Wireless 2-Gang Water Leak Detector

R311W
User Manual

Table of Content

1. Introduction

Wireless 2-Gang Water Leak Detector (R311W) is a LoRaWAN device compatible with LoRaWAN protocol (ClassA). When the R311W sensor detects a leak, it will send an alarm message to the gateway. When the sensor detects no leaks, it will send a message that shows no leak to the gateway.

LoRa Wireless Technology:

LoRa is a wireless communication technology famous for its long-distance transmission and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation technique greatly extend the communication distance. It can be widely used in any use case that requires long-distance and low-data wireless communications. For example, automatic meter reading, building automation equipment, wireless security systems, industrial monitoring. It has features like small size, low power consumption, long transmission distance, strong 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

Indicator

Function Key

Water Leak Sensor
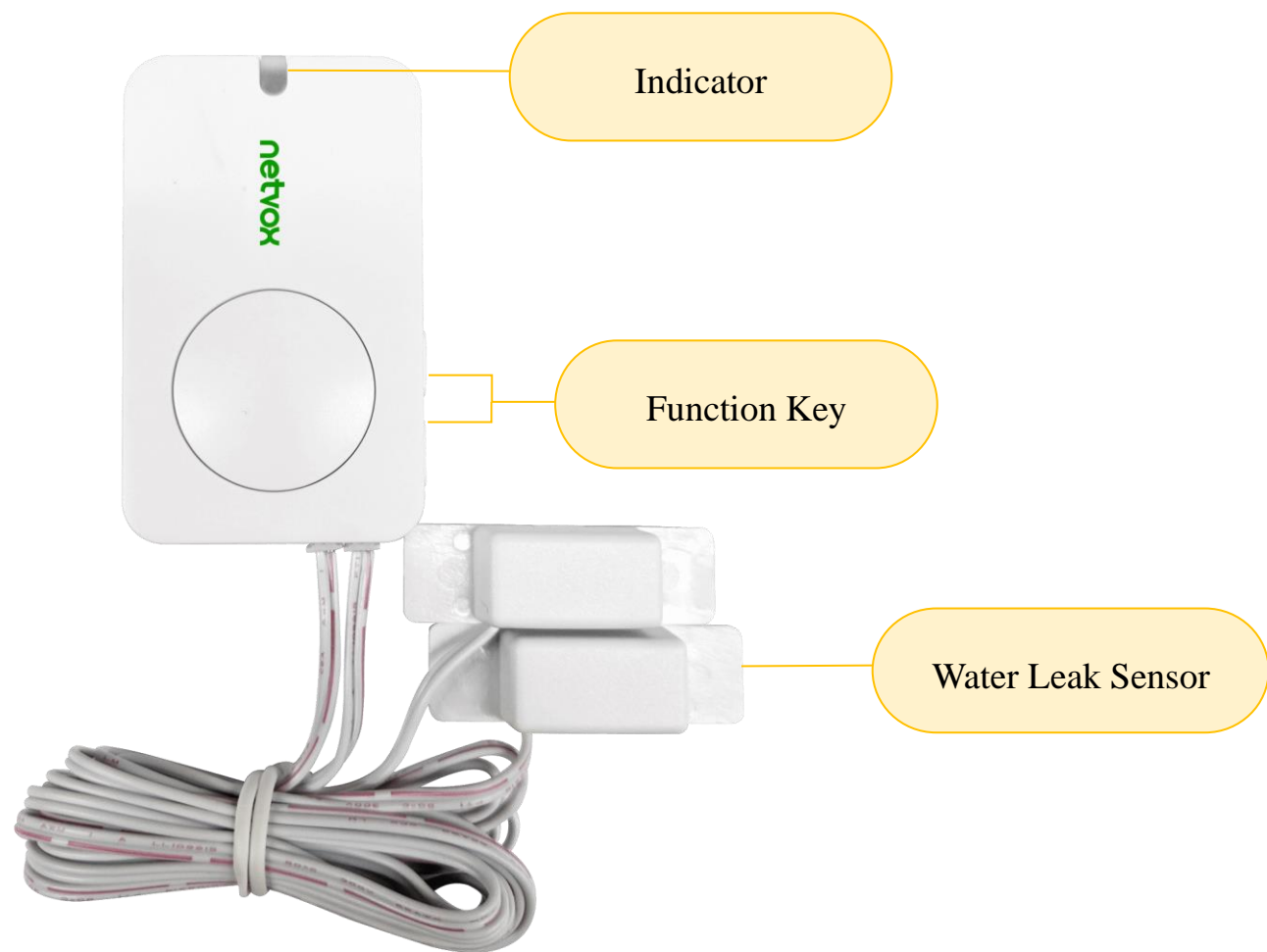
3. Main Features

- Compatible with LoRaWAN

- 2 sections of 3V CR2450 button battery power supply

- Detectable voltage and water leak status

- Simple operation and setting

- Compatible with LoRaWAN^{TM} 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

4.Set up Instruction

On/Off

Power on	Insert batteries. (users may need a screwdriver to open); Insert two sections of 3V CR2450 button batteries and close the battery cover.)
Turn on	Press any function key till green and red indicator flashes once.
Turn off (Restore to factory setting)	Press and hold both function keys for 5 seconds till green indicator flashes for 20 times.
Power off	Remove Batteries.
Note:	1. Remove and insert the battery; the device memorizes previous on/off state by default. 2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components. 3. Press any 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 and hold for 5 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

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

5. Data Report

The device will immediately send a version packet report along with an uplink packet including battery voltage, leak status

The device sends data in the default configuration before any configuration is done.

Default setting:

Maximum time: 3600s

Minimum time: 3600s

Battery: 0x01 (0.1V)

R311W sensor is triggered:

When the R311W status changes, it will send warning report.

No water leak:0

Water leak:1

Note:

The reported data is decoded by the Netvox LoRaWAN Application Command document and

http://www.netvox.com.cn:8888/cmddoc

Data report configuration and sending period are as following:

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

Example of ConfigureCmd

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			
Config ReportReq	R311W	0x01	0x06	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)

（1）**Configure R311W device parameters:**

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

Downlink：0106003C003C0100000000 $003C_{(Hex)} = 60_{(Dec)}$

Device returns：

8106000000000000000000（Configuration success）

8106010000000000000000（Configuration failed）

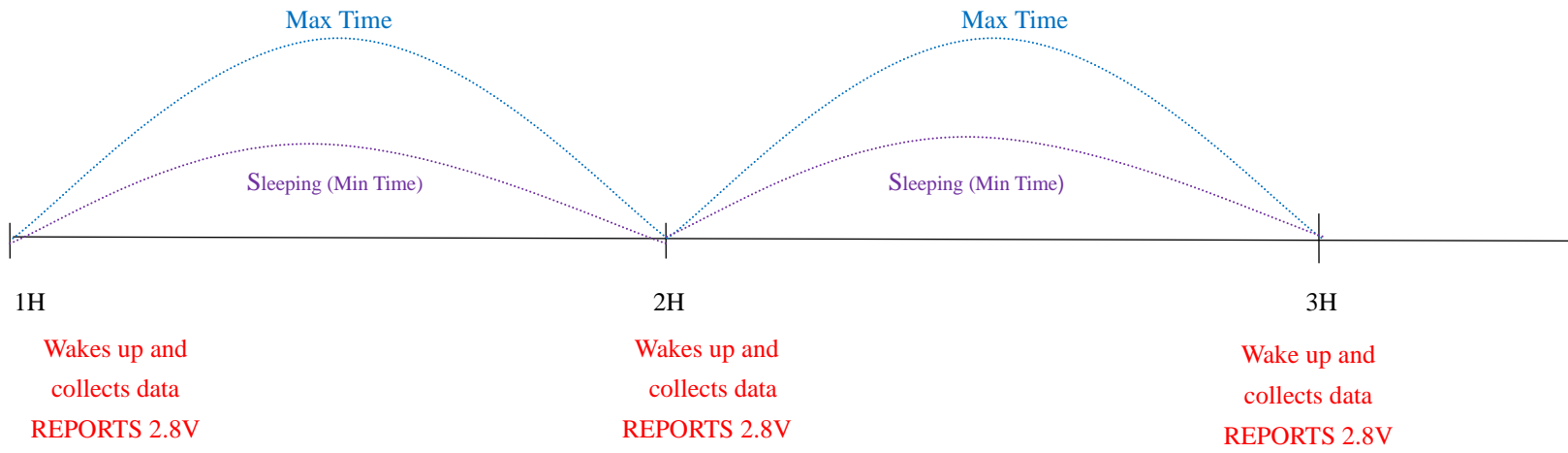（2）**Read R311W device parameters:**

Downlink：0206000000000000000000

Device returns：

8206003C003C0100000000（Current configuration）
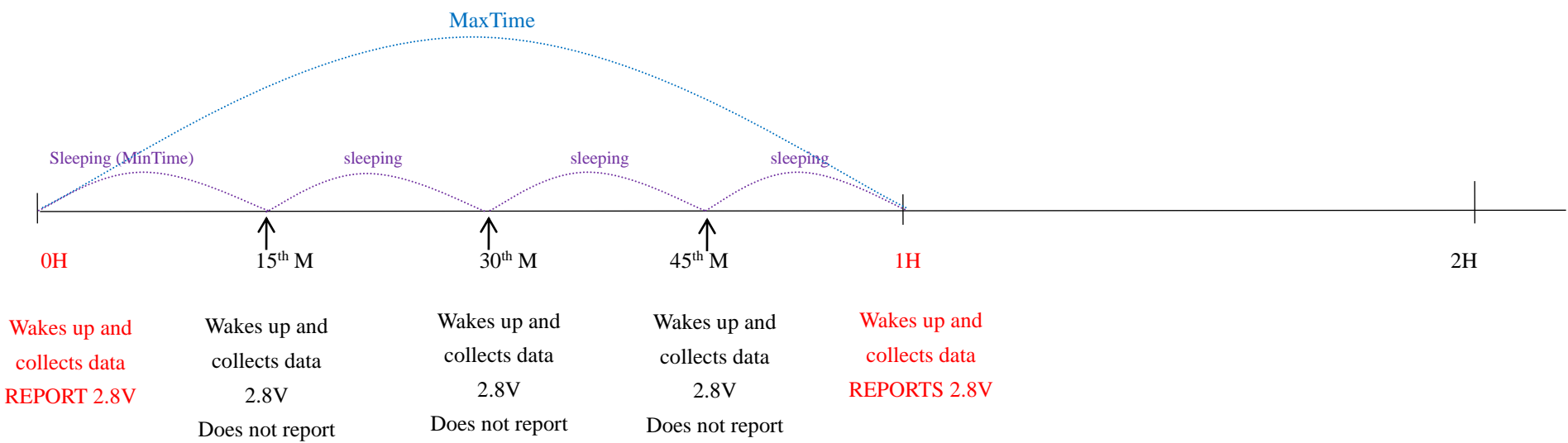
Example for MinTime/MaxTime logic

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

Max Time

Max Time

Sleeping (Min Time)

Sleeping (Min Time)

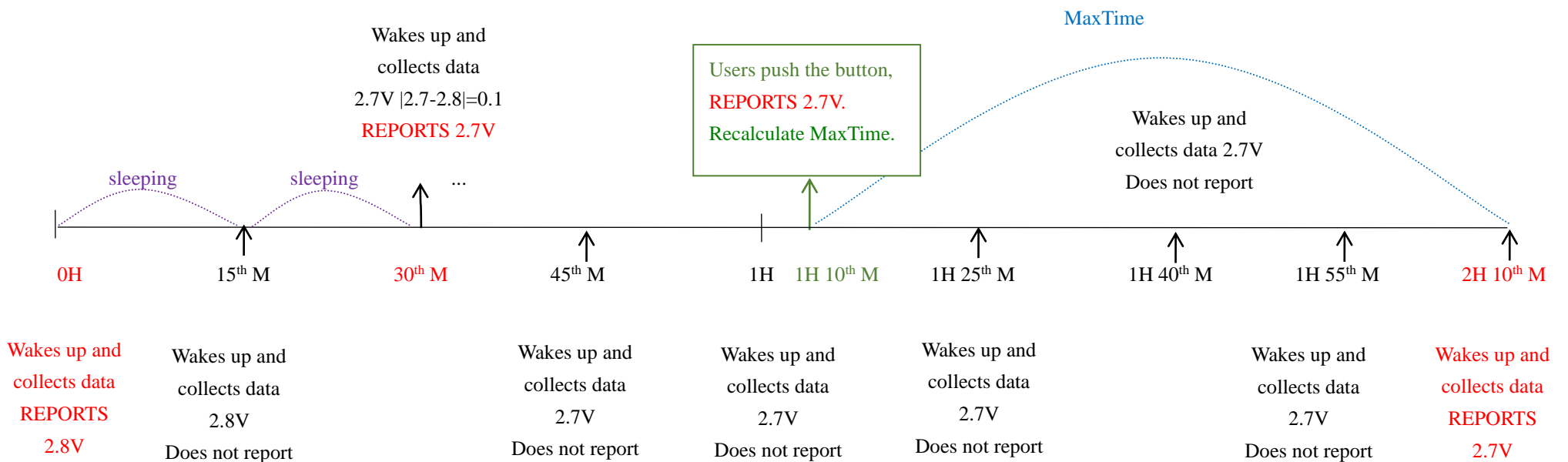| 1H	2H	3H
Wakes up and collects data REPORTS 2.8V	Wakes up and collects data REPORTS 2.8V	Wake up and collects data REPORTS 2.8V

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.

MaxTime

Sleeping (MinTime)   sleeping   sleeping   sleeping

0H	15th M	30th M	45th M	1H	2H
Wakes up and collects data REPORT 2.8V	Wakes up and collects data 2.8V Does not report	Wakes up and collects data 2.8V Does not report	Wakes up and collects data 2.8V Does not report	Wakes up and collects data REPORTS 2.8V	

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

Wakes up and collects data 2.7V |2.7-2.8|=0.1 REPORTS 2.7V

Users push the button, REPORTS 2.7V. Recalculate MaxTime.

MaxTime

Wakes up and collects data 2.7V Does not report

sleeping   sleeping   ...

0H	15th M	30th M	45th M	1H	1H 10th M	1H 25th M	1H 40th M	1H 55th M	2H 10th M
Wakes up and collects data REPORTS 2.8V	Wakes up and collects data 2.8V Does not report		Wakes up and collects data 2.7V Does not report	Wakes up and collects data 2.7V Does not report		Wakes up and collects data 2.7V Does not report		Wakes up and collects data 2.7V Does not report	Wakes up and collects data REPORTS 2.7V

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 <u>reported</u>. 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

This product does not have a waterproof function. After the screening is completed, please place it indoors.

1. Remove the 3M glue on the back of the magnet body and attach the body to the door frame (please do not stick it on the rough door to avoid falling off after using the device for a long time).

Note:

- Wipe the door clean before installation to avoid dust on the door and 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.


The figure shows that the water immersion sensor (R311W) is used in bathing rooms where there is a possibility of water leakage in the pipeline.

It can also be applied to the following scenarios:

- Data center and computer room
- Document storage center
- Basement leak monitoring
- Water pipe leak detection
- Bilge monitoring

The device is designed to detect water leaks and is not suitable for detecting hazardous chemicals, solvents, oils, fuels, strong acids or other corrosive liquids.

2. Remove the 3M glue from the bottom of the sensor probe and attach it to a flat ground position where it may accumulate water leaks. As shown in the enlarged view on the right.
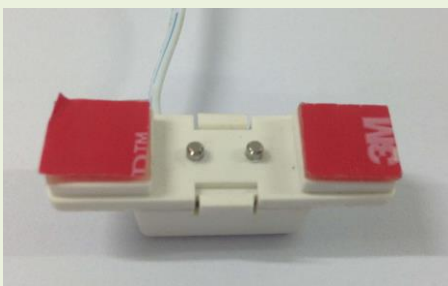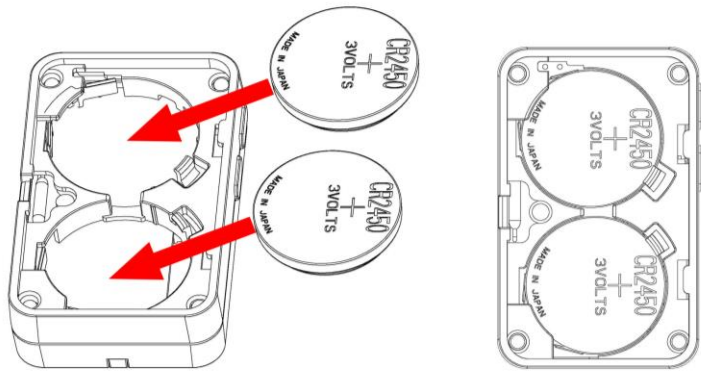

3. When the sensor probe detects a leak, the flood sensor device will send an "alarm" message.

Remove the probe from the accumulated leak location; dry the remaining water inside the sensor. The device is back to a "normal" state, and send a "normal" status message.

(2) The battery installation method is shown in the figure below (battery with "+" facing outward).

Note: To install the battery, use a screwdriver or similar tool to assist in opening the battery cover.

7. Important Maintenance Instruction

Kindly pay attention to the following in order to achieve the best maintenance of the product:

• Keep the device dry. Rain, moisture, or any liquid, might contain minerals and thus corrode electronic circuits. If the device gets wet, please dry it completely.

• Do not use or store the device in dusty or dirty environment. It might damage its detachable parts and electronic components.

• Do not store the device under excessive heat condition. High temperature can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.

• Do not store the device in places that are too cold. 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 clean the device with strong chemicals, detergents or strong detergents.

• Do not apply the device with paint. Smudges might block in the device and affect the operation.

• Do not throw the battery into the fire, or the battery will explode. Damaged batteries may also explode.

All of the above applies to your device, battery and accessories. If any device is not working properly,
 please take it to the nearest authorized service facility for repair.