

Wireless 2-Gang Water Leak Detector with Rope Sensor

R718WB2 User Manual

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1. Introduction

R718WB2 is a LoRaWAN device compatible with LoRaWAN protocol (ClassA). When the R718WB2 water rope sensor detects a leak, it will send an alarm message to the gateway. When the water rope 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



3. Main Features

- Adopt SX1276 wireless communication module
- 2 ER14505 battery AA size (3.6V / section) parallel power supply
- Water leakage status detection
- The base is attached with a magnet that can be attached to a ferrous object
- Protection class: Main body-IP65/IP67 (optional), Sensor-IP67
- Compatible with LoRaWAN™ Class A
- Frequency hopping spread spectrum
- Configuration parameters can be configured via a third-party software platform, data can be read and alarms 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 the sensor reporting frequency and other variables, please refer to

http://www.netvox.com.tw/electric/electric_calc.html

On this website, users can find battery life of various models in different configurations.

4.Set up Instruction

On/Off

Power on	Insert batteries. (Users may need a screwdriver to open)
Turn on	Press and hold the function key for 3 seconds till the green indicator flashes once.
Turn off (Restore to factory setting)	Press and hold the function key for 5 seconds till the green indicator flashes for 20 times.
Power off	Remove Batteries.
Note:	<ol style="list-style-type: none"> 1. Remove and insert the battery; the device is at off state by default. Press and hold the function key for 3 seconds till the green indicator flashes once to turn on the device. 2. On/off interval is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components. 3. At 1st -5th second after power on, the device will be in engineering test mode.

Network Joining

Never joined the network	<p>Turn on the device to search the network to join 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 (not at factory setting mode)	<p>Turn on the device to search the previous network to join the network.</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 (when the device is on)	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 for 20 times: success</p> <p>The green indicator remains off: fail</p>
Press once	<p>The device is in the network: the green indicator flashes once and sends a report</p> <p>The device is not in the network: the green indicator remains off</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 Voltage Warning

Low Voltage	3.2V
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5. Data Report

The device will immediately send a version package report and a report data with leak detection status and voltage value.

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

Default report time:

MaxTime: 0x0E10 (3600s)

MinTime: 0x0E10 (3600s)

Battery Change = 0x01 (0.1v)

R718WB2 sensor is triggered:

When the R718WB2 status changes, it will send warning report.

No water leak:0

Water leak:1

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

<http://cmddoc.netvoxcloud.com/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

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			
R718WB2	0x47	0x01	Battery (1Byte) unit:0.1V	WaterLeak 1 (1Byte) 0:noLeak 1:Leak	WaterLeak 2 (1Byte) 0:noLeak 1:Leak	Reserved (5Bytes) fixed 0x00

Example of Uplink: 0147012401000000000000

1st byte (01): Version

2nd byte (47): DeviceType 0x47 — R718WB2

3rd byte (01): ReportType

4th byte (24): Battery—3.6v , 24Hex=36 Dec 36*0.1v=3.6v

5th byte (01): Water Leak1—Leak

6th byte (00): Water Leak1—No leak

7th ~11th byte (0000000000): 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			
Config ReportReq	R718WB2	0x01	0x47	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 device parameters MinTime = 1min, MaxTime = 1min, BatteryChange = 0.1v

Downlink: 0147003C003C0100000000

The device returns:

81470000000000000000000000000000 (configuration is successful)

81470100000000000000000000000000 (configuration is failed)

(2) Read device configuration parameters

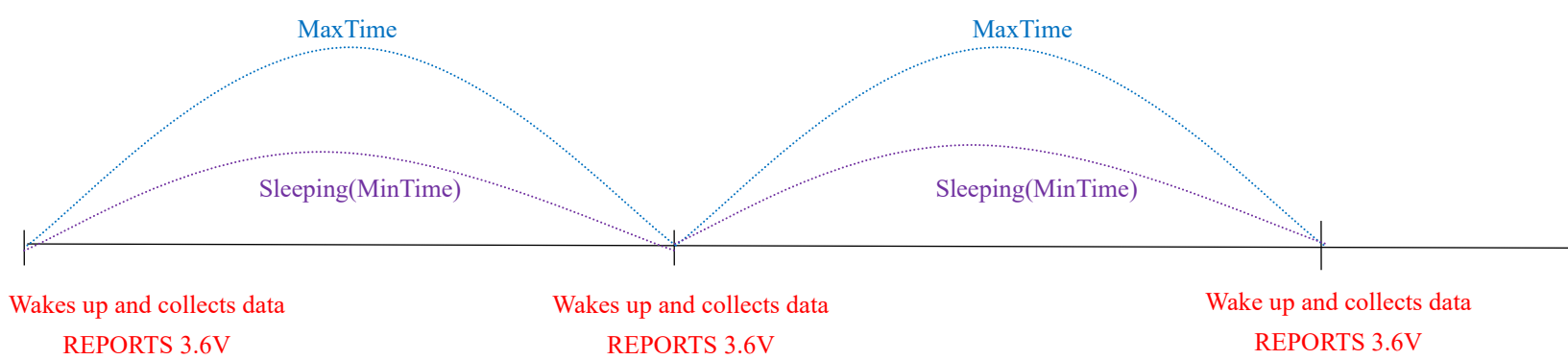
Downlink: 02470000000000000000000000000000

The device returns:

8247003C003C010000000000 (device current configuration parameter)

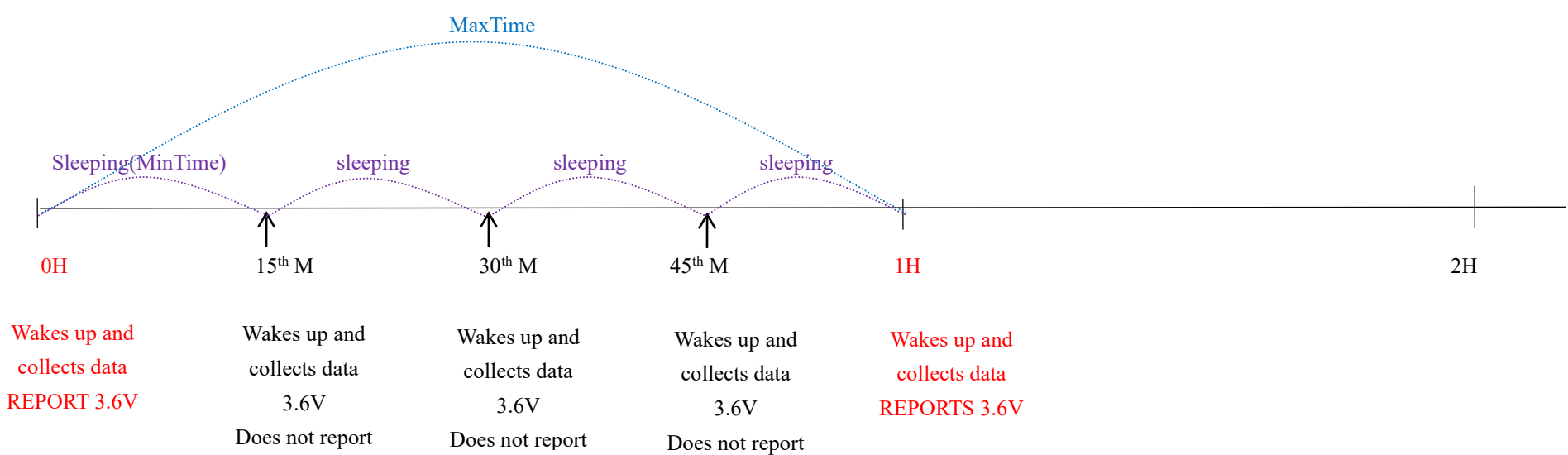
5.3 Example for MinTime/MaxTime logic

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

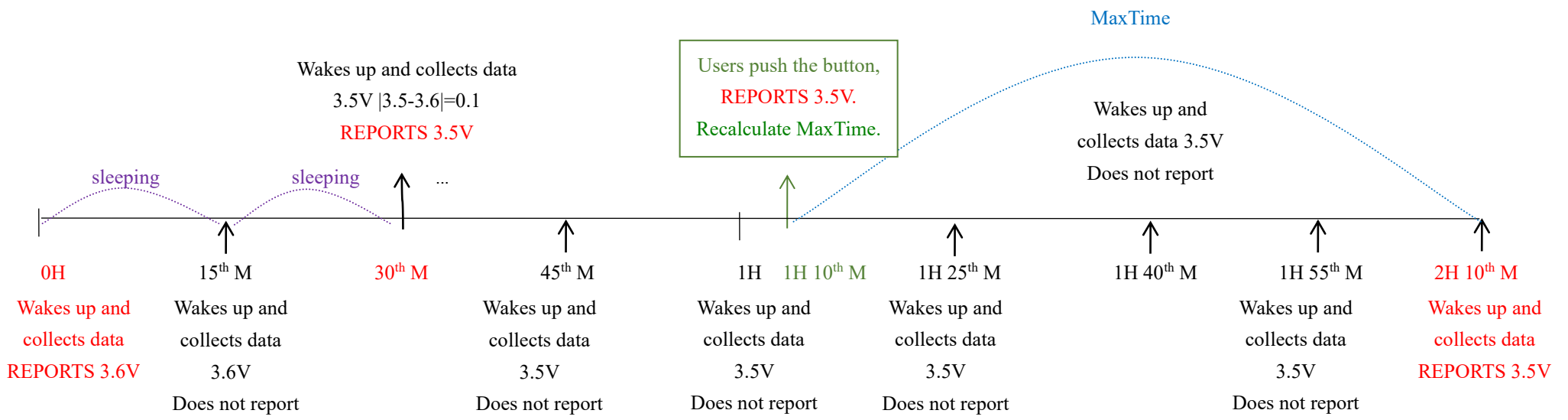


Note: MaxTime=MinTime. Data will only be report according to MaxTime (MinTime) duration regardless BatteryVoltageChange value.

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



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



Notes:

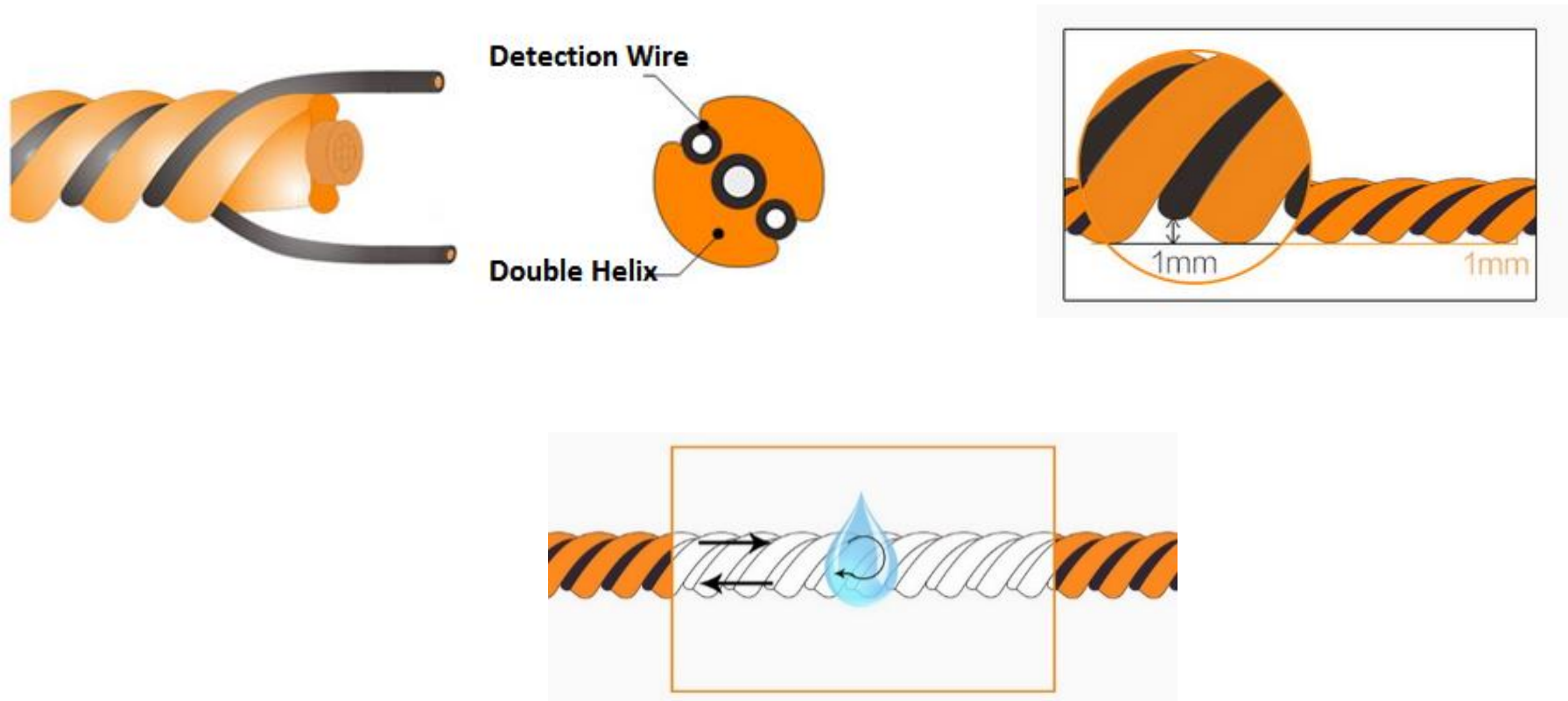
- 1) The device only wakes up and performs data sampling according to MinTime Interval. When it is sleeping, it does not collect data.
- 2) The data collected is compared with the last data reported. If the data variation is greater than the ReportableChange value, the device reports according to MinTime 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 comes with waterproof function. When using it, the back of it can be adsorbed on the iron surface, or the two ends can be fixed to the wall with screws.

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

Waterline Structure:



Leakage Rope Length: Up to 300m*

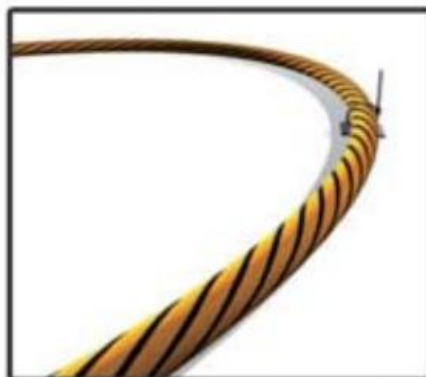
Water contacting alarm: At least 3 cm line length

Alert: Instant report (within 10 seconds)

Installation Suggestions and Examples



fixed by cable clips
(recommend)



fixed by vertical
(recommend)



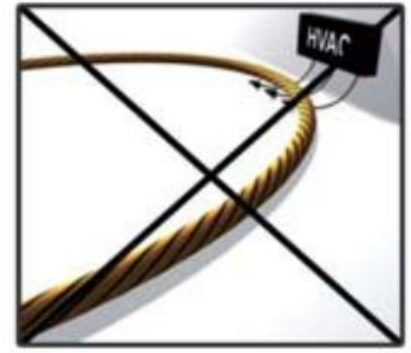
hoisting along pipe
(recommend)



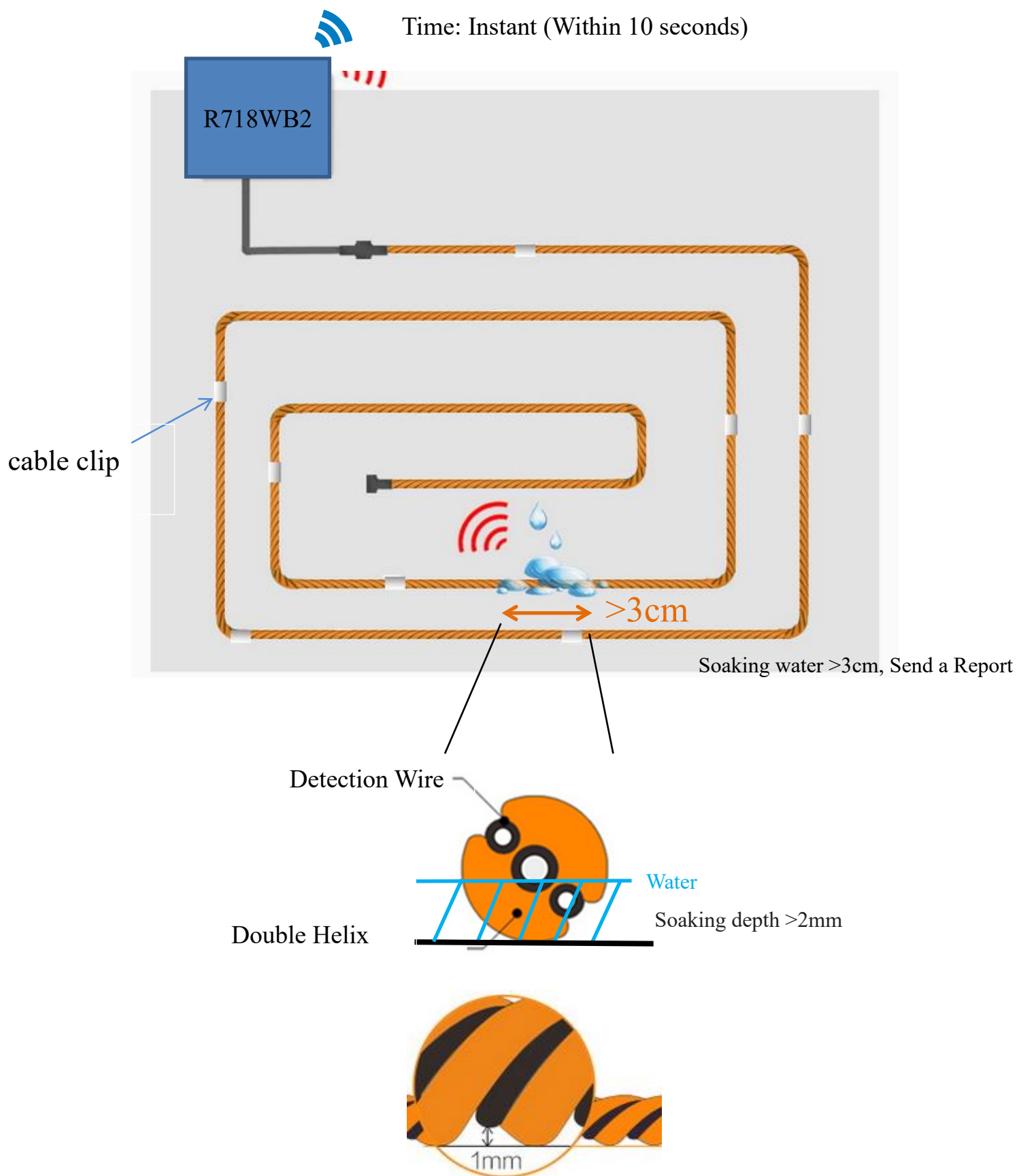
binding with metal
(susceptible to interference)



fixed by glue
(susceptible to damage cable)



in front of air-conditioning outlet
(damp to false alarm)



7. Information about Battery Passivation

Many of Netvox devices are powered by 3.6V ER14505 Li-SOCl₂ (lithium-thionyl chloride) batteries that offer many advantages including low self-discharge rate and high energy density.

However, primary lithium batteries like Li-SOCl₂ batteries will form a passivation layer as a reaction between the lithium anode and thionyl chloride if they are in storage for a long time or if the storage temperature is too high. This lithium chloride layer prevents rapid self-discharge caused by continuous reaction between lithium and thionyl chloride, but battery passivation may also lead to voltage delay when the batteries are put into operation, and our devices may not work correctly in this situation.

As a result, please make sure to source batteries from reliable vendors, and it is suggested that if the storage period is more than one month from the date of battery production, all the batteries should be activated.

If encountering the situation of battery passivation, users can activate the battery to eliminate the battery hysteresis.

ER14505 Battery Passivation:

7.1 To determine whether a battery requires activation

Connect a new ER14505 battery to a resistor in parallel, and check the voltage of the circuit.

If the voltage is below 3.3V, it means the battery requires activation.

7.2 How to activate the battery

- a. Connect a battery to a resistor in parallel
- b. Keep the connection for 5~8 minutes
- c. The voltage of the circuit should be ≥ 3.3 , indicating successful activation.

Brand	Load Resistance	Activation Time	Activation Current
NHTONE	165 Ω	5 minutes	20mA
RAMWAY	67 Ω	8 minutes	50mA
EVE	67 Ω	8 minutes	50mA
SAFT	67 Ω	8 minutes	50mA

Note:

If you buy batteries from other than the above four manufacturers, then the battery activation time, activation current, and required load resistance shall be mainly subject to the announcement of each manufacturer.

8. 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 a 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.