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*Wireless Activity Timer*

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***Wireless Activity Timer***  
**User Manual**

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# 1. Introduction

R311FC is a vibration alarm device for Netvox ClassA type device based on LoRaWAN open protocol. It can detect movement or vibration duration of the device and is compatible with LoRaWAN protocol.

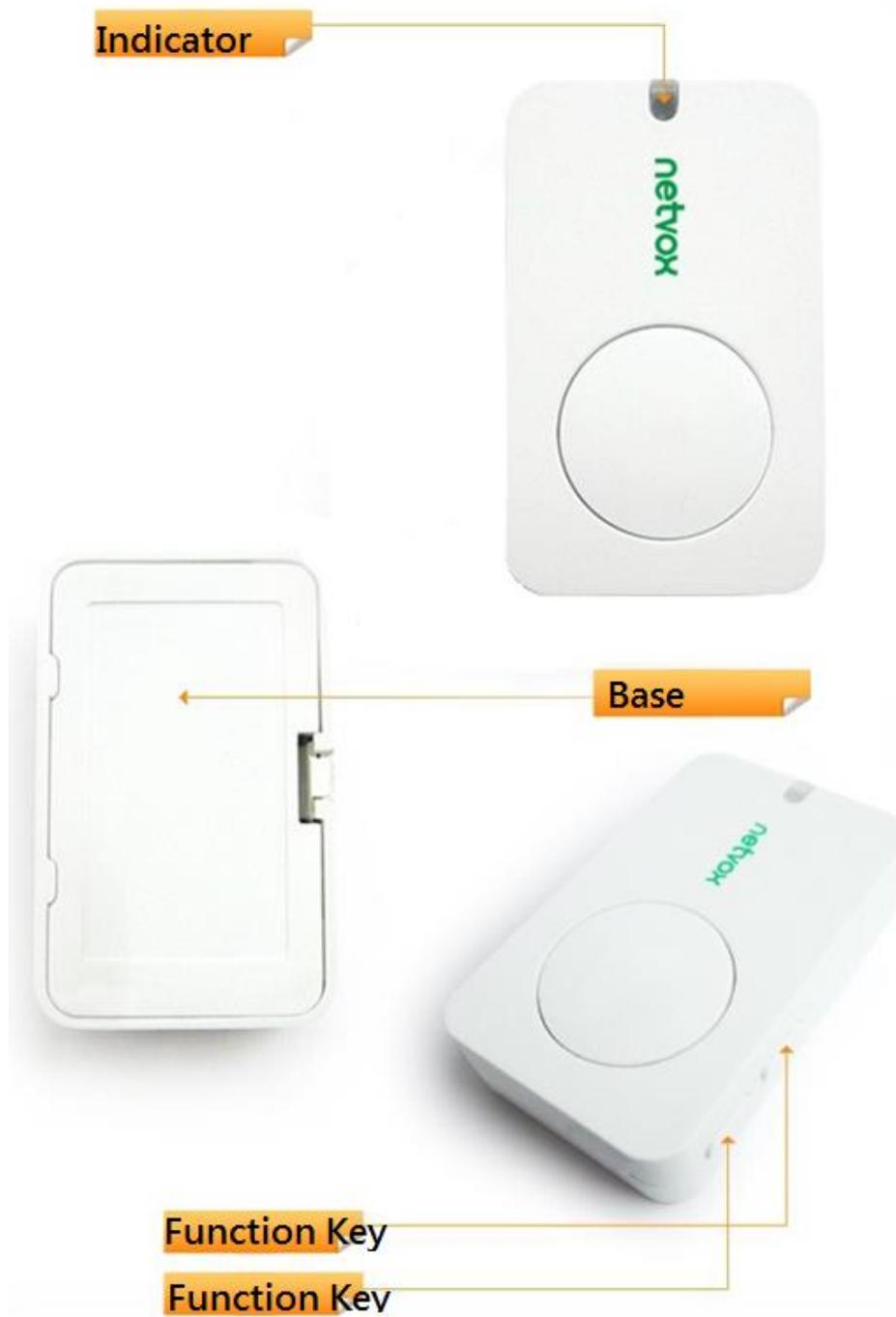
LoRa Wireless Technology:

LoRa is a wireless communication technology dedicated to long distance and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, 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.

## 2. Appearance



### 3. Main Features

- Compatible with LoRaWAN
- 2 section 3V CR2450 button battery powered
- Report voltage status, vibration of duration
- Compatible with LoRaWANTM Class A
- Frequency hopping spread spectrum technology
- Configuration parameters can be configured through third-party software platforms, data can be read and alarms can be set via SMS text and email (optional)
- Available third-party platform: Actility / ThingPark, TTN, MyDevices/Cayenne
- Low power consumption and long battery life
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### 4. Set up Instruction

#### 4.1 Power on and Turn on / off

- (1) **Power on.** Open the battery cover (users may need a flat blade screwdriver to open); insert two sections of 3V CR2450 button batteries and close the battery cover.
- (2) **Turn on.** If the device had never joined in any network or at factory setting mode, after powering on, the device is at off mode by default setting. Press function key and release to turn on the device. The green and red indicator will flash once to show that R311FC is turned on.
- (3) **Turn off.** Press and hold both function keys for 5 seconds till the green indicator flashes quickly and release. The green indicator will flash 20 times to show that R311FC is turned off.
- (4) Remove batteries (power off) when R311FC is on. Wait till 10 seconds after the capacitance discharging. Insert batteries again, R311FC will be setted to be on mode by default. There is not need to press function key to turn on the device. The red and green indicators will both flash and then light off.

Note:

1. The interval between turning on/off or powering off/on is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.
2. Do not press function key and insert batteries in the same time, otherwise, it will enter engineer testing mode.

#### 4.2 Join Into Lora Network

To join R311FC into LoRa network to communicate with LoRa gateway.

The network operation is as following:

- (1) If R311FC had never joined any network or at factory setting mode, turn on the device; it will search an available LoRa network to join. The green indicator will stay on for 5 seconds to show it joins into the network, otherwise, the green indicator does not work.

(2) If R311FC had been joined into a LoRa network, remove and insert the batteries; the green indicator will stay on for 5 seconds to show it joins into the network.

### 4.3 Function Key

- (1) Press and hold function key for 5 seconds to reset to factory setting. After restoring to factory setting successfully, the green indicator will flash quickly 20 times.
- (2) Press function key; the green indicator will flash once and the device will send a data report.

### 4.4 Data Report

When the device is turned on, it will immediately send a version package.

Data will be reported once per hour by default setting.

Maximum time: 3600s

Minimum time: 3600s (Detect the current voltage value every 3600s by default setting)

Default reportchange:

Battery ---- 0x01 (0.1V)

Remarks:

1. The device periodically sends data according to the maximum time. The data content is:  
R311FC current device status;
2. R311FC device will only report according to the minimum time when the battery voltage changes.

#### **R311FC vibration alarm:**

The device detects sudden movement or vibration, and the quiescent state changes. The device waits for a certain period of time (DeactiveTime) to enter the quiescent state and calculate the duration, sends a report of duration of vibrations, and restarts the calculation for the next detection. If the vibration continues to occur within (DeactiveTime), the duration will be continuously calculated till it enters the quiescent state.

Can send downlink command through the gateway to change the device type, active vibration threshold and DeactiveTime.

The Active vibration threshold range is 0x0003-0x00FF (default is 0x0003);

DeactiveTime is 0x01-0xFF (default is 0x05);

**R311F** DeviceType(1Bytes,0x01\_ **R311FA**,0x02\_ **R311FC**,0x03\_ **R311FC**), the default value is the programming value.

Data report configuration and sending period are as following:

Min Interval (Unit:second)	Max Interval (Unit:second)	Reportable Change	Current Change $\geq$ 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

## Report Configuration

Config ReportReq	R311FC	0x01	0x51	MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	BatteryChange (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)	
Config ReportRsp		0x81		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)			
ReadConfig ReportReq		0x02		Reserved (9Bytes,Fixed 0x00)				
ReadConfig ReportRsp		0x82		MinTime (2bytes Unit:s)	MaxTime (2bytes Unit:s)	BatteryChange (1byte Unit:0.1v)	Reserved (4Bytes,Fixed 0x00)	
SetR311F TypeReq	R311FC	0x03	0x51	R311FType (1Bytes,0x01_R311FA,0x02_R311FB,0x03_R311FC)			Reserved (8Bytes,Fixed 0x00)	
SetR311F TypeRsp		0x83		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)			
GetR311F TypeReq		0x04		Reserved (9Bytes,Fixed 0x00)				
GetR311F TypeRsp		0x84		R311FType (1Bytes,0x01_R311FA,0x02_R311FB,0x03_R311FC)			Reserved (8Bytes,Fixed 0x00)	
SetActive ThresholdReq		0x05		Threshold (2Bytes)	Deactivetime (1Byte,Unit:1s)	Reserved (6Bytes,Fixed 0x00)		
SetActive ThresholdRsp		0x85		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)			
GetActive ThresholdReq		0x06		Reserved (9Bytes,Fixed 0x00)				
GetActive ThresholdRsp		0x86		Threshold (2Bytes)	Deactivetime (1Byte,Unit:1s)	Reserved (6Bytes,Fixed 0x00)		

### (1) Configure device parameters MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v

Downlink: 0151003C003C0100000000

The device returns:

81510000000000000000 (configuration succeeded)

81510100000000000000 (configuration failed)

**(2) Read device configuration parameters**

Downlink: 02510000000000000000

The device returns:

8251003C003C0100000000 (current device configuration parameters)

**(3) Configure device type 0x01 = R311FA, 0x02 = R311FB, 0x03 = R311FC**

Downlink: 03510200000000000000

The device returns:

83510000000000000000 (configuration succeeded)

83510100000000000000 (configuration failed)

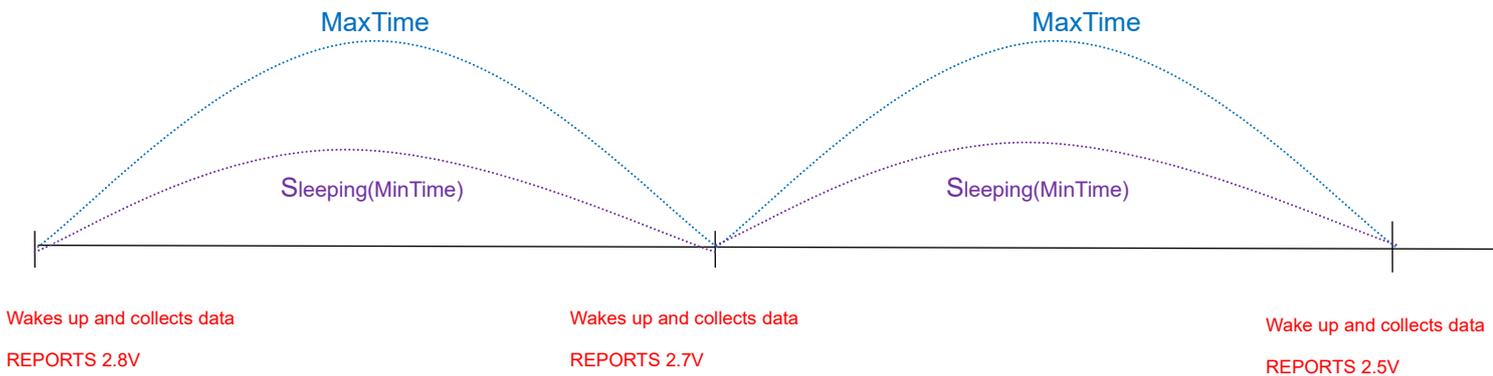
**(4) Read device type**

Downlink: 04510000000000000000

The device returns:

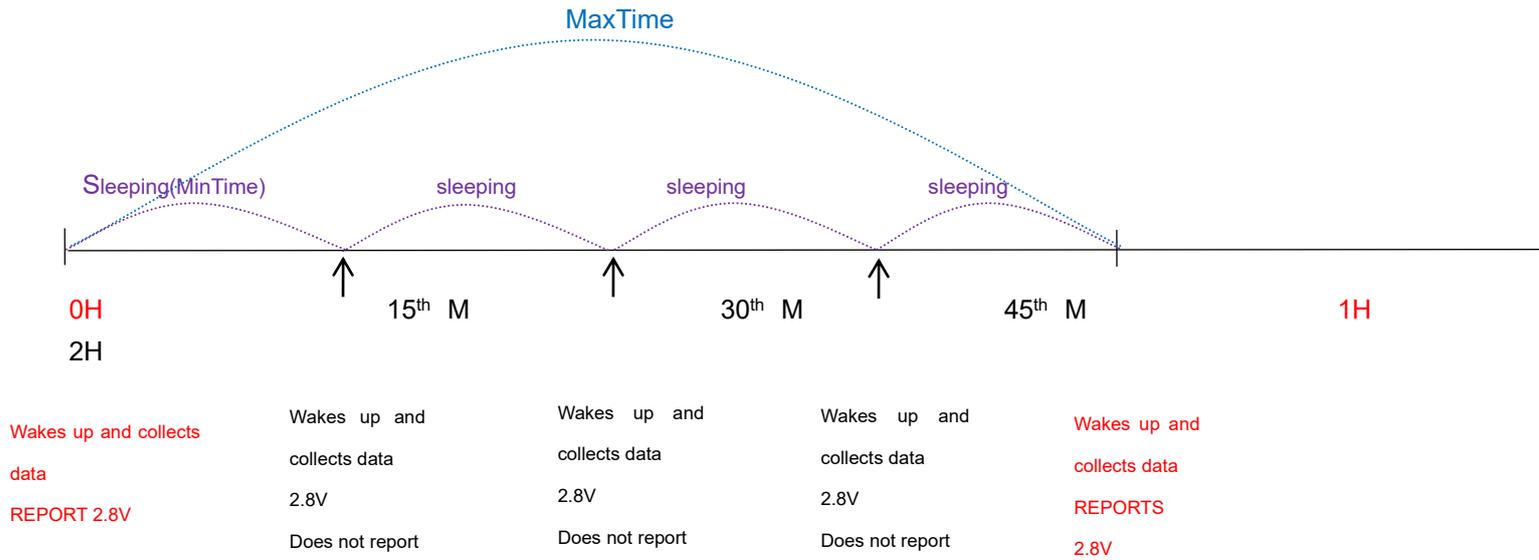
84510200000000000000 (current device type R311FB)

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

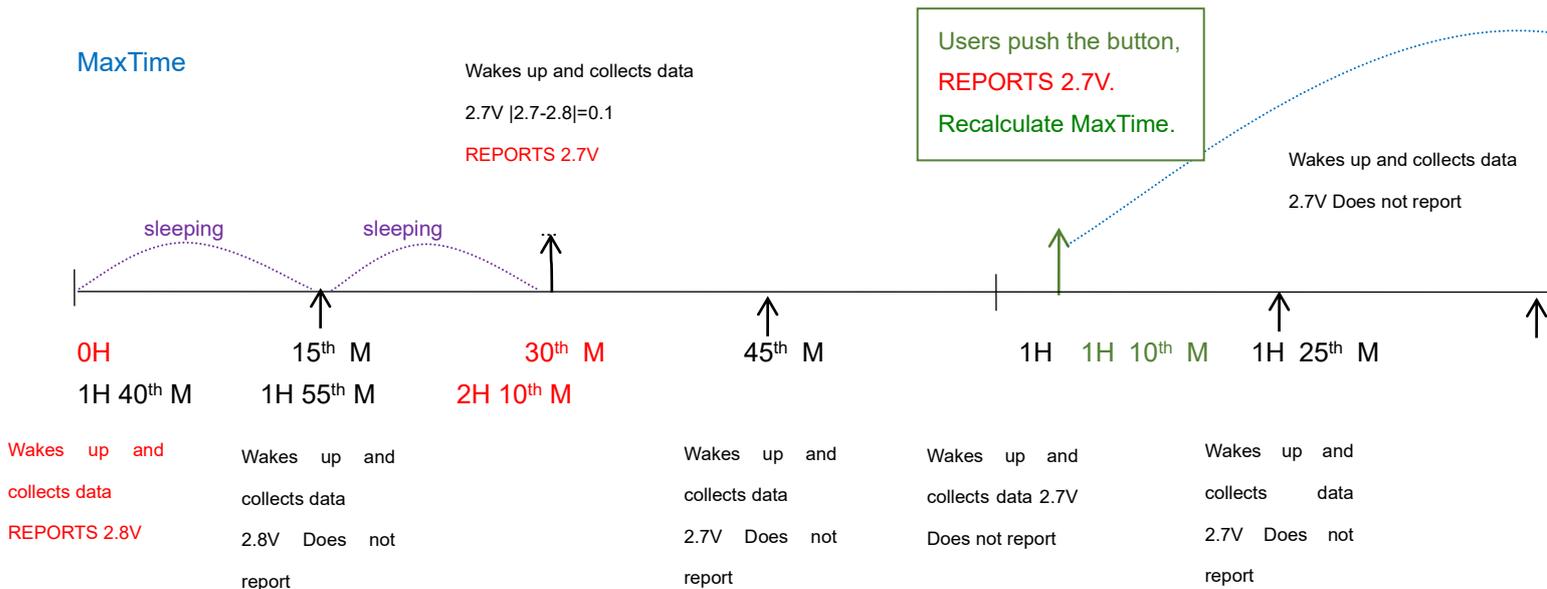


Note: MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless BatteryVoltageChange value.

**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 data collected is compared with the last data reported. If the data change value is greater than the ReportableChange value, the device reports according to MinTime interval. If the data variation is not greater than the last data reported, the device reports according to MaxTime interval.
- 3) We do not recommend to set the MinTime Interval value too low. If the MinTime Interval is too low, the device wakes up frequently and the battery will be drained soon.
- 4) Whenever the device sends a report, no matter resulting from data variation, button pushed or MaxTime interval, another cycle of MinTime / MaxTime calculation is started.

## 5. Restore to Factory Setting

R311FC saves data including network key information, configuration information, etc. To restore to factory setting, users need to execute below operations.

1. Press and hold function key for 5 seconds till the green indicator flashes and then release; LED flashes quickly 20 times.
2. R311FC will be turned off mode after restoring to factory setting.

## 6. Sleeping Mode

R311FC is designed to enter sleeping mode for power-saving in some situations:

(A) While the device is in the network → the sleeping period is Min Interval. (During this period, if the reportchange is larger than setting value, it will wake up and send a data report).

(B) When it is not in the network → R311FC will enter sleeping mode and wake up every 15 seconds to search a network to join in the first two minutes. After two minutes, it will wake up every 15 minutes to request to join the network.

If it's at (B) status, to prevent this unwanted power consumption, we recommend that users remove the batteries to power off the device.

## 7. Low Voltage Alarming

The operating voltage threshold is 2.4V. If the voltage is lower than 2.4V, R311FC will send a low-power report to the Lora network.

## 8. Installation

1. Remove the 3M adhesive on the back of the Activity Timer and attach the body to the surface of a smooth object (please do not stick it to a rough surface to prevent the device from falling off after a long time use).

### Note:

- Wipe the surface clean before installation to avoid dust on the surface to affect the adhesion of the device.
- Do not install the device in a metal shielded box or other electrical equipment around it to avoid affecting the wireless transmission of the device.



2. When the device detects a sudden movement or vibration of the object (or electrical machinery).

Wait for a certain period of time (DeactiveTime-default 5 seconds , can be modified) to enter the quiescent state and it sends a report of duration of vibrations, and restarts the calculation for the next detection, the timer data will clear.

### Note:

- If the vibration continues to occur during this process (quiescent state), the timer continue calculation until the device enter the quiescent state.

Activity Timer (R311FC) is suitable for the following scenarios:

- Industrial Equipment
- Industrial Instrument
- Medical Instruments

When it necessary to detect the motor running time.



## 9. Relative Devices

Model	Function	Appearance
R718MBA	Send an alarm when detecting vibration or movement	
R718MBB	Count the number of vibration or movement	
R718MBC	Count the time interval of vibration or movement	

## 10. Important Maintenance Instruction

Your device is a product of superior design and craftsmanship and should be used with care. The following suggestions will help you use the warranty service effectively.

- Keep the equipment dry. Rain, moisture, and various liquids or moisture 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 can damage its detachable parts and electronic components.
- Do not store in excessive heat. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store in excessive 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. Rough handling of equipment can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents or strong detergents.
- Do not apply with paint. Smudges can block debris in detachable parts and affect normal operation.
- Do not throw the battery into a fire to prevent the battery from exploding. Damaged batteries may also explode.

All of the above suggestions apply equally to your device, battery and accessories.

If any device is not working properly.

Please take it to the nearest authorized service facility for repair.