



Features

- Single, dual or omni-directional tilt sensing
- Adjustable switching threshold from 1 to 50°
- 'ZERO' button to set zero after installation
- Small size and low power consumption.
- No moving parts means no servicing and long life
- High precision switching threshold
- Mercury free and RoHS compliant
- Sealed to IP67
- CE certified

Applications

- Bank angle warning system for ride-on mowers
- Safety cut-out for cranes with hydraulic levelling
- Tilt warning system for platform and hoist levelling
- Rollover warning system for agricultural vehicles
- Safety cut-out for telescopic and scissor lifts
- Can be readily customised to suit most applications



Description

A highly configurable tilt switch that is factory configured as either single axis, dual axis and omni-directional tilt threshold sensing. For each of these types there are four versions to cover a variety of switching angles. The exact switching angle can be adjusted with the PCB mounted rotary switches. With the dual axis version the tilt threshold (the trip angle) can be adjusted individually for the X and Y axis. With the single axis version, only the

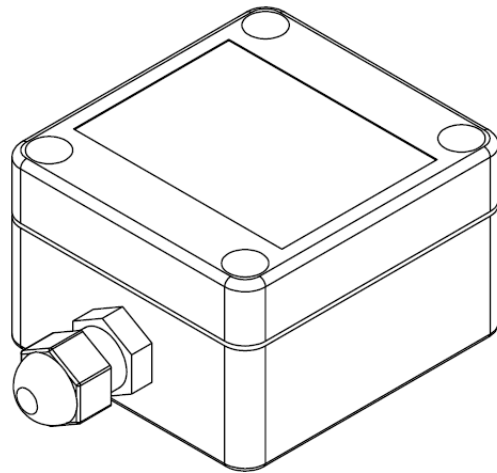
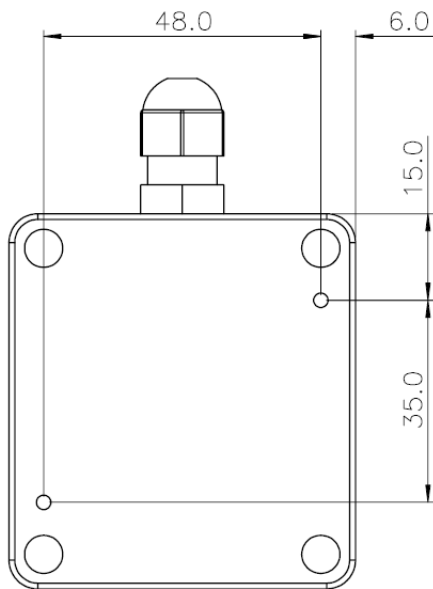
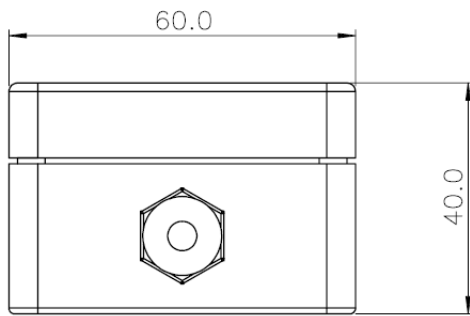
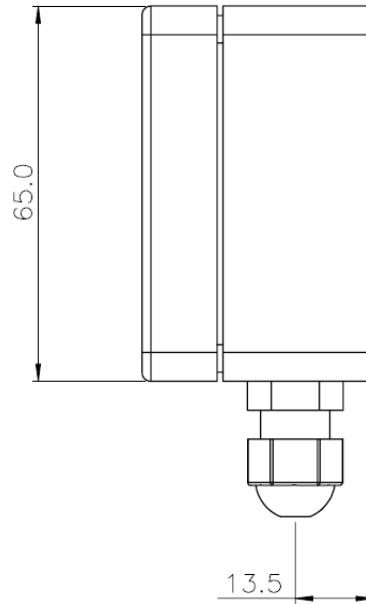
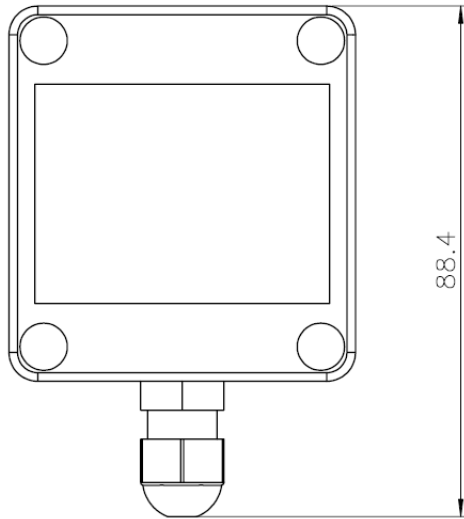
X axis is monitored, and with the omni-directional version, the measurement of both axis is combined to calculate the resultant tilt angle, and the switch will operate if the threshold angle is exceeded in any direction of tilt. Once the tilt threshold is reached the relay operates and the switch contacts are closed. This can be used to sound an alarm, switch on a warning light, or interface directly to a machines control system.

Specifications

Part Number	ETS 1-4	ETS 4-11.5	ETS 10-25	ETS 20-50	Notes
Switching Range	1-4°	4-11.5°	10-25°	20-50°	Range is adjustable via the 16 position PCB rotary switch
Adjustment Step	0.2°	0.5°	1°	2°	Adjustment resolution of the rotary switch
Switching Accuracy	±0.1°	±0.2°	±0.5°	±1°	Switching Accuracy at 20°C
Hysteresis ¹	0.2°	0.5°	1°	2°	The angle between the switch on and switch off position. Necessary to prevent oscillation at the threshold
Bandwidth (-3dB)	0.25Hz				Frequency response. (Can be factory configured between 0.125 and 16Hz on request)
Power Supply	10-30Vdc				Low noise dc supply should be used
Current	10-40mA				Normal operating current is 10mA maximum but increases to 40mA when relay is switched
Switching Capacity	220Vdc, 250Vac, 60W max				Maximum switching capacity of relay
Dimensions	65x60x40mm (housing) or 50x35mm (pcb)				
Operational Temperature	-20 to 70°C				
Storage Temperature	-40 to 85°C				
Sealing	IP67				



Housing Drawing





Cable Details

- 1. Core wires, tin plated copper, 7x0.2mm strands per conductor (24 AWG). 5 conductors colours brown, green, yellow, grey and white. PVC core insulation.
- 2. Braided screen of tin copper wire with minimum 85% coverage.
- 3. PVC dark grey outer jacket
- 4. Approvals: UL AWM Style 2464
CSA AWM I/II A

Wire Colour	Terminal Block Pin	Function
Brown	5	+Ve Supply
Green	4	GND
Yellow	3	Normally closed relay contact
Grey	2	Normally open relay contact
White	1	Relay Common

Parameter	Value	Unit	Notes
Approximate Weight	51	g/m	
Operating Temperature	-40 to 80	°C	
Conductor Resistance	100	Ω/Km	Maximum resistance
Test Voltage	1.5	KV DC	
Voltage Rating	300	V	
Core Current Rating	2	A	At 40°C air temperature
Individual Core Diameter	1.25	mm	
Overall Diameter	5.5	mm	

Certification

The products are type approved to in accordance with the following directive(s):

EMC Directive 2004/108/EC



And it has been designed, manufactured and tested to the following specifications:

BS EN61326-1:2006

Electrical equipment for measurement, control and laboratory use – EMC Requirements

BS EN55011:2007, Group 1
Class B

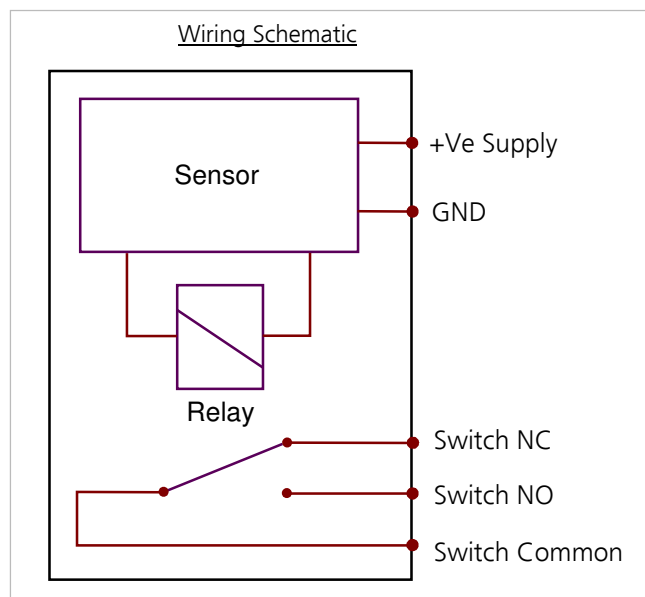
Certification is available on request.

Wiring Information

The Tilt sensor has a five wire connection. The brown and green wires are used for the power supply and the other wires are connected to the switch contacts. **The unit is not fused internally.** On a vehicle system it should be connected to a supply from the fuse box with a 1A rating, or connected using an inline 1A fuse. Please see the schematic opposite and the table below for connection details.

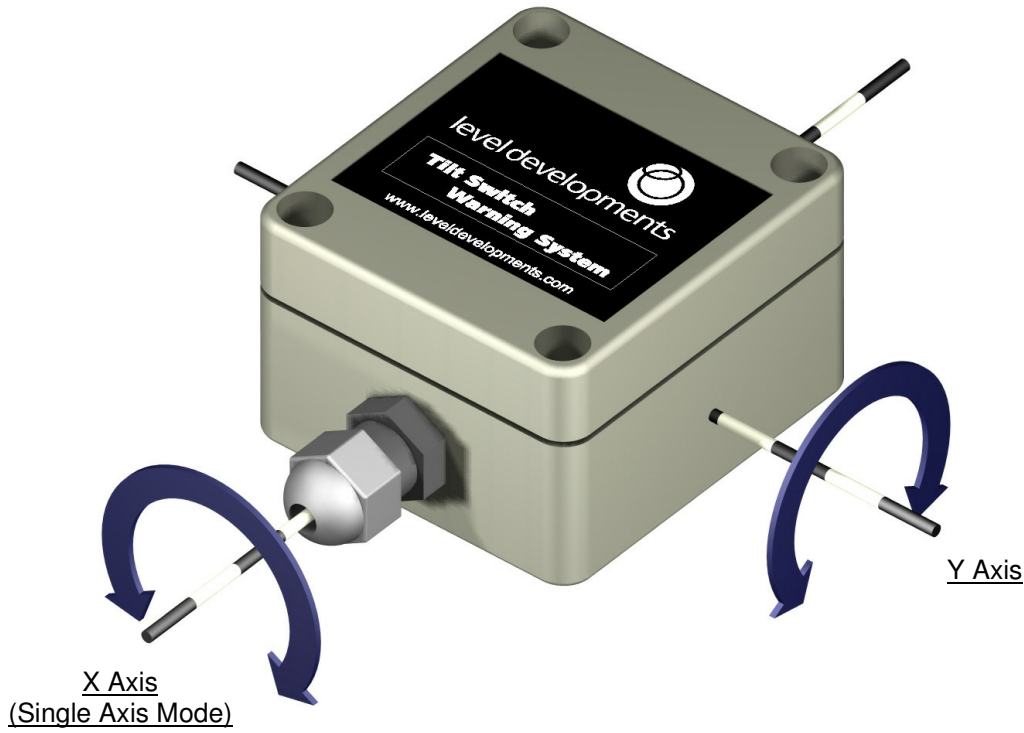
Wiring Details

Wire Colour	Terminal Block Pin	Function
Brown	5	+ve Supply
Green	4	GND (0v)
Yellow	3	Normally closed relay contact
Grey	2	Normally open relay contact
White	1	Relay Common

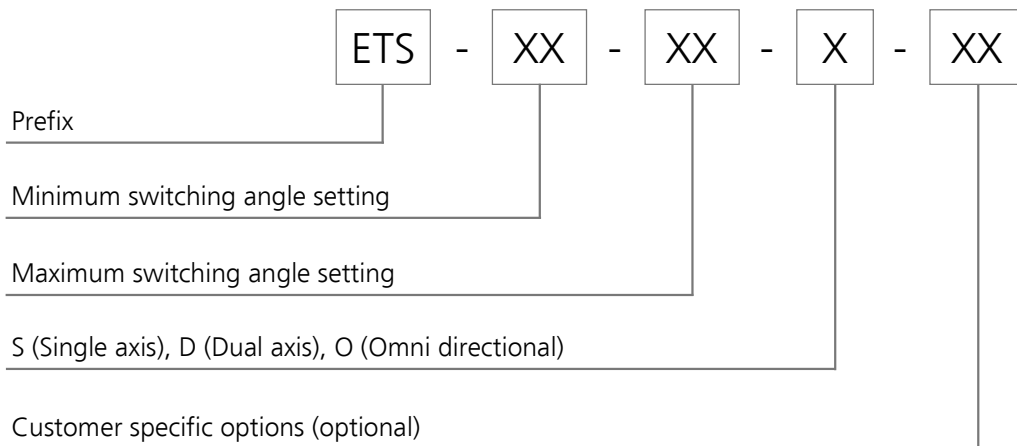




Axis Direction



Part Numbering



Example:

ETS-4-11.5-D

Switching angle when adjustment switch is at lowest setting : 4°
 Switching angle when adjustment switch is at highest setting : 11.5°
 Dual axis