

AN-103A

LoRaWAN Temperature and Humidity Sensor

User Manual



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1. Introduction

1.1 Profile

AN-103A LoRaWAN Temperature and Humidity Sensor is a wireless temperature and humidity acquisition. It is designed for temperature and humidity monitoring and alarm. It comply with LoRaWAN standard communication protocol and integrates data acquisition and monitoring. With built-in temperature and humidity sensor chip, it has high detection accuracy, stable performance with low power consumption. It has long transmission distance and reliable signal output.

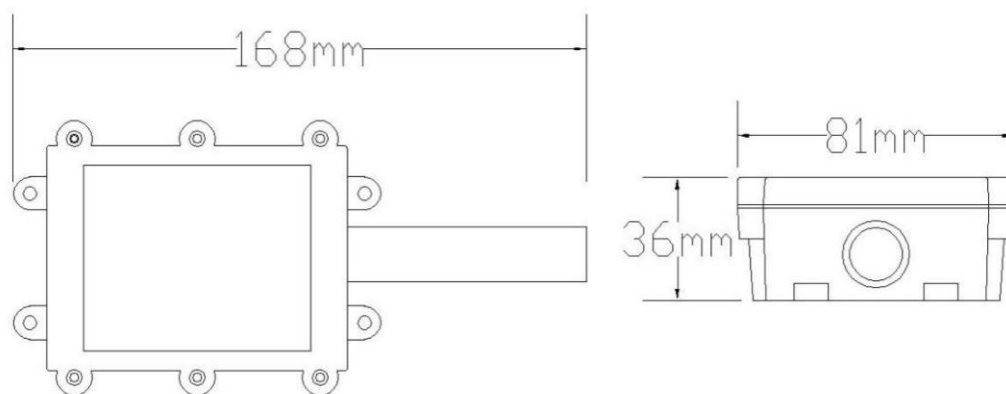
Application scenarios

It is widely used in communication machine room, workshop production line, pharmaceutical warehouse, large logistics warehouse, greenhouse, flower greenhouse, archives, museum, HVAC control and others.

1.2 Feature

- ◇ Support standard LoRaWAN™
- ◇ High accuracy
- ◇ Waterproof IP65
- ◇ Working Temperature: -30℃~80℃

1.3 Dimension



1.4 Specification

Description	Parameter
Communication	LoRaWAN™ protocol
Frequency	CN 470MHz~510MHz
	EU 863MHz~870MHz
	US 902MHz~928MHz
	AU 915MHz~928MHz
	AS 923MHz~925MHz
Max Rx Power	17dBm
Rx sensitivity	-140dBm
Output voltage	-30℃~+80℃
Power consumption	36mW
Battery volume	3.6V/ 8000mAh
Power	Built-in lithium battery
Sleep mode current	15uA
Transmission current	110mA
Dimension	168mm x 81mm x 36mm
IP grade	IP65

2. How to use

2.1 Operation

Turn on: Put a piece of magnet close to the induction position near the middle part of the device until the buzzer sound. Hold the magnet still. The buzzer sounds about 2 seconds and then stops automatically. The magnet can be removed then. It means device is starting up.

Network connection: When the device is powered on, the buzzer "beep, beep" three times. It means the device gets network connection successfully.

Turn off: Put a piece of magnet close to the induction position near the middle part of the device until the buzzer sound. Hold the magnet still. The buzzer sounds about 6 seconds and then stops automatically. The magnet can be removed then. It means device is shutdown.



Turn on/ off with magnet

2.2 Buzzer

The buzzer responses in a beep sound for 2 seconds when it turns on.

The buzzer sounds beep 3 times when it gets network connection.

The buzzer responses in a blast beep sound for 6 seconds when it turns off.

Note: Use the magnet to turn on/off the device. Do not move the magnet until the buzzer sounds ends.

2.3 Installation

2.3.1 Tools

Please prepare the tools below, which not supplied in packaging accessories.



It is recommended that user finishes device configuration and network connection before installation.

2.3.2 Installation process

1. Select the appropriate installation location. Please put the rod-like induction part downward for installation.
2. Install the wall. Mark the installation hole at the installation position and punch holes.
3. Fix the device on the wall with screws in the pre-punched hole position.
4. Turn it on and check if the device is working normally.



Remark

1. Please arrange professional technician for installation.
2. Before installation, please turn off the device. After installation, please turn it on.
3. Select the appropriate installation location according to the scenario. The installation drawing in this paper is for reference only.

3.Configuration

3.1 Tool kits

Item	Description
Laptop	Installation
Wireless Configuration tool	The laptop communicates with device via wireless configuration tool wireless configuration tool(wireless configuration), you should install CP210x driver for this tool
Configuration software	Winext manage App



Laptop



Wireless configuration tool



Winext manage APP

a) Install the CP210x driver for wireless configuration tool, file as below:

CP210x_Windows_Drivers (for wireless configuration tool)	2019/1/4 19:37	WinRAR 压缩文件	6,600 KB
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b) Install Winext manage App, file as below:

serialport-win32-x64(09-25) (Winext manage App)	2019/9/26 13:49	WinRAR ZIP 压缩...	73,158 KB
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3.2 Install CP210x driver for wireless configuration tool

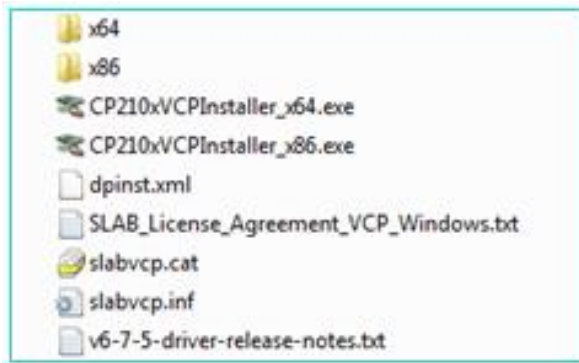
(1) Open CP210x driver for wireless configuration tool

CP210x_Windows_Drivers (for wireless configuration tool)	2019/1/4 19:37	WinRAR 压缩文件	6,600 KB
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(2) Select the driver program to install depending to the system type.

32-bit operating system selects "CP210xVCPIInstaller_x86.exe".

64-bit operating system selects "cp210xvcpiinstaller_x64.exe".



(3) Install Wireless configuration tool driver

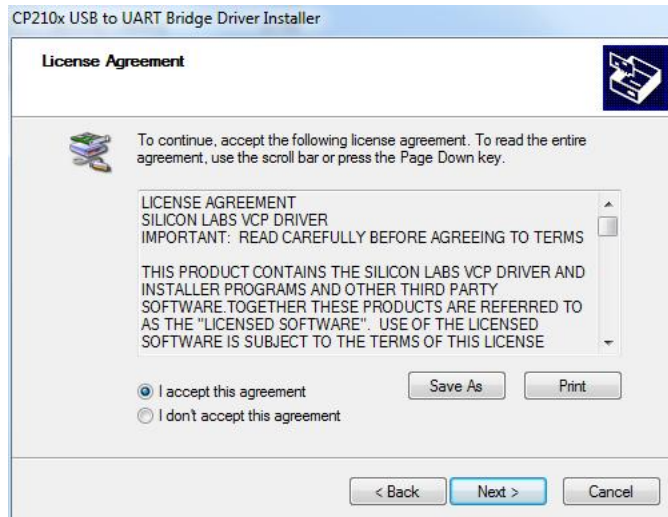
Here we take an example to use the 64-bit operating system to install the wireless configuration tool driver

Click and select *Next* to the driver file "**cp210xvcpinstaller_x64.exe**".

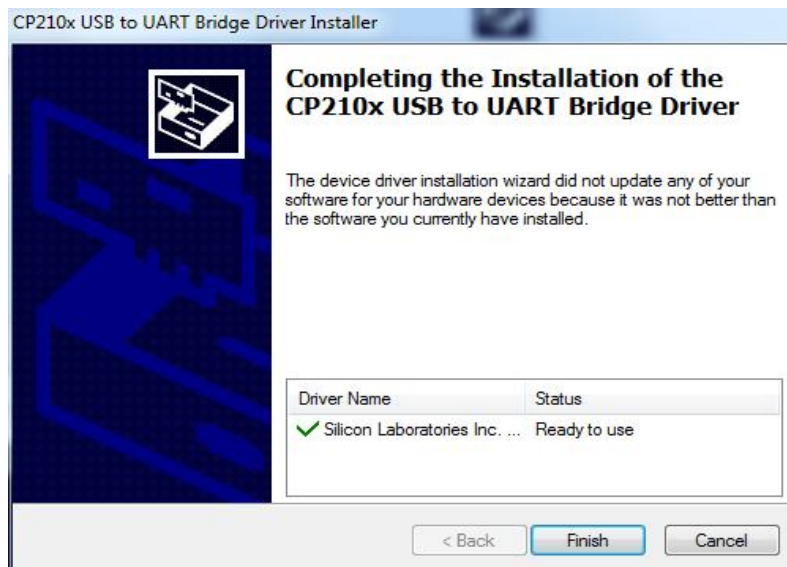
As below:



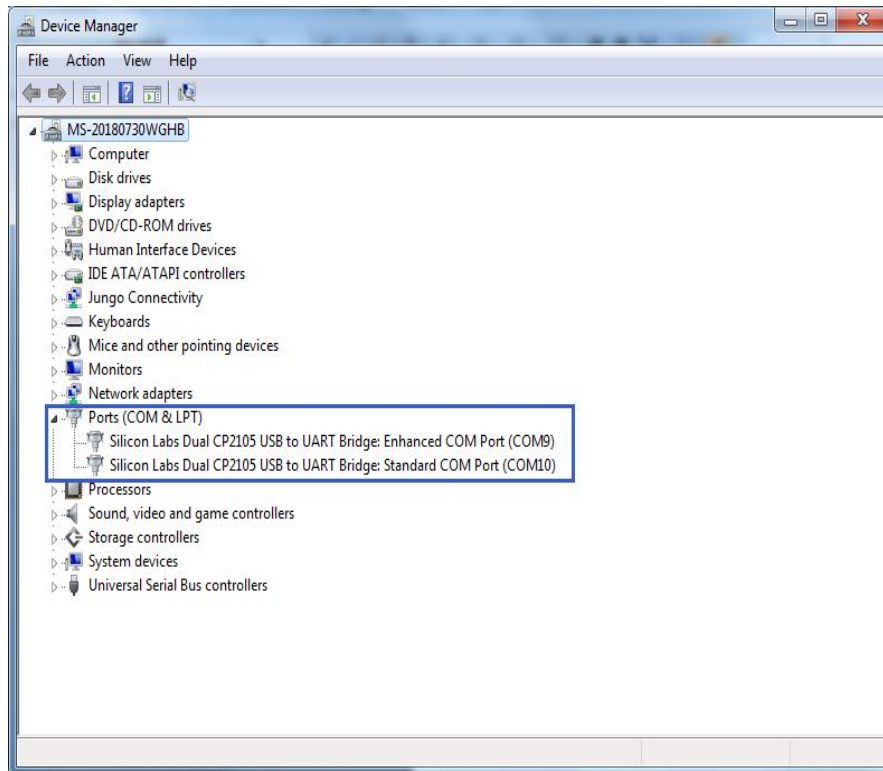
Select *Accept the License Agreement* and click on *Next*, as below:



Wait for a while and click on **Finish**, as below:



Check the driver program after installation finished. Click on *Computer-Attribute-Device manager*, as below:



3.3 Configuration process

- (1) . Insert the wireless serial port tool into the USB port of the laptop.



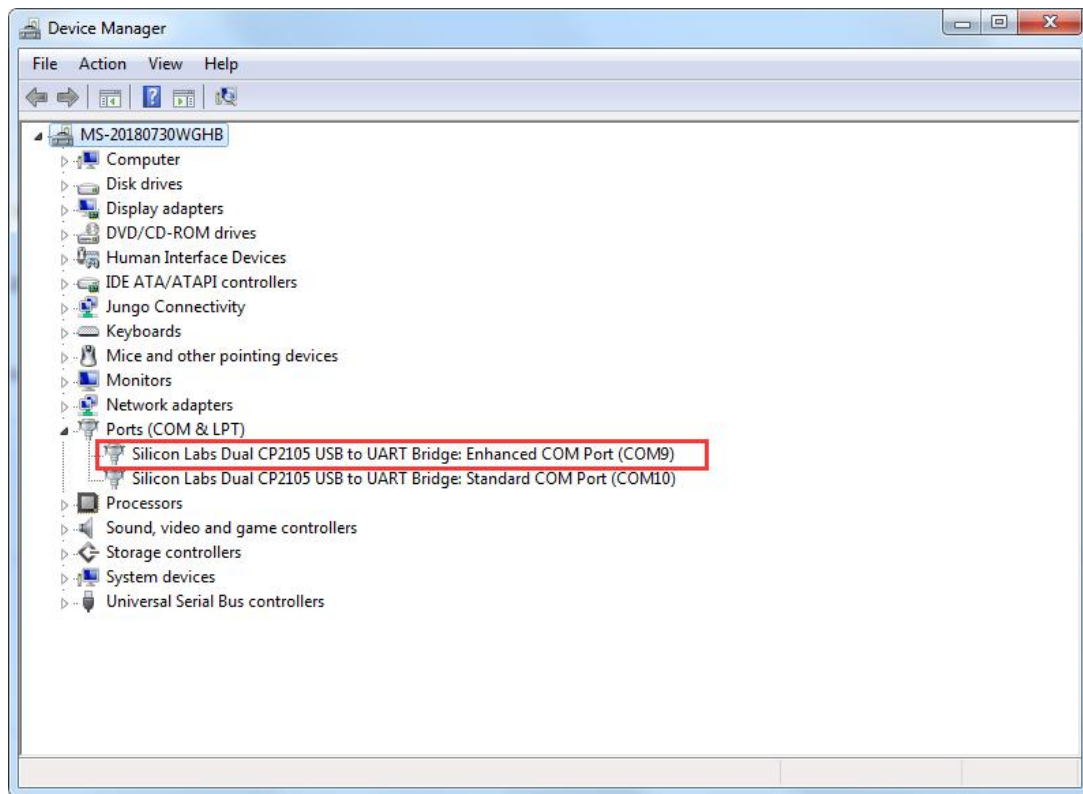
- (2) Open the web-based configuration tool folder, “serialport-win32-x64” folder, double-click “serialport.exe” to open the web-based configuration tool software.

Note: The serial port number may different on different laptop.

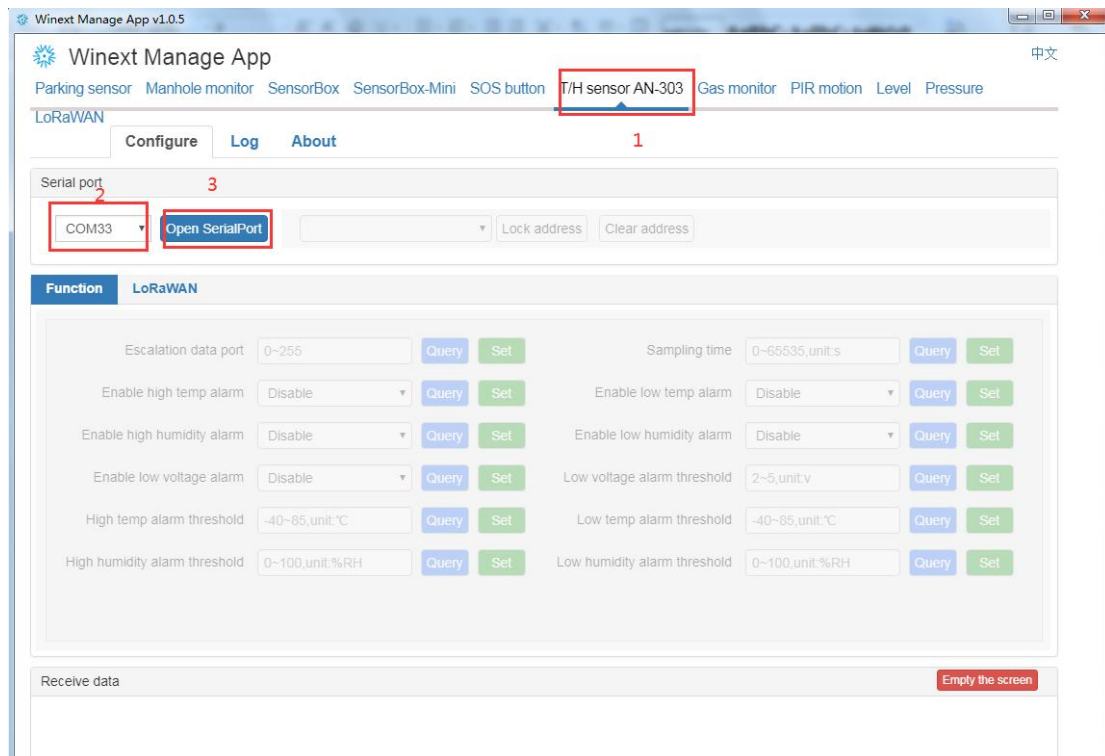
- (3) Process

- a. Choose serial port

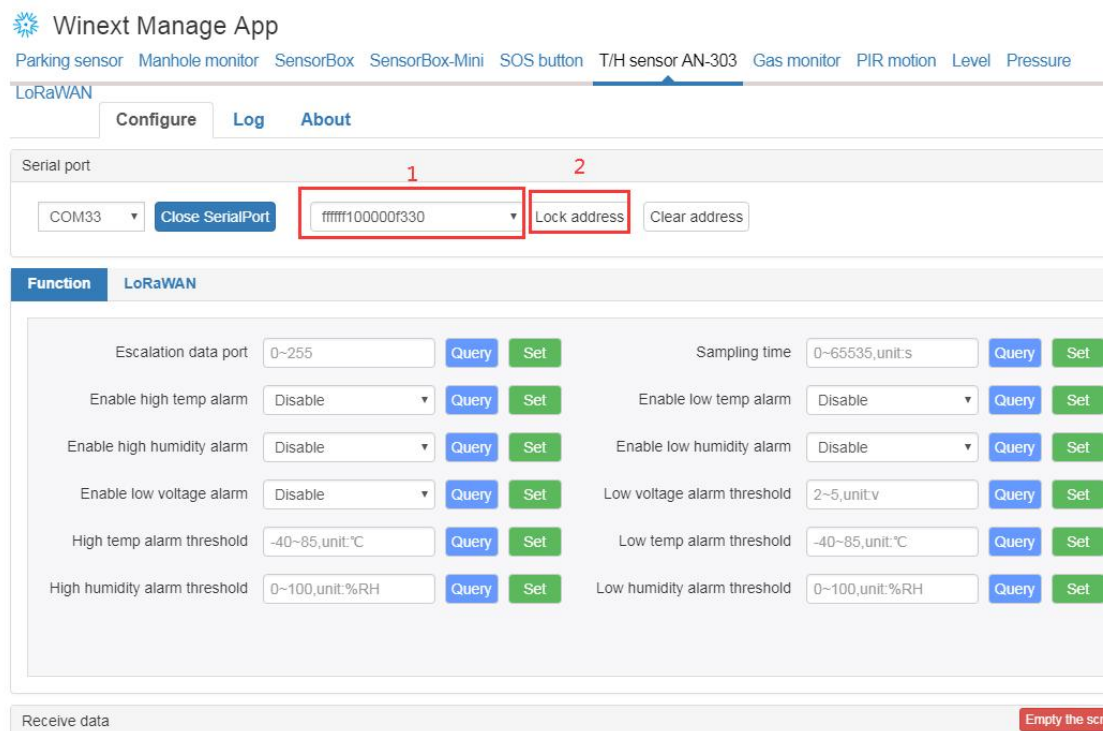
Click on Computer-Attribute- Device manager icon to check serial port number, select “Silicon Labs Dual CP2105 USB to UART Bridge: Enhanced COM Port”. Here is an example to type in COM9.



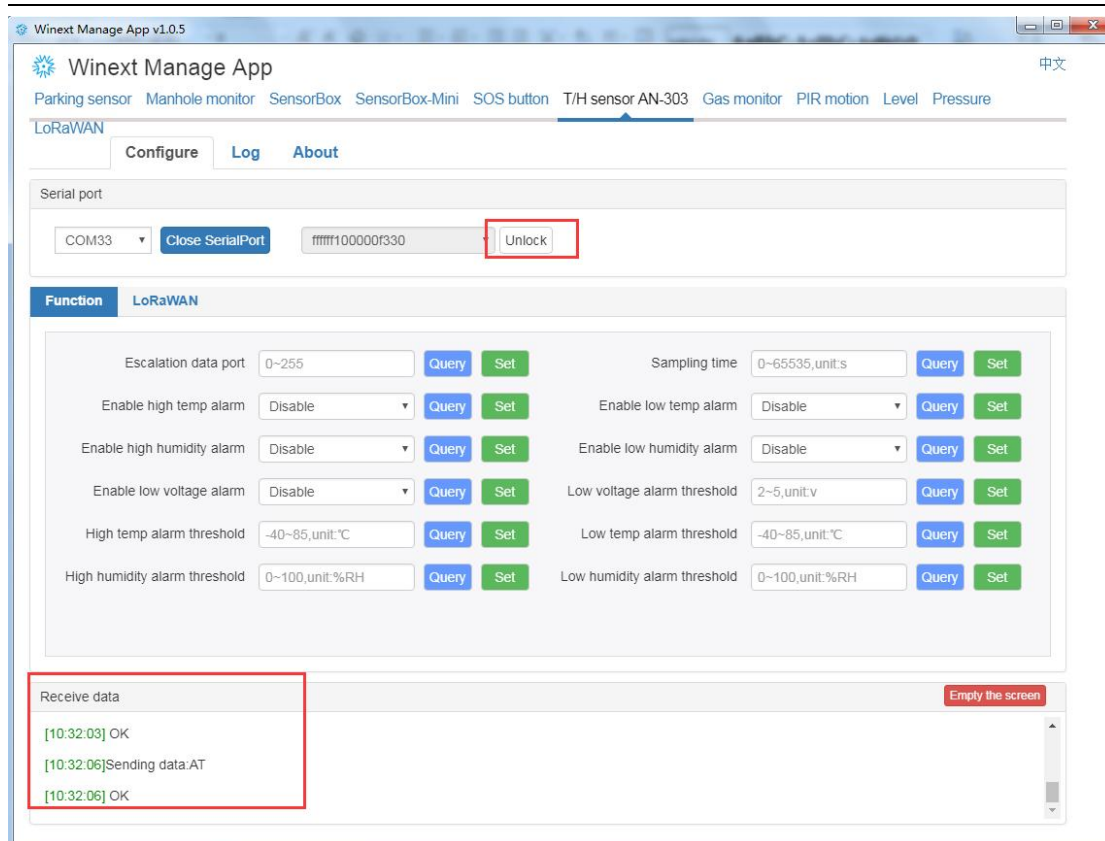
b. Open the web-based configuration tool software- Winext Manage App. Click T/H sensor AN-303 icon (it works with AN-103A) and open serial port. Please follow step 1,2,3.



c. Turn off the device and turn it on later. Choose the device's DevEUI and lock its address. Please follow step 1,2.



d. If the device is locked successfully, it will return OK at the bottom message box.



After successfully lock, you can set and query the parameters including function parameters and LoRaWAN parameters.

e.g.: How to query high temperature threshold in function parameters?

Click Query icon, it will show its current high temperature threshold set at 45°C at the bottom message box.

Winext Manage App 中文

Parking sensor Manhole monitor SensorBox SensorBox-Mini SOS button **T/H sensor AN-303** Gas monitor PIR motion Level Pressure

LoRaWAN

Configure Log About

Serial port

COM33 Close SerialPort fffff100000f330 Unlock

Function LoRaWAN

Escalation data port	0-255	Query Set	Sampling time	0-65535,unit:s	Query Set
Enable high temp alarm	Disable	Query Set	Enable low temp alarm	Disable	Query Set
Enable high humidity alarm	Disable	Query Set	Enable low humidity alarm	Disable	Query Set
Enable low voltage alarm	Disable	Query Set	Low voltage alarm threshold	2-5,unit:v	Query Set
High temp alarm threshold	-40-85,unit:°C	Query Set	Low temp alarm threshold	-40-85,unit:°C	Query Set
High humidity alarm threshold	0-100,unit:%RH	Query Set	Low humidity alarm threshold	0-100,unit:%RH	Query Set

Receive data Empty the screen

```
[10:33:25] OK
[10:33:25]Sending data:AT+WRNTEMPH=?
[10:33:25] +WRNTEMPH:45.0 OK
```

e.g.: in order to set the high temperature threshold as 60°C, enter 60 in the text box and click Query icon. Once setting successfully, it will return OK at the bottom message box.

Winext Manage App

Parking sensor Manhole monitor SensorBox SensorBox-Mini SOS button **T/H sensor AN-303** Gas monitor PIR motion Level Pressure

LoRaWAN

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Function LoRaWAN

Escalation data port	0-255	Query Set	Sampling time	0-65535,unit:s	Query Set
Enable high temp alarm	Disable	Query Set	Enable low temp alarm	Disable	Query Set
Enable high humidity alarm	Disable	Query Set	Enable low humidity alarm	Disable	Query Set
Enable low voltage alarm	Disable	Query Set	Low voltage alarm threshold	2-5,unit:v	Query Set
High temp alarm threshold	60	Query Set	Low temp alarm threshold	-40-85,unit:°C	Query Set
High humidity alarm threshold	0-100,unit:%RH	Query Set	Low humidity alarm threshold	0-100,unit:%RH	Query Set

Receive data Empty the screen

```
[10:34:32] OK
[10:34:34]Sending data:AT+WRNTEMPH=60
[10:34:34] OK
```

It is in the same way to set and query LoRaWAN parameters as that to set and query device function parameters.

Note:

After the device is reboot, it will be in the wireless configuration receiving mode. Please click "Lock" within five seconds. After five seconds, the device will automatically change from the configuration mode and try to get the network connection.

After successful lock, if there is no operation within 15 seconds, the device will exit the wireless configuration mode and try to get the network connection.

3.4 Remote configuration

Fport: 220

By issuing AT command on the platform to complete remote configuration.

e.g.: AT command AT+REBOOT conversion

AT command	Hexadecimal
A+REBOOT	41 54 2B 52 45 42 4F 4F 54 0D 0A

Note:

It is fine to add FF before the converted data

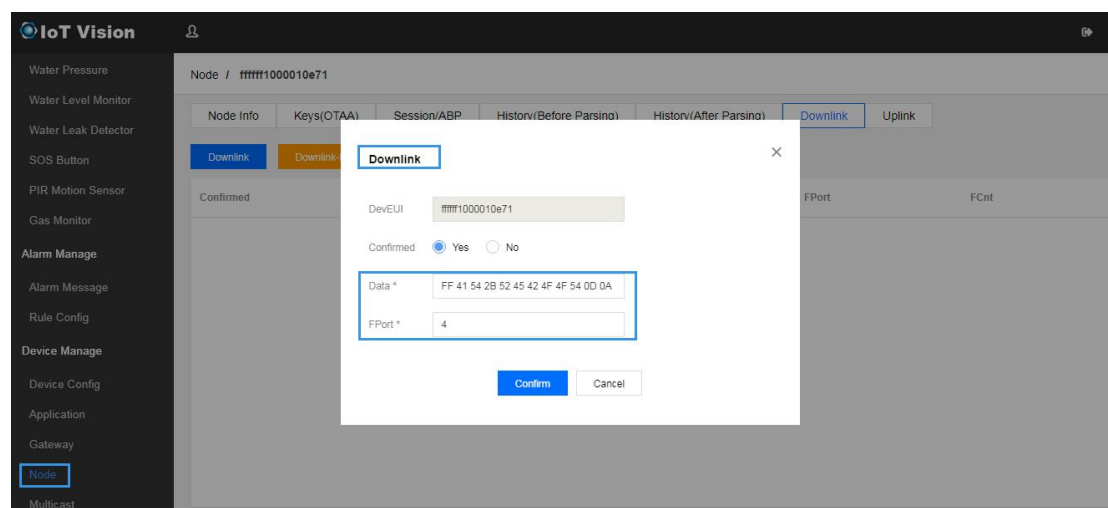
e.g.: FF 41 54 2B 52 45 42 4F 4F 54 0D 0A

And the last four character can be omitted

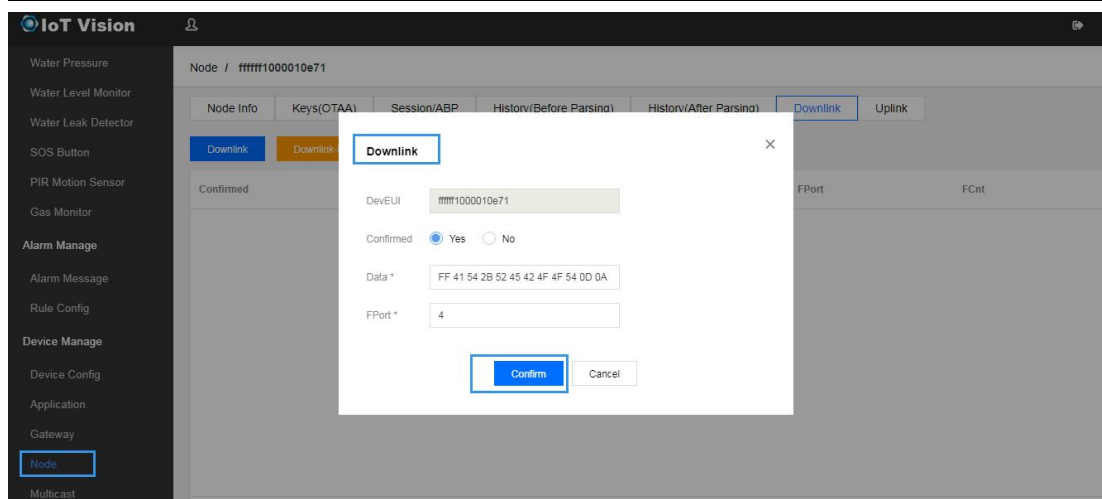
e.g.: 41 54 2B 52 45 42 4F 4F 54 0D 0A

Here is an example of how to operate at Winext web platform **IoT Vision**.

1. Login IoT Vision(<http://iot.smartkit.io>) for node management, click downlink icon and enter data and Fport number.



2. Click confirm icon. The platform will downlink it after receiving uplink data from the device according to Class A protocol.



4.Communication format

Fport: 45. Here are the frame definitions below:

No.	Definition	Description
①	Device ID	0x01 fixed value
②	Frame format	0x00: Heartbeat frame, 0x01: Data frame
③	Anti-dismantle	0x00: Not dismantle; 0x01:Dismantled
④	Temperature status	0x00: Normal 0x01: High temperature threshold alarm 0x02: Low temperature threshold alarm
⑤	⑤⑥ works as a combination of 16 bit signed number. It is 10 times of the current temperature	⑤ is high level bite
⑥		⑥ is low level bite
⑦	Humidity status	0x00: Normal 0x01: High humidity 0x02: Low humidity
⑧	⑧⑨works as a combination of 16 bit no unsigned number. It is 100 times of the current humidity	⑧ is high level bit
⑨		⑨ is low level bit
⑩	⑧⑨works as a combination of 16 bit no unsigned number. It is 100 times of the current power	⑩ is high level bite, the highest level indicates current power status: 0: Normal 1: Low power
⑪		⑪ is low level bite

5.Cautions

1. Prohibit the use in the conditions of salt spray, acid, alkaline and organic solvents.
2. Avoid using in the conditions with large dust.
3. Prolonged exposure to sunlight or intense ultraviolet radiation is prohibited, which will degrade the performance.
4. It is forbidden to use in high concentration of chemical pollution conditions, which will damage induction part of the device.
5. When detecting a room humidity, please do not place the device too close to the wall or the position where the air is not circulating.
6. If it needs to carry out long-distance signal transmission, please be aware of attenuation of the signal.
7. Please pay attention to the applicable scope and condition. Please read this manual carefully and keep it for future reference.

Version	Description	Editor	Date
V1.0	Initial version	Peng Su	18th-May-2019

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This is a product manual as an installation, operation and use file. Specifications subject to change are without notice. For more information, please call us or contact the sales staff.