netvox R311K Wireless Tilt Sensor User Manual

Model R311K
Wireless Tilt Sensor
R311K
User Manual

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Introduction

R311K is a long-distance tilt detection device that is a Class A device based on the LoRaWAN open protocol of Netvox and is compatible with the LoRaWAN protocol. The device is a title detection sensor. When the device is tilted greater than or equal to 45 degrees in any direction, it will send a tipping signal.

LoRa Wireless Technology:

Lora is a wireless communication technology dedicated to long-distance and low power consumption. Compared

with other communication methods, the LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. Examples, automatic meter reading, building automation equipment, wireless security systems, and industrial monitoring. Main features include small size, low power consumption, transmission distance, anti-interference ability, and so on.

LoRaWAN:

LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.

Appearance

3. Main Feature

- 2 x 3V CR2450 button batteries
- Compatible with LoRaWAN
- Detect voltage and tilt status of the device
- Easy setup and installation
- Protection level IP30
- Compatible with LoRaWANTMClass A
- Frequency-hopping spread spectrum technology
- Configurable parameters via a third-party software platform, reading data and setting alarms via SMS text and email (optional)
- Applicable to the third-party platforms: Actility/ ThingPark/ TTN/ MyDevices/ Cayenne
- The product has low power consumption and supports long battery life.

Note: Battery life is determined by sensor reporting frequency and other variables.
Please refer to the web: **http://www.netvox.com.tw/electric/electric_calc.html**
On this website, users can find battery lifetime for various models at different configuration

Set up Instruction

On/Off

Pmoer on	Insert batteries (the user may need a screwdriver to open) Insert 2 x 3V CR2450 button batteries into the battery slot in the correct direction an d close the back cover. Note: Require 2 button batteries to supply power at the same time.
Turn on	Press and hold the function key till the green and red indicator flashes once.
Turn off (Restore to original setti ng)	Press simultaneously and hold two buttons for 5 seconds, and then the green indicat or flashes 20 times and the device will turn off automatically.
Power off	Remove Batteries
Note:	1. Remove and reinsert the battery: the device will remember the previous on/off stat us by default. 2. After inserting batteries and pressing the button at the same time, the device will b e in engineering testing mode. 3. On/off interval is suggested to be about 10 seconds to avoid the interference of ca pacitor inductance and other energy storage components.

Network Joining

Never join the network	Turn on the device to search the network to join. The green indicator stays on for 5 s econds: success The green indicator remains off: fail
Had joined the network (Not restored to the origin al setting)	Turn on the device to search the previous network to join. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Fail to join the network	Suggest checking the device verification information on the gateway or consult your platform sere es provider

Function Key

Press and hold for 5 sec onds	Restore to the original setting / Turn off The green indicator flashes 20 times: success The green indicator remains off: fail
Press once	The device is in the network: the green indicator flashes once and sends a report The device is not in the network: the green indicator remains off

Sleeping Mode

The device is turned on and joins in the network	Sleeping period: Min Ir When the report chang a report according to M

Low Voltage Warning

Low Voltage …….. 2.4V

Data Report

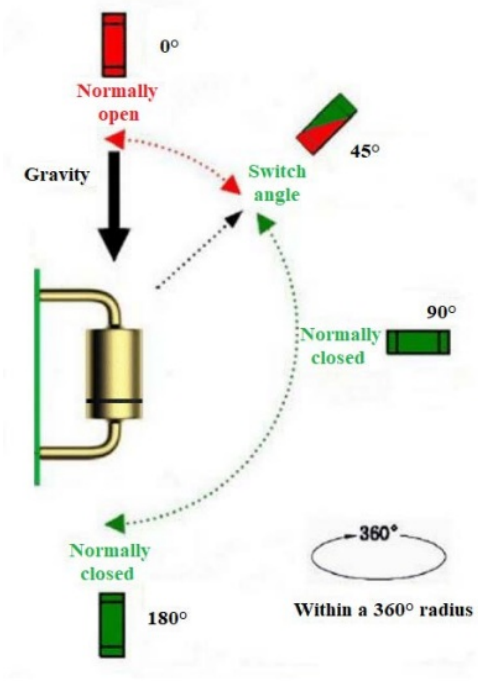
After power on, the device will immediately send a version packet report and an attributes report.
The device sends data according to the default configuration before any other configuration.

Default setting:

Report MaxTime Max Interval —-3600s
Report MinTime Min Interval —-3600s (Default: Every Min Interval will detect the state of the dry contact one time)
BatteryVoltageChange —- 0x01(0.1V)

Triggering the tilt detection:

The device adopts 45° tilt detection around the entire circumference. The initial state of the device is vertical placement.
When the tilt angle (any direction) changes more than 45° (45°~180°), a tipping alarm will be issued immediately.
Device Tilt: 1, Device Recovery: 0



Note:

1. The cycle of the device sending the data report is according to the default.
2. The interval between two reports must be the MinTime.
3. R311K defaults Max Interval = 60min, Min Interval = 60min

(If there are specially customized shipments, the settings will be changed according to the customer's requirement.)
The device reported data parsing please refer to
Netvox LoraWAN Application Command document and Netvox Lora Command Resolver
http://www.netvox.com.cn:8888/page/index

Data report configuration and sending period are as follows

Min Interval (Unit: second)	Max Interval (Unit: second)	Reportable Change	Current Change > Reportable Change	Current Change < Reportable Change
Any number between 1-65535	Any number between 1-65535	Can not be 0	Report per Min Interval	Report per Max Interval

Example of ConfigureCmd
F port 0x07

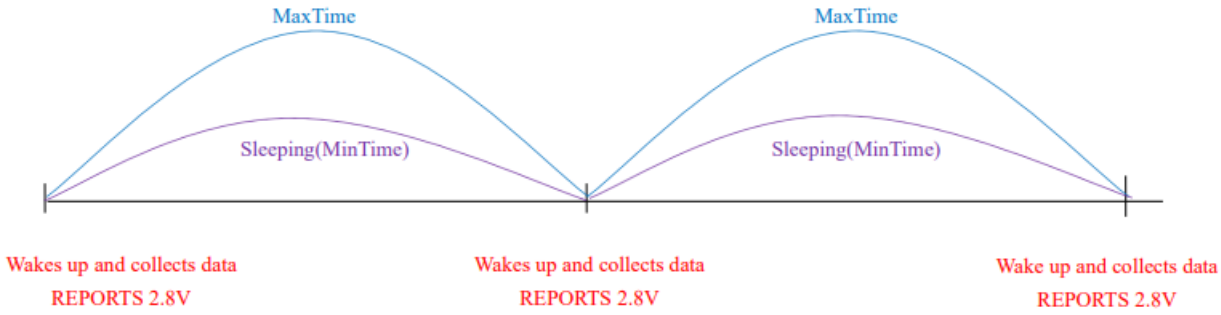
Bytes	1	1	
	CmdID	DeviceType	

CmdID– 1 bytes
DeviceType– 1 byte – Device Type of Device
NetvoxPayLoadData– var bytes (Max=9bytes)

Description	**Device**	CmdID	**Device Type**	**NetvoxPayLoadData**			
ConfigReport Req	R311K	0.01	Ox9E	Minime (2bytes Unit: s)	Maxime (2bytes Unit: s)	BatteryChange (1byte Unit:0.1v)	Reserved (4Bytes, Fixed Ox00)
ConfigReport Rp		0x81		Status (0x00_success)		Reserved (8Bytes, Fixed Ox00)	
ReadConfigR reporter		0x02		Reserved (9Bytes, Fixed Ox00)			
ReadConfigR sports		0x82		Minime (2bytes Unit:s)	Maxime (2bytes Unit: s)	BatteryChange (I byte Unit:0.1v)	Reserved (4Bytes, Fixed Ox00)

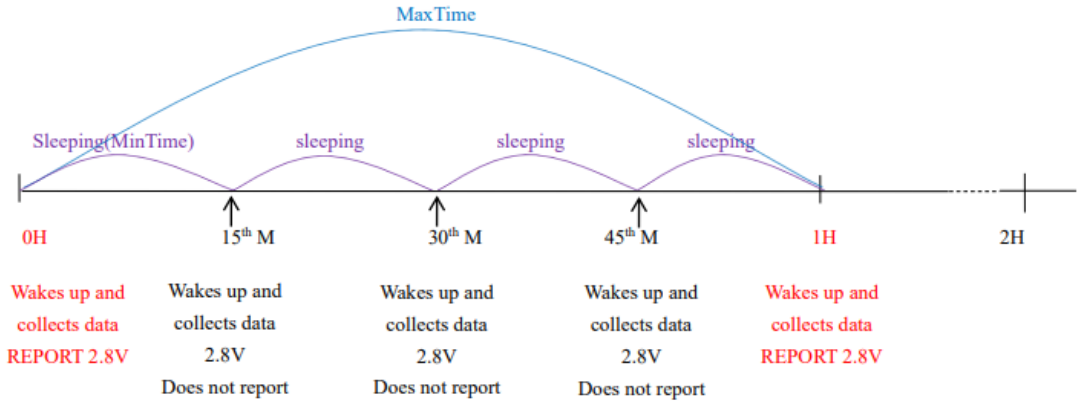
(1) Configure R311K device parameter
MinTime = 1min MaxTime = 1min BatteryChange = 0.1v
Downlink 019E003C003C0100000000
Device return
819E000000000000000000 (configuration success)
819E010000000000000000 (configuration failure)
(2) Read R311K device parameter
Downlink 029E000000000000000000
Device return
829E003C003C0100000000 (device current parameter)

Example#1 based on MinTime = 1 Hour, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange=0.1V

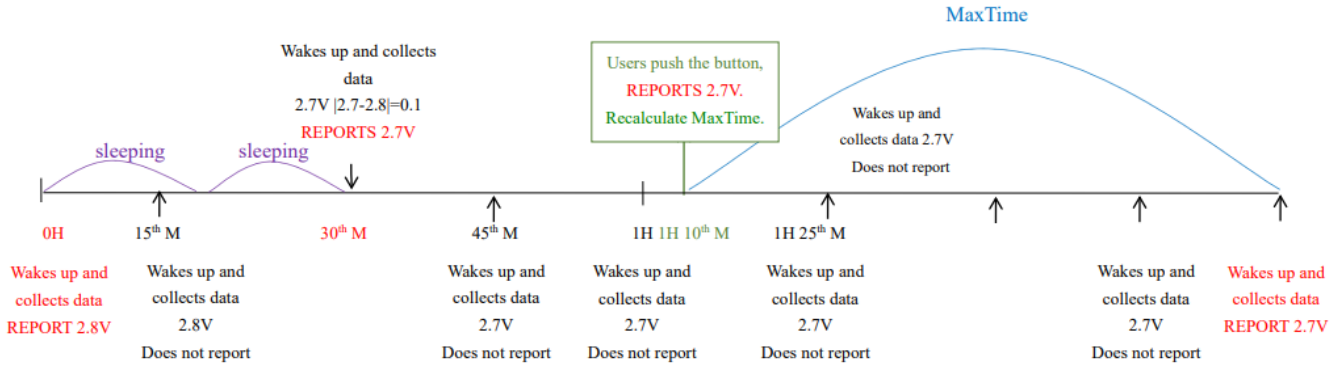


Note: MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless BtteryVoltageChange value.

Example#2 based on MinTime = 15 Minutes, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange= 0.1V.



Example#3 based on MinTime = 15 Minutes, MaxTime= 1 Hour, Reportable Change i.e. BatteryVoltageChange= 0.1V.

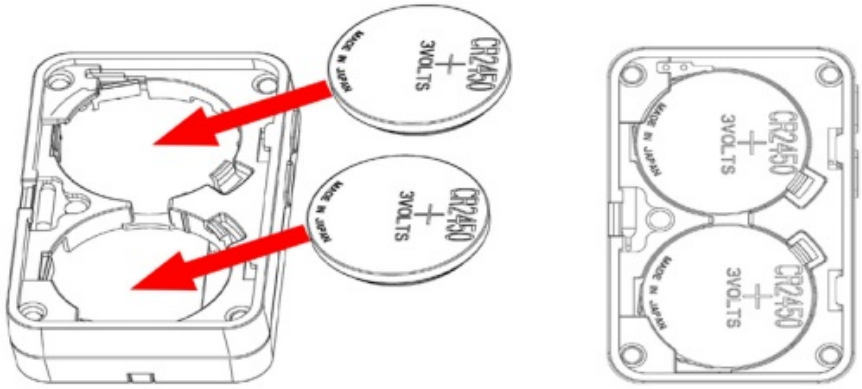


Notes:

1. The device only wakes up and performs data sampling according to MinTime Interval. When it is sleeping, it does not collect data.
2. The collected data is compared with the last reported data. If the variation of the data is greater than the value of ReportableChange, the device will report according to the MinTime interval. If the data variation is not greater than the last reported data, the device will report according to the Maxime interval.
3. We do not recommend setting the MinTime Interval value too low. If the MinTime Interval is too low, the device will wake up frequently and the battery will be drained soon.
4. When the device sends a report, no matter the data changes, the button is pushed or the Maxime interval comes, another cycle of MinTime / Maxime calculation starts.

Installation

1. The device does not have a waterproof function. After the configuration of joining the network is completed, please place it indoors.
2. The dust at the installation location should be wiped clean before pasting the device.
3. The battery installation method is as the figure below. (the battery with the “+” side facing up)



Note: The user may need a screwdriver to open the cover.

Important Maintenance Instruction

- Kindly pay attention to the following in order to achieve the best maintenance of the product:
- Keep the equipment dry. Rain, moisture, and various liquids or water may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.
- Do not use or store in dusty or dirty areas. This way can damage its detachable parts and electronic components.
- Do not store in an excessive heat place. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store in an excessively cold place. Otherwise, when the temperature rises to normal temperature, moisture will form inside which will destroy the board.
- Do not throw, knock or shake the device. Treating equipment roughly can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents, or strong detergents.
- Do not paint the device. Smudges can make debris block detachable parts up and affect normal operation.
- Do not throw the battery into the fire to prevent the battery from exploding. Damaged batteries may also explode.

All the above suggestions apply equally to your device, batteries, and accessories.
If any device is not operating properly.
Please take it to the nearest authorized service facility for repair.

Documents / Resources

	**netvox R311K Wireless Tilt Sensor** [pdf] User Manual R311K, Wireless Tilt Sensor, R311K Wireless Tilt Sensor

References

- Lora Command Resolver
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