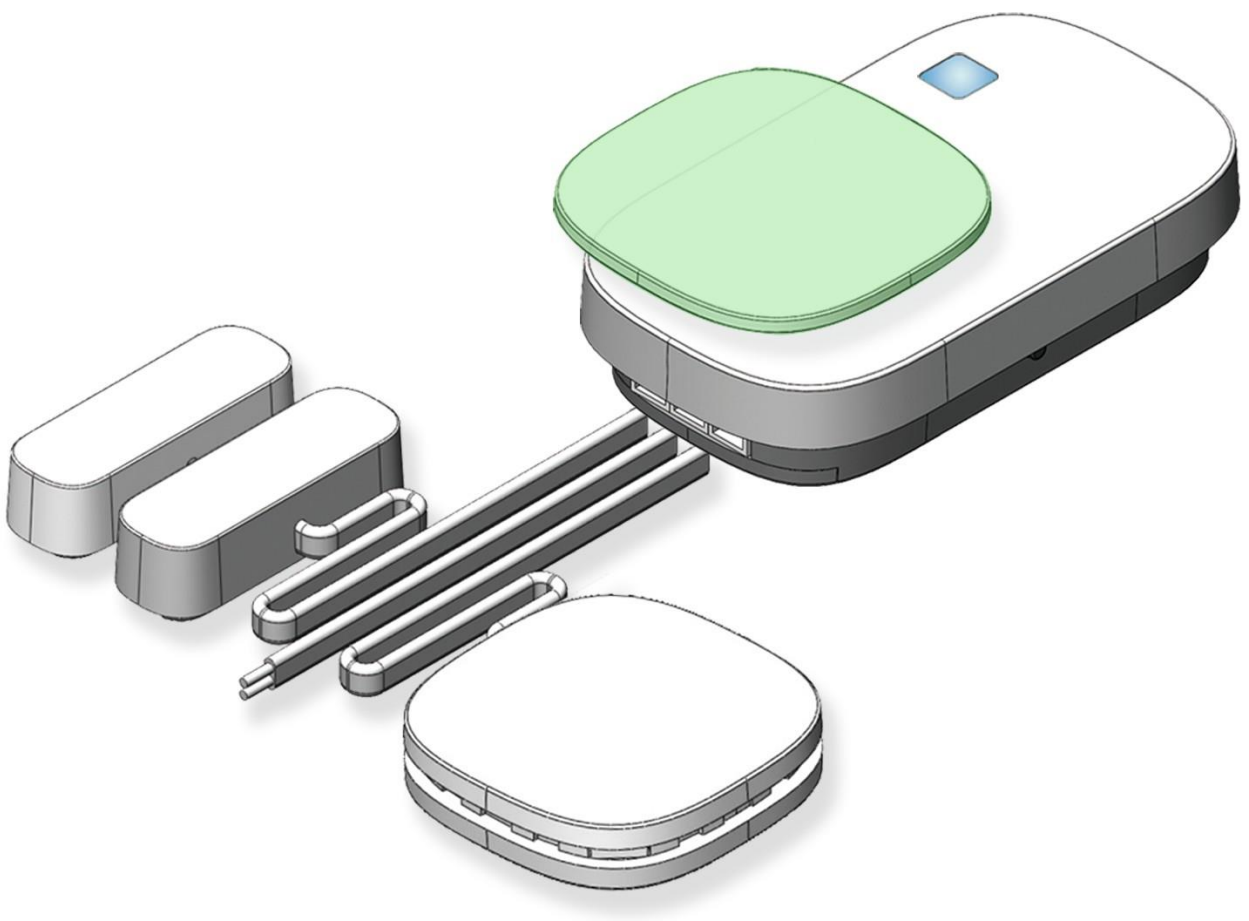
Wireless Multi Sensor Device



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.

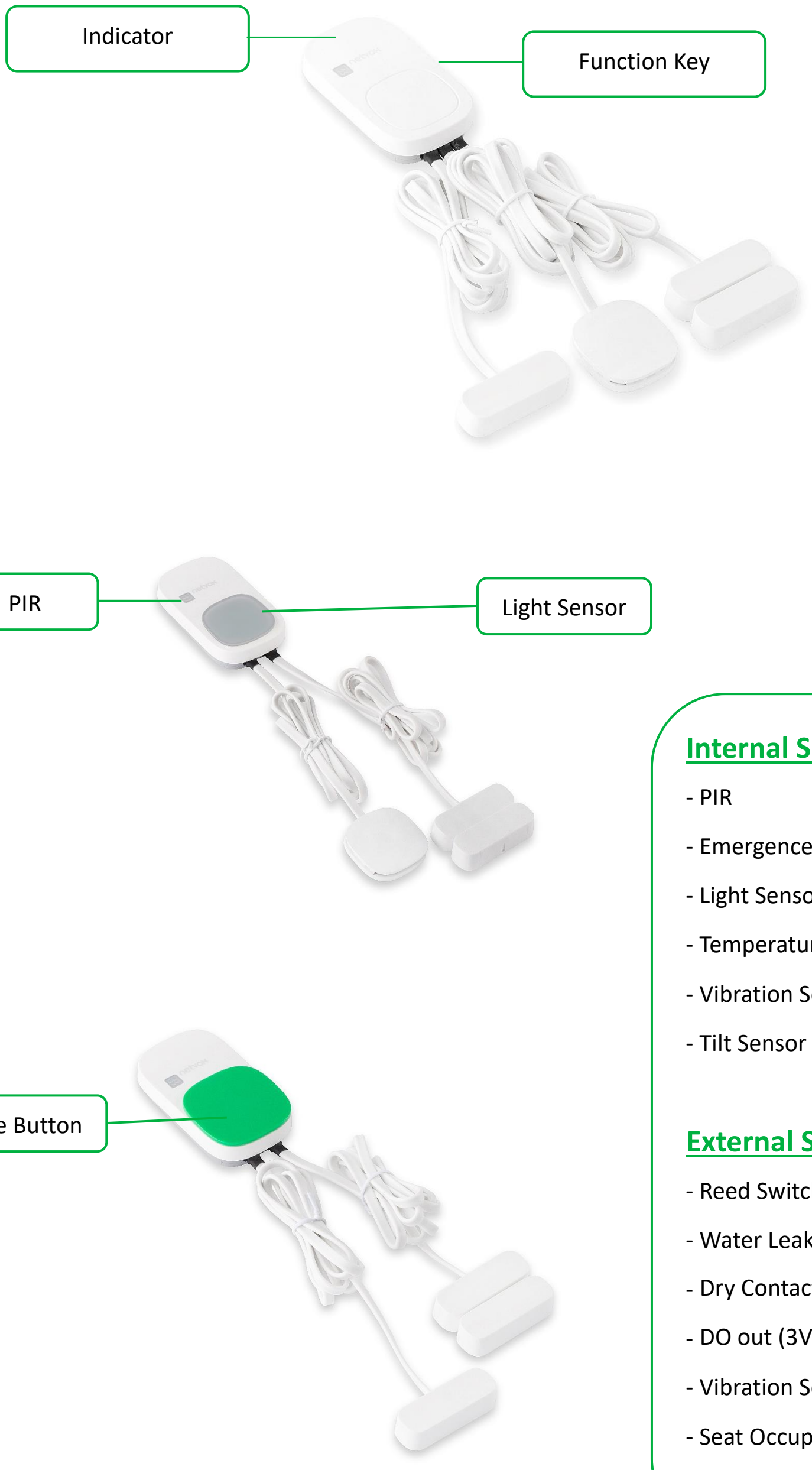
LoRa Wireless Technology:

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
- Emergence 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

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: 0.01%

(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.

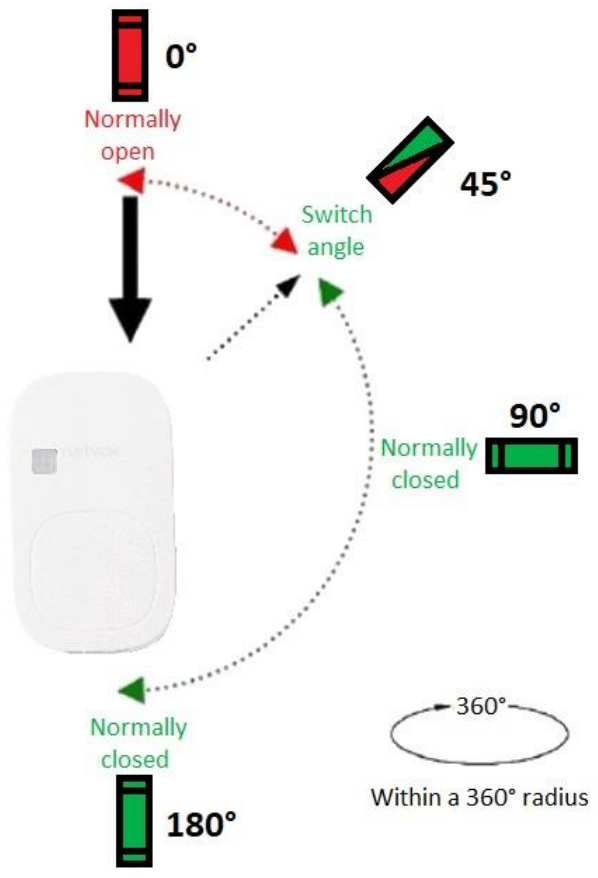
Device tilt: report 1

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.

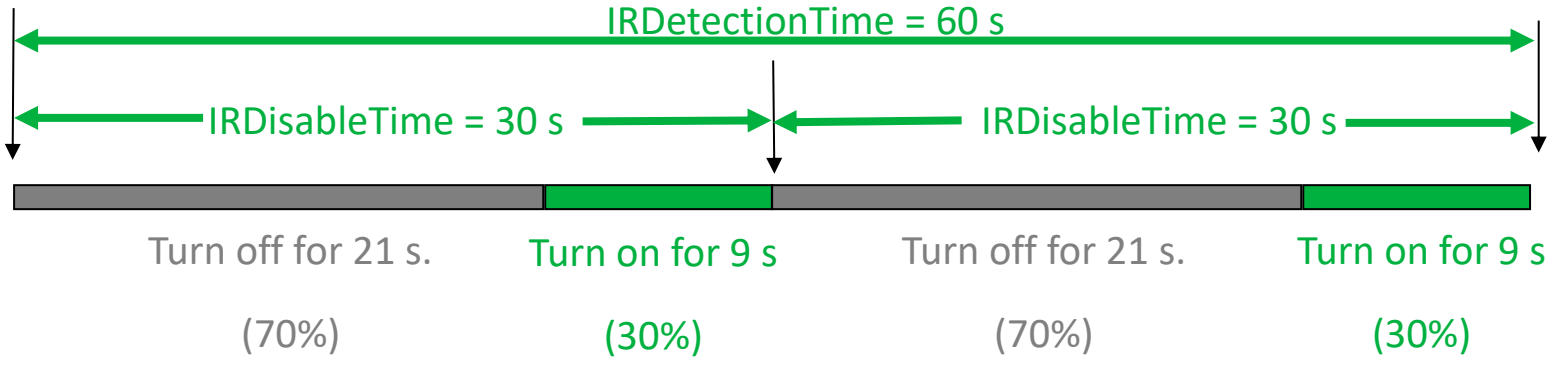
- If living creature is detected during the rest 30% of IRDisableTime, the IR delay time will be extended for another IRDetectionTime until no infrared signal is detected.
- If no living creature is detected during IRDetectionTime, PIR/seat occupancy will report un-occupied along

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).

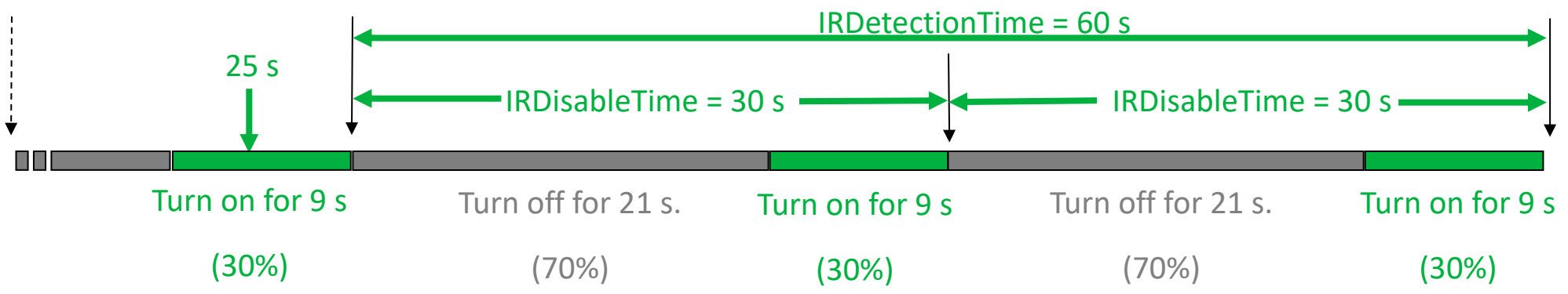


Example2:

While IRDetectionTime is 60 secs and IRDisableTime is 30 secs, living creature is detected during 25th 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. (Indicator light display: the indicator light will flash once every 2s to prompt the current pressing duration)
Power off	Remove Batteries.
Note	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. 2. Two CR2450 button batteries are required to supply power at the same time. 3. Remove and insert the battery; the device memorizes previous on/off state by default. 4. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components. 5. Press function key and insert batteries at the same time; it will enter engineer testing mode.

--- Network Joining ---

Never joined the network	Turn on the device to search the network. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Had joined the network	Turn on the device to search the previous network. The green indicator stays on for 5 seconds: success The green indicator remains off: fail
Fail to join the network (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 The green indicator flashes for 20 times: success The green indicator remains off: fail
Press once	The device is in the network: green indicator flashes once and sends a report The device is not in the network: green indicator remains off
Press and hold the key for 2s	Turn off the buzzing buzzer. *Applicable to device with buzzer
Press and hold the key for 4s	Turn off the infrared detection function. *Applicable to device with PIR

--- Sleeping Mode ---

The device is on and in the network	Sleeping period: Min Interval. When the reportchange exceeds setting value or the state changes: 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 ≥ 5s)

  Detechtime: 0x012C (300s) // PIR and Seat Occupancy (DectionTime must ≥ 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)

<table>
<tr><th>Device Type</th><th>Report Type</th><th colspan="5">NetvoxPayLoadData</th></tr>
<tr><td rowspan="2">0xD2</td><td>0x11</td><td>Battery
(1Byte)
unit:0.1V</td><td>FunctionEnableBits(3Bytes)
BIT0:THSensor,
BIT1:LightSensor,
BIT2:PIRSensor,
BIT3:EmergenceButton,
BIT4:TiltSensor,
BIT5:InternalContactSwitch,
BIT6:ExternalContactSwitch1,
BIT7:ExternalContactSwitch2,
BIT8:InternalShockSensor,
BIT9_ExternalShockSensor,
BIT10:ExternalDryContactPointIN,
BIT11:DryContactPointOut,
BIT12:ExternalWaterLeakSenor1,
BIT13:ExternalWaterLeakSenor2,
BIT14:ExternalSeatSensor,
BIT15:ExternalGlassSensor1,
BIT16:ExternalGlassSensor2,
BIT17_BIT23:Reserved

When BIT is 1,the function is enabled</td><td colspan="2">BinarySensorReport(2bytes)
Bit0:PIRSensorState
(0b01_ON,0b00_OFF),
Bit1: EmergenceButtonAlarmState
(0b01_Alarm,0b00_NoAlarm),
Bit2:TiltSensorState
(0b01_ON,0b00_OFF),
Bit3: InternalContactSwitchSensorState
(0b01_ON,0b00_OFF),
Bit4: ExternalContactSwitch1SensorState
(0b01_ON,0b00_OFF),
Bit5: ExternalContactSwitch2SensorState
(0b01_ON,0b00_OFF),
Bit6: InternalShockSensorState
(0b01_ON,0b00_OFF),
Bit7: ExternalShockSensorState
(0b01_ON,0b00_OFF),
Bit8: ExternalDryContactPointINState
(0b01_ON,0b00_OFF),
Bit9: ExternalWaterLeak1SensorState
(0b01_ON,0b00_OFF),
Bit10: ExternalWaterLeak2SensorState
(0b01_ON,0b00_OFF),
Bit11: ExternalSeatSensorState
(0b01_ON,0b00_OFF),
Bit12: ExternalGlassSensor1State
(0b01_ON,0b00_OFF),
Bit13: ExternalGlassSensor2State
(0b01_ON,0b00_OFF),
BIT15:HeartBeat
(0b01_Heartbeat,0b00_NOTHeartbeat)</td><td>Reserved
(2Byte,fixed 0x00)</td></tr>
<tr><td>0x12</td><td>Battery
(1Byte)
unit:0.1V</td><td>Temperature
(Signed2Bytes,unit:0.01°C)
(When THSensorBit is 0 in the FunctionEnableBits,the filed is fixed 0xFFFF)</td><td>Humidity
(2Bytes,unit:0.01%)
(When THSensorBit is 0 in the FunctionEnableBits,the filed is fixed 0xFFFF)</td><td>illuminance
(2Bytes,unit:1Lux)
(When LightSensor is 0 in the FunctionEnableBits,the filed is fixed 0xFFFF)</td><td>ThresholdAlarm
(1Byte)
Bit0_Low TemperatureAlarm,
Bit1_High TemperatureAlarm,
Bit2_ Low Humidity Alarm,
Bit3_ High Humidity Alarm,</td></tr>
</table>

						Bit4_ Low illuminance Alarm, Bit5_ High illuminance Alarm, Bit6-7:Reserved)

Note:

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

2. Battery (1Byte, unit:0.1V): Bit7 represent low battery, Bit6-0 represent battery voltage

3. Temperature (Signed 2Bytes, unit:0.01°C): Negative numbers are represented by 2's complement

Example of uplink:

Packet #1: 01D2111C00110702000000

1st byte (01): Version

2nd byte (D2): DeviceType 0XD2 — R315 Series

3rd byte (11): Report Type

4th byte (1C): Battery—2.8v , 1C Hex=28 Dec 28*0.1v=2.8v

5th -7th byte (001107): FunctionEnableBits, 0x001107 = 0000 0000 0001 0001 0000 0111 (Bin)

//Bit 0,1,2,8,12 = 1 (enable)

Bit0: Temperature and Humidity Sensor

Bit1: Light Sensor

Bit2: PIR Sensor

Bit8: Internal Shock Sensor

Bit12: External Water Leak Senor 1

8th 9th byte (0200): BinarySensorReport, 0x0200 = 0000 0010 0000 0000 (Bin) //Bit 0,6 =0 ; Bit 9 = 1

Bit0: PIR off

Bit6: Internal Shock Sensor off

Bit9: External WaterLeak1 Sensor on

10th 11th byte (0000): Reserved

Packet #2: 01D2121C0ADC14B401F920

1st byte (01): Version

2nd byte (D2): DeviceType 0XD2 — R315 Series

3rd byte (12): Report Type

4th byte (1C): Battery—2.8v , 1C Hex=28 Dec 28*0.1v=2.8v

5th 6th byte (0ADC):Temperature—27.8°C, ADC Hex=2780 Dec 2780*0.01°C =27.80°C

7th 8th byte (14B4): Humidity—53%, 14B4 Hex=5300 Dec 5300*0.01% =53%

9th 10th byte (01F9): illuminance—505 lux, 0x01F9 Hex=505 Dec

11th byte (20): Threshold Alarm—0x20 =0010 0000 (Bin) //Bit 5= 1

Bit 5: High illuminance Alarm

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					
Config ReportReq	0x01	0xD2	MinTime (2bytes) Unit:s)	MaxTime (2bytes) Unit:s	Battery Change (1byte) Unit:0.1v	Temperature Change (2bytes) Unit:0.01°C	Humidity Change (1byte) Unit:0.5 %	Illuminance Change (1byte) Unit：1Lux
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	Battery Change (1byte) Unit:0.1v	Temperature Change (2bytes) Unit:0.01°C	Humidity Change (1byte) Unit:0.5 %	Illuminance Change (1byte) Unit：1Lux

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

   Downlink: 01D2003C003C0103E82864

   1st byte (01): CMD ID

   2nd byte (D2): DeviceType 0XD2 — R315 Series

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

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

   7th byte (01): Battery Change, 0.1v

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

10th byte (28): Humidity Change, 28(Hex)=40(Dec), 40*0.5%=20%

11th byte (64): Illuminance Change, 64(Hex)=100(Dec), 100*1 lux=100 lux

Response:

81D2000000000000000000（Configuration success）

81D2010000000000000000（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 (1Byte,0x00_Disable,0x01_Enable)	Reserved (8Bytes,Fixed 0x00)
SetPIR EnableRsp	0x83		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)
GetPIR EnableReq	0x04		Reserved (9Bytes,Fixed 0x00)	
GetPIR EnableRsp	0x84		PIREnable (1Byte) 0x00_Disable,0x01_Enable	Reserved (8Bytes,Fixed 0x00)

1. Disable PIR detection

Downlink: 03D2000000000000000000

2. Enable PIR detection

Downlink: 03D2010000000000000000

Response:

83D2000000000000000000（Configuration success）

83D2010000000000000000（Configuration failure）

7.2.3 Vibration Sensor Sensitivity Setting

FPort：0x07

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

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

Downlink: 05D20319000000000000 //19(Hex)=25(Dec)

Response:

85D20000000000000000（Configuration success）

85D20100000000000000（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			
SetIR DisableTImeReq	0x07	0xD2	IRDisableTime (2bytes Unit:s)	IRDetectionTime (2bytes Unit:s)	SensorType(1Byte) 0x00_PIRSensor 0x01_SeatSensor	Reserved (4Bytes,Fixed 0x00)
SetIR DisableTImeRsp	0x87		Status (0x00_success)		Reserved (8Bytes,Fixed 0x00)	
GetIR DisableTImeReq	0x08		SensorType (1Byte) 0x00_PIRSensor 0x01_SeatSenso		Reserved (8Bytes,Fixed 0x00)	
GetIR DisableTImeRsp	0x88		IRDisableTime (2bytes Unit:s)	IRDetectionTime (2bytes Unit:s)	Reserved (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:

87D2000000000000000000（Configuration success）

87D2010000000000000000（Configuration failure）

Note:

1. DetectionTime must ≥ IRDisableTime
2. DisableTime must ≥ 5s

7.2.5 Buzzer Beep Duration

FPort：0x07

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

Set buzzer alarm time = 5s

Downlink: 09D20005000000000000

Response:

89D200000000000000000（Configuration success）

89D201000000000000000（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) 0x00_Normally Open 0x01_Normally Close	Reserved (8Bytes,Fixed 0x00)
Set DryContact PointOutTypeRsp	0x8B		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)
Get DryContact PointOutTypeReq	0x0C		Reserved (9Bytes,Fixed 0x00)	
Get DryContact PointOutTypeRsp	0x8C		DryContactPointOutType (1Byte) 0x00_Normally Open 0x01_Normally Close	Reserved (8Bytes,Fixed 0x00)

Set dry contact point out type = Normally Close

Downlink:0BD2010000000000000000

Response:

8BD2000000000000000000（Configuration success）

8BD2010000000000000000（Configuration failure）

7.2.7 Vibration / Tilt Sensor Restore Function

FPort：0x07

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

Set restore =1 (DO report when sensor restore)

Downlink:0DD2010000000000000000

Response:

8DD2000000000000000000（Configuration success）

8DD2010000000000000000（Configuration failure）

7.2.8 Dry Contact Resend Time Function

FPort：0x07

Description	Device	Cmd ID	Device Type	NetvoxPayLoadData	
SetLastMessage ResendtimeReq	only used in contactswitch devicetype	0x1F	0xFF	Resendtime (1Byte,Unit:1s,range:3-254s) when 0 or 255 no resend, default is no resend	Reserved (8Bytes,Fixed 0x00)
SetLastMessage ResendtimeRsp		0x9F		Status (0x00_success)	Reserved (8Bytes,Fixed 0x00)
GetLastMessage ResendtimeReq		0x1E		Reserved (9Bytes,Fixed 0x00)	
GetLastMessage ResendtimeRsp		0x9E		Resendtime (1Byte,Unit:1s,range:3-254s) when 0 or 255 no resend, default is no resend	Reserved (8Bytes,Fixed 0x00)

Set resend time =5s

Downlink:1FFF0500000000000000000

Response:

9FFF0000000000000000000（Configuration success）

9FFF0100000000000000000（Configuration failure）

7.2.9 Button Press Time

FPort：0x0D

Description	CmdID	PayLoad(Fix byte,1byte)
SetButton PressTimeReq	0x01	PressTime(1bytes) 0x00_QuickPush_Less then 1 Second OtherValue 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 0x06_6 Seconds push, and so on
SetButton PressTimeRsp	0x81	Status (0x00_Success 0x01_Failure)
GetButton PressTimeReq	0x02	Reserved (1Byte,Fixed 0x00)
GetButton PressTimeRsp	0x82	PressTime(1byte) 0x00_QuickPush_Less then 1 Second OtherValue 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 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

7.2.10 ConfigDryContactINTriggerTime

FPort：0x0F

Description	CmdID	PayLoad(Fix byte,2byte)	
SetDryContactIN TriggerTimeReq	0x01	MinTriggeTime (2bytes) (Unit:1ms,Default 50ms)	
SetDryContactIN TriggerTimeRsp	0x81	Status (0x00_Success 0x01_Failure)	Reserved (1Byte,Fixed 0x00)
GetDryContactIN TriggerTimeReq	0x02	Reserved (2Byte,Fixed 0x00)	
GetDryContactIN TriggerTimeRsp	0x82	MinTriggeTime (2bytes) (Unit:1ms,Default 50ms)	

Set trigger time =100ms

Downlink:010064

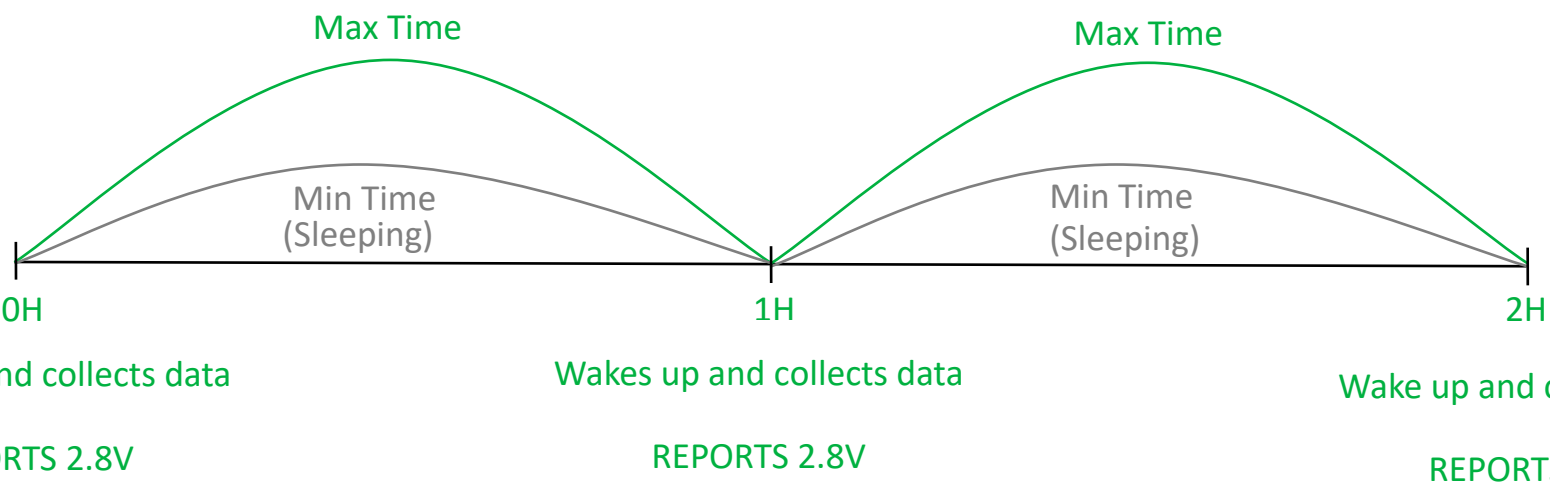
Response:

810000（Configuration success）

820100（Configuration failure）

7.3 Example for MinTime/MaxTime logic

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

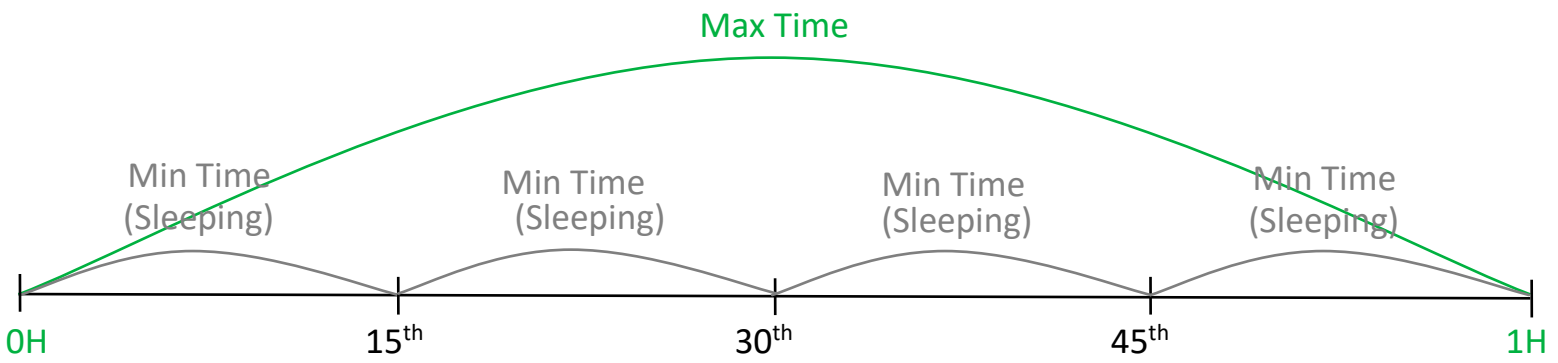


Note:

MaxTime=MinTime.

Data will only be report according to MaxTime (MinTime) duration regardless Battery Voltage Change value.

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



Wakes up and collects data

REPORTS 2.8V

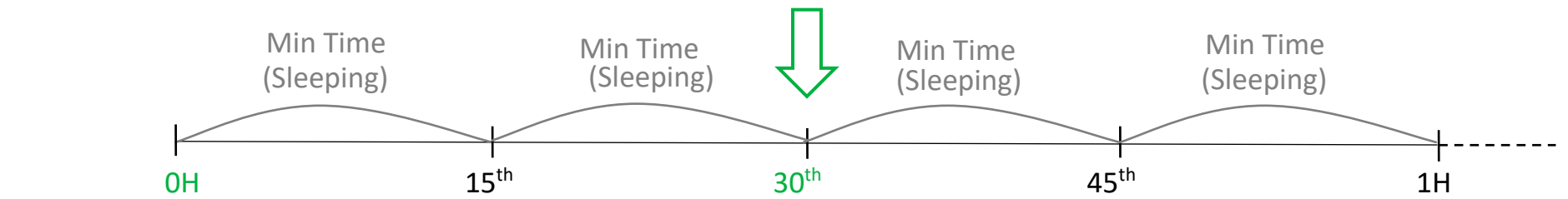
Wakes up and collects data 2.8V

Does not report

Wake up and collects data

REPORTS 2.8V

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



Wakes up and collects data

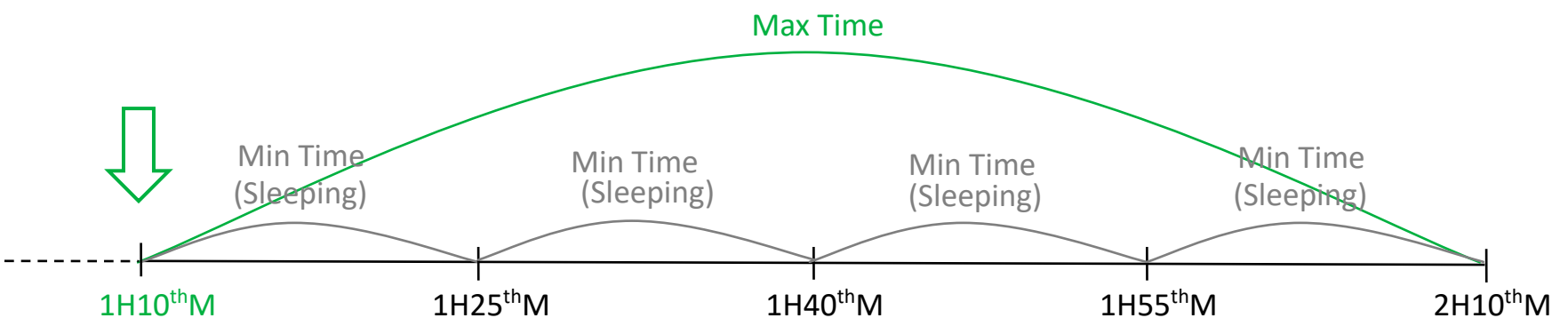
REPORTS 2.8V

Wakes up and collects data

REPORTS 2.7V

Wakes up and collects data 2.7V

Does not report



Users push the button

REPORTS 2.7V.

Wakes up and collects data 2.7V

Does not report

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.