

# Inclinometer

## **Digital Readout and Customised Alarm Functionality**

Hummingbird's Inclinometer provides a highly visible and configurable pitch and roll display to operators of industrial machinery.

The unit allows customisation of sensor response times to allow maximum flexibility in various applications.

Alarms and warnings can be configured from the integrated menu and saved to integrated memory.

### **Powerful Performance**

Designed for harsh industrial environments, the module features a tough fascia with integrated buttons and LCD graphics display. An industrial adjustable mount allows for optimum positioning for the operator.

Both pitch and roll can simultaneously be displayed and can optionally be made to invert in the event of an alarm or warning condition. The display is highly visible both at night and in sunlight due to the use of an industrially rated transfective graphics LCD display.

The integrated keypad allows for customisation of the display; in application calibration; warning and alarm setup; minimum and maximum tilt display and sensor customisation.

For optimum performance, Hummingbird's range of high accuracy RS485 tilt sensors should be used. When used in combination with the command module, accuracy of one degree and customisable frequency response are achievable.

Individual outputs for pitch and roll warnings can drive external relays, buzzers or can be connected to a vehicle management system. An integrated alarm relay provides normally open, normally closed and common outputs. All warnings and alarms can be configured to be normally-on or normally-off.

Optional password protection on the setup menu can be configured by the user.



*Highly visible pitch and roll readout*

### **Features**

- 10V to 36V supply voltage
- Adjustable industrial mount
- Highly visible pitch and roll readout
- Integrated user interface for customisation
- One degree accurate, variable frequency response sensors
- Highly configurable warning and alarm functions
- Integrated relay and voltage output

### **Rugged Hardware**

The Inclinometer is supplied in a rugged ABS plastic enclosure with a polycarbonate fascia.

A fully adjustable aluminium mount can be screw mounted to the vehicle, or optional suction mounts are available.

Power, outputs and the sensor are connected through a pluggable connector at the rear of the unit.

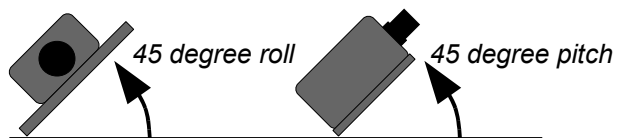
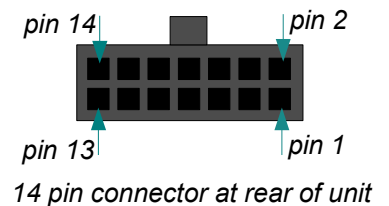
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## Digital Readout and Customised Alarm Functionality

Technical Specifications and Ordering Information	
Part number	HMDS1000
Companion sensor series	HMTS1F0000 or HMTS2F0000
Input voltage	minimum 10V; maximum 36V
Power consumption (W)	maximum 2.5W (200mA @ 12V) – includes dual axis tilt sensor
Relay output	normally open or normally closed, 36V max, 1A max
Warning outputs	150mA souce or sink, short circuit protected
Non-trigger output (warning outputs)	no load, less than 400mV; 100mA sink, less than 800mV
Trigger output (warning outputs)	no load – more than Vin-1.4; 100mA source, more than Vin-2
Maximum tilt	-90 to 90 degrees, recommended use -60 to 60 degrees
Accuracy	one degree from 0 to 30 degrees, 2 degrees from 30-60 degrees
Refresh rate	10 updates per second
Frequency response	10Hz to 0.1Hz, user settable
Communications protocol	enhanced RS485 – differential, will operate with one broken connection
Dimensions – display module (mm)	110mm(width), 75mm(height), 25mm(depth)
Operating temperature	-40°C to 85°C; 5% to 95% relative humidity

### Connection Specification

- 1 Positive input voltage (10-36V), red
- 2 Ground (0V), black
- 3 Sensor inverting input B, Yellow
- 5 Sensor non-inverting input A, Green
- 9 Relay normally closed, orange
- 11 Relay common, dark brown
- 13 Relay normally open, blue
- 12 Roll warning output, white
- 14 Pitch warning output, grey



**Positive pitch and roll shown: negative pitch and roll will be opposite angle from horizontal**

