INCLIN'O

LoRaWAN

The INCLIN'O sensor measures the inclination of an equipment compared to an original position (set at start-up and stored in flash). For example, INCLIN'O detects a change in position to warn about a falling pole or an open window via a LoRaWAN® network

INCLIN'O can also monitor shock events and report the shock amplitude vector, this configuration is not available by default and needs a specific configuration (config ref 36-70-201-000)

APPLICATIONS

- Roof window monitoring
- Tilt detection
- Shock detection *
- Electricity, telecom or CCTV poles monitoring

BENEFITS & KEY FEATURES

- LoRaWAN®, Class A
- Easy to use and deploy
- Tilt
  - Range: 0...180° from vertical
  - Periodic measurement
- Shock *
  - Range: ±16g
  - Threshold: 1,1g on each axis
  - Standby sample frequency: 100Hz
- > 10 years autonomy (Tilt configuration only with measurement period of 10s / 1 frame per day)
- IP68

QUALITY & RELIABILITY

- RED, UKCA, RoHS

INCLIN'O is an autonomous LoRaWAN® IoT device. It monitors the inclination of the equipment on which it is installed.

After a measurement if a tilt threshold is passed (over 40° or below 10°), it sends an alert immediately.

INCLIN'O can also monitor shock events and report them upon detection based on a threshold (with config ref 36-70-201-000). Later detection are combined in a batch frame sent 3 minutes after the first detection.

Battery powered, the sensor has a lifespan of over 10 years when configured with a position check every 10 seconds and one radio transmission per day.

INCLIN'O can be attached using:

- screws,
- magnets (option),
- a pole mounting bracket (option),
- an adhesive strip (default configuration).

FABRIQUÉ EN FRANCE

INCLIN'O is suitable for outdoor installations thanks to its IP68 enclosure and its anti-UV treated material.

Installation and commissioning are quick and easy. INCLIN'O is equipped with:

- a magnetic switch for activation or deactivation;
- an NFC identification tag (product code, serial number, batch number).

INCLIN'O is delivered with a default configuration that can be reconfigured using the downlink, according to its ZCL application layer, for example:

- interval between two tilt checks;
- threshold of alert "opening", "re-closing";
- threshold of alert for shock detection *
- number of confirmations before alert;
- periodicity on life frame.

* (with config ref 36-70-201-000)

THE LARGEST IOT PRODUCTS RANGE FOR YOUR PROJECT

WATTECO is a European leader in the design and manufacture of smart IoT devices to suit all remote reading and data collection solutions.

WATTECO is a LoRa Alliance® member.

TECHNICAL DATA

RADIOFREQUENCY	Frequency (MHz)	Transmit Power (dBm)	Receiver Sensitivity (dBm)
	EU: 863-870	+14	-140

FIRMWARE	
Protocol	LoRaWAN®, Class A
Activation method	Activation by Personalization (ABP) or Over-The-Air Activation (OTAA)
Data encryption	AES128
Application layer	ZCL (ZigBee Cluster Library) – to be interpreted by the remote server
Measurement cycles	From 1s to 59s in 1s steps Or from 1min to 59min in 1min steps Default: 10 seconds (24h with config ref 36-70-201-000) Shock sampling frequency: 100Hz * (from 1Hz (~10µA consumption) up to 5376Hz (~200µA))
Transmission cycles	Configurable from 10 minutes to 24 hours / Upon shock event detection*
Alarm thresholds	Opening: configurable in the range 10° … 180° in steps of 1° (default 40° with a 2.5° Hysteresis). Closing: configurable in the range 10° … 180° in steps of 1° (default 10° with a 2.5° Hysteresis). Shock: 1,1g on any axis *

	TILT MEASUREMENT	SHOCK MEASUREMENT *
Range	0 … 180°	±16g (configurable to ±2g/±4g/±8g)
Resolution	0.1°	186mg (16mg@±2g/32mg@±4g/62mg@±8g)
Accuracy	±1°	±100mg

POWER SUPPLY	
Voltage	3.6V / 3600mAh – Replaceable lithium battery (replacement kit 71-70-151-000):
Autonomy in a range of +10°C to +25°C	> 10 years: Tilt configuration only, measurement period of 10s / 1 frame per day

USER INTERFACES	
NFC Tag	Product code, serial number, batch number
Buzzer	Sensor status
Magnetic switch	Reset, On/Off

ENCLOSURE	Size (mm)	Fastenings	IP rating	Fire resistance
UV-resistant ASA plastic	100 x 75 x 35	Magnets (option), pole mounting bracket (option) or adhesive strip (default)	IP68	UL94-V0HB

ENVIRONMENT	Operating conditions	Storage conditions
	-20°C to +60°C +0%rH to +95%rH (non condensing)	+10°C to +30°C +20%rH to +60%rH

DIRECTIVES & STANDARD
Radio Equipment Directive 2014/53/EU, RoHS

UK CA CE ⌧ ☑ RoHS

* (with config ref 36-70-201-000)

PRODUCT NUMBER

REFERENCE	HS Code	DESCRIPTION
50-70-201	85 17 62	LoRaWAN® INCLIN'O sensor
71-70-132	85 17 62	Magnet kit (2 magnets with 75n force each)
71-70-133	85 17 62	Pole mounting bracket kit (No ties/collars provided, max width=11mm, max height=1.5mm)
71-70-151	85 17 62	Battery replacement kit
36-70-201	85 17 62	Firmware configuration for Tilt monitoring + Shock detection