

# Wireless 3-Gang Push Button

## RB02C

## User Manual

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## 1. Introduction

RA02C is the Class A device based on the LoRaWAN protocol of Netvox.

RB02C, a smart wall switch, is a long-distance trigger device.

According to the needs of different scenarios, press the trigger button of RB02C, and the device will immediately send the trigger information to the gateway. RB02C is compatible with the LoRaWAN protocol. The device has three trigger buttons.

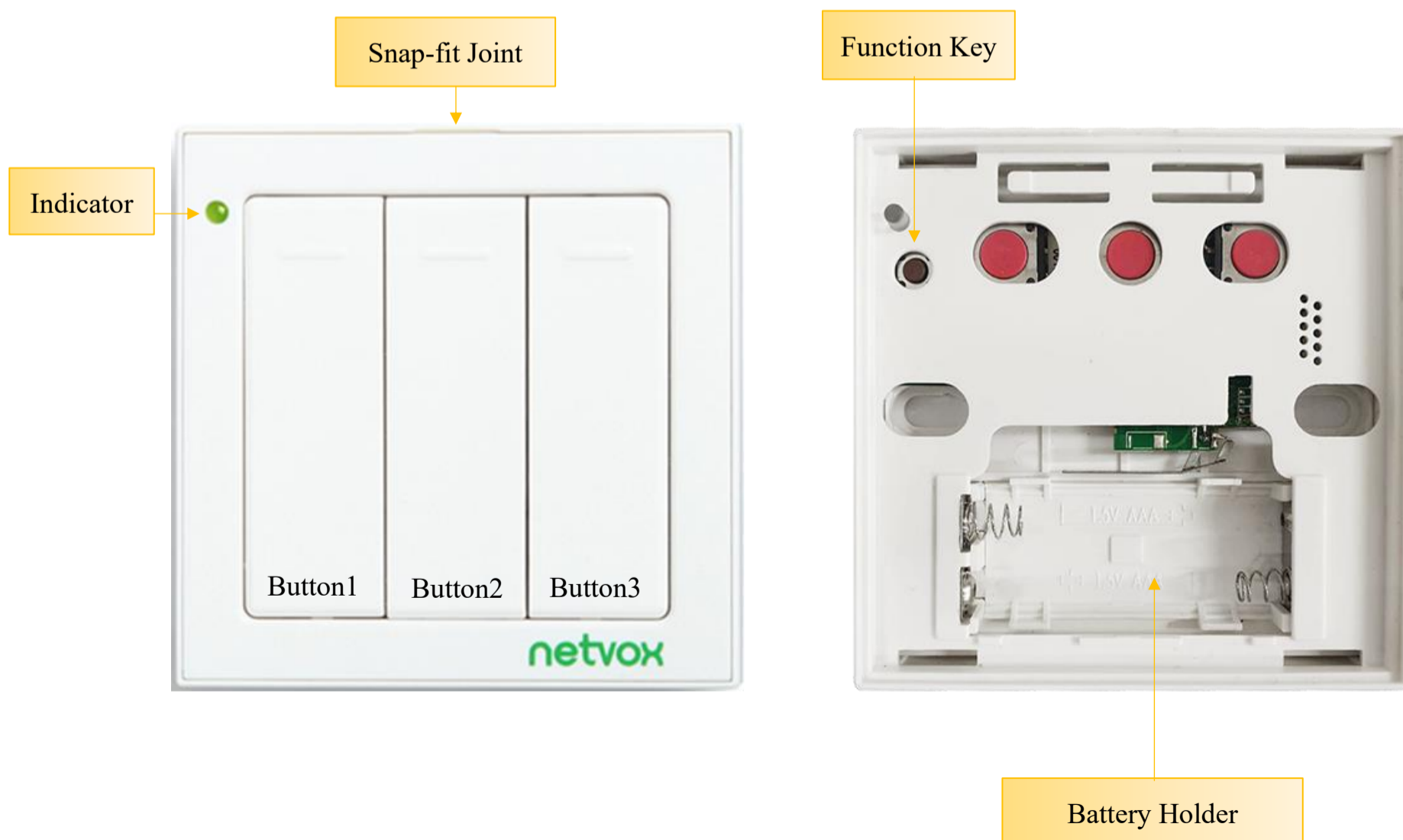
### LoRa Wireless Technology:

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 Feature

- Adopt SX1276 wireless communication module
- 2 AAA size batteries (1.5V/ section) series power supply
- Press the smart switch button to send trigger information to the gateway
- Compatible with LoRaWAN™ Class A
- Frequency hopping spread spectrum technology
- Configuration parameters can be configured via a third-party software platform, data can be read and alerts can be set via SMS text and email (optional)
- Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne
- Low power consumption and long battery life

Note:

Battery life is determined by sensor reporting frequency and other variables.

Please refer to web: [http://www.netvox.com.tw/electric/electric\\_calc.html](http://www.netvox.com.tw/electric/electric_calc.html)

In this website, users can find battery lifetime for various models at different configurations.

## 4. Set up Instruction

### On/Off

Power on	Insert batteries. (users may need a screwdriver to open the cover)
Turn on	Press the function key till seeing one green indicator flash and one red indicator flash.
Turn off (Restore to original setting)	Press and hold the function key for 5 seconds till green indicator flashes 20 times.
Power off	Remove Batteries.
Note	<ol style="list-style-type: none"> <li>1. Remove and insert the battery; the device is at off state by default.</li> <li>2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.</li> <li>3. After insert batteries and press any button, the device will be in engineering test mode.</li> </ol>

### Network Joining

Never joined the network	<p>Turn on the device to search the network to join.</p> <p>The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p>
Had joined the network (not at factory setting)	<p>Turn on the device to search the previous network to join.</p> <p>The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p>
Fail to join the network	Suggest to check the device verification information on the gateway or consult your platform server provider.

### Function Key

Press and hold for 5 seconds	<p>Restore to factory setting / Turn off</p> <p>The green indicator flashes 20 times: success</p> <p>The green indicator remains off: fail</p>
Press once	<p>The device is in the network: green indicator flashes once and sends a report</p> <p>The device is not in the network: green indicator remains off</p>
The time of pressing the alarm button exceeds the default	<p>The device is in the network: red indicator flashes once and sends a report</p> <p>The device is not in the network: red indicator remains off</p> <p>Note: If the button of the device is kept pressed that leads to exceeding the set value, the device will automatically send the data packet and flash once whether the button is released or not.</p>

## Sleeping Mode

The device is on and in the network	<p>Sleeping period: Min Interval.</p> <p>When the reportchange exceeds setting value or the state changes: send a data report according to Min Interval.</p>
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## Low Battery Voltage Threshold

Low Voltage	2.4 V
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## 5. Data Report

After power on, the device will immediately send a version packet report and a data report including the voltage and button status.

The device sends data according to the default configuration before any other configuring.

### Default setting:

Report MaxTime: 3600s (1H)

Report MinTime: 3600s (1H)

Battery Voltage Change: 0x01 (0.1V)

(If there are special customized shipments, the settings will be changed according to customer's requirement.)

### Status change:

Press: Report: 1.

Not pressed: Report: 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.

Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver

<http://cmddoc.netvoxcloud.com/cmddoc> to resolve uplink 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

## 5.1 Example of ReportDataCmd

**FPort:** 0x06

Bytes	1	1	1	Var(Fix=8 Bytes)
	Version	DeviceType	ReportType	NetvoxPayLoadData

**Version**– 1 byte –0x01—the Version of NetvoxLoRaWAN Application Command Version

**DeviceType**– 1 byte – Device Type of Device

The devicetype is listed in Netvox LoRaWAN Application Devicetype doc

**ReportType** – 1 byte –the presentation of the NetvoxPayLoadData, according the devicetype

**NetvoxPayLoadData**– Fixed bytes (Fixed =8bytes)

Device	Device Type	Report Type	NetvoxPayLoadData				
RB02C	0xA7	0x01	Battery (1Byte, unit:0.1V)	Key1Trigger (1Byte) 0x00_NoTrigger 0x01_Trigger	Key2Trigger (1Byte) 0x00_NoTrigger 0x01_Trigger	Key3Trigger (1Byte) 0x00_NoTrigger 0x01_Trigger	Reserved (4Bytes, fixed 0x00)

Example of Uplink: 01A7011C01000000000000

1<sup>st</sup> byte (01): Version

2<sup>nd</sup> byte (A7): DeviceType –RB02C

3<sup>rd</sup> byte (01): ReportType

4<sup>th</sup> byte (1C): Battery –2.8v , 1C Hex=28 Dec  $28*0.1v=2.8v$

5<sup>th</sup> byte (01): Key1 Trigger – Trigger

6<sup>th</sup> byte (00): Key2 Trigger – No Trigger

7<sup>th</sup> byte (00): Key3 Trigger – No Trigger

8<sup>th</sup> ~11th byte (00000000): Reserved

## 5.2 Example of ConfigureCmd

**FPort:** 0x07

Bytes	1	1	Var(Fix =9 Bytes)
	CmdID	DeviceType	NetvoxPayLoadData

**CmdID**– 1 byte

**DeviceType**– 1 byte – Device Type of Device

**NetvoxPayLoadData**– var bytes (Max=9bytes)

Description	Device	Cmd ID	Device Type	NetvoxPayLoadData			
ConfigReport Req	RB02C	0x01	0xA7	MinTime (2bytes Unit: s)	MaxTime (2bytes Unit: s)	BatteryChange (1byte Unit: 0.1v)	Reserved (4Bytes, Fixed 0x00)
ConfigReport Rsp		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)

(1) Configure RB02C report parameters:

MinTime = 1min、MaxTime = 1min、BatteryChange = 0.1v

Downlink: 01A7003C003C0100000000

Device Return:

81A700000000000000000000 (Configuration success)

81A701000000000000000000 (Configuration failure)

(2) Read Device Configuration:

Downlink: 02A7000000000000000000

Device Return:

82A7003C003C0100000000 (Current configuration)

### 5.3 Example of Button Pressing

FPort: 0x0D

Description	CmdID	PayLoad(Var bytes)
SetButtonPress TimeReq	0x01	PressTime(1byte) 0x00_QuickPush_Less then 1 Second, Other value present the presstime such as 0x01_1 Second push, 0x02_2 Seconds push, 0x03_3 Seconds push, 0x04_4 Seconds push, 0x05_5 Seconds push, and so on



SetButtonPress TimeRsp	0x81	Status (0x00_Success 0x01_Failure)
GetButtonPress TimeReq	0x02	
GetButtonPress TimeRsp	0x82	PressTime(1byte) Other value present the presstime such as 0x01_1 Second push, 0x02_2 Seconds push, 0x03_3 Seconds push, 0x04_4 Seconds push, 0x05_5 Seconds push, and so on Other value is reserved

(1) Configure RB02C device parameter ButtonPressTime=0x0A ( Press and hold the button for 10 seconds to report )

Downlink: 010A

Device Return:

8100 (Configuration success)

8101(Configuration failure)

(2) Read RB02C device parameter:

Downlink: 02

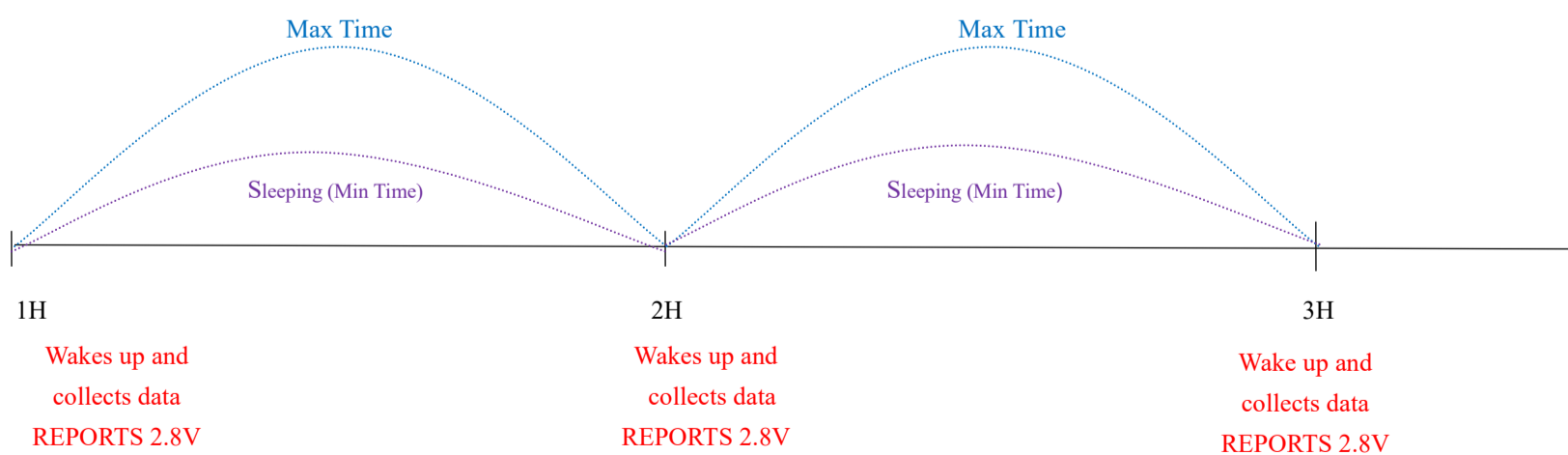
Device Return:

820A (device current parameter)

\* ButtonPressTime can be set to 255 at most.

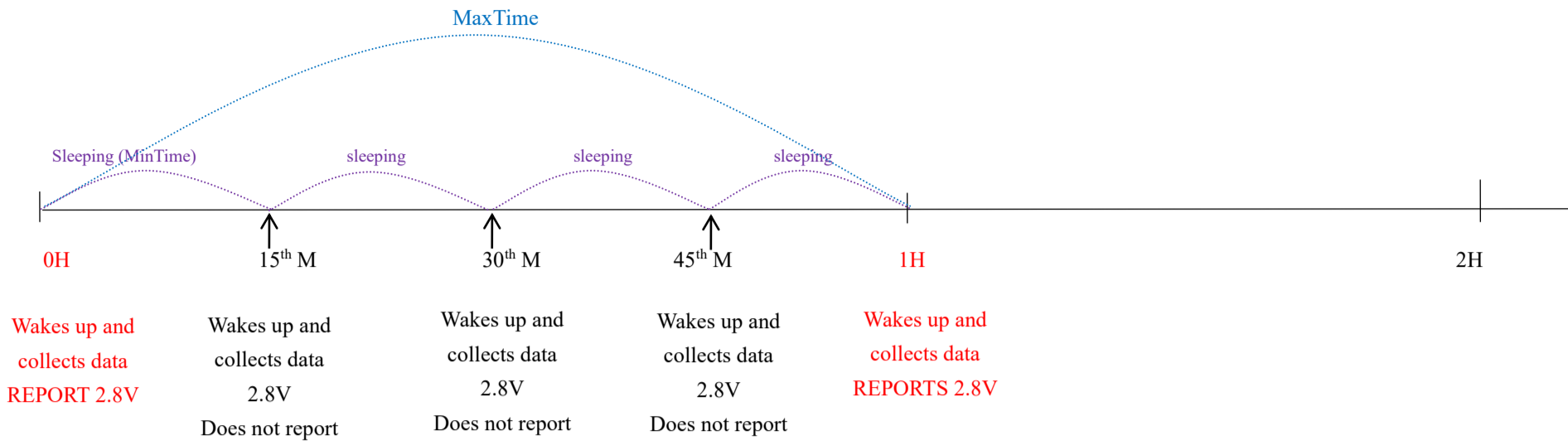
## 5.4 Example for MinTime/MaxTime logic

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

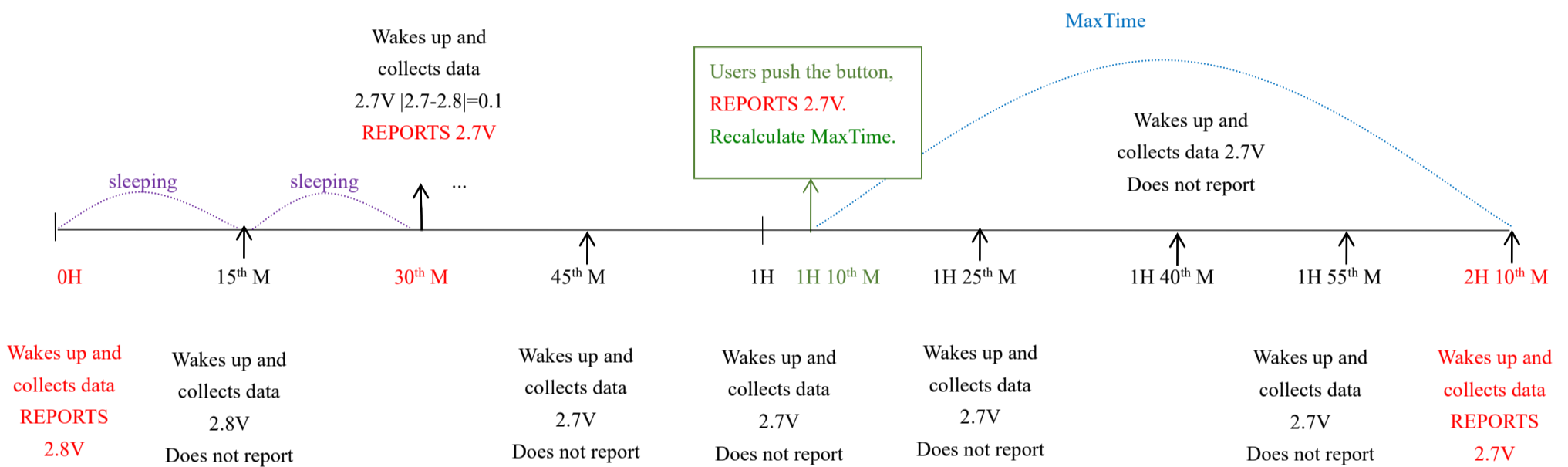


MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless BatteryVoltageChange value.

**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.

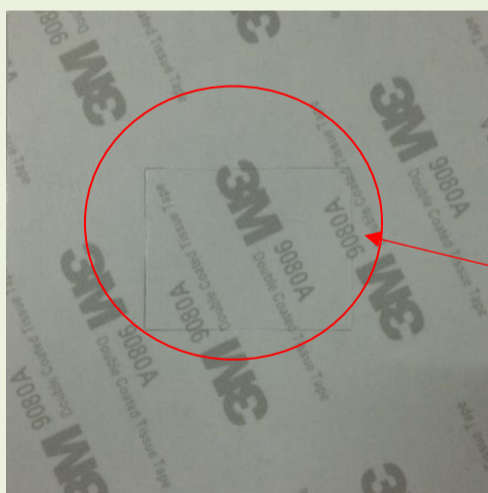
## 6. Installation

1. Use the attached 3M rubber pad, stick one side to the Wireless 3-Gang Push Button (RB02C), and stick the other side to the wall.

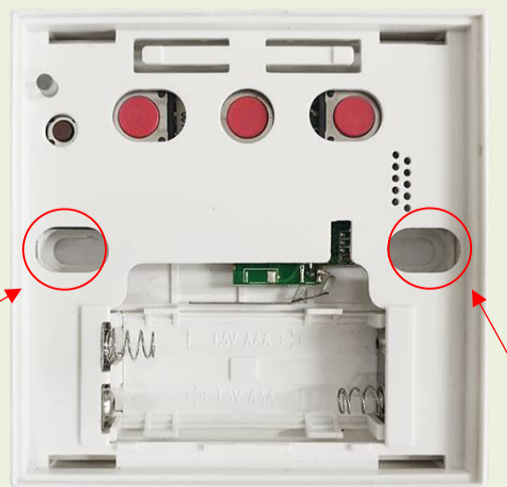
To make the installation firmer, please use screws (purchased separately) to fix the device to the wall.

\* Note:

- Please don't stick it on the rough wall to avoid the device from falling off after the long-term usage.
- If use the supplied 3M rubber pad, please wipe the wall clean before installation to avoid dust on the wall and affect the effect of the paste.
- The middle part of the 3M rubber pad (the part with the red frame in the left picture below) is where the label is attached to the device. Please remove the rubber pad that has been cut.
- Do not install the device in a metal shielded box or in an environment surrounded by other electrical equipment to avoid affecting the wireless transmission of the device.



3M Rubber Pad



Screw holes

2. Install the battery in the battery holder, and close the snap-fit joint of the device.



Snap-fit Joint

3. When the button of the device is pressed, the device will send button status.

When the device periodically reports data next time, it restores the "normal" state and sends the "normal" state information.

When button pressing, the bit of data is "1".

When button no pressing, the bit of data is "0".

\*Note:

If user wants to open the snap-fit joint, user can pry it gently.

RB02C can be applied to the following scenarios:

- Home (bathroom)
- School
- Nursing home
- Hospital
- Bank
- Hotel

The place where an emergency may occur.



## 7. 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 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 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. 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 repairing.