# SKYSENS

SKYMOT1

Tilt Sensor

Skysens SKYMOT1 is a LoRaWAN based orientation sensor which uses acceleration sensor to determine slope. It also comes with sensing temperature and humidity measurement specifications.

> **Highlights**

- ☑ Up to 10 years of battery life
- ☑ Precise measurements with high resolution sensor.
- ☑ Excellent long-term stability
- ☑ LED interface
- ☑ Adjustable sensor reading interval from network
- ☑ Adjustable sensor orientation threshold through network.
- ☑ Ready with end-to-end software application
- ☑ 2 mode restart pin button.

> **Application Areas**

Industries, Smart City Applications, Warehouses, Supply Chains, e
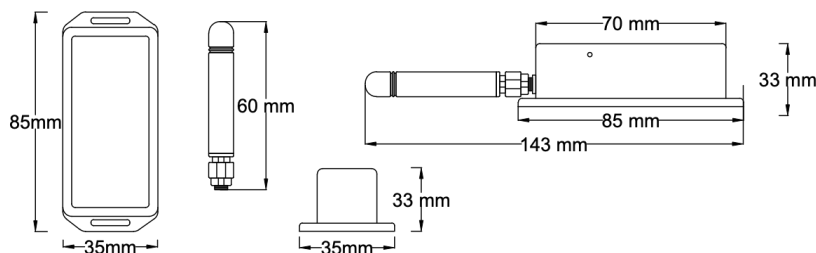
Dimensions	35 x 85 x 33 mm	Available Frequencies	All
Weight	150 gr (apprx)	Measurement Range	360º on 3 Axis
Casing	ABS with RoHS Compliancy	Measurement Resolution	12 Bits
Antenna	+2 dBi or +3 dBi external	Operating Conditions	-40ºC to +80ºC & 0% RH to 100% RH
Expected Battery Life	Minimum 3 Years with 30 min Interval	Battery	3.6V Lithium AA (Changeable)

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PRODUCT IMAGES, BUTTONS AND PLUG-INS

Antenna Input

Antenna

Reset Button

Led Indicator

Reset Needle

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PAYLOAD STRUCTURE – Uplink

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Temperature MSB	Temperature LSB	Humidity MSB	Humidity LSB	Min X Axis Value MSB	Min X Axis Value LSB

Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11
Max X Axis Value MSB	Max X Axis Value LSB	Sum of Avg. X Axis Values MSB	Sum of Avg. X Axis Values LSB	Min Y Axis Value MSB	Min Y Axis Value LSB

Byte 12	Byte 13	Byte 14	Byte 15	Byte 16	Byte 17
Max Y Axis Value MSB	Max Y Axis Value LSB	Sum of Avg. Y Axis Values MSB	Sum of Avg. Y Axis Values LSB	Min Z Axis Value MSB	Min Z Axis Value LSB

Byte 18	Byte 19	Byte 20	Byte 21	Byte 22	Byte 23 - 24
Max Z Axis Value MSB	Max Z Axis Value LSB	Sum of Avg. Z Axis Values MSB	Sum of Avg. Z Axis Values LSB	Tilt Status	Battery

- **Note:** All axis data are 16-bit unsigned number.

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PAYLOAD STRUCTURE – Downlink

Interval Change Downlink

Following message should be sent to the device in order to change message period of the device.

Interval Change Command	
Port	**Message**
0x0B	$0x02T_0T_0T_1T_1T_2T_2T_3T_3$

T values at the above table are time values in seconds and hexadecimal form. Must be sent in MSB first form. For example, 0x0200000384 message should be sent to the device in order to set message interval to 900 seconds. (0x384H = 900) These values can take from 1 minute to 6 hours.

Axis Threshold Change Downlink

Following message should be sent to the device in order to change axis threshold of the device.

Axis Threshold Change Command	
Port	**Message**
0x0C	0xXXXX

X values at the above table represents the threshold value in 16 bits hexadecimal form.

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Device Behaviour

Device wakes up once at every one second, reads the orientation values. After sleep interval device sends the values of orientation.

Reset Operation

Push the reset button and hold, red LED must light for a while and start blinking. When you see the blinking release the button. The device gets reset by this operation and after every reset operation, the device goes into sleep mode automatically by blinking red and greed LEDs once.

Wake Up

To exit sleep mode and take the device to the normal operation mode, push the reset button until you see the red LED light. When you see red light release the button and the device will go into normal operation mode by blinking LEDs in a sequence of green-red-green.

OTAA Mode

The device requests OTAA join to the server after the device wakes up and goes into the normal operation mode. OTAA requests are represented by the blinking green LED once per request. When the device successfully joins to OTAA mode green LED lights for a while.

ABP

For ABP please contact SKYSENS.

Communication

The device indicates uplink communication by blinking green LED once and downlink communication by blinking red LED once.

Error Behaviour

The first time device with a hardware problem is energized, it flashes the red led at the intervals of five hundred milliseconds, to indicate there is a hardware problem.