



WTS506

IoT Weather Station

User Guide

Contents

Chapter 1. Preface.....	4
Copyright Statement.....	4
Safety Instruction.....	4
Revision History.....	4
Chapter 2. Product Introduction.....	6
Overview.....	6
Features.....	6
Chapter 3. Hardware Introduction.....	7
Packing List.....	7
Button and LED Indicator	8
Dimensions(mm).....	8
Chapter 4. Power Supply.....	10
Chapter 5. Quick Start.....	11
Access the Sensor via NFC.....	11
Access the Sensor via USB.....	12
Configure the Network Setting.....	12
Chapter 6. Operation Guide.....	14
LoRaWAN [®] Settings.....	14
Time Synchronization.....	16
General Settings.....	18
Threshold Settings.....	20
Maintenance.....	21
Upgrade.....	21
Backup and Restore.....	23
Reset to Factory Default.....	25
Chapter 7. Installation.....	27
Installation Locations.....	27

Solar Panel and WTS Hub Installation.....	27
WTS506 Sensor Installation.....	28
Chapter 8. Device Maintenance.....	30
Chapter 9. Uplink and Downlink.....	31
Overview.....	31
Uplink Data.....	31
Basic Information.....	31
Periodic Report.....	32
Alarm Report.....	33
Historical Data.....	34
Downlink Command.....	35
General Settings.....	35
Time Settings.....	36
Threshold Settings.....	36
Historical Data Enquiry.....	38
Chapter 10. Services.....	41

Chapter 1. Preface

Copyright Statement

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Milesight reserves the right to change this guide and the specifications without prior notice. The latest specifications and user documentation for all Milesight products are available on our official website <http://www.milesight.com>

Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss. Milesight will not shoulder responsibility for any loss or damage resulting from not following the instructions of this operating guide.



CAUTION:

Injury or equipment damage may be caused if any of these cautions are neglected.

- The device must not be disassembled or remodeled in any way.
- In order to protect the security of the device, please change device password when first configuration. The default password is 123456.
- The device is not intended to be used as a reference sensor, and Milesight will not should responsibility for any damage which may result from inaccurate readings.
- Do not place the device close to objects with naked flames.
- Do not place the device where the temperature is below/above the operating range.
- Make sure electronic components do not drop out of the enclosure while opening.
- The device must never be subjected to shocks or impacts.

Revision History

Release Date	Version	Description
Oct.10, 2022	V 1.0	Initial version

Release Date	Version	Description
Sept. 5, 2023	V 1.1	<ol style="list-style-type: none"> 1. Add threshold alarm feature 2. Change rainfall related payload definition 3. Add maintenance note

Chapter 2. Product Introduction

Overview

IoT Weather Station is an all-in-one LoRaWAN[®] weather monitoring system for various atmospheric conditions, such as temperature, humidity, wind speed, wind direction, barometric pressure and rainfall. Consisting of 3 main parts, WTS Sensors, WTS Hub and solar panel, IoT Weather Station is designed to withstand the most challenging weather conditions and is easy to install in different scenarios to be widely used in meteorology, smart agriculture, smart building, etc.

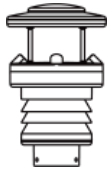
Sensor data is transmitted using LoRaWAN[®] technology. Compliant with Milesight LoRaWAN[®] gateway and Milesight IoT Cloud solution, users can manage all sensor data and trigger other sensors or appliances easily via webpage or mobile App remotely.

Features

- Integrated with multiple sensors like humidity, temperature, barometric pressure, wind speed, wind direction, rainfall, etc.
- Waterproof, UV-proof and salt spray resistant enclosure for outdoor harsh environment applications
- High power solar powered with chargeable batteries backup
- Store locally more than 19, 000 historical records and support retransmission to ensure no data miss
- Easy to carry and install
- Ultra-wide-distance wireless transmission up to the line of sight of 15 km in rural areas
- Equipped with NFC for easy and quick configuration
- Compliant with standard LoRaWAN[®] gateways and network servers
- Quick and easy management with Milesight IoT Cloud

Chapter 3. Hardware Introduction

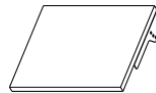
Packing List



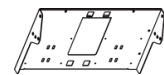
1 × WTS Sensor



1 × WTS Hub



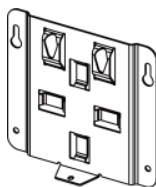
1 × Solar Panel (With Bracket)



1 × Solar Panel Mounting Bracket



1 × Sensor Cable



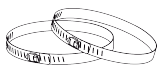
1 × WTS Hub Mounting Bracket



5 × Fixing Screws



4 × Solar Panel Screws Kits



2 × Hose Clamps



1 × Mounting Bracket



1 × Bent Pipe



3 × Hex Socket Cap Mounting Screws



1 × Quick Start Guide



1 × Warranty Card



Note:

If any of the above items is missing or damaged, please contact your sales representative.

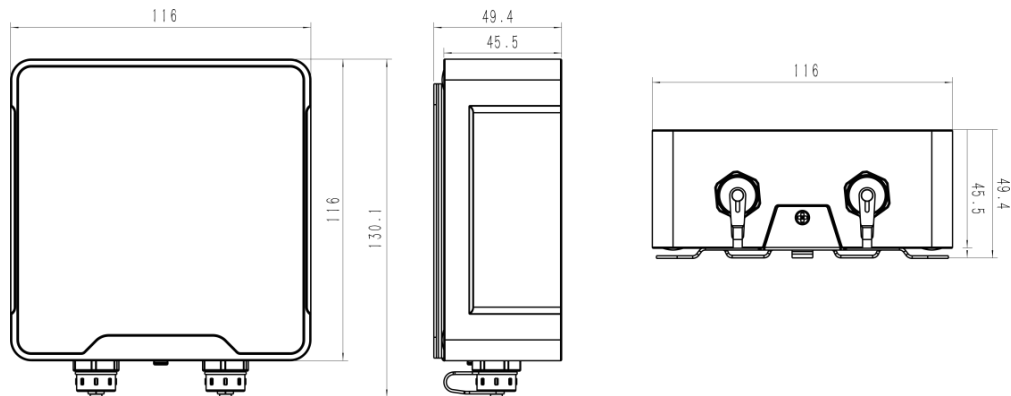
Button and LED Indicator

The LED indicator and power button are inside the WTS Hub device. Switch on/off and reset can also be configured via NFC.

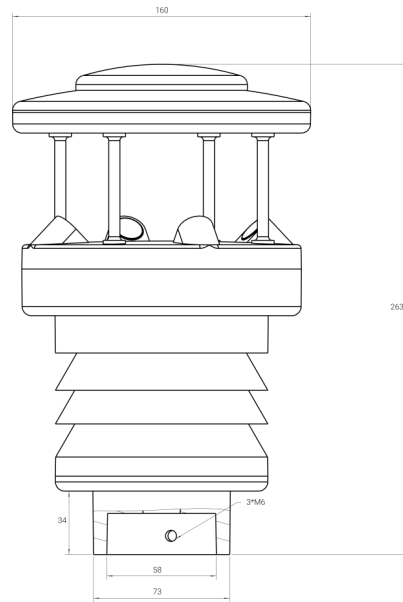
Function	Action	LED Indicator
Power On	Press and hold the button for more than 3 seconds.	Off → On
Power Off		On → Off
Check On/Off Status	Quickly press the power button for within 3 seconds	Light On: Device is on.
		Light Off: Device is off.
Reset to Factory Default	Press and hold the button for more than 10 seconds.	Blink 3 times.

Dimensions(mm)

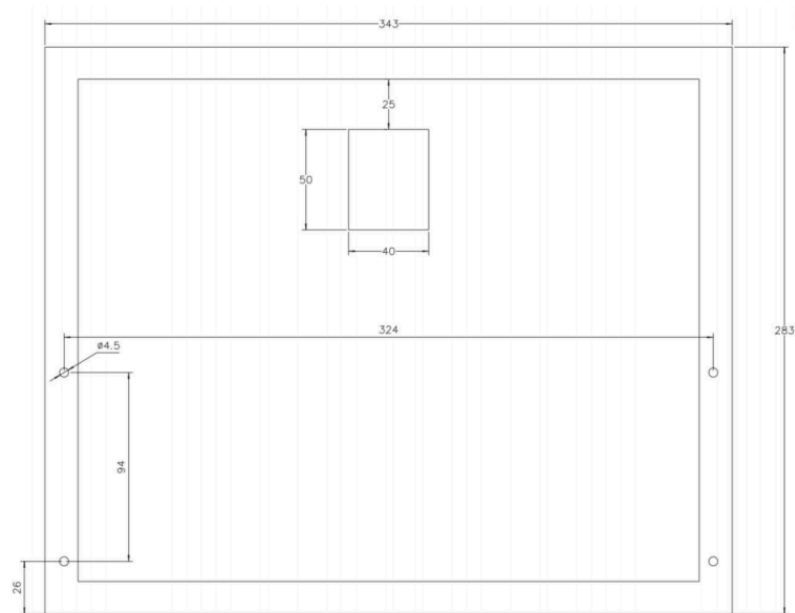
WTS Hub



WTS506



Solar Panel



Chapter 4. Power Supply

The device can be powered by a [solar panel](#). In the meantime, the internal batteries will also be charged. When the external supply is disconnected or there is not enough power for the solar panel, device can be powered by the internal batteries.




Note:

The device can not be charged when its temperature is more than 45°C. Please avoid direct exposure of the device sunlight.

Chapter 5. Quick Start

This chapter describes how to access the status and configuration page of the device.

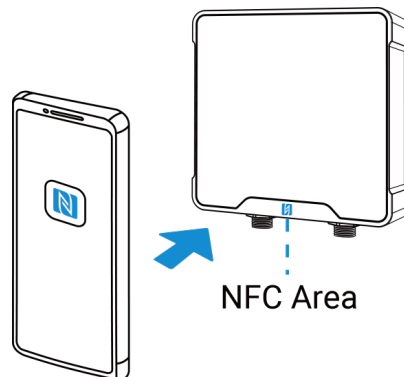
Access the Sensor via NFC

1. Download and install “Milesight ToolBox” App from Google Play or Apple Store on an NFC-supported smartphone.
2. Enable NFC function on the smartphone.
3. Launch Milesight ToolBox, and select the default mode as NFC.
4. Attach the smart phone with NFC area to the device and click  to read device information. Basic information, data, and settings of the device will be shown on the Milesight ToolBox App if it's recognized successfully.
5. Adjust the settings on the App, then attach the smartphone with NFC area to the device and click **Write** to write the settings. After writing, reread the device to check if the configuration is written well.



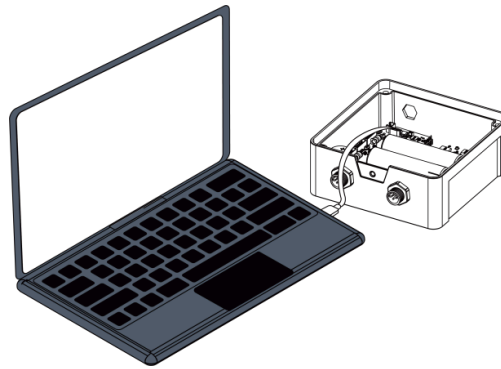
Note:

- Ensure the location of smartphone NFC area and it's recommended to take off phone case.
- If the smart phone fails to read/write configurations via NFC, keep the phone away and back to try again.
- The default device password is 123456. Please change a new password for security.



Access the Sensor via USB

1. Download ToolBox software from [Milesight website](#).
2. Release the back panel of WTS Hub and connect the device to computer via Type-C port.
3. Open ToolBox software, select type as “General” and select the serial port as USB port, then type the login password (Default password: 123456) to log in to the device to check or configuring the device. It's suggested to change the default password for security reasons.



Configure the Network Setting

1. Go to **Network** settings page, select the join type as OTAA or ABP as required.



Note:

OTAA mode is required if you connect device to Milesight IoT Cloud.

2. Select supported frequency the same as LoRaWAN[®] gateway.



Note:

Set the channel index as 8-15 for US915 or AU915 if using default settings of Milesight gateways.

Device

Network

LoRaWAN

* Support Frequency

US915

Enable Channel Index ⓘ

8-15



Index	Frequency/MHz ⓘ
0 - 15	902.3 - 905.3
16 - 31	905.5 - 908.5
32 - 47	908.7 - 911.7
48 - 63	911.9 - 914.9
64 - 71	903 - 914.2



3. Keep other settings by default and click **Write** to save the settings.

Chapter 6. Operation Guide

LoRaWAN[®] Settings

This chapter describes the LoRaWAN[®] network settings of device.

Parameter	Description
Device EUI	<p>Unique ID of the device which can be found on the device.</p> <div>  Note: please contact sales for device EUI list if you have many units. </div>
App EUI	The default App EUI (join EUI) is 24E124C0002A0001.
Application Port	The port used for sending and receiving data, the default port is 85.
LoRaWAN [®] Version	V1.0.2 and V1.0.3 are available.
Work Mode	It's fixed as Class A.
Confirmed Mode	If the device does not receive ACK packet from network server, it will resend data once.
Join Type	<p>OTAA and ABP mode are available.</p> <div>  Note: it's necessary to select OTAA mode if connecting device to Milesight IoT Cloud. </div>
Application Key	Appkey for OTAA mode, default value: "Device EUI" + "Device EUI" (since Q4 of 2025). Example: 24e124123456789024e1241234567890

Parameter	Description
	 Note: <ul style="list-style-type: none"> • The default value of earlier devices is 5572404C696E6B4C6F52613230313823. • Please contact sales before purchase if you require random App Keys.
Network Session Key	Nwkskey for ABP mode, the default is 5572404C696E6B4C6F52613230313823.
Application Session Key	Appskey for ABP mode, the default is 5572404C696E6B4C6F52613230313823.
Device Address	DevAddr for ABP mode, default is the 5 th to 12 th digits of SN.
Rejoin Mode	<p>Reporting interval ≤ 35 mins: the device will send a specific number of Link-CheckReq MAC packets to the network server every reporting interval or every double reporting interval to validate connectivity; If there is no response, the device will re-join the network.</p> <p>Reporting interval > 35 mins: the device will send a specific number of Link-CheckReq MAC packets to the network server every reporting interval to validate connectivity; If there is no response, the device will re-join the network.</p>  Note: <ol style="list-style-type: none"> 1. Only OTAA mode supports rejoin mode. 2. The actual sending number is Set the number of packets sent +1.
Supported Frequency	<p>Enable or disable the frequency to send uplinks. If frequency is one of CN470/AU915/US915, enter the index of the channel to enable in the input box, making them separated by commas.</p> <p>Examples:</p>

Parameter	Description
	1, 40: Enabling Channel 1 and Channel 40 1-40: Enabling Channel 1 to Channel 40 1-40, 60: Enabling Channel 1 to Channel 40 and Channel 60 All: Enabling all channels Null: Indicate that all channels are disabled
ADR Mode	Enable or disable network server to adjust Spreading Factor, Bandwidth and Tx Power to optimize data rates, airtime and energy consumption in the network.
Spreading Factor	If ADR mode is disabled, the device will send uplink data following this SF parameter. The higher the spreading factor, the longer the transmission distance, the slower the transmission speed and the more the consumption.
Tx Power	Tx power (transmit power) refers to the strength of the outgoing signal transmitted by the device. This is defined by LoRa alliance.
RX2 Data Rate	RX2 data rate to receive downlinks.
RX2 Frequency	RX2 frequency to receive downlinks. Unit: Hz

Time Synchronization

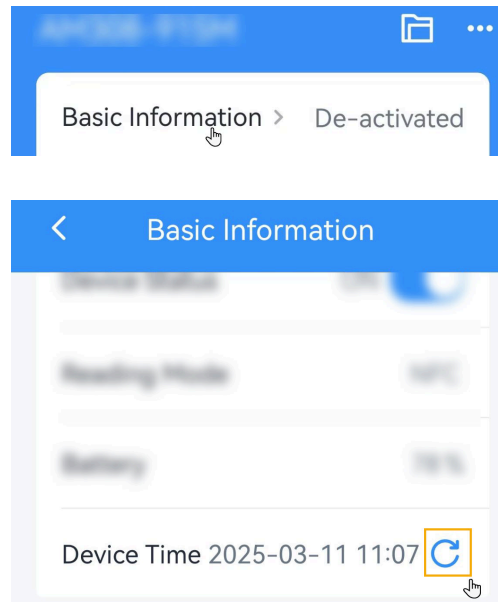
Sync via ToolBox Software

Click **Sync** to sync the device time with time zone from the PC.

Channel Mask:	0003
Uplink Frame-counter:	86
Downlink Frame-counter:	0
Device Time:	2022-10-10 07:26:15 Sync

Sync via ToolBox App

After reading the device via Milesight ToolBox App, sync the device time with time zone from the smart phone.



Sync via Network Server

This requires to ensure the LoRaWAN[®] network server supports device time synchronization feature. Example: Milesight gateway embedded NS.

1. Set the LoRaWAN[®] version of the device to V1.0.3.
2. Connect the device to the network server. After joining the network, the device will send a DeviceTimeReq MAC command to enquire the time from network server.



Note:

- This only supports to get the time but not time zone. The time zone can be configured by ToolBox App or downlink command.
- The device will send the DeviceTimeReq command every 5 days since the last sync.

General Settings

General
Threshold

Temperature Unit ⓘ
°C


Reporting Interval
- 1 + min

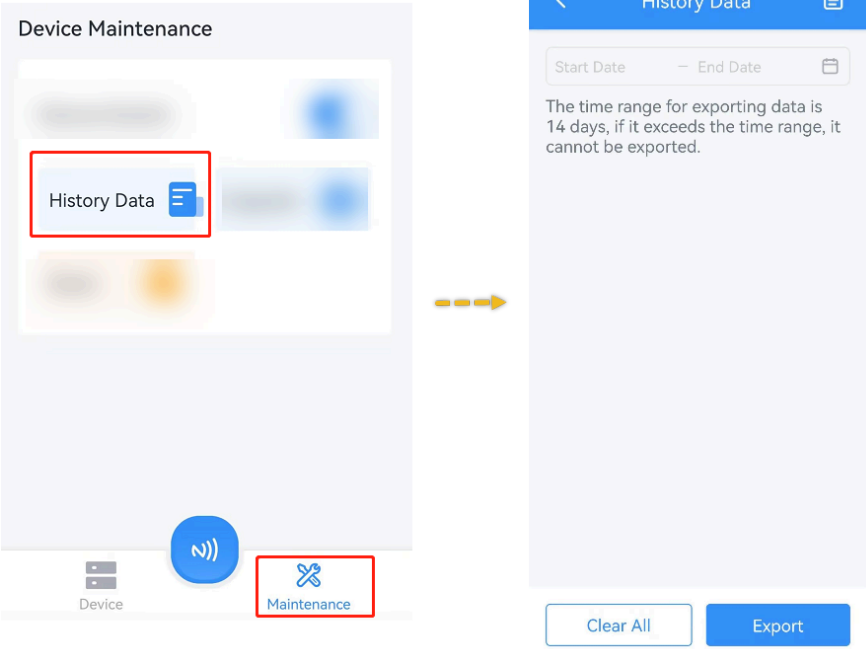

Data Storage ⓘ
☐


When Power is Restored
On

Rainfall Accumulation Phase
24h 0min

Change Password
☐

Parameter	Description
Temperature Unit	<p>Change the temperature unit displayed on the ToolBox.</p> <div>  Note: <ol style="list-style-type: none"> The temperature unit in the reporting package is fixed as Celsius(°C). Please modify the threshold settings if the unit is changed. </div>
Reporting Interval	Reporting interval of transmitting weather data and battery level to network server. Default: 10 mins, Range: 1-1080 mins.
Data Storage	Disable or enable to store periodic report data locally. The stored data can be exported as CSV format file and saved to smartphone via ToolBox.

Parameter	Description
	<div data-bbox="548 289 1409 934">  </div> <div data-bbox="560 1003 1409 1367"> <p> Note:</p> <ol style="list-style-type: none"> 1. It is necessary to sync the time to ensure the data is stored in correct time. 2. The device will still store the data even the network status is de-activated. 3. ToolBox App can only export the last 14 days' data at most. </div>
Data Retransmission	<p>Disable or enable data retransmission. When the device detects the network status is de-activated via Rejoin Mode, the device will record a data lost time point and re-transmit the lost data after device re-connects to the network.</p>

Parameter	Description
	 Note: <ol style="list-style-type: none"> 1. This setting only takes effect when Data Storage is enabled. 2. If the device is rebooted or re-power when data retransmission is not completed, the device will re-send all retransmission data again after device is reconnected to the network. 3. If the network is disconnected again during data retransmission, it will only send the latest disconnected data. 4. The default report data retransmission interval is 600s, this can be changed via downlink command. 5. The reported format of retransmission data will include timestamps and is different from periodic report data. 6. This setting will increase the uplink frequencies and shorten the battery life.
When Power is Restored (Restoration of Power)	If the device loses power and returns to power supply, the device will be on or off according to this parameter.
Rainfall Accumulation Phase	After the rainfall accumulates up to this time range or up to 1000 mm, it will clear and re-count the accumulated rainfall value. There are two parameters to set the time range, range: 0~48 h
Change Password	Change the password for ToolBox App to write this device or ToolBox software to log in this device.

Threshold Settings

If the threshold is triggered, the device will upload the alarm packet once and collect the data at the specified interval.

General
Threshold

Temperature
☒

Above / °C

Below / °C

Wind Speed
☐

Accumulated Rainfall
☐

Barometric Pressure
☐

Parameters	Description
Temperature	When the temperature is over or below the threshold value, the device will report an alarm packet.
Wind Speed	When the wind speed is over the threshold value, the device will report an alarm packet.
Accumulated Rainfall	When the accumulated rainfall is over the threshold value, the device will report an alarm packet.
Barometric Pressure	When the barometric pressure is over the threshold value, the device will report an alarm packet.
Data Collecting Interval	Collecting interval of sensor to collect the data . Range: 1~1080min.

Maintenance

Upgrade

Upgrade via ToolBox App

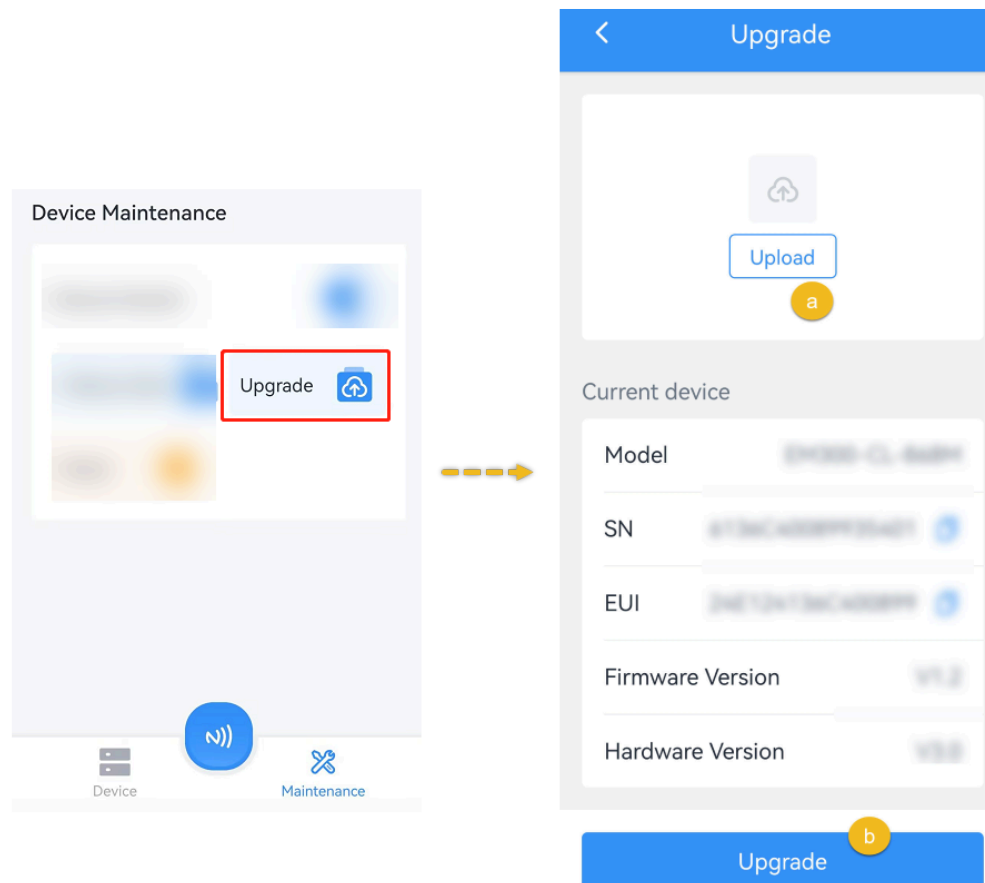
1. Download firmware from Milesight official website to your smartphone.
2. Read the target device via ToolBox App, click **Upgrade** to upload the firmware file.

3. Click **Upgrade** to upgrade the device.



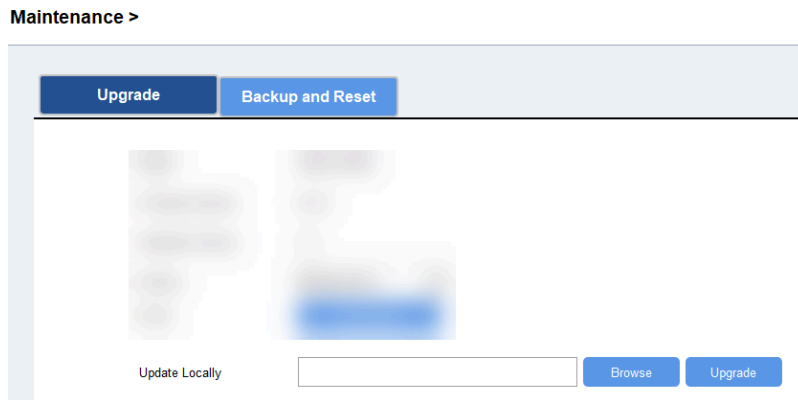
Note:

- Operation on ToolBox is not supported during an upgrade.
- Only Android version ToolBox supports the upgrade feature.



Upgrade via ToolBox Software

1. Download firmware from Milesight official website to your computer.
2. Connect the device to computer via USB port, then log in to the device via ToolBox software.
3. Go to **Maintenance > Upgrade** page, click **Browse** to upload the firmware file and click **Upgrade** to upgrade the device.

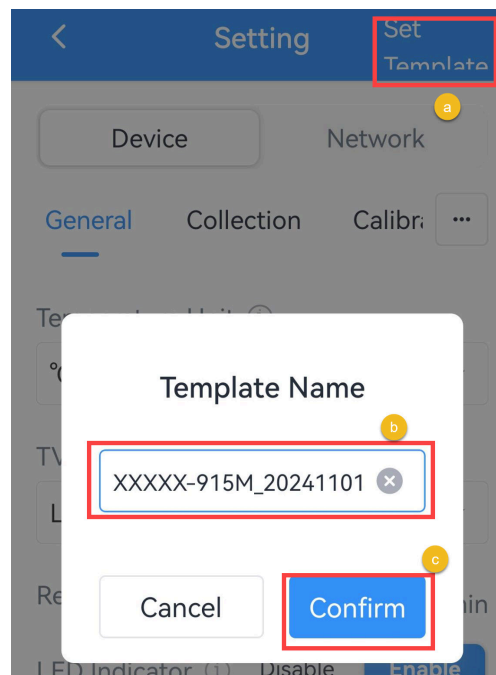


Backup and Restore

This device supports configuration backup for easy and quick device configuration in bulks. Backup and restore is allowed only for devices with the same model and frequency band.

Backup and Restore via ToolBox App

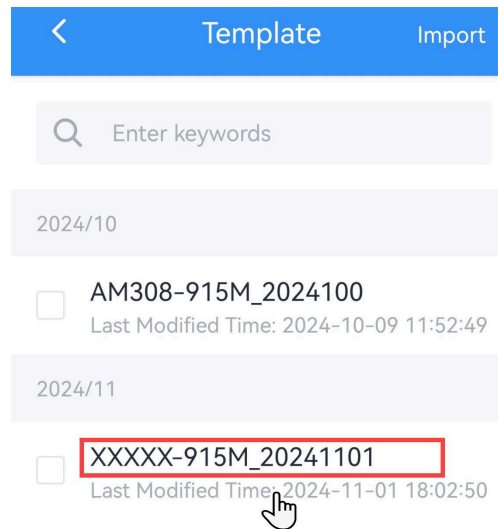
1. Launch ToolBox App, attach the NFC area of smartphone to the device to read the configuration.
2. Edit the configuration as required, click **Set Template** to save current configuration as a template to the ToolBox App.



3. Go to **Device > Template** page.



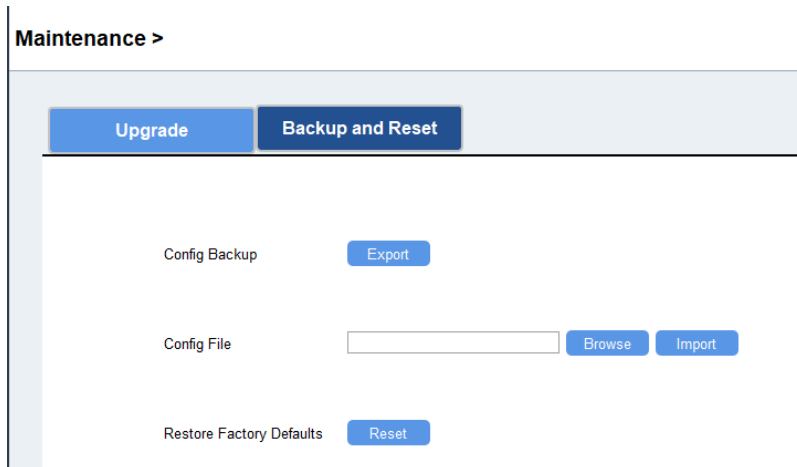
4. Select and click the target template, click **Write** to import the configuration to target devices.



5 (Optional). Check the box of the target template, click **Export** to export this template as JSON format file and save it to the smartphone, click **Delete** to delete this template from your ToolBox App.

Backup and Restore via ToolBox Software

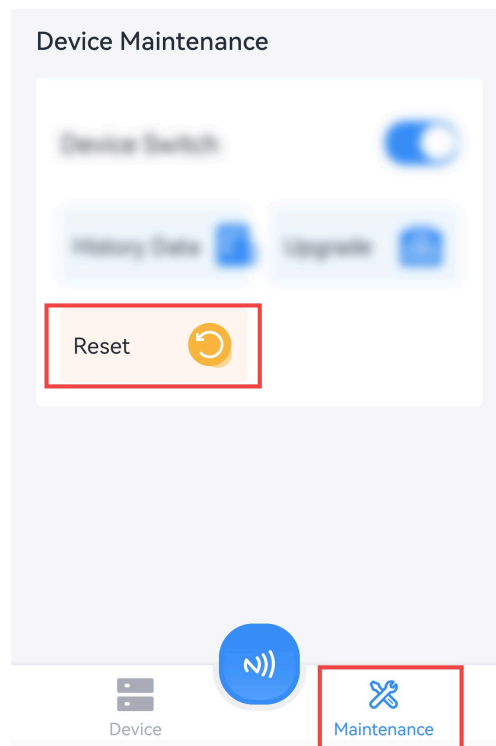
1. Connect the device to a computer via USB port, then log in to the device via ToolBox software.
2. Configure the device and save the settings.
3. Go to **Maintenance > Upgrade** page, click **Export** to save the template file to the computer.
4. Connect another target device to the same computer, go to **Maintenance > Upgrade** page to import the template file.



Reset to Factory Default

Via Hardware: Hold on the reset button for more than 10s until the LED indicator quickly blinks.

Via ToolBox App: Click **Reset** and attach the smartphone to device to reset the device.



Via ToolBox Software: Go to **Maintenance > Backup and Reset** page, click **Reset** to reset the device.

Upgrade

Backup and Reset

Config Backup

Export

Config File

Browse

Import

Restore Factory Defaults

Reset

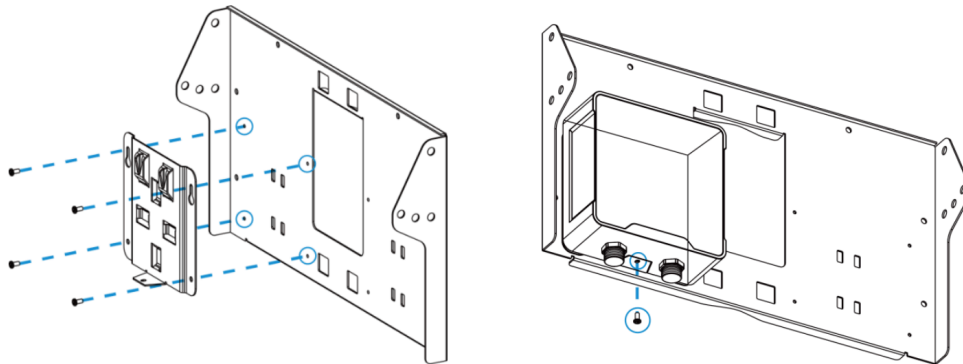
Chapter 7. Installation

Installation Locations

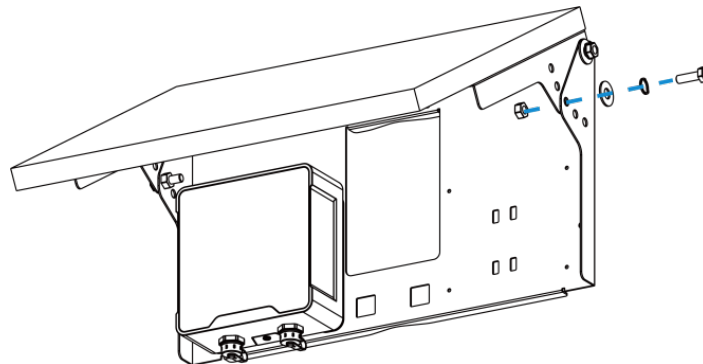
- Within the communication range of LoRaWAN[®] gateway.
- No high buildings or barriers (trees, telegraph poles) around; the distance between the IoT weather station and the nearest obstacle is preferably 10 times the height of the obstacle.
- Keep away from radars, transmitters and any other instruments which can generate electrical interference; keep a distance of more than 2 meters between sensor and radar.
- Keep away from heat sources like chimney, vents, etc.
- No fence plants (higher than 1m) around weather station within 10m.

Solar Panel and WTS Hub Installation

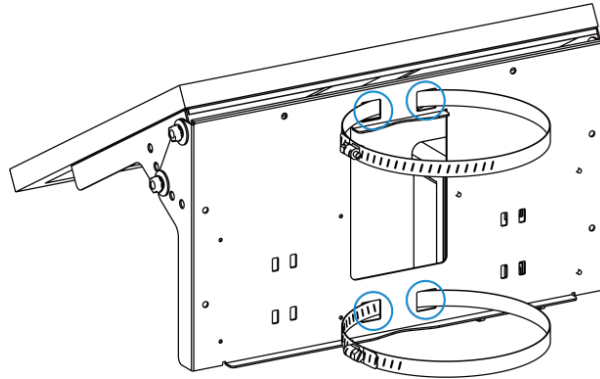
Step 1: Fix the hub mounting bracket to the solar panel bracket with 4 fixing screws, then put the WTS Hub to the bracket fix the bottom of hub to the bracket with a fixing screw.



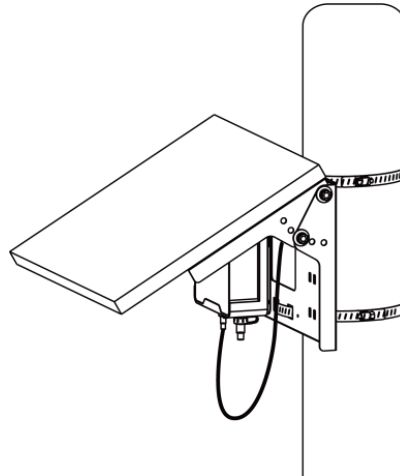
Step 2: Adjust the angle of solar panel brackets (20°, 40° or 60° is optional) according to the installation environment, then fix the two sides of bracket with screw kits.



Step 3: Straighten the hose clamps and slide them through the rectangular rings in the solar panel's bracket, wrap the hose clamps around the pole. After that use a screwdriver to tighten the locking mechanism by turning it clockwise.

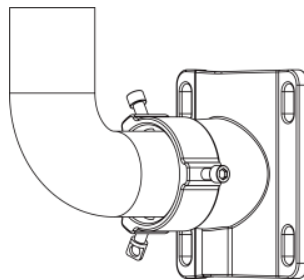


Step 4: Connect the cable of solar panel to left interface of WTS Hub.

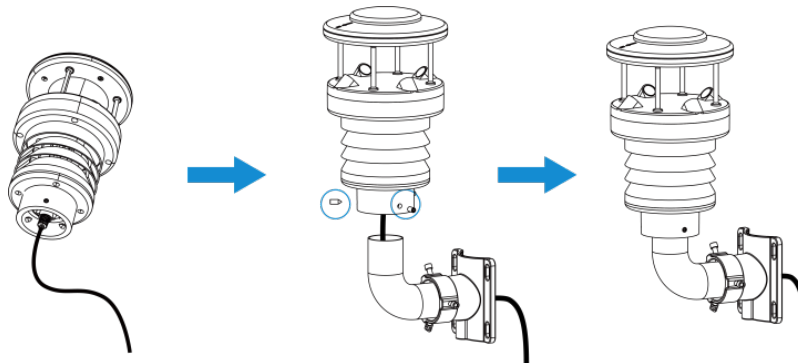


WTS506 Sensor Installation

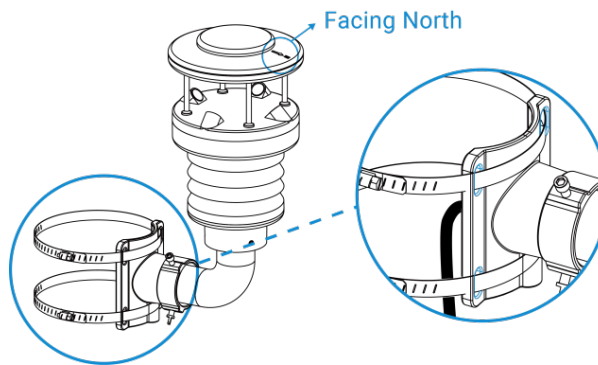
Step 1: Connect the bent pipe to the mounting bracket, tighten the 2 hex socket cap screws with screwdriver and tighten the insurance screw by hand to ensure the two parts are fixed well.



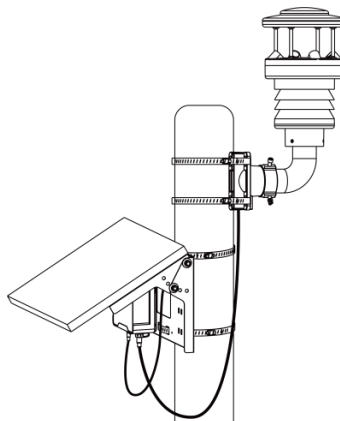
Step 2: Connect one side of sensor cable to WTS Sensor and tighten the cable, pass the cable through the bent pipe and bracket, then connect the pipe to the bottom of sensor and fix both parts with 3 hex socket cap mounting screws.



Step 3: Straighten the hose clamps and slide them through the rings in the bracket, wrap the hose clamps around the pole. After that use a screwdriver to tighten the locking mechanism by turning it clockwise. When installing, ensure the arrow on the sensor facing north according to a compass.



Step 4: Connect the other side of sensor cable to the right interface of WTS Hub.



Chapter 8. Device Maintenance

- Clean the solar panel surface on schedule or according local environmental conditions. The solar panel may be affected by environmental factors such as dust, sand, and bird droppings, which can reduce their charge efficiency.
- To clean the device, wipe with a soft moistened cloth with soft detergents.
- When there is accumulated snow or ice on the surface of WTS sensor, wait for it to dissolve naturally and do not remove with tools forcibly.
- Do not destroy the surface of devices and solar panel.

Chapter 9. Uplink and Downlink

Overview

All messages are based on following format (HEX), the Data field should follow little-endian:

Channel1	Type1	Data1	Channel2	Type2	Data2	Channel3	...
1 Byte	1 Byte	N Bytes	1 Byte	1 Byte	N Bytes	1 Byte	...

For decoder examples please find files on <https://github.com/Milesight-IoT/SensorDecoders>.

Uplink Data

This chapter describes the reported data of the device.

Basic Information

The device will report a basic information packet whenever joining the network.

Item	Channel	Type	Byte	Description
Power On	ff	0b	1	Device is on
Protocol Version	ff	01	1	Example: 01=V1
Hardware Version	ff	09	2	Example: 03 10 = V3.1
Software Version	ff	0a	2	Example: 03 01 = V3.1
Device Type	ff	0f	1	00: Class A, 01: Class B, 02: Class C, 03: Class C to B
Serial Number	ff	16	8	16 digits


Example:

ff0bff ff0101 ff166454c32424650043 ff090200 ff0a0101 ff0f00		
Channel	Type	Value
ff	0b	ff
ff	01	Protocol Version: 01=V1

ff0bff ff0101 ff166454c32424650043 ff090200 ff0a0101 ff0f00		
Channel	Type	Value
ff	16	Serial Number: 6454c32424650043
ff	09	Hardware Version: 0200=V2.0
ff	0a	Software Version: 0101=V1.1
ff	0f	00: Class A

Periodic Report

The device supports to report below types of periodic report packets.

Item	Channel	Type	Byte	Description
Battery Level	01	75	1	UINT8, Unit: %
Temperature	03	67	2	INT16/10, Unit: °C
Humidity	04	68	1	UINT8/2, Unit: %RH
Wind Direction	05	84	2	INT16/10, Unit: °
Barometric Pressure	06	73	2	UINT16/10, Unit: hPa
Wind Speed	07	92	2	UINT16/10, Unit: m/s
Rainfall	08	ec	5	<p>Byte 1-4: Accumulated rainfall, UINT32/100, Unit: mm</p> <p>Byte 5: Frame counter, calculate the uplink amounts of every phase, range: 0~255</p> <div>  Note: <ul style="list-style-type: none"> • When the rainfall is cleared and start a new accumulation phase, the counter will be also cleared to 0; • When frame counter reaches 255 and not enter a new phase, it will always report 255. </div>

Example:

017564 03671001 046871 05844605 0673aa27 07929201 08ecc413000025		
Channel	Type	Value
01	75	Battery: 64 => 100%
03	67	Temperature: 10 01 => 01 10 = 272/10=27.2°C
04	68	Humidity: 73=>113/2=56.5%
05	84	Wind Direction: 46 05=> 05 46 = 1350/10=135°
06	73	Barometric Pressure: aa 27=>27 aa=10154/10=1015.4 hPa
07	92	Wind Speed: 92 01 => 01 92 = 402/10= 40.2 m/s
08	ec	Rainfall: c4 13 00 00=>00 00 13 c4=5060/100=50.6 mm, Counter=25=>37

Alarm Report

The device supports to report below types of alarm report packets.

Item	Channel	Type	Byte	Description
Temperature Alarm	83	67	3	Byte 1-2: Temperature Byte 3: 01=Threshold Alarm
Barometric Pressure Alarm	86	73	3	Byte 1-2: Pressure Byte 3: 01=Threshold Alarm
Wind Speed Alarm	87	92	3	Byte 1-2: Wind Speed Byte 3: 01=Threshold Alarm
Rainfall Alarm	88	ec	6	Byte 1-4: Rainfall Byte 5: Frame Counter Byte 6: 01=Threshold Alarm

Example:

1. Temperature threshold alarm: report when threshold alarm is triggered.

83 67 0001 01		
Channel	Type	Value
83	67	00 01 => 01 00 = 255/10=25.5°C 01= Threshold Alarm

2. Low battery level alarm: report when battery level is below to 1%.

017501		
Channel	Type	Value
01	75	Battery: 01=>1%

Historical Data

The device will report retransmission data or stored data.

Channel	Type	Byte	Description
21	ce	17	Data time stamp (4 Bytes) + Temperature (2 Bytes) + Humidity (1 Byte) + Pressure (2 Bytes) + Wind Direction (2 Bytes) + Wind Speed (2 Bytes) + Rainfall (4 Bytes)

Example:

21ce 0d755b63 0e01 64 8c27 c706 0400 10000000			
Channel	Type	Time Stamp	Value
21	ce	0d 75 5b 63 => 63 5b 75 0d=1666938125s	Temperature: 0e 01=>01 0e=270/10=27°C Humidity: 64=>100/2=50% Barometric pressure: 8c 27=>27 8c =10124/10=1012.4 hPa

21ce 0d755b63 0e01 64 8c27 c706 0400 10000000			
Channel	Type	Time Stamp	Value
			Wind Direction: c7 06=> 06 c7=1735/10=173.5° Wind Speed: 0400=>0004=4/10=0.4m/s Rainfall: 10 00 00 00=>00 00 00 10=16/100=0.16 mm

Downlink Command

This device supports downlink commands for configuration and control. The downlink application port is 85 by default.

General Settings

Item	Channel	Type	Byte	Description
Reboot	ff	10	1	ff
Report Interval	ff	03	2	UINT16, Unit: s
Restoration of Power	ff	67	1	00: Off 01: On 02: Return to Previous Working State
Rainfall Accumulation Phase	ff	6e	2	Unit: min
Data Storage	ff	68	1	00: Disable, 01: Enable
Data Re-transmission	ff	69	1	00: Disable, 01: Enable
Data Retransmission Interval	ff	6a	3	Byte 1: 00 Byte 2-3: UINT16, Unit: s, Range: 30~1200, Default: 600

Example:

1. Reboot the device.

ff10ff

2. Set report interval as 20 minutes.

ff03b004		
Channel	Type	Value
ff	03	b004=>04b0=1200s=20 minutes

Time Settings

Item	Channel	Type	Byte	Parameter
UTC Time Zone	ff	17	2	INT16/10
Device Time	ff	11	4	Unix Timestamp, UINT32, Unit: s

Examples:

1. Set time zone as UTC-2.

ff17ecff		
Channel	Type	Value
ff	17	ecff=>ff ec=-20/10=-2

2. Set the device time.

ff 11 3d 1c de 5d		
Channel	Type	Value
ff	11	3d 1c de 5d=>5d de 1c 3d=1574837309s

Threshold Settings

	Channel	Type	Byte	Description
Thresh- old Alarm	ff	06	9	Wind Speed/Pressure: CTR- L(1B)+0000+Max(2B)+00000000(4B)

	Channel	Type	Byte	Description
				Rainfall: CTRL(1B)+0000+Max_ Low(2B)+0000+Max_High (2B) CTRL: Bit0~Bit2: 010-over (maximum threshold) Bit3~Bit5: <ul style="list-style-type: none"> • 010-wind speed • 011-rainfall • 100-pressure Bit6: <ul style="list-style-type: none"> • 1=enable • 0=disable Bit7: 1
Threshold Alarm-Tem- perature	ff	06	9	Temperature: CTR- L(1B)+Min(2B)+Max(2B)+00000000(4B) CTRL: Bit0~Bit2: <ul style="list-style-type: none"> • 001-below (minimum threshold) • 010-over (maximum threshold) • 011-within • 100 -below or above Bit3~Bit5: 001 Bit6: <ul style="list-style-type: none"> • 1=enable • 0=disable

	Channel	Type	Byte	Description
				Bit7: 1
Collecting Interval	ff	bb	3	Byte 1: 01-temperature, 02-wind speed, 03-rainfall, 04-pressure Byte 2-3: collecting interval, unit: s

Example:

Set rainfall threshold alarm: rainfall is over 995.35 mm.

ff06 5a 0000 cf84 0000 0100		
Channel	Type	Value
ff	06	Ctrl: 5a=>01 011 010 010=above, 011=rainfall, 1=enable Max_value: cf 84 01 00=>00 01 84 cf=99535/100=995.35 mm

Historical Data Enquiry

The device supports data retrievability feature to send downlink command to enquire the historical data stored in the device. Before that, ensure the device time is correct and data storage feature was enabled to store data.

Command Format:

Item	Channel	Type	Byte	Description
Enquire Data in Time Point	fd	6b	4	Unix timestamp, Unit: s
Enquire Data in Time Range	fd	6c	8	Byte 1-4: Start timestamp, Unit: s Byte 5-8: End timestamp, Unit: s

Item	Channel	Type	Byte	Description
Stop Query Data Report	fd	6d	1	ff
Data Retrieval Interval	ff	6a	3	Byte 1: 01 Byte 2-3: UINT16, Unit: s, Range: 30~1200, Default: 60

Reply Format:

Item	Channel	Type	Byte	Description
Enquiry Result	fc	6b/6c	1	00: Enquiry success. The device will report the historical data according to data retrievability interval. 01: Time point or time range invalid 02: No data in this time or time range

**Note:**

1. Use [Unix Timestamp Converter](#) to calculate the time.
2. The device only uploads no more than 300 data records per range enquiry.
3. When enquiring the data in time point, it will upload the data which is closest to the search point within the reporting interval range. For example, if the device's reporting interval is 10 minutes and users send command to search for 17:00's data, if the device find there is data stored in 17:00, it will upload this data; if not, it will search for data between 16:50 to 17:10 and upload the data which is closest to 17:00.

Example:

Enquire the historical data in a time range.

fd6c 64735b63 7c885b63		
Channel	Type	Value
fd	6c	Start time: 64 73 5b 63 => 63 5b 73 64 = 1666937700s

fd6c 64735b63 7c885b63		
Channel	Type	Value
		End time: 7c 88 5b 63 => 63 5b 88 7c = 1666943100s

Reply:

fc6c00		
Channel	Type	Value
fc	6c	00: Enquiry success

21ce 0d755b63 0e01 64 8c27 c706 0400 10000000			
Channel	Type	Time Stamp	Value
21	ce	0d 75 5b 63 => 63 5b 75 0d=1666938125s	<p>Temperature: 0e 01=>01 0e=270/10=27°C</p> <p>Humidity: 64=>100/2=50%</p> <p>Barometric pressure: 8c 27=>27 8c =10124/10=1012.4 hPa</p> <p>Wind Direction: c7 06=> 06 c7=1735/10=173.5°</p> <p>Wind Speed: 0400=>0004=4/10=0.4m/s</p> <p>Rainfall: 10 00 00 00=>00 00 00 10=16/100=0.16 mm</p>

Chapter 10. Services

Milesight provides customers with timely and comprehensive technical support services. End-users can contact your local dealer to obtain technical support. Distributors and resellers can contact directly with Milesight for technical support.

Technical Support Mailbox: iot.support@milesight.com

Online Support Portal: <https://support.milesight-iot.com>

Resource Download Center: <https://www.milesight.com/iot/resources/download-center/>

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