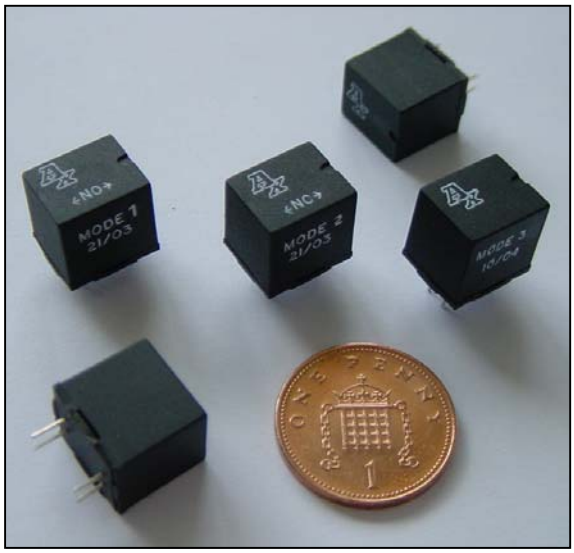
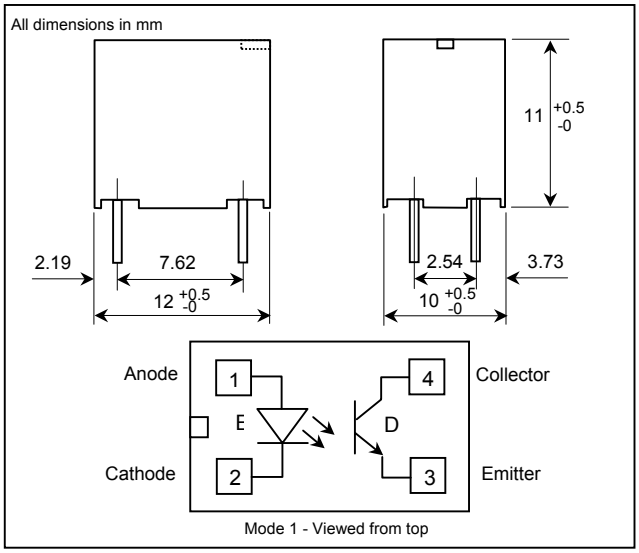
# Non-Mercury Tilt Sensor

**RoHS Compliant**

**TuControls Limited** 2c Connect & Control






The TuControls Non-Mercury Tilt Sensor is a RoHS compliant, transmissive type photo interrupter that consists of a light emitting diode (emitter) & a photo-transistor (detector), mounted either side of a specially designed cavity that contains a stainless steel sphere. When the sensor is tilted/moved, the sphere moves/rolls within the cavity to obscure the light emanating from the emitter, thus stopping the light reaching the detector & turning it on.

The sensor is housed in a small (11x12x10mm) & very robust package. This allows it to be readily mounted on the most complex of printed circuit boards in either a vertical or horizontal plane, depending on the “mode” selected.

The sensor is currently available in various “modes” & angles of operation: -
*Mode 1 : Bi-directional, normally open , horizontal mount.. (ie OFF, ON when tilted in two directions, 35° from vertical)*
*Mode 2 : Bi-directional, normally closed, horizontal mount. (ie ON, OFF when tilted in two directions, 65° from vertical)*
*Mode 3 : Omni-directional, normally open, horizontal mount. (ie OFF, ON when tilted in all directions, 35° from vertical)*
*(Other angles / mounting options, are available on request)*

As a primary sensing device, the tilt sensor can be interfaced to CMOS & standard TTL using a minimal amount of components, enabling the sensor to drive devices, power transistors & FET’s, enable solenoids, motors & lamp loads etc. Additional circuitry can also be supplied to create a sensor module.

**Features**:

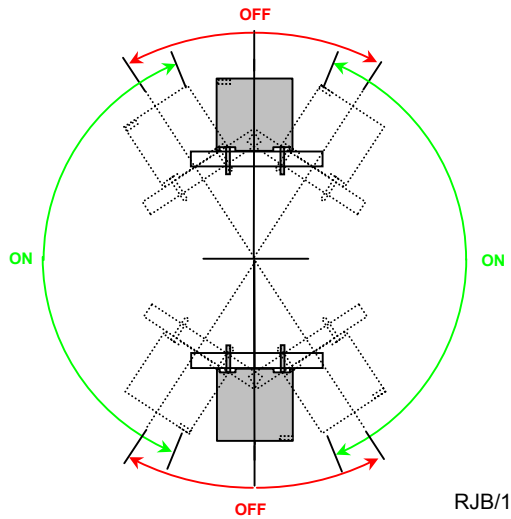
- RoHS Compliant
- Small robust construction
- Printed circuit board mounting
- Optical coupling
- Low power consumption
- Optional interface circuitry available
- Other tilt angles available
- Other “modes” of operation available

**Typical Applications:**

- Emergency shutdown
- Door / barrier position sensing
- Cam / motor position indicator
- Movement alarm

***Important Note:***
*Suitable for PCB washing, but not total immersion.*

*Example of operation – Mode 1*

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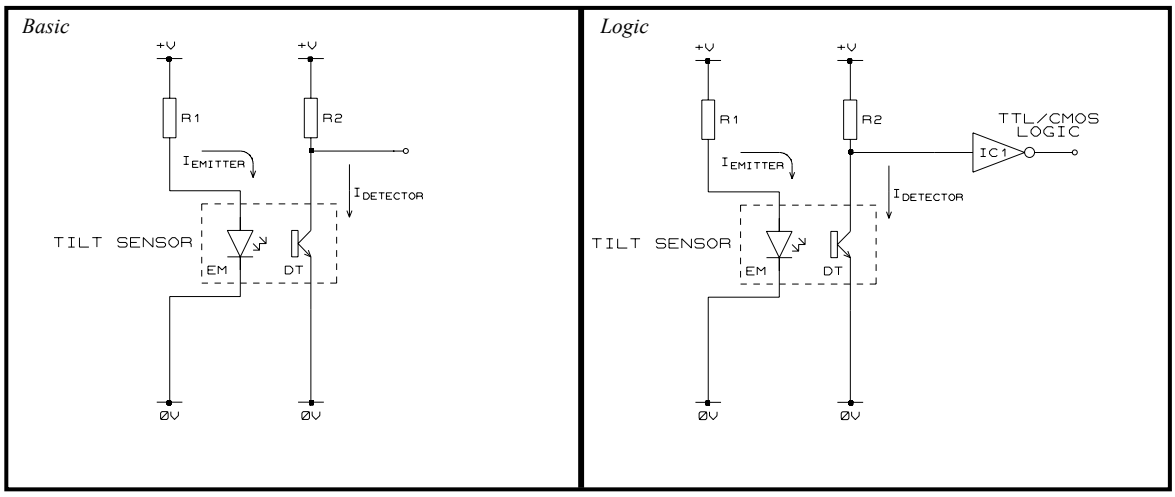
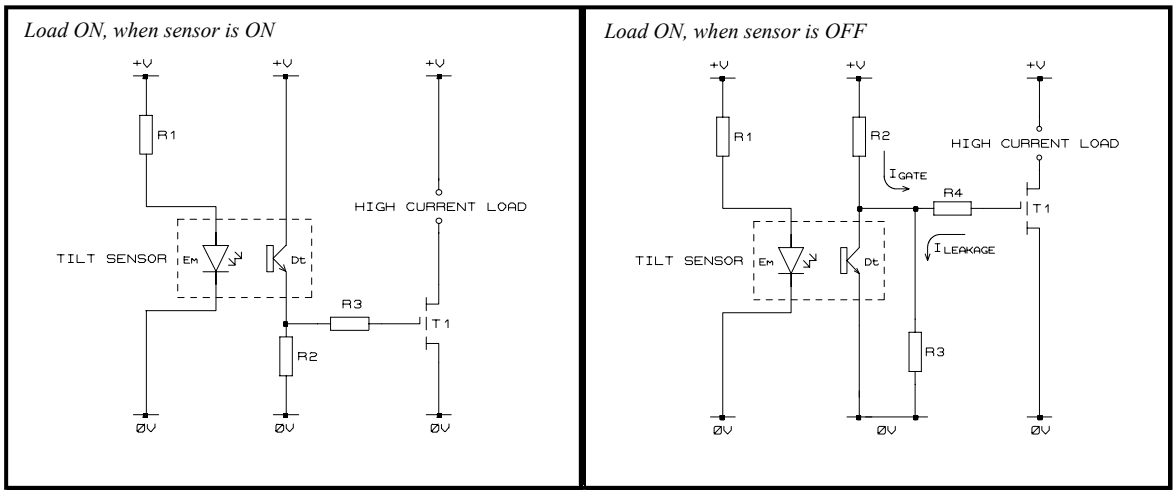
| Example Technical Characteristics – Mode 1 | | | | | | |
|---|---|---|---|---|---|---|
| **Emitter** | | | | | | |
| *Parameter* | *Symbol* | *Min.* | *Typ.* | *Max.* | *Unit* | *Test Condition* |
| *Fwd Voltage* | $V_F$ | ----- | 1.45 | 1.7 | V | $I_F$ = 20mA |
| *Cont. Fwd Current* | $I_F$ | ----- | 20 | 100 | mA | $V_F$=5V |
| *Rev. Voltage* | $V_R$ | ----- | ----- | 5 | V | $I_R$=100μA |
| *Power Dissipation* | $P_M$ | ----- | ----- | 170 | mW | ---------- |
| **Detector** | | | | | | |
| *Coll. Emitt. Voltage* | $V_{CEO}$ | ----- | ----- | 30 | V | $I_C$=100μA |
| *Emitt. Coll. Voltage* | $V_{ECO}$ | ----- | ----- | 6 | V | $I_E$=100μA |
| *Coll. Emitt. Leak. I* | $I_{CEO}$ | ----- | ----- | 100 | nA | $V_{CE}$=10V |
| *On-state Current* | $I_{C(ON)}$ | 2 | ----- | 10 | mA | $V_{CE}$=25V |
| *Coll. Emitt. Sat. V* | $V_{CE(SAT)}$ | ----- | ----- | 0.4 | V | $I_C$=2.0mA, Ib=100μA |
| *Power Dissipation* | $P_M$ | ----- | ----- | 100 | mW | ---------- |
| **Operating Specification** | | | | | | |
| *Operating Angle* | Op | 30 | 35 | 40 | Deg | $I_F$=20mA |
| *Release (from Op)* | Rel | 8 | 10 | 12 | Deg | $I_F$=20mA |
| *Operating Temp.* | Temp | -10 | ----- | +70 | °C | $I_F$=20mA, $I_C$=10mA |
| *Soldering Temp.* | $T_{SOL}$ | ----- | ----- | +260 | °C | For 5seconds max. |

Minimal Circuit Requirements




FET Interface Circuit Requirements

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