and output connections.

**Connector:**

- J1-1 (red) +7 to +16 VDC in
- J1-2 (black) Common
- J1-3 not used
- J1-4 (brown) X axis - analog output
- J1-5 (green) Y axis - analog output
- J1-6 (blue) X axis - pulse width (optional)
- J1-7 (white) Y axis - pulse width (optional)

### 2. CALIBRATION

The signal conditioner is calibrated at the factory. After mounting it may be necessary to trim the offset and gain to accommodate variations in mounting. Below is a description of how to make these adjustments. Remove the 4 screws on top of the housing and remove the cover to access the printed circuit board.



Sensor Trim Adjustments	
P1	X null
P2	Y null
P3	X gain
P4	Y gain
P5	Analog dac offset (factory set, do not adjust)

P1 and P2 are offset adjustments for the X and Y analog and digital outputs when the board is in the null or non-tilted position.

P3 and P4 are gain adjustments for the X and Y analog and digital outputs when the board is tilted to the specified angle.

P5 is the analog dac offset for the X and Y outputs. **This adjustment is made at the factory and should not be adjusted.**

### 3. ADJUSTMENTS – ANALOG

Adjust P1 and P2 for 2.5 volts for the X and Y outputs with the sensor in the null or non-tilted position.

Adjust P3 and P4 for the selected X and Y analog voltage range when the sensor is tilted to the selected angular range

### 4. ADJUSTMENTS – DIGITAL (OPTIONAL)

Adjust P1 and P2 for 50% duty cycle on the digital X and Y outputs with the sensor in the null or non-tilted position.

Adjust P3 and P4 for the X and Y outputs to 10 and 90 percent of the selected angular range.

**Sensor Operating Specifications:**

Tilt sensor part number.....0717-4304-99  
 Operating Range (max.).....  $\pm 45^\circ$   
 Linear Range.....  $\pm 25^\circ$   
 Null Voltage.....  $\leq 0.025$  Volts  
 Null Current (max.) ..... 0.2 mA (continuous)  
 Null Impedance (nom) ..... 40 K Ohms (25° C)  
 (measured left to right electrode) see figure 2  
 Repeatability..... 0.1°  
 Resolution..... < 0.2 arc minutes  
 Symmetry (typ.)..... 5 %  
 Null Offset (max.)..... 5.0°  
 Mech. Crosstalk / Deg. (to 20°)..... 0.025°  
 Temperature Coefficient  
 Null..... 0 arc sec / °C  
 Scale..... 0.1 % / °C  
 Stability @ 24 Hrs..... 0.1°  
 Operating Temperature ..... -40° C to +85° C  
 Storage Temperature..... -55° C to +100° C  
 Time Constant (1) .....  $\leq 100$  msec  
 Material ..... magnetic

**Case Dimensions:**

Length..... 2.500"  
 Width.....2.500"  
 Height.....0.900"  
 Flange Length..... 3.500"  
 Flange Holes (centerline).....3.000"  
 Hole Diameter.....0.190"

**Circuit Board Operating Specifications:**

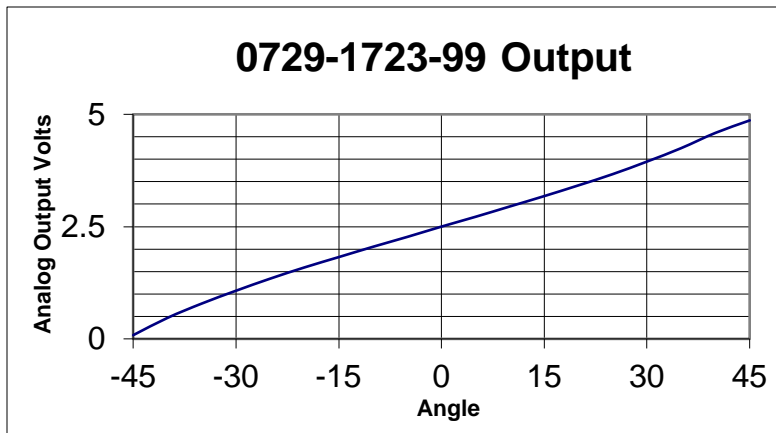
Circuit board part number..... 1-6200-002  
 Power supply voltage (range).....+7 to +16 VDC  
 Power supply current (typical).....11.0 mA @ 9VDC  
 Analog output voltage (max).....Power supply voltage minus 2 Volts  
 Analog output load current (max).....1 mA  
 Analog output resolution (0 to 5 volts output).....1.5 mV  
 Digital output voltage (typical).....0 to 5 Volts  
 Digital output load current (max).....1 mA  
 Digital output resolution (percent).....0.1%  
 (time).....2.0 usec  
 Digital output frequency.....488 Hz

**Environmental:**

Temperature range  
 Operating.....-40 to +85 ° C  
 Storage.....-55 to +100 ° C

**Connector:**

J1-1 +7 to +16 VDC  
 J1-2 Common  
 J1-3 not used  
 J1-4 X axis analog  
 J1-5 Y axis analog  
 J1-6 X axis pulse width (optional)  
 J1-7 Y axis pulse width (optional)  
 Cable length.....60.0"



## Power and signal connection guide

*Caution: Observe polarity when connecting power to power inputs!*

