

# R315 Series User Manual

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# 1. Introduction

R315 series is a multi-sensor device of Netvox's Class A type device based on LoRaWAN open protocol. It can be mixed with temperature and humidity, illuminance, door magnetism, internal vibration, external vibration, infrared detection, emergency button, tilt detection, water leakage detection, glass break, seat occupancy detection, dry contact in, DO out related functions (up to 5 types of sensors can be compatible at the same time), and compatible with LoRaWAN protocol.

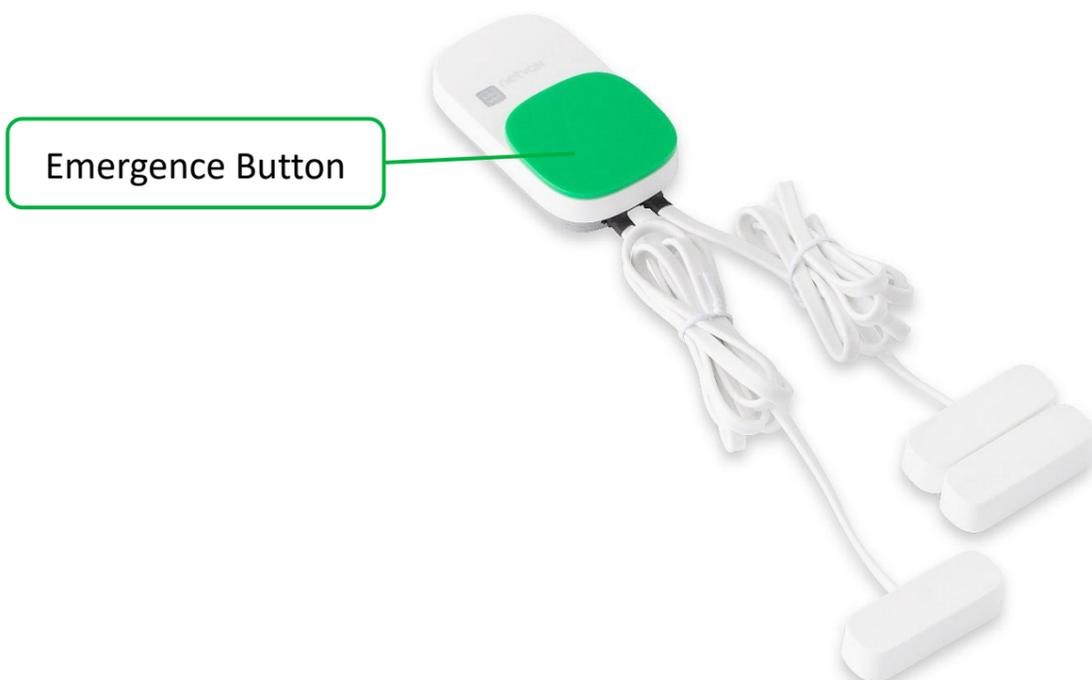
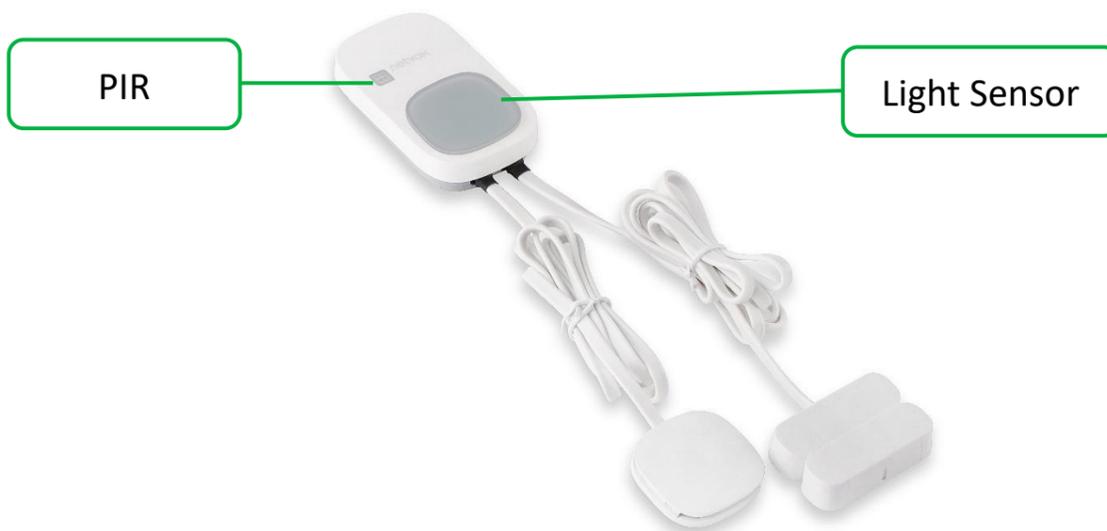
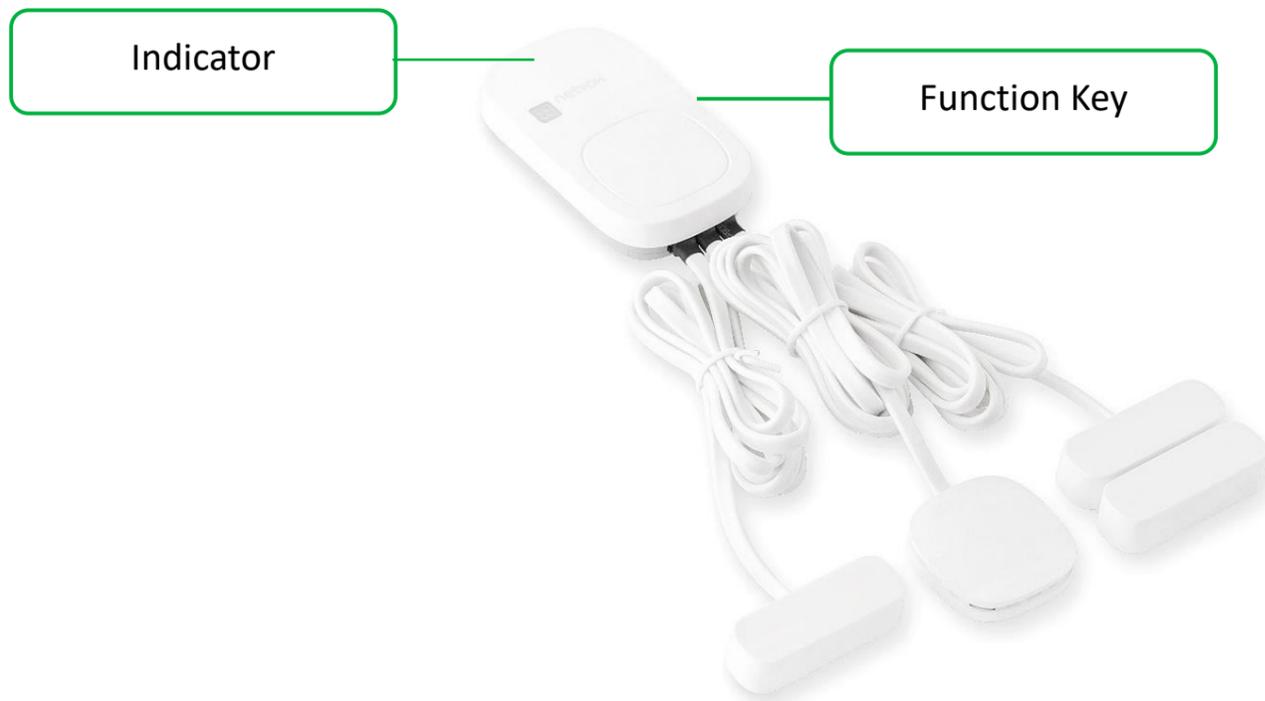
## **LoRa Wireless Technology:**

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



### Internal Sensor

- PIR
- Emergency Button
- Light Sensor
- Temperature and humidity Sensor
- Vibration Sensor (built-in)
- Tilt Sensor

### External Sensor

- Reed Switch
- Water Leak
- Dry Contact In
- DO out (3V)
- Vibration Sensor (external)
- Seat Occupancy
- Glass Break

### 3. R315 Series Combinations

| Model   | TH | Light | Reed Switch (internal) | Vibration (internal) | PIR | Emergency button | Tilt | Water Leak | Reed Switch (external) | Dry contact IN | Digital OUT | Vibration (external) | Glass break | Seat | Water Leak *2 | Reed Switch (external) *2 | Glass break *2 |
|---------|----|-------|------------------------|----------------------|-----|------------------|------|------------|------------------------|----------------|-------------|----------------------|-------------|------|---------------|---------------------------|----------------|
| R31521  | V  | V     |                        |                      |     |                  |      | V          |                        |                | V           |                      |             |      | V             |                           |                |
| R31525  | V  | V     |                        | V                    | V   |                  |      | V          |                        |                |             |                      |             |      |               |                           |                |
| R31526  | V  |       |                        | V                    |     |                  |      | V          |                        |                | V           |                      |             |      | V             |                           |                |
| R31527  | V  |       |                        | V                    |     |                  |      |            | V                      |                |             |                      | V           |      |               | V                         |                |
| R31532  | V  |       |                        |                      |     | V                |      | V          |                        |                |             |                      |             |      | V             |                           |                |
| R31555  |    |       |                        |                      | V   | V                |      |            | V                      |                |             |                      | V           |      |               | V                         |                |
| R31559  |    |       |                        | V                    |     | V                |      | V          |                        |                | V           |                      |             |      | V             |                           |                |
| R31564  |    | V     |                        | V                    |     |                  |      | V          |                        |                | V           |                      |             |      | V             |                           |                |
| R31569  | V  |       |                        |                      |     | V                |      |            | V                      |                |             |                      | V           |      |               | V                         |                |
| R31578  | V  |       |                        |                      | V   |                  |      |            | V                      |                |             |                      | V           |      |               | V                         |                |
| R31589  | V  |       |                        |                      |     |                  |      | V          |                        |                |             |                      |             |      | V             |                           |                |
| R31597  | V  |       |                        |                      | V   |                  |      |            | V                      |                |             |                      | V           |      |               |                           | V              |
| R315102 |    |       |                        | V                    | V   |                  |      |            | V                      |                |             |                      | V           |      |               |                           | V              |
| R315103 |    |       |                        | V                    | V   | V                |      |            |                        |                | V           |                      |             |      |               |                           |                |

For more model combinations, please refer to this file:

[http://www.netvox.com.tw/download/R315\\_combination.xlsx](http://www.netvox.com.tw/download/R315_combination.xlsx)

Note: After the external port is configured, the corresponding sensor should be connected according to the configuration. If the corresponding sensor is not connected, the reported status should be ignored.

### 4. Main Features

- Compatible with LoRaWAN
- 2 sections of 3V CR2450 button battery power supply
- Simple operation and setting
- Compatible with LoRaWAN Class A
- Frequency hopping spread spectrum technology.
- Available third-party platform: Actility / ThingPark, TTN, MyDevices/Cayenne
- Low power consumption and long battery life

## 5. R315 Series Sensor Function

### 5.1 Sensor Function

#### (1) Temperature and humidity Sensor

Detection of temperature and humidity in ambient air.

Temperature unit: 0.01°C, signed value.

Humidity unit: 0.5%

#### (2) Light Sensor

Detection of ambient light illuminance and detection range 0~3000 lux.

Illuminance unit: 1 lux

#### (3) Reed Switch

Detect the opening and closing state of the reed switch.

Open: report 1

Close: report 0

- If the DO out function is available, after the reed switch is turned on, a signal will be output to the DO out.  
(it is off by default)
- Configurable resend function.
- The reed switch needs to be fixed when used, such as the double sided tape.

#### (4) Internal Vibration Sensor

Detect the vibration state of the current device body.

Vibration: report 1

Static: report 0

- Sensitivity is configurable, the smaller the configuration value, the more sensitive it is.
- The sensitivity configuration level is 0x00~0x0A, default sensitivity is 0x05.
- When configured as 0xFF, it means that the vibration function is disabled.
- The restore function can be configured.

#### (5) External Vibration Sensor

Detection of external sensor vibration status.

Vibration: report 1

Static: report 0

- Sensitivity is configurable, the smaller the configuration value, the more sensitive it is.
- The sensitivity configuration level is 0x00~0xFE, default sensitivity is 0x14.
- When configured as 0xFF, it means that the vibration function is disabled.
- Configurable restore function.
- External vibration sensor needs to be fixed when using, such as double sided tape.

## **(6) PIR**

Detect infrared

There are people: report 1

There are no people: report 0

- Report follows IR disable time and IR detection time rules.
- If there is a DO out function, PIR will output a signal to DO out after detecting it. (it is off by default)

## **(7) Emergency Button**

Press the emergency button to report the alarm status.

No alarm = report 0

Alarm = report 1

- Configurable press duration.

## **(8) Tilt Sensor**

The sensor adopts 45 ° tilt detection, and the initial state of the device is vertical,

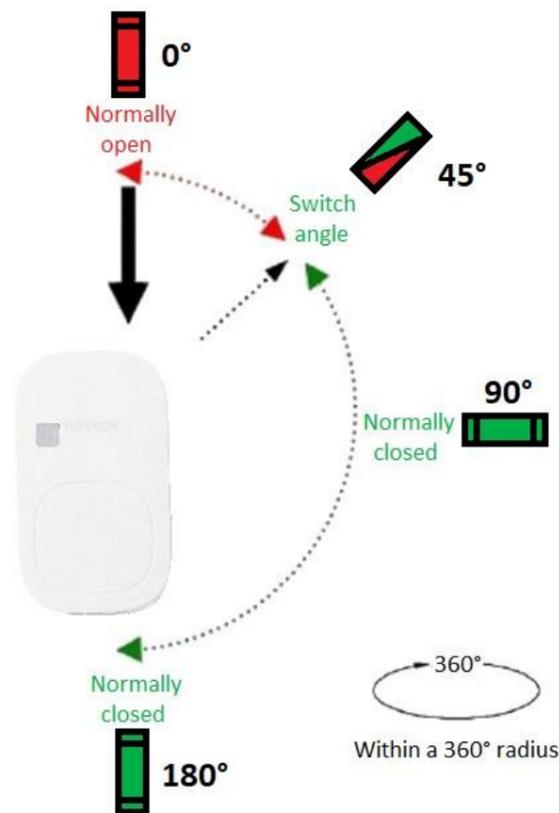
When the inclination angle changes by more than 45 ° (in either direction), a tilt alarm will be sent immediately.

Device tilt: report 1

Device recovery: report 0

- Configurable resend function
- If there is a DO out function, Tilt sensor will output a signal to DO out after detecting it.  
(it is off by default)
- When the inclination is greater than 45 °~180 °, alarm will be sent.

The following is the working diagram of the sensor:



Note:

Please place it vertically for use, otherwise the test result may be affected.

## (9) Water Leak

When the leak sensor is immersed in water, it will immediately issue a report, leaking status:1.

When the leak sensor is out of the immersion state, a report is issued immediately, with no water leakage status: 0

- If the DO out function is available, a signal will be output to the DO out after the water leakage is triggered. (it is off by default)

## (10) Dry Contact IN

When the dry contact is disconnected (open circuit): Report 0

When dry contact is connected (short circuit): Report 1

- If the DO out function is available, a signal will be output to the DO out after the dry contact in is triggered.
- The default is low level, and the output can be configured by command.

## (11) Seat Occupancy

When the seat occupancy sensor detects that the occupancy status has changed,

The seat is occupied: report 1

The seat is not occupied: report 0

- Report follows IR disable time and IR detection time rules.

## (12) DO OUT

When PIR、 emergency button alarm、 reed switch、 leakage、 tilt、 internal vibration、 external vibration、 glass break=1 (Alarm), then DO OUT = 1 ( Hight level , enable)

- DO OUT default is 0. (Low level, disable)
- It can be turned on by command, and the output time can be configured by command.
- Only one DO OUT function can be enabled at most.

## (13) Glass Break

No broken glass detected: report 0

Broken glass detected: report 1

- If the DO out function is available, a signal will be output to the DO out after the glass is broken. (it is off by default)

## (14) Buzzer (optional)

The functions of water leak, reed switch and glass break detection will trigger the buzzer to sound. The default time of the buzzer is 15s, which can be configured through the command. As the buzzer sounds more power consuming, which affects the service life of the battery, it is recommended that the longest buzzer time should not exceed 3min.

## 5.2 Command Rules

### 5.2.1 IRDisableTime and IRDetectionTime

IRDisableTime and IRDetectionTime are parameters defining PIR/seat occupancy behavior after it detects motion.

IRDisableTime is the sampling period while IRDetectionTime is detecting period.

By default, IRDisableTime is 30 seconds and IRDetectionTime is 5 minutes.

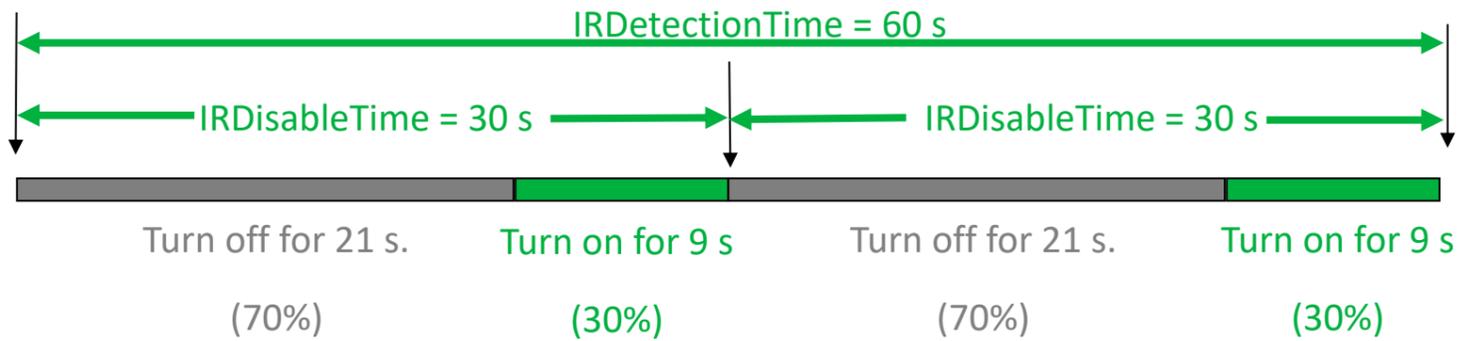
When PIR/seat occupancy is triggered, PIR/seat occupancy will be turned off for first 70% of IRDisableTime to save power and then turned on for rest 30% of IRDisableTime.

- If living creature is detected during the rest 30% of IRDisableTime, the IR delay time will be extended for another IRDetectionTime until no infrared signal is detected.
- If no living creature is detected during IRDetectionTime, PIR/seat occupancy will report un-occupied along with other sensor status.

Example1:

While IRDetectionTime is 60 s and IRDisableTime is 30 s, no living creature is detected after triggered.

PIR/seat occupancy will report un-occupied after 60 secs (IRDetectTime).

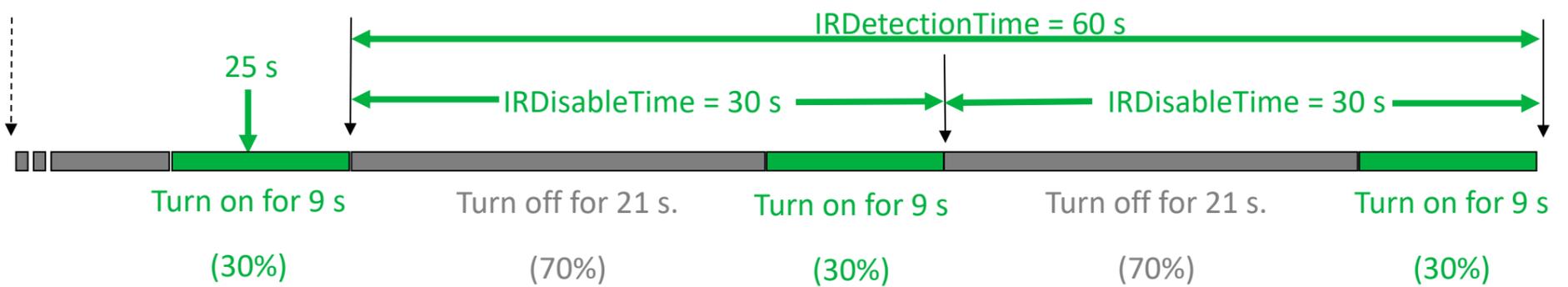


Example2:

While IRDetectionTime is 60 secs and IRDisableTime is 30 secs, living creature is detected during 25<sup>th</sup> sec.

PIR/seat occupancy will restart IR detect procedure(IRDetectionTime).

No living creature is detected during next IRDetectionTime and PIR/seat occupancy therefore report un-occupied.



## 5.2.2 Restore Rereport

➤ **Applicable sensor:** Internal vibration sensor, external vibration sensor

RestoRereportSet = 0x00, only sends vibration data

RestoRereportSet = 0x01, sends vibration data and vibration stop data,

When the light sensor is disable, the vibration stop data is sent 10 seconds after the vibration stops.

When the light sensor is enable, the stop vibration stop data will be sent 30 seconds after the vibration stops

## 5.2.3 LastMessageResendtime

➤ **Applicable sensor:** Reed switch, tilt sensor

When the device is triggered quickly, additional data can be sent

Resendtime=0, When the reed switch is closed immediately after magnetic opening, it will only receive reed switch status =1

Resendtime=3, Close the reed switch as soon as it is opened, and you will receive reed switch status =1,  
It will be received after 3 seconds reed switch status =0

Resendtime = 0x00 or 0xFF, No additional data will be sent

Resendtime = 0x03 to 0xFE, The device will send data after triggering, and then supplement the last status  
data after 3-254s

## 6. Set up Instruction

### --- On/Off ---

|                                       |  |
|---------------------------------------|--|
| Power on                              | Insert batteries.  |
| Turn on                               | Press function key till green indicator flashes once.  |
| Turn off (Restore to factory setting) | Press the function key for more than 8 seconds, and the green indicator light will flash continuously. Release the key after the flash starts, and the device will automatically shut down after the flash ends.<br>(Indicator light display: the indicator light will flash once every 2s to prompt the current pressing duration)  |
| Power off                             | Remove Batteries.  |
| Note                                  | <ol style="list-style-type: none"> <li>1. Please put the battery into the battery holder according to the positive and negative electrodes of the battery, and push back the back cover.</li> <li>2. Two CR2450 button batteries are required to supply power at the same time.</li> <li>3. Remove and insert the battery; the device memorizes previous on/off state by default.</li> <li>4. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.</li> <li>5. Press function key and insert batteries at the same time; it will enter engineer testing mode.</li> </ol> |

### --- Network Joining ---

|                          |  |
|--------------------------|--|
| Never joined the network | <p>Turn on the device to search the network.</p> <p>The green indicator stays on for 5 seconds: success</p> <p>The green indicator remains off: fail</p> |
|--------------------------|--|

|   |  |
|---|--|
| Had joined the network                              | Turn on the device to search the previous network.<br>The green indicator stays on for 5 seconds: success<br>The green indicator remains off: fail |
| Fail to join the network<br>(when the device is on) | Suggest to check the device verification information on the gateway with your platform server provider.  |

**--- Function Key ---**

|  |  |
|--|--|
| Press the function key for more than 8 seconds | Restore to factory setting / Turn off<br>The green indicator flashes for 20 times: success<br>The green indicator remains off: fail            |
| Press once                                     | The device is in the network: green indicator flashes once and sends a report<br>The device is not in the network: green indicator remains off |
| Press and hold the key for 2s                  | Turn off the buzzing buzzer.<br>*Applicable to device with buzzer  |
| Press and hold the key for 4s                  | Turn off the infrared detection function.<br>*Applicable to device with PIR  |

**--- Sleeping Mode ---**

|                                     |  |
|-------------------------------------|--|
| The device is on and in the network | Sleeping period: Min Interval.<br>When the reportchange exceeds setting value or the state changes:<br>send a data report according to Min Interval. |
|-------------------------------------|--|

**--- Low Voltage Warning ----**

|             |      |
|-------------|------|
| Low Voltage | 2.4V |
|-------------|------|

## 7. Data Report

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

➤ **Default setting:**

Max Interval: 0x0E10 (3600s)

Min Interval: 0x0E10 (3600s)

Battery Change: 0x01 (0.1V)

Temperature Change: 0x0064 (1°C), Signed 2 Bytes, unit: 0.01°C

Humidity Change: 0x14 (10%), 1 Byte, unit: 0.5%

Illuminance Change: 0x64 (100 lux), 1 Byte, unit:1 lux

Internal Shock Sensor Sensitivity: 0x05 // Internal Vibration Sensor, Sensitivity Range:0x00-0x0A

External Shock Sensor Sensitivity: 0x14 // External Vibration Sensor, Sensitivity Range:0x00-0xFE

(The smaller the number, the more sensitive)

DisableTime: 0x001E (30s) // PIR and Seat Occupancy (DisableTime must  $\geq$  5s)

DetectTime: 0x012C (300s) // PIR and Seat Occupancy (DetectTime must  $\geq$  DisableTime)

AlarmONTime: 0x0F (15s) // Buzzer

Dry Contact Point Out Type: 0x00 (Normally Open)

RestoreReportSet: 0x00 (DO NOT report when sensor restore) // Vibration Sensor

- The device report interval will be programmed based on the default firmware.
- The interval between two reports must be the minimum time.
- The reported data is decoded by the Netvox LoRaWAN Application Command document and <http://cmddoc.netvoxcloud.com/cmddoc>

## 7.1 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

Device Type – 1 byte – Device Type of Device

The device type is listed in Netvox LoRaWAN Application Devicetype.doc

ReportType – 1 byte –the presentation of the NetvoxPayLoadData, according the device type

NetvoxPayLoadData– Fixed bytes (Fixed =8bytes)

| Device Type | Report Type | NetvoxPayLoadData               |  |  |  |  |
|-------------|-------------|---------------------------------|--|--|--|--|
| 0xD2        | 0x01        | Battery<br>(1Byte)<br>unit:0.1V | <b>FunctionEnableBits</b><br>(2Bytes)<br>Bit0: THSensor<br>Bit1: LightSensor<br>Bit2: PIRSensor<br>Bit3: EmergenceButton<br>Bit4:TiltSensor<br>Bit5: InternalContactSwitch<br>Bit6:ExternalContactSwitch<br>Bit7:InternalShockSensor<br>Bit8: ExternalShockSensor<br>Bit9:ExternalDryContactPointIN<br>Bit10: DryContactPointOut<br>Bit11: ExternalWaterLeakSenor<br>Bit12:ExternalSeatSensor<br>Bit13:ExternalGlassSensor<br>Bit14-Bit15: Reserved<br>When Bit is 1,<br>the function is enabled | <b>BinarySensorReport</b><br>(2bytes)<br>Bit0: PIRSensorState<br>(0b01_ON,0b00_OFF)<br>Bit1: EmergenceButtonAlarmState<br>(0b01_Alarm,0b00_NoAlarm)<br>Bit2:TiltSensorState<br>(0b01_ON,0b00_OFF)<br>Bit3:InternalContactSwitchSensorState<br>(0b01_ON,0b00_OFF)<br>Bit4:ExternalContactSwitchSensorState<br>(0b01_ON,0b00_OFF)<br>Bit5: InternalShockSensorState<br>(0b01_ON,0b00_OFF)<br>Bit6: ExternalShockSensorState<br>(0b01_ON,0b00_OFF)<br>Bit7: ExternalDryContactPointINState<br>(0b01_ON,0b00_OFF)<br>Bit8: ExternalWaterLeakSenorState<br>(0b01_ON,0b00_OFF)<br>Bit9: ExternalSeatSenorState<br>(0b01_ON,0b00_OFF)<br>Bit10: ExternalGlassSenorState<br>(0b01_ON,0b00_OFF)<br>Bit11~Bit14:<br>(Reserved Fixed 0b00)<br>Bit15:HeartBeat<br>(0b01_Heartbeat,0b00_NOTHeartbeat) | Temperature<br>(Signed 2Bytes)<br>unit:0.01°C<br>When THSensor<br>Bit is 0 in the<br>FunctionEnableBits,<br>the filed is fixed<br>0xFFFF | Humidity<br>(1Byte)<br>unit:0.5%<br>When THSensor<br>Bit is 0 in the<br>FunctionEnableBits,<br>the filed is fixed 0xFF |
|             | 0x02        | Battery<br>(1Byte)<br>unit:0.1V | <b>Illuminance</b><br>(2Bytes,unit:1Lux)   | <b>Reserved</b><br>(5Bytes,fixed 0x00)   |  |  |

Note:

The payload with report type=0x02 only present when light sensor is enabled in FunctionEnableBits.

When the light sensor function is enabled, two packets of data will be reported.

The DeviceType are 0x01 and 0x02, and the interval between the two packets of data is 10s.

If the light sensor function is disabled, only one packet of data will be reported each time.

Uplink: 01D2011C084900120ADC6A

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

2<sup>nd</sup> byte (D2): DeviceType 0XD2 — R315 Series

3<sup>rd</sup> byte (01): Report Type

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

5<sup>th</sup> 6<sup>th</sup> byte (0849): FunctionEnableBits, 0x0849 = 0000 1000 0100 1001 (Bin) //Bit 0,3,6,11 = 1 (enable)

Bit0: Temperature and Humidity

Bit3: Emergence Button

Bit6: Reed Switch

Bit11: Water Leak

7<sup>th</sup> 8<sup>th</sup> byte (0012): BinarySensorReport, 0x0012 = 0000 0000 0001 0010 (Bin) //Bit 1,4 = 1 (ON)

Bit1: Emergence Button Alarm

Bit4: Reed Switch Alarm

9<sup>th</sup> 10<sup>th</sup> byte (0ADC): Temperature— 27.8°C, ADC Hex=2780 Dec  $2780 * 0.01°C = 27.80°C$

11<sup>th</sup> byte (6A): Humidity— 53%, 6A Hex=106 Dec  $106 * 0.5% = 53%$

Note:

1. Battery (1Byte, unit:0.1V): Bit7 represent low battery, Bit6-0 represent battery voltage
2. Temperature (Signed 2Bytes, unit:0.01°C): Negative numbers are represented by 2's complement

## 7.2 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)

## 7.2.1 Min Time / MaxTime / Data Variation

FPort: 0x07

| Description          | Cmd ID | Device Type | NetvoxPayloadData               |                               |   |  |   |  |
|----------------------|--------|-------------|---------------------------------|-------------------------------|---|--|---|--|
|                      |        |             | MinTime<br>(2bytes)<br>Unit:s   | MaxTime<br>(2bytes)<br>Unit:s | Battery<br>Change<br>(1byte)<br>Unit:0.1v | Temperature<br>Change<br>(2bytes)<br>Unit:0.01°C | Humidity<br>Change<br>(1byte)<br>Unit:0.5 % | Illuminance<br>Change<br>(1byte)<br>Unit: 1Lux |
| Config ReportReq     | 0x01   | 0xD2        |                                 |                               |   |  |   |  |
| Config ReportRsp     | 0x81   |             | Status<br>(0x00_success)        |                               |   | Reserved<br>(8Bytes,Fixed 0x00)                  |   |  |
| ReadConfig ReportReq | 0x02   |             | Reserved<br>(9Bytes,Fixed 0x00) |                               |   |  |   |  |
| ReadConfig ReportRsp | 0x82   |             |                                 |                               |   |  |   |  |

1. Configure device parameters MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v, TemperatureChange = 10°C, HumidityChange = 20%, Illuminancechange = 100lux

Downlink: 01D2003C003C0103E82864

1<sup>st</sup> byte (01): CMD ID

2<sup>nd</sup> byte (D2): DeviceType 0XD2 — R315 Series

3<sup>rd</sup> 4<sup>th</sup> byte (003C): Min Time, 003C(Hex)=60(Dec), 60s

5<sup>th</sup> 6<sup>th</sup> byte (003C): Max Time, 003C(Hex)=60(Dec), 60s

7<sup>th</sup> byte (01): Battery Change, 0.1v

8<sup>th</sup> 9<sup>th</sup> byte (03E8): Temperature Change, 03E8(Hex) = 1000(Dec), 1000\*0.01°C=10°C

10<sup>th</sup> byte (28): Humidity Change, 28(Hex)=40(Dec), 40\*0.5%=20%

11<sup>th</sup> byte (64): Illuminance Change, 64(Hex)=100(Dec), 100\*1 lux=100 lux

Response:

81D20000000000000000 ( Configuration success )

81D20100000000000000 ( Configuration failure )

2. Read Configuration:

Downlink: 02D20000000000000000

Response:

82D2003C003C0103E82864 ( Current configuration )

**7.2.2 PIR Setting**

**FPort: 0x07**

| Description      | Cmd ID | Device Type | NetvoxPayLoadData                             |                                 |
|------------------|--------|-------------|---|---------------------------------|
| SetPIR EnableReq | 0x03   | 0xD2        | PIREnable<br>(1Byte,0x00_Disable,0x01_Enable) | Reserved<br>(8Bytes,Fixed 0x00) |
| SetPIR EnableRsp | 0x83   |             | Status<br>(0x00_success)                      | Reserved<br>(8Bytes,Fixed 0x00) |
| GetPIR EnableReq | 0x04   |             | Reserved<br>(9Bytes,Fixed 0x00)               |                                 |
| GetPIR EnableRsp | 0x84   |             | PIREnable (1Byte)<br>0x00_Disable,0x01_Enable | Reserved<br>(8Bytes,Fixed 0x00) |

1. Disable PIR detection

Downlink: 03D20000000000000000

2. Enable PIR detection

Downlink: 03D20100000000000000

Response:

83D20000000000000000 ( Configuration success )

83D20100000000000000 ( Configuration failure )

## 7.2.3 Vibration Sensor Sensitivity Setting

FPort: 0x07

| Description                   | Cmd ID | Device Type | NetvoxPayLoadData  |  |                                 |
|-------------------------------|--------|-------------|--|--|---------------------------------|
| SetShockSensor SensitivityReq | 0x05   | 0xD2        | InternalShockSensor Sensitivity (1Byte)<br>0xFF represent disable ShockSensor  | ExternalShockSensor Sensitivity (1Byte)<br>0xFF represent disable ShockSensor  | Reserved<br>(7Bytes,Fixed 0x00) |
| SetShockSensor SensitivityRsp | 0x85   |             | Status<br>(0x00_success)   | Reserved<br>(8Bytes,Fixed 0x00)  |                                 |
| GetShockSensor SensitivityReq | 0x06   |             | Reserved<br>(9Bytes,Fixed 0x00)  |  |                                 |
| GetShockSensor SensitivityRsp | 0x86   |             | InternalShockSensor Sensitivity (1Byte)<br>0xFF represent disable ShockSensor) | ExternalShockSensor Sensitivity (1Byte)<br>0xFF represent disable ShockSensor) | Reserved<br>(7Bytes,Fixed 0x00) |

Set Internal Vibration Sensor Sensitivity = 3, External Vibration Sensor Sensitivity = 25

Downlink: 05D203190000000000000000 //19(Hex)=25(Dec)

Response:

85D20000000000000000000000 ( Configuration success )

85D20100000000000000000000 ( Configuration failure )

Note:

1. Internal Vibration Sensor Sensitivity default is 0x05, sensitivity range: 0x00 - 0x0A (0~10)
2. External Vibration Sensor Sensitivity default is 0x14, sensitivity range: 0x00 - 0xFE (0~254)
3. 0xFF represent disable vibration sensor
4. The smaller the number, the more sensitive

## 7.2.4 Disable Time and Detection Time

FPort: 0x07

| Description             | Cmd ID | Device Type | NetvoxPayloadData                                      |                                    |  |                                    |
|-------------------------|--------|-------------|--|------------------------------------|--|------------------------------------|
|                         |        |             | IRDisableTime<br>(2bytes Unit:s)                       | IRDetectionTime<br>(2bytes Unit:s) | SensorType(1Byte)<br>0x00_PIRSensor<br>0x01_SeatSensor | Reserved<br>(4Bytes,Fixed<br>0x00) |
| SetIR<br>DisableTimeReq | 0x07   | 0xD2        | IRDisableTime<br>(2bytes Unit:s)                       | IRDetectionTime<br>(2bytes Unit:s) | SensorType(1Byte)<br>0x00_PIRSensor<br>0x01_SeatSensor | Reserved<br>(4Bytes,Fixed<br>0x00) |
| SetIR<br>DisableTimeRsp | 0x87   |             | Status<br>(0x00_success)                               |                                    | Reserved<br>(8Bytes,Fixed 0x00)                        |                                    |
| GetIR<br>DisableTimeReq | 0x08   |             | SensorType (1Byte)<br>0x00_PIRSensor<br>0x01_SeatSenso |                                    | Reserved<br>(8Bytes,Fixed 0x00)                        |                                    |
| GetIR<br>DisableTimeRsp | 0x88   |             | IRDisableTime<br>(2bytes Unit:s)                       | IRDetectionTime<br>(2bytes Unit:s) | Reserved<br>(5Bytes,Fixed 0x00)                        |                                    |

1. Set PIR Sensor IRDisableTime=30s, IRDetectionTime=60s

Downlink: 07D2001E003C0000000000 //1E(Hex)=30(Dec), 3C(Hex)=60(Dec)

2. Set Seat sccupancy sensor IRDisableTime=30s, IRDetectionTime=90s

Downlink: 07D2001E005A0100000000 //1E(Hex)=30(Dec), 5A(Hex)=90(Dec)

Response:

87D200000000000000000000 ( Configuration success )

87D201000000000000000000 ( Configuration failure )

Note:

1. DetectionTime must  $\geq$  IRDisableTime
2. DisableTime must  $\geq$  5s

## 7.2.5 Buzzer Beep Duration

FPort: 0x07

| Description        | Cmd ID | Device Type | NetvoxPayloadData               |                                 |
|--------------------|--------|-------------|---------------------------------|---------------------------------|
| SetAlarm OnTimeReq | 0x09   | 0xD2        | AlarmONTime<br>(2Bytes,Unit:1s) | Reserved<br>(7Bytes,Fixed 0x00) |
| SetAlarm OnTimeRsp | 0x89   |             | Status<br>(0x00_success)        | Reserved<br>(8Bytes,Fixed 0x00) |
| GetAlarm OnTimeReq | 0x0A   |             | Reserved<br>(9Bytes,Fixed 0x00) |                                 |
| GetAlarm OnTimeRsp | 0x8A   |             | AlarmONTime<br>(2Bytes,Unit:1s) | Reserved<br>(7Bytes,Fixed 0x00) |

Set buzzer alarm time = 5s

Downlink: 09D200050000000000000000

Response:

89D200000000000000000000 ( Configuration success )

89D201000000000000000000 ( Configuration failure )

## 7.2.6 Dry Contact Point Out Type

FPort: 0x07

| Description                    | Cmd ID | Device Type | NetvoxPayloadData   |                                 |
|--------------------------------|--------|-------------|---|---------------------------------|
| Set DryContact PointOutTypeReq | 0x0B   | 0xD2        | DryContactPointOutType (1Byte)<br>0x00_Normally Open<br>0x01_Normally Close | Reserved<br>(8Bytes,Fixed 0x00) |
| Set DryContact PointOutTypeRsp | 0x8B   |             | Status<br>(0x00_success)  | Reserved<br>(8Bytes,Fixed 0x00) |
| Get DryContact PointOutTypeReq | 0x0C   |             | Reserved<br>(9Bytes,Fixed 0x00)   |                                 |
| Get DryContact PointOutTypeRsp | 0x8C   |             | DryContactPointOutType (1Byte)<br>0x00_Normally Open<br>0x01_Normally Close | Reserved<br>(8Bytes,Fixed 0x00) |

Set dry contact point out type = Normally Close

Downlink:0BD2010000000000000000

Response:

8BD200000000000000000000 ( Configuration success )

8BD201000000000000000000 ( Configuration failure )

### 7.2.7 Vibration / Tilt Sensor Restore Function

FPort: 0x07

| Description          | Cmd ID | Device Type | NetvoxPayloadData  |                                 |
|----------------------|--------|-------------|--|---------------------------------|
| SetRestore ReportReq | 0x0D   | 0xD2        | RestoreReportSet (1byte)<br>0x00_DO NOT report when sensor restore<br>0x01_DO report when sensor restore | Reserved<br>(8Bytes,Fixed 0x00) |
| SetRestore ReportRsp | 0x8D   |             | Status<br>(0x00_success)   | Reserved<br>(8Bytes,Fixed 0x00) |
| GetRestore ReportReq | 0x0E   |             | Reserved<br>(9Bytes,Fixed 0x00)  |                                 |
| GetRestore ReportRsp | 0x8E   |             | RestoreReportSet (1byte)<br>0x00_DO NOT report when sensor restore<br>0x01_DO report when sensor restore | Reserved<br>(8Bytes,Fixed 0x00) |

Set restore =1 (DO report when sensor restore)

Downlink:0DD2010000000000000000

Response:

8DD200000000000000000000 ( Configuration success )

8DD201000000000000000000 ( Configuration failure )

## 7.2.8 Dry Contact Resend Time Function

FPort: 0x07

| Description                 | Device                                | Cmd ID | Device Type | NetvoxPayloadData  |                                 |
|-----------------------------|---------------------------------------|--------|-------------|--|---------------------------------|
| SetLastMessageResendtimeReq | only used in contactswitch devicetype | 0x1F   | 0xFF        | Resendtime<br>(1Byte,Unit:1s,range:3-254s)<br>when 0 or 255 no resend,<br>default is no resend | Reserved<br>(8Bytes,Fixed 0x00) |
| SetLastMessageResendtimeRsp |                                       | 0x9F   |             | Status<br>(0x00_success)   | Reserved<br>(8Bytes,Fixed 0x00) |
| GetLastMessageResendtimeReq |                                       | 0x1E   |             | Reserved<br>(9Bytes,Fixed 0x00)  |                                 |
| GetLastMessageResendtimeRsp |                                       | 0x9E   |             | Resendtime<br>(1Byte,Unit:1s,range:3-254s)<br>when 0 or 255 no resend,<br>default is no resend | Reserved<br>(8Bytes,Fixed 0x00) |

Set resend time =5s

Downlink:1FFF05000000000000000000

Response:

9FFF00000000000000000000 ( Configuration success )

9FFF01000000000000000000 ( Configuration failure )

## 7.2.9 Button Press Time

FPort: 0x0D

| Description               | CmdID | PayLoad(Fix byte,1byte)  |
|---------------------------|-------|--|
| SetButton<br>PressTimeReq | 0x01  | PressTime(1bytes)<br>0x00_QuickPush_Less then 1 Second<br>OtherValue present the presstime such as<br>0x01_1 Second push<br>0x02_2 Seconds push<br>0x03_3 Seconds push<br>0x04_4 Seconds push<br>0x05_5 Seconds push<br>0x06_6 Seconds push, and so on |
| SetButton<br>PressTimeRsp | 0x81  | Status<br>(0x00_Success 0x01_Failure)  |
| GetButton<br>PressTimeReq | 0x02  | Reserved<br>(1Byte,Fixed 0x00)   |
| GetButton<br>PressTimeRsp | 0x82  | PressTime(1byte)<br>0x00_QuickPush_Less then 1 Second<br>OtherValue present the presstime such as<br>0x01_1 Second push<br>0x02_2 Seconds push<br>0x03_3 Seconds push<br>0x04_4 Seconds push<br>0x05_5 Seconds push<br>0x06_6 Seconds push, and so on  |

Set button press time =5s

Downlink:0105

Response:

8100 ( Configuration success )

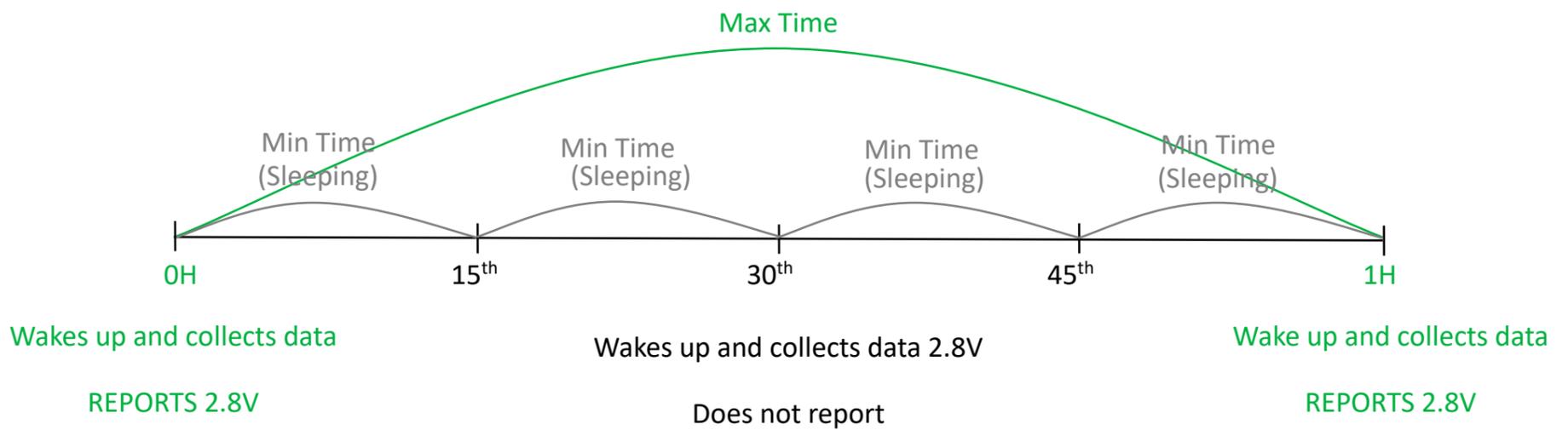
8201 ( Configuration failure )

Note:

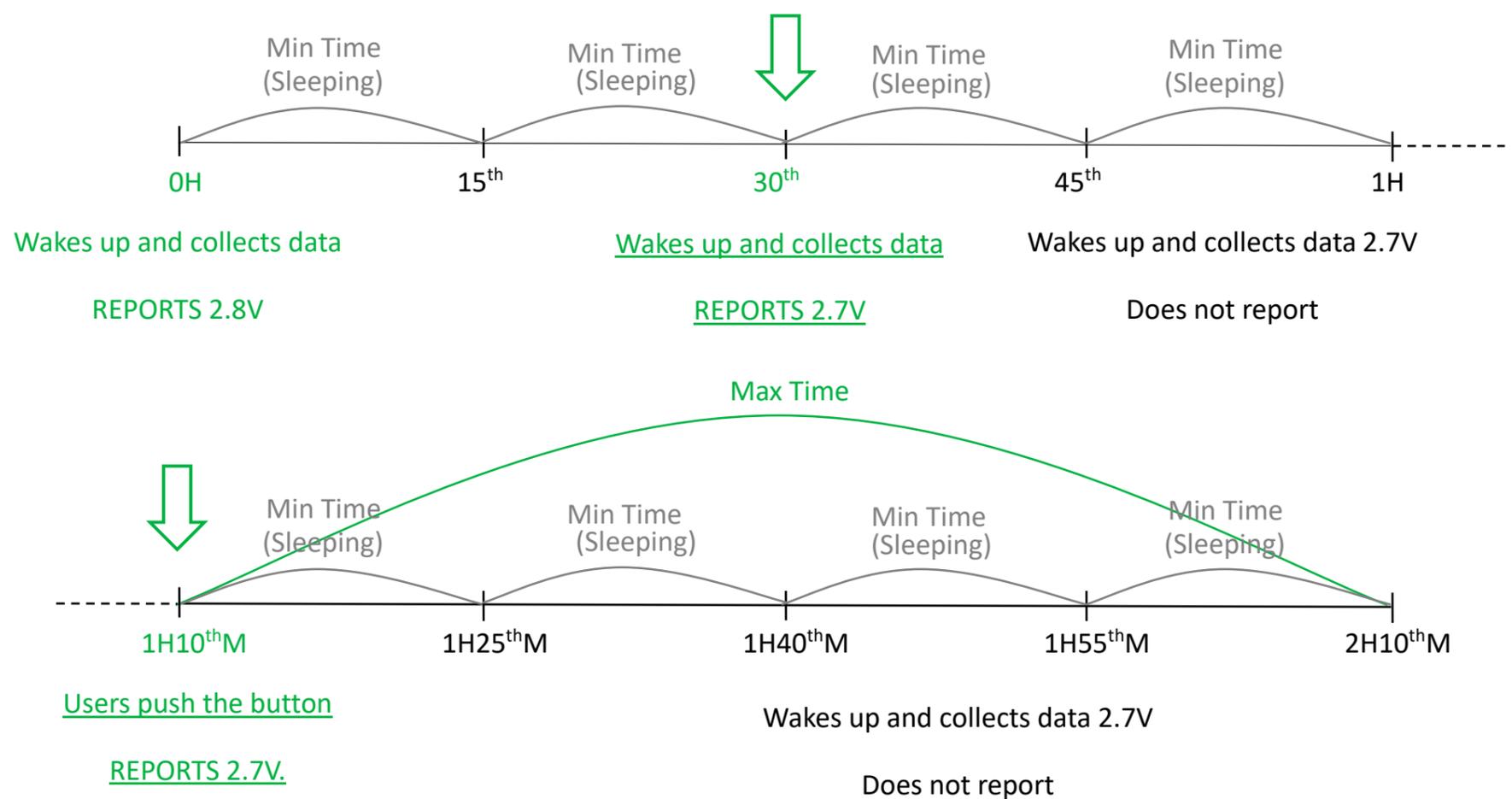
1. The issuing port is 0x0D
2. Default is 3s



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



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



Note:

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.

## 8. Installation

Remove the 3M adhesive on the back of the R315 series 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:

1. Wipe the surface clean before installation to avoid dust on the surface to affect the adhesion of the device.
2. 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.



## 9. 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.