DS03A-NB -- NB-IoT Door Sensor User Manual

Last modified by Mengting Qiu (/xwiki/bin/view/XWiki/ting) on 2023/11/15 17:57

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1. Introduction

1.1 What is DS03A-NB NB-IoT Door Sensor

The Dragino DS03A-NB is a **NB-IoT Door Sensor** for Internet of Things solution. It **detects door open/close status** and uplinks to IoT server via NB-IoT network. user o

The DS03A-NB will send periodically data every 2 hours as well as for each door open/close action. It also counts the door open times and calculates the last door open d

DS03A-NB supports **Datalog Feature,** it can save the data when there is no NB-IoT network and uplink when network recover.

DS03A-NB has the **Open Alarm Feature**, user can set this feature so the device will send an alarm if the door has been open for a certain time.

DS03A-NB is designed for outdoor use. It has a weatherproof enclosure and industrial level battery to work in low to high temperatures

DS03A-NB supports different uplink methods including **MQTT, MQTTs, UDP & TCP** for different application requirement, and support uplinks to various IoT Servers.

DS03A-NB **supports BLE configure** and **OTA update** which make user easy to use.

DS03A-NB is powered by **8500mAh Li-SOCl2 battery**, it is designed for long-term use up to several years.

DS03A-NB has optional built-in SIM card and default IoT server connection version. Which makes it works with simple configuration.
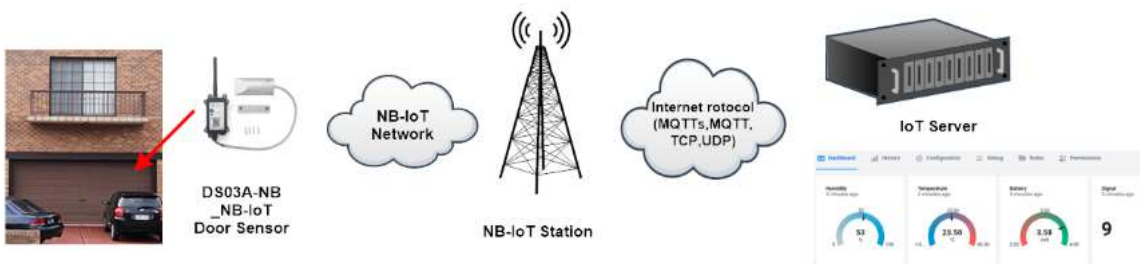
1.2 Features

- NB-IoT Bands: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66/B70/B85 @H-FDD
- Ultra-low power consumption
- Door Open/Close detect
- Door open/close statistics
- Datalog Feature
- Open Alarm Feature
- Multiply Sampling and one uplink
- Support Bluetooth v5.1 remote configure and update firmware
- Uplink on periodically
- Downlink to change configure
- 8500mAh Battery for long term use
- Nano SIM card slot for NB-IoT SIM

1.3 Specification

Common DC Characteristics:

- Supply Voltage: 2.5v ~ 3.6v
- Operating Temperature: -40 ~ 85°C

NB-IoT Spec:

NB-IoT Module: BC660K-GL

Support Bands:

- B1 @H-FDD: 2100MHz
- B2 @H-FDD: 1900MHz
- B3 @H-FDD: 1800MHz
- B4 @H-FDD: 2100MHz
- B5 @H-FDD: 860MHz

- B8 @H-FDD: 900MHz
- B12 @H-FDD: 720MHz
- B13 @H-FDD: 740MHz
- B17 @H-FDD: 730MHz
- B18 @H-FDD: 870MHz
- B19 @H-FDD: 870MHz
- B20 @H-FDD: 790MHz
- B25 @H-FDD: 1900MHz
- B28 @H-FDD: 750MHz
- B66 @H-FDD: 2000MHz
- B70 @H-FDD: 2000MHz
- B85 @H-FDD: 700MHz

Battery:

- Li/SOCl2 un-chargeable battery
- Capacity: 8500mAh
- Self Discharge: <1% / Year @ 25°C
- Max continuously current: 130mA
- Max boost current: 2A, 1 second

Power Consumption

- STOP Mode: 10uA @ 3.3v
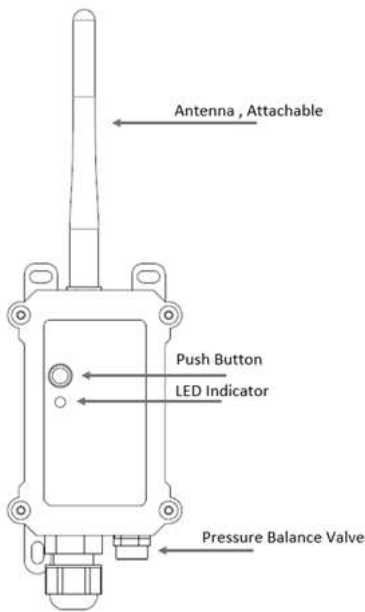- Max transmit power: 350mA@3.3v

1.4 Applications

1.5 Sleep mode and working mode

Deep Sleep Mode: Sensor doesn't have any NB-IoT activate. This mode is used for storage and shipping to save battery life.

Working Mode: In this mode, Sensor will work as NB-IoT Sensor to Join NB-IoT network and send out sensor data to server. Between each sampling/tx/rx periodically, se

1.6 Button & LEDs

Antenna , Attachable
Push Button
LED Indicator
Pressure Balance Valve

Behavior on ACT	Function	Action
Pressing ACT between 1s < time < 3s	Send an uplink	If sensor has already attached to NB-IoT network, sensor will send an uplink packet, **blue led** will blink once. Meanwhile, BLE module will be active and user can connect via BLE to configure device.
Pressing ACT for more than 3s	Active Device	**Green led** will fast blink 5 times, device will enter **OTA mode** for 3 seconds. And then start to attach NB-IoT network. **Green led** will solidly turn on for 5 seconds after joined in network. Once sensor is active, BLE module will be active and user can connect via BLE to configure device, no matter if device attach NB-IoT network or not.
Fast press ACT 5 times.	Deactivate Device	**Red led** will solid on for 5 seconds. Means device is in Deep Sleep Mode.

Note: When the device is executing a program, the buttons may become invalid. It is best to press the buttons after the device has completed the program exe

1.7 BLE connection

DS03A-NB support BLE remote configure and firmware update.
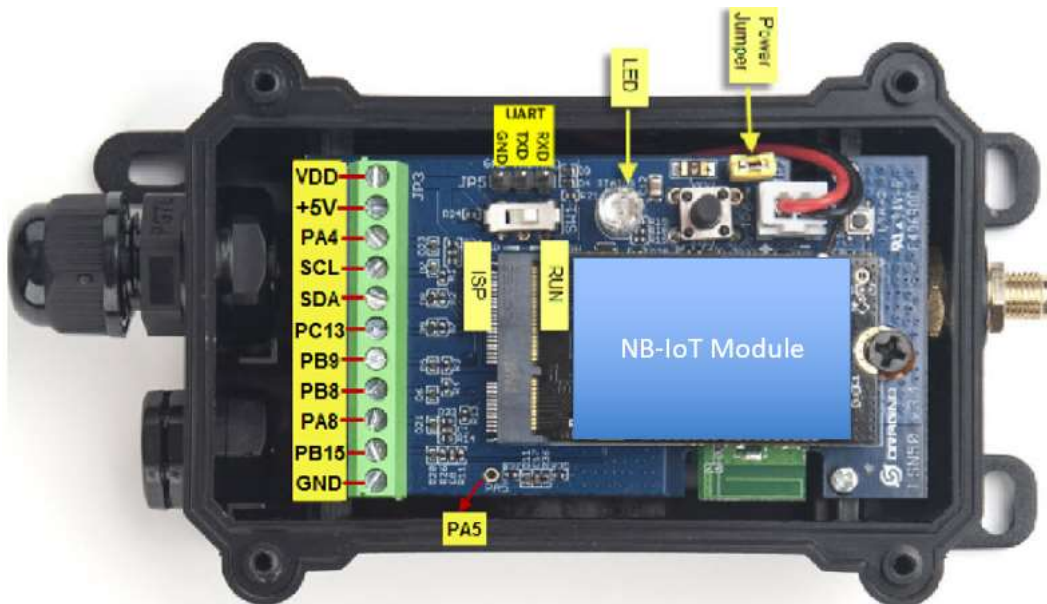
BLE can be used to configure the parameter of sensor or see the console output from sensor. BLE will be only activate on below case:

- Press button to send an uplink
- Press button to active device.
- Device Power on or reset.

If there is no activity connection on BLE in 60 seconds, sensor will shut down BLE module to enter low power mode.

1.8 Pin Definitions & Switch

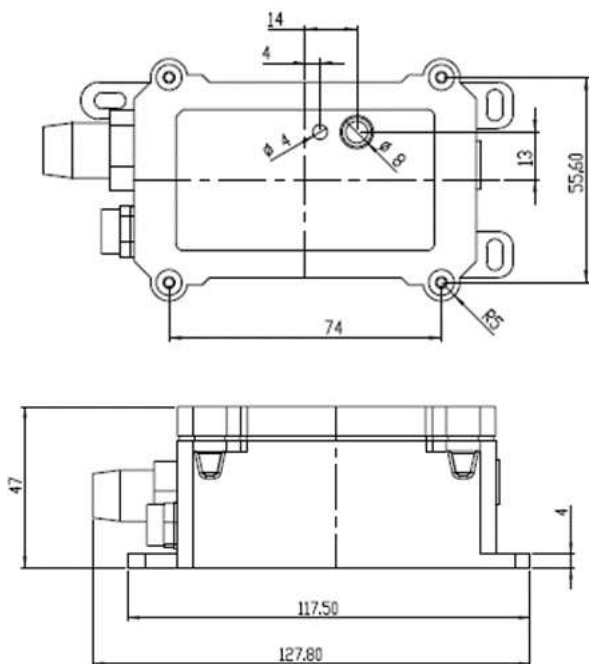## 1.8.1 Jumper JP2

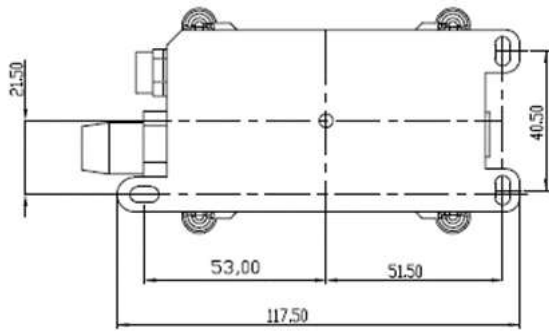Power on Device when put this jumper.

1.8.2 BOOT MODE / SW1

1) **ISP**: upgrade mode, device won't have any signal in this mode. but ready for upgrade firmware. LED won't work. Firmware won't run.

2) **Flash**: work mode, device starts to work and send out console output for further debug
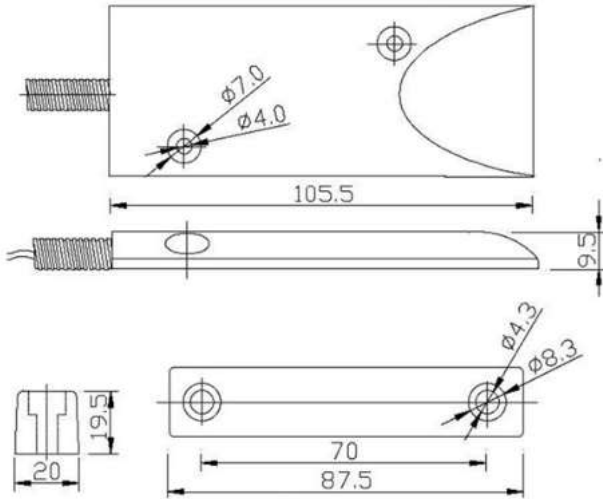
1.8.3 Reset Button

Press to reboot the device.

1.9 Mechanical

Probe Mechanical:

1.10 Magnet Distance

- Wood Door: 10mm ~ 30mm
- Iron Door: 30 ~ 45mm

2. Use DS03A-NB to communicate with IoT Server

2.1 Send data to IoT server via NB-IoT network

The DS03A-NB is equipped with a NB-IoT module, the pre-loaded firmware in DS03A-NB will get environment data from sensors and send the value to local NB-IoT netw

Below shows the network structure:
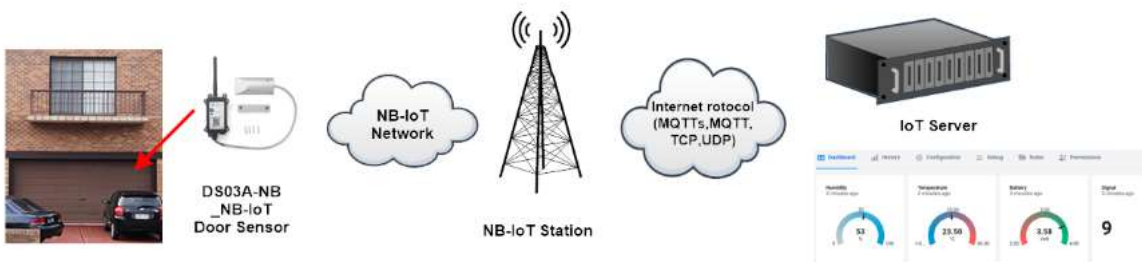
There are two version: **-GE** and **-1D** version of DS03A-NB.

GE Version: This version doesn't include SIM card or point to any IoT server. User needs to use AT Commands to configure below two steps to set DS03A-NB send data

- Install NB-IoT SIM card and configure APN. See instruction of Attach Network (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connec

- Set up sensor to point to IoT Server. See instruction of Configure to Connect Different Servers (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%2

Below shows result of different server as a glance.

Servers	Dash Board	Comments
Node-Red (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connect%20to%20IoT%20server%20for%20-NB%20%26%20-NS%20NB-IoT%20models/#H3.5A0Node-RedA028viaA0MQTT29)		
DataCake (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connect%20to%20IoT%20server%20for%20-NB%20%26%20-NS%20NB-IoT%20models/#H3.4Datacake)		
Tago.IO (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connect%20to%20IoT%20server%20for%20-NB%20%26%20-NS%20NB-IoT%20models/#H3.7A0Tago.ioA028viaA0MQTT29)		
General UDP (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connect%20to%20IoT%20server%20for%20-NB%20%26%20-NS%20NB-IoT%20models/#H3.1GeneralA0UDPA0Connection)	Raw Payload. Need Developer to design Dash Board	
General MQTT (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connect%20to%20IoT%20server%20for%20-NB%20%26%20-NS%20NB-IoT%20models/#H3.2GeneralA0MQTTA0Connection)	Raw Payload. Need Developer to design Dash Board	
ThingSpeak (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connect%20to%20IoT%20server%20for%20-NB%20%26%20-NS%20NB-IoT%20models/#H3.3A0ThingSpeakA028viaA0MQTT29)		
ThingsBoard (http://wiki.dragino.com/xwiki/bin/view/Main/General%20Configure%20to%20Connect%20to%20IoT%20server%20for%20-NB%20%26%20-NS%20NB-IoT%20models/#H3.6A0ThingsBoard.CloudA028viaA0MQTT29)		

1D Version: This version has 1NCE SIM card pre-installed and configure to send value to DataCake. User Just need to select the sensor type in DataCake and Activate [IoT%20models/#H3.4Datacake) .

2.2 Payload Types

To meet different server requirement, DS03A-NB supports different payload type.

Includes:

- General JSON format payload. (Type=5)
- HEX format Payload. (Type=0)
- ThingSpeak Format. (Type=1)
- ThingsBoard Format. (Type=3)

User can specify the payload type when choose the connection protocol. Example:

AT+PRO=2,0　　　// Use UDP Connection & hex Payload

AT+PRO=2,5　　　// Use UDP Connection & Json Payload

AT+PRO=3,5　　　// Use MQTT Connection & Json Payload

2.2.1 General Json Format(Type=5)

This is the General Json Format. Payloads in General Json format for single-channel mode and double-channel mode have different byte lengths.

The General Json format payload for the single-channel mode is as follows:

{"IMEI":"866207052559857","Model":"DS03A-NB","level status":1,"alarm status":0,"door open num":0,"last open time":0,"level status2":1,"alarm status2":0,"d {0,79,261,2023/11/13 01:43:16},"7":{227,9896991,5368540,2023/11/13 01:18:46},"8":{0,19,5367640,2023/11/11 08:53:57}}

The General Json format payload for the double-channel mode is as follows:

{"IMEI":"866207058378443","Model":"DS03A-NB","level status":1,"alarm status":0,"door open num":2,"last open time":0,"level status2":1,"alarm status2":0,"d
{0,0,0,1,4,11,2023/11/15 03:28:16},"7":{0,0,0,1,4,11,2023/11/15 03:13:16},"8":{0,0,0,1,3,11,2023/11/15 02:58:25}}
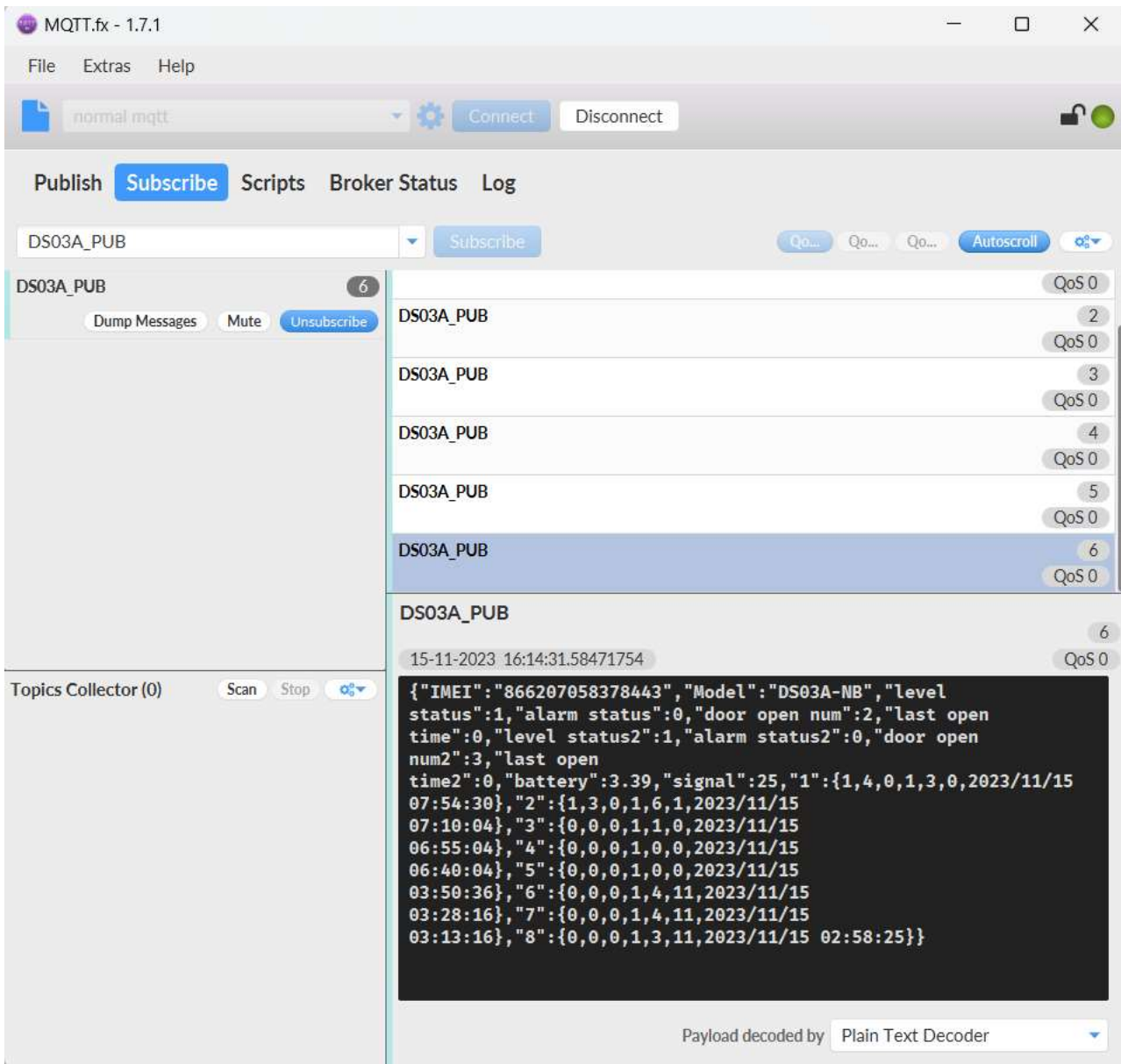
Notice, from above payload:

- level status, alarm status, door open num, last open time, level status2, alarm status2, door open sum2, last open time2, Battery & Signal are the value at uplink tim
- Json entry 1 ~ 8 are the last 1 ~ 8 sampling data as specify by **AT+NOUD=8** Command. Each entry includes (from left to right):

  Single-channel mode: level status, door open num, last open time, Sampling time.

  Double-channel mode: level status, door open num, last open time, level status2, door open sum2, last open time2, Sampling time.

2.2.2 HEX format Payload(Type=0)

This is the HEX Format. Payloads in HEX format for single-channel mode and double-channel mode have different byte lengths.

The HEX format payload for the single-channel mode is as follows:

f86620705255985712640d9c180101000000000000006551f42401000000000000006551f3650000000000000105655195e0ed97040b0001076551925c0000001d0001076551

If we use the MQTT client to subscribe to this MQTT topic, we can see the following information when the NB sensor uplink data.

The HEX format payload for the double-channel mode is as follows:

f86620705255985712640db71701010000000000000001000000000000006552d13401000000000000000000000000006551f36500000000001050000005f00005f6551

HEX Format for DS03A-NB (AT+NOUD=8)(double channel)									
f866207058386669		1264	0db4	16	01	01	00	000000	000000	01
f+IMEI		Version	BAT	Singal	Mod	Door Status(pb14)	Alarm Status(pb14)	door open num(pb14)	last open time(pb14)	Door Status(pb15)
8 Bytes										25 Bytes

01	000000	000000	00	000000	000000	64eee555	0100000000000000000000000000064eee
Door Status(pb14)	door open num(pb14)	last open time(pb14)	Door Status(pb15)	door open num(pb15)	last open time(pb15)	Timestamp	last 2nd data
18 Bytes							18 Bytes

0000000000000000000000000000064eed591	0000000000000000000000000000064eed4dd	0000000000000000000000000000064eed429	0000000000000000000000000000064eec
last 5th data	last 6th data	last 7th data	last 8th data
18 Bytes	18 Bytes	18 Bytes	18 Bytes

If we use the MQTT client to subscribe to this MQTT topic, we can see the following information when the NB sensor uplink data.
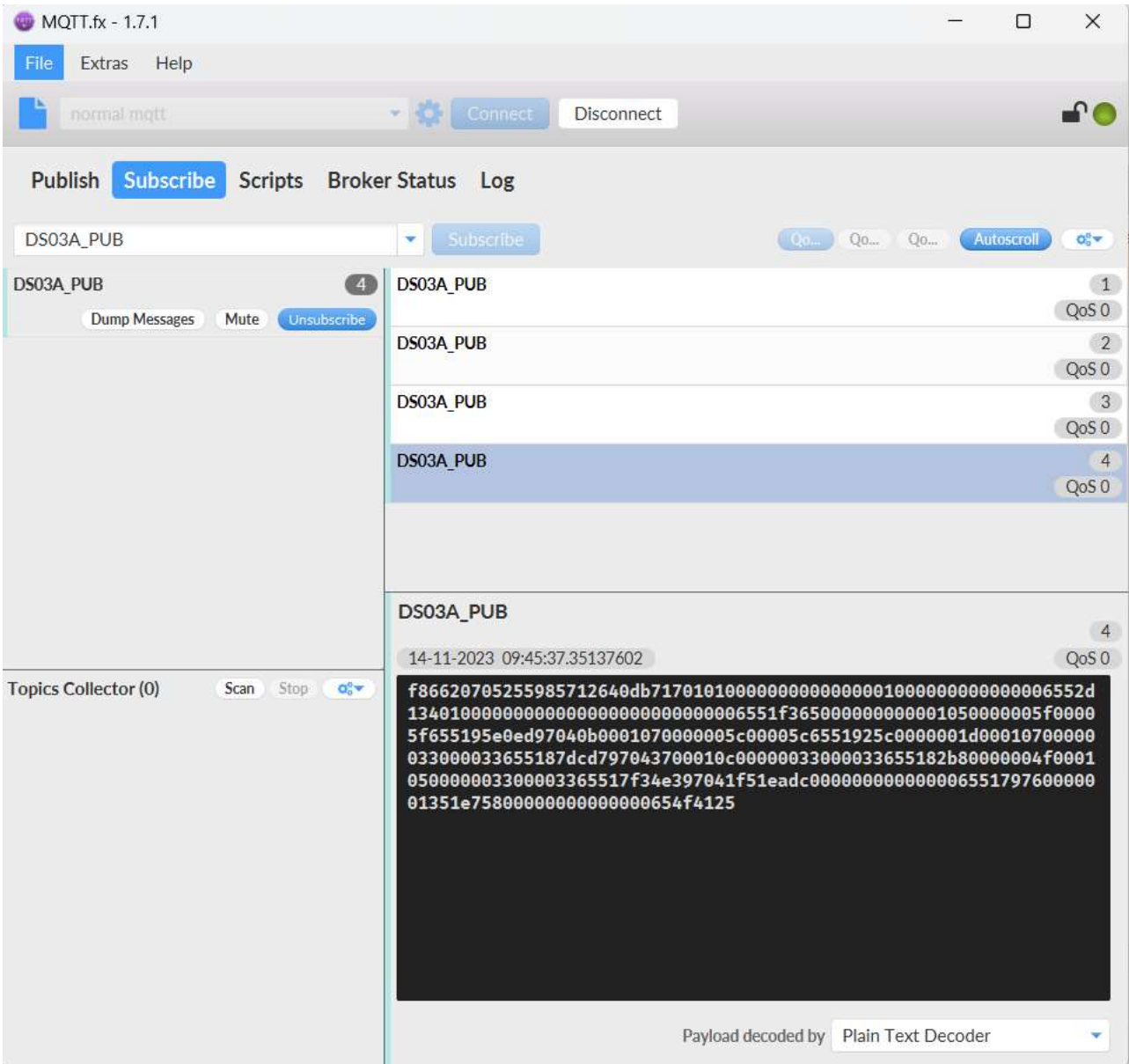
Version:

These bytes include the hardware and software version.

Higher byte: Specify Sensor Model: 0x12 for DS03A-NB

Lower byte: Specify the software version: 0x64=100, means firmware version 1.0.0

BAT (Battery Info):

Ex1: 0x0dda = 3546mV

Signal Strength:

NB-IoT Network signal Strength.

Ex1: 0x15 = 21

0   -113dBm or less

1   -111dBm

2...30 -109dBm... -53dBm

31   -51dBm or greater

99   Not known or not detectable

Timestamp:

Unit Timestamp Example: 650abc40(H) = 1695202368(D)

Put the decimal value into this link(https://www.epochconverter.com) (https://www.epochconverter.com)   ) to get the time.

2.2.3 ThingsBoard Payload(Type=3)

Type3 payload special design for ThingsBoard, it will also configure other default server to ThingsBoard.

```
{
    "IMEI": "866207058378443",
    "Model": "DS03A-NB",
    "level status": 1,
    "alarm status": 0,
    "door open num": 6,
    "last open time": 1,
    "level status2": 1,
    "alarm status2": 0,
    "door open num2": 2,
    "last open time2": 0,
    "battery": 3.4,
    "signal": 24
}
```
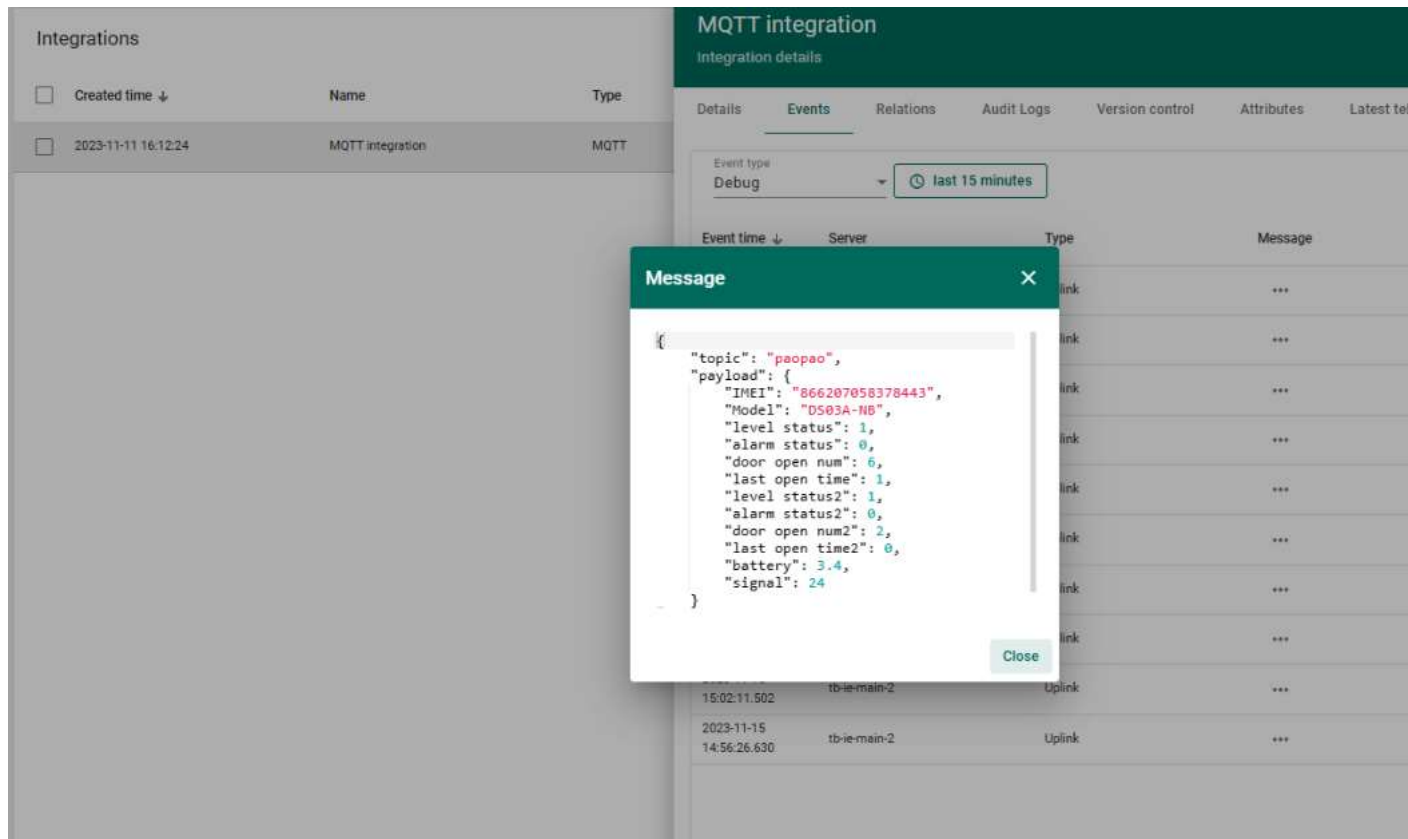

2.2.4 ThingSpeak Payload(Type=1)

This payload meets ThingSpeak platform requirement. It includes eight fields. Form 1~8 are:

Distance, Battery & Signal. This payload type only valid for ThingsSpeak Platform

As below:

field1=Flow value&field2=Battery value&field3=signal value

Field 1 Chart ⬈ ○ ✎ ✖

level status

Field 2 Chart ⬈ ○ ✎ ✖

level status

Field 3 Chart ⬈ ○ ✎ ✖

door open num

Field 4 Chart ⬈ ○ ✎ ✖

last open time

Field 5 Chart ⬈ ○ ✎ ✖

level status2

Field 6 Chart ⬈ ○ ✎ ✖

alarm status2

Field 7 Chart ⬈ ○ ✎ ✖

door open num2

Field 8 Chart ⬈ ○ ✎ ✖

last open time2
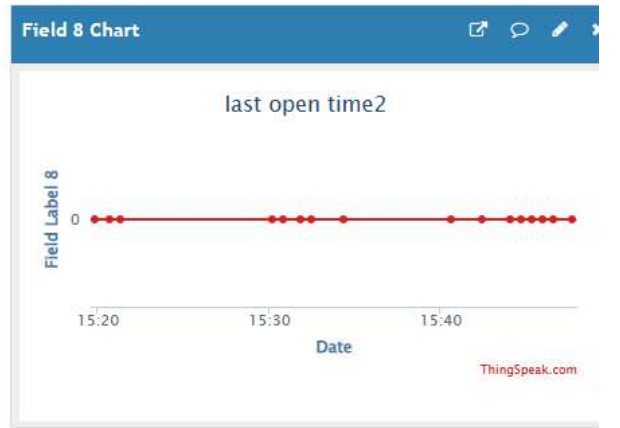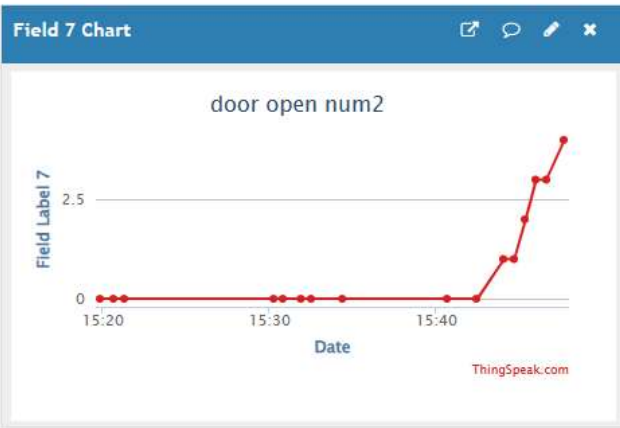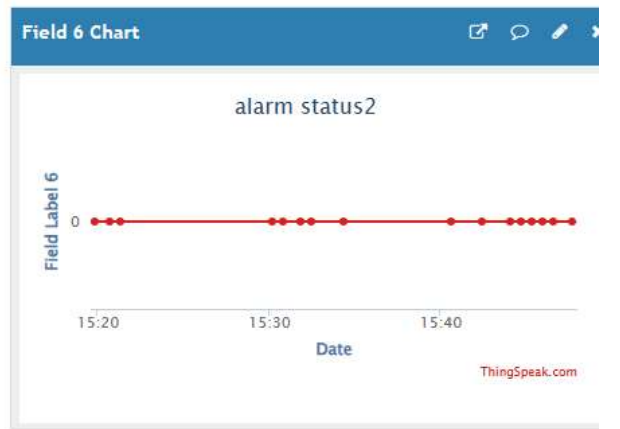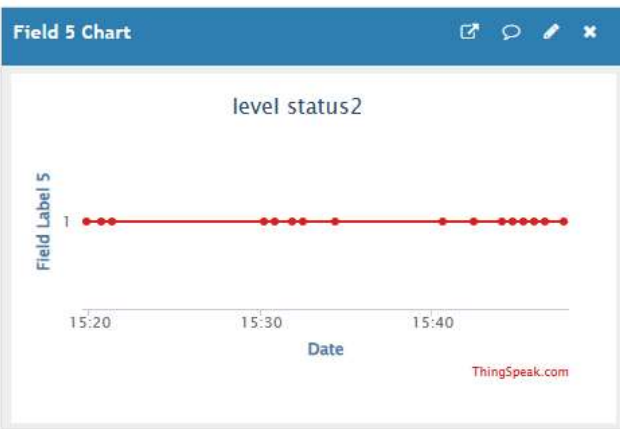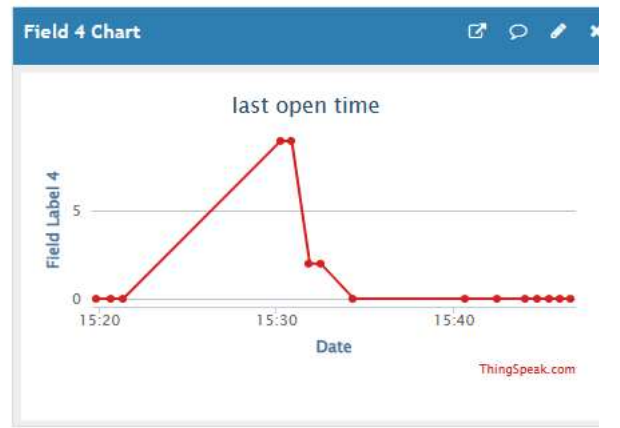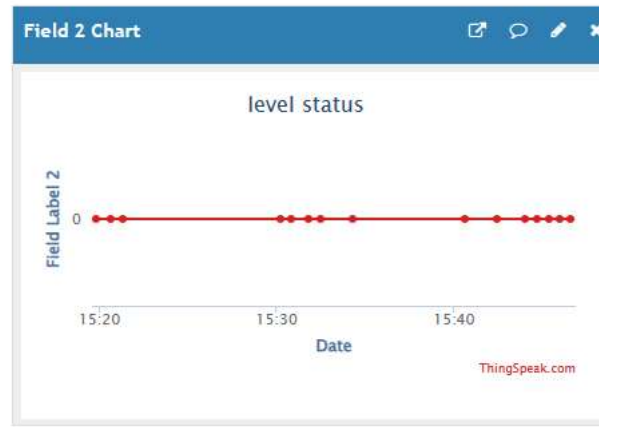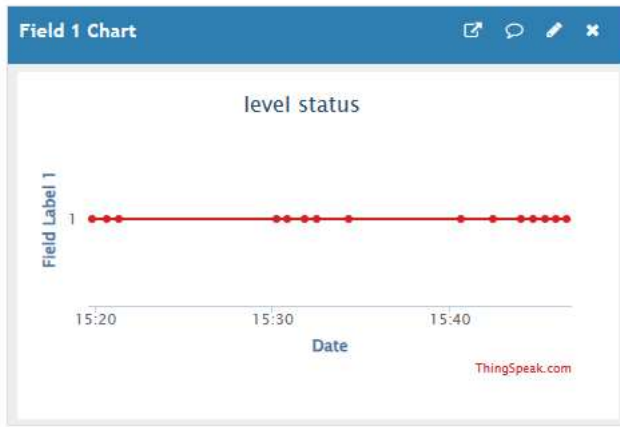
2.3 Test Uplink and Change Update Interval

By default, Sensor will send uplinks **every 2 hours** & AT+NOUD=8

User can use below commands to change the **uplink interval**.

AT+TDC=600　　　// Set Update Interval to 600s

User can also push the button for more than 1 seconds to activate an uplink.

2.4 Multi-Samplings and One uplink

To save battery life, DS03A-NB will sample Water Flow data every 15 minutes and send one uplink every 2 hours. So each uplink it will include 8 stored data + 1 real-time

- **AT+TR=900**　　　// The unit is seconds, and the default is to record data once every 900 seconds (15 minutes, the minimum can be set to 180 seconds)

- **AT+NOUD=8**　　// The device uploads 8 sets of recorded data by default. Up to 32 sets of record data can be uploaded.

The diagram below explains the relationship between TR, NOUD, and TDC more clearly:
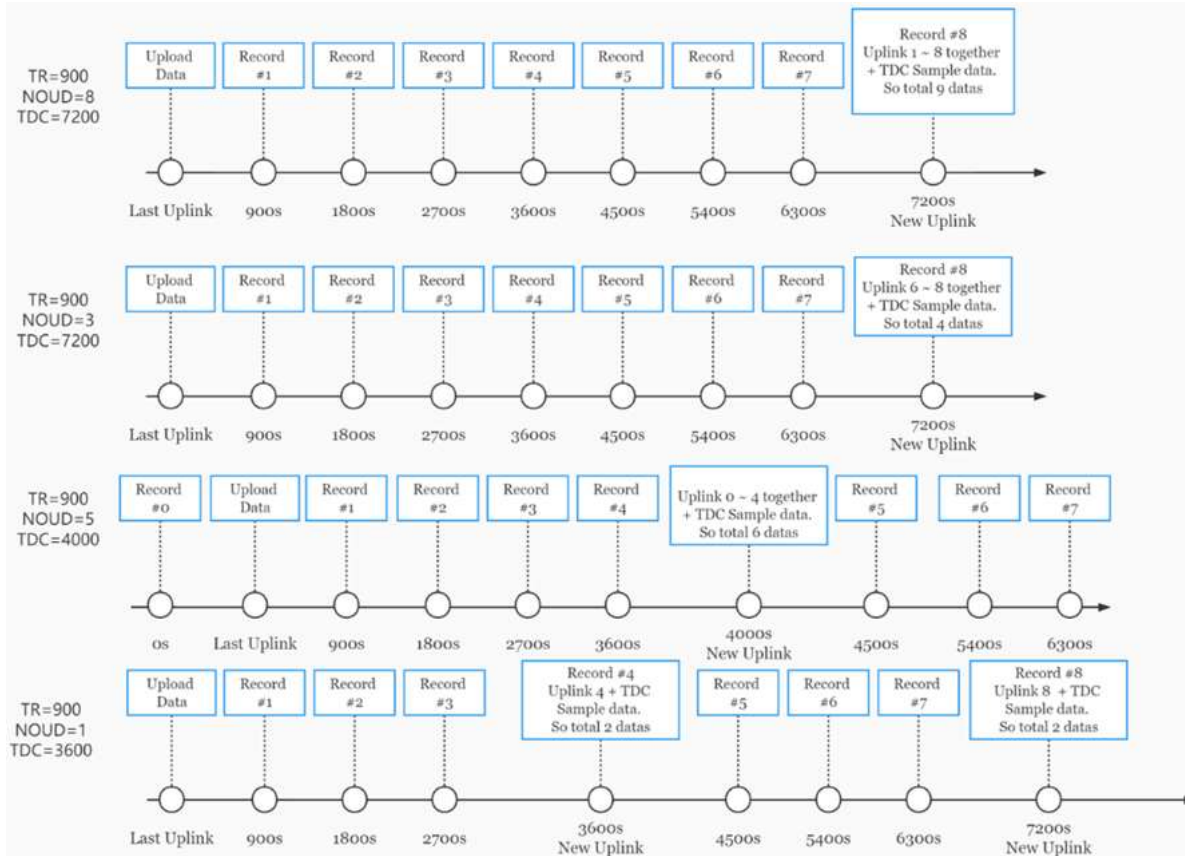
2.5 Trggier an uplink by external interrupt

DS03A-NB has an external trigger interrupt function. Users can use the PB15 pin to trigger the upload of data packets.

AT command:

- **AT+INTMOD**　　　// Set the trigger interrupt mode
- **AT+INTMOD=0**　// Disable Interrupt
- **AT+INTMOD=1**　// Trigger by rising and falling edge
- **AT+INTMOD=2**　// Trigger by falling edge
- **AT+INTMOD=3**　// Trigger by rising edge

2.5 Set Transmit Interval Time

Feature: Change NB-IoT End Node Transmit Interval.

AT Command: AT+TDC

Command Example	Function	Response
AT+TDC=?	Show current transmit Interval	30000 OK the interval is 30000ms = 30s

AT+TDC=60000	Set Transmit Interval	OK Set transmit interval to 60000ms = 60 seconds

Downlink Command: 0x01

Format: Command Code (0x01) followed by 3 bytes time value.

If the downlink payload=0100003C, it means set the END Node's Transmit Interval to 0x00003C=60(S), while type code is 01.

- Example 1: Downlink Payload: 0100001E   // Set Transmit Interval (TDC) = 30 seconds
- Example 2: Downlink Payload: 0100003C   // Set Transmit Interval (TDC) = 60 seconds

2.7 Enable / Disable Alarm

Feature: Enable/Disable Alarm for open/close event. Default value 0.

AT Command:

Command Example	Function	Response
AT+DISALARM=1	End node will only send packets in TDC time.	OK
AT+DISALARM=0	End node will send packets in TDC time or status change for door sensor	OK

Downlink Command:

0xA7 01   // Same As AT+DISALARM=1

0xA7 00   // Same As AT+DISALARM=0

2.8 Alarm Base on Timeout

DS03A-NB can monitor the timeout for a status change, this feature can be used to monitor some events such as door opening too long etc. Related Parameters are:

- **Keep Status: Status to be monitor**

Keep Status = 1: Monitor Close to Open event

Keep Status = 0: Monitor Open to Close event

- **Keep Time: Timeout to send an Alarm**

Range 0 ~ 65535(0xFFFF) seconds.

If **keep time = 0**, Disable Alarm Base on Timeout feature.

If **keep time > 0**, device will monitor the keep status event and send an alarm when status doesn't change after timeout.

- **Downlink Command**

Command: 0xA9 aa bb cc dd

A9: Command Type Code

aa: 01:TTRIG1; 02:TTRIG2

bb: status to be monitored

cc dd: timeout.

1) AT+TTRIG1 : (PA8 of pin)

AT Command to configure:

- **AT+TTRIG1=1,30** --> When the **Keep Status** change from close to open, and device remains in open status for more than 30 seconds. DS03A-NB will send an up
- **AT+TTRIG1=0,30** --> When the **Keep Status** change from open to close, and device remains in open status for more than 30 seconds. DS03A-NB will send an up
- **AT+TTRIG1=0,0** --> Default Value, disable timeout Alarm.

Downlink Command to configure:

If user send 0xA9 01 01 00 1E: equal to AT+TTRIG1=1,30 **or** 0xA9 01 00 00 00: Equal to AT+TTRIG1=0,0.

2) AT+TTRIG2 : (PA4 of pin,need to use AT+TTRCHANNEL=2)

AT Command to configure:

- **AT+TTRIG2=1,30** --> When the **Keep Status** change from close to open, and device remains in open status for more than 30 seconds. DS03A-NB will send an up

AT+TTRIG2=0,30 --> When the **Keep Status** change from open to close, and device remains in open status for more than 30 seconds. DS03A-NB will send an u

- **AT+TTRIG2=0,0** --> Default Value, disable timeout Alarm.

Downlink Command to configure:

If user send 0xA9 02 00 00 1E: equal to AT+TTRIG2=0,30 **or** 0xA9 02 00 00 00: Equal to AT+TTRIG2=0,0.

2.9 TTRIG1 & TTRIG2 timeout status alarm

It needs to be used with AT+TTRIG1 or AT+TTRIG2. When TTRIG1 or TTRIG2 times out and causes an alarm, and the status does not change subsequently, an alarm pa

AT Command:

Command Example	Function	Response
AT+TTRALARM=0	disable continuous alarm	OK
AT+TTRALARM=60	The alarm interval is 60 minutes (unit: minutes)	OK

Downlink Command:

Example: 0C aa => AT+TTRALARM= aa

2.10 Count Mod

Feature: Manually set the count mode.

AT Command:

Command Example	Function	Response
AT+COUNTMOD=0	the count value keeps accumulating mode	OK
AT+COUNTMOD=1	the count value will be reset after each TDC time(Last Close Duration Reset after each uplink)	OK

Downlink Command:

Example: 0B aa => AT+COUNTMOD = second byte

2.11 Number of channel of door sensors

Feature: Set the number of door sensor channels.

AT Command:

Command Example	Function	Response
AT+TTRCHANNEL=1	Set as single channel, only use PA8 pin as interrupt pin.	OK
AT+TTRCHANNEL=2	Set as dual channel, use PA8 pin and PA4 pin as interrupt pin.	OK

Downlink Command:

Example: 0D aa => AT+TTRCHANNEL = second byte

2.12 Clear the open door times and the duration of the last open door

AT Command:

Command Example	Function	Response
AT+CLRC	clear the open door times and the duration of the last open door.	OK

Downlink Command:0xA6 01

The sensor will clear the open door times and the duration of the last open door.

2.13 Set the count value of the number of open door

AT Command:

Command Example	Function	Response
AT+SETCNT=1,100	Set the open door times of PA8 pin to 100 times.	OK
AT+SETCNT=1,0	Clear the open door times of PA8 pin.	OK
AT+SETCNT=2,50	Set the open door times of PA4 pin to 100 times.	OK

Downlink Command:

0xA6 01 00 00 64   ==> AT+SETCNT=1,100

0xA6 01 00 00 00   ==> AT+SETCNT=1,0

0xA6 02 00 00 32   ==> AT+SETCNT=2,50

3. Configure DS03A-NB

3.1 Configure Methods

DS03A-NB supports below configure method:

- AT Command via Bluetooth Connection (**Recommended**): BLE Configure Instruction (http://wiki.dragino.com/xwiki/bin/view/Main/BLE%20Bluetooth%20Remote%2
- AT Command via UART Connection : See UART Connection (http://wiki.dragino.com/xwiki/bin/view/Main/UART%20Access%20for%20LoRa%20ST%20v4%20bas

3.2 AT Commands Set

AT+<CMD>?   : Help on <CMD>

AT+<CMD>   : Run <CMD>

AT+<CMD>=<value>   : Set the value

AT+<CMD>=?   : Get the value

General Commands

AT   : Attention

AT?   : Short Help

ATZ   : MCU Reset

AT+TDC   : Application Data Transmission Interval

AT+CFG   : Print all configurations

AT+CFGMOD   : Working mode selection

AT+DEUI   : Get or set the Device ID

AT+INTMOD   : Set the trigger interrupt mode

AT+5VT   : Set extend the time of 5V power

AT+PRO   : Choose agreement

AT+RXDL   : Extend the sending and receiving time

AT+DNSCFG   : Get or Set DNS Server

AT+GETSENSORVALUE   : Returns the current sensor measurement

AT+NOUD : Get or Set the number of data to be uploaded

AT+CDP   : Read or Clear cached data

AT+SHTEMP: Get or Set alarm of temp

AT+SHHUM: Get or Set alarm of moisture

AT+SERVADDR :   Server Address

UDP Management

AT+CFM : Upload confirmation mode (only valid for UDP)

MQTT Management

AT+CLIENT   : Get or Set MQTT client

AT+UNAME   : Get or Set MQTT Username

AT+PWD   : Get or Set MQTT password

AT+PUBTOPIC   : Get or Set MQTT publish topic

AT+SUBTOPIC   : Get or Set MQTT subscription topic

Information

AT+FDR   : Factory Data Reset

AT+PWORD   : Serial Access Password

AT+LDATA   : Get the last upload data

AT+CDP   : Read or Clear cached data

4. Battery & Power Consumption

DS03A-NB use ER26500 + SPC1520 battery pack. See below link for detail information about the battery info and how to replace.

Battery Info & Power Consumption Analyze (http://wiki.dragino.com/xwiki/bin/view/Main/How%20to%20calculate%20the%20battery%20life%20of%20Dragino%20sens

5. Firmware update

User can change device firmware to::

- Update with new features.
- Fix bugs.

Firmware and changelog can be downloaded from : **Firmware download link (https://www.dropbox.com/sh/zbsm9p4coksqwd5/AADy2ZJc39KsvfbhTMCUGmz1a?c

Methods to Update Firmware:

- (Recommended way) OTA firmware update via BLE: **Instruction** (http://wiki.dragino.com/xwiki/bin/view/Main/BLE_Firmware_Update_NB_Sensors_BC660K-GL/)
- Update through UART TTL interface : **Instruction (http://wiki.dragino.com/xwiki/bin/view/Main/UART%20Access%20for%20LoRa%20ST%20v4%20base%20**

6. FAQ

6.1 How can I access t BC660K-GL AT Commands?

User can access to BC660K-GL directly and send AT Commands.

See BC660K-GL AT Command set (https://www.dropbox.com/sh/5f6ssda5fum8rvs/AABT68I8ZzWOvZ5eg2qwOoFda?dl=0)

7. Order Info

Part Number: **DS03A-NB-XX**

XX:

- **GE**: General version (Exclude SIM card)
- **1D**: with 1NCE* 10 years 500MB SIM card and Pre-configure to DataCake server

1NCE SIM Card NB-IoT network coverage: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, Germany, Great Britain, Greece, Hungary, Ireland, It

8. Packing Info

Package Includes:

- DS03A-NB NB-IoT Door sensor x 1
- External antenna x 1

Dimension and weight:

- Device Size: 13.0 x 5 x 4.5 cm
- Device Weight: 150g

- Package Size / pcs : 14.0 x 8x 5 cm

- Weight / pcs : 180g

9. Support

- Support is provided Monday to Friday, from 09:00 to 18:00 GMT+8. Due to different timezones we cannot offer live support. However, your questions will be answer

- Provide as much information as possible regarding your enquiry (product models, accurately describe your problem and steps to replicate it etc) and send a mail to

♥ 0   Tags:

No comments for this page