

2.3.2.4 MOD=4 (3 x DS18B20)

This mode has total 11 bytes. As shown below:

Size(bytes)	2	2	2	1	2	2
Value	BAT	Temperature1(DS18B20) (PC13)	ADC(PA4)	Digital in(PB15) & Digital Interrupt(PA8)	Temperature2(DS18B20) (PB9)	Temperature3(DS18B20) (PB8)

The image shows a Wireshark packet capture of a Modbus RTU frame. The frame is highlighted in yellow. The payload is shown in hexadecimal and ASCII. Red arrows point from labels to specific bytes in the payload:

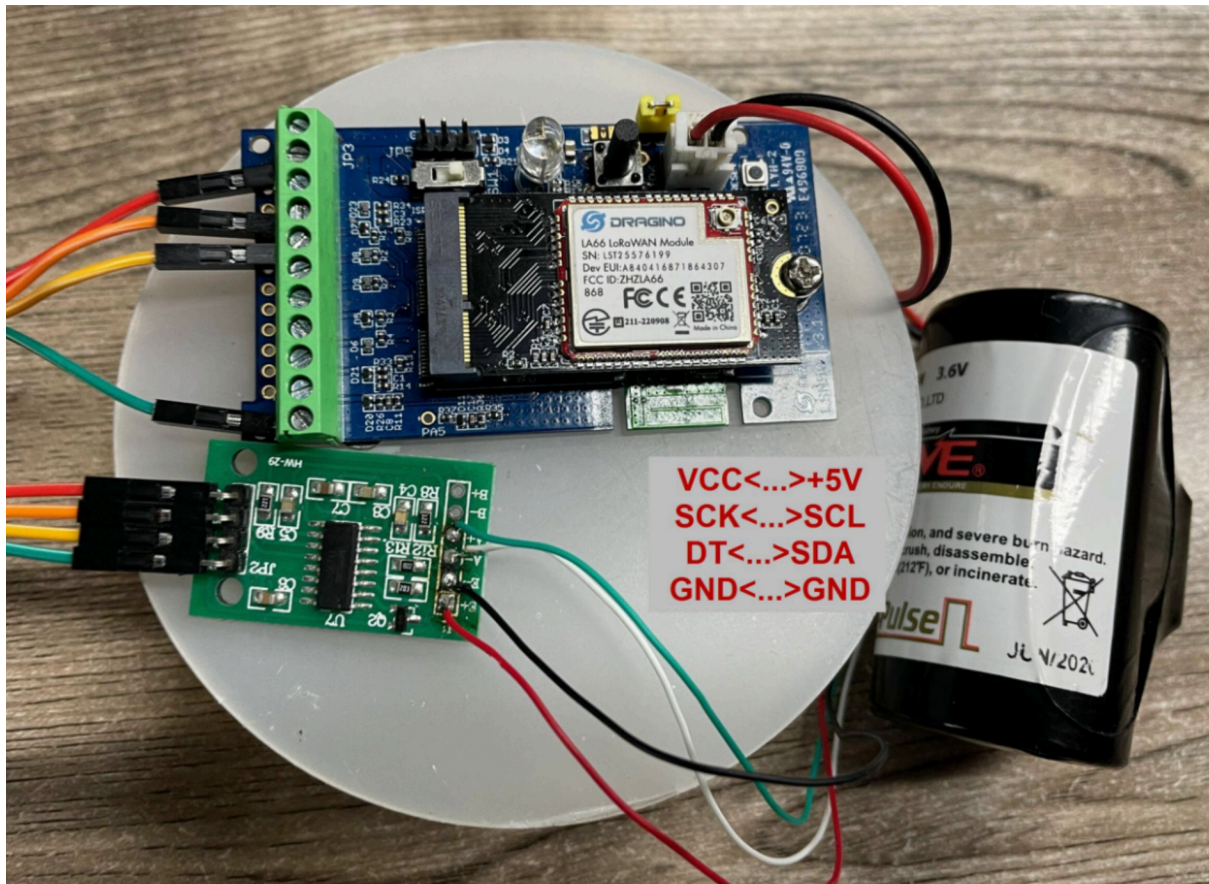
- Temperature1 (DS18B20)**: Points to the first byte of the payload (0D 93).
- Digital Input and Digital Interrupt**: Points to the second byte of the payload (91 1A).
- Temperature2 (DS18B20)**: Points to the third byte of the payload (1 00).
- Battery Info**: Points to the fourth byte of the payload (91 1B).
- ADC**: Points to the fifth byte of the payload (91 17).
- Temperature3 (DS18B20)**: Points to the sixth byte of the payload (91 17).

The frame details show the following fields:

- DevAddr: 26 0B DE BC
- MAC payload: 13 4F 40 ED C8 AB 77 E8 53 68 28
- FPort: 2
- SNR: 0.5
- RSSI: -108
- Bandwidth: 125000
- Raw payload: 40 BC DE



2.3.2.5 MOD=5(Weight Measurement by HX711)



Each HX711 need to be calibrated before used. User need to do below two steps:

1. Zero calibration. Don't put anything on load cell and run **AT+WEIGRE** to calibrate to Zero gram.
2. Adjust calibration factor (default value 400): Put a known weight thing on load cell and run **AT+WEIGAP** to adjust the Calibration Factor.
3. Weight has 4 bytes, the unit is g.

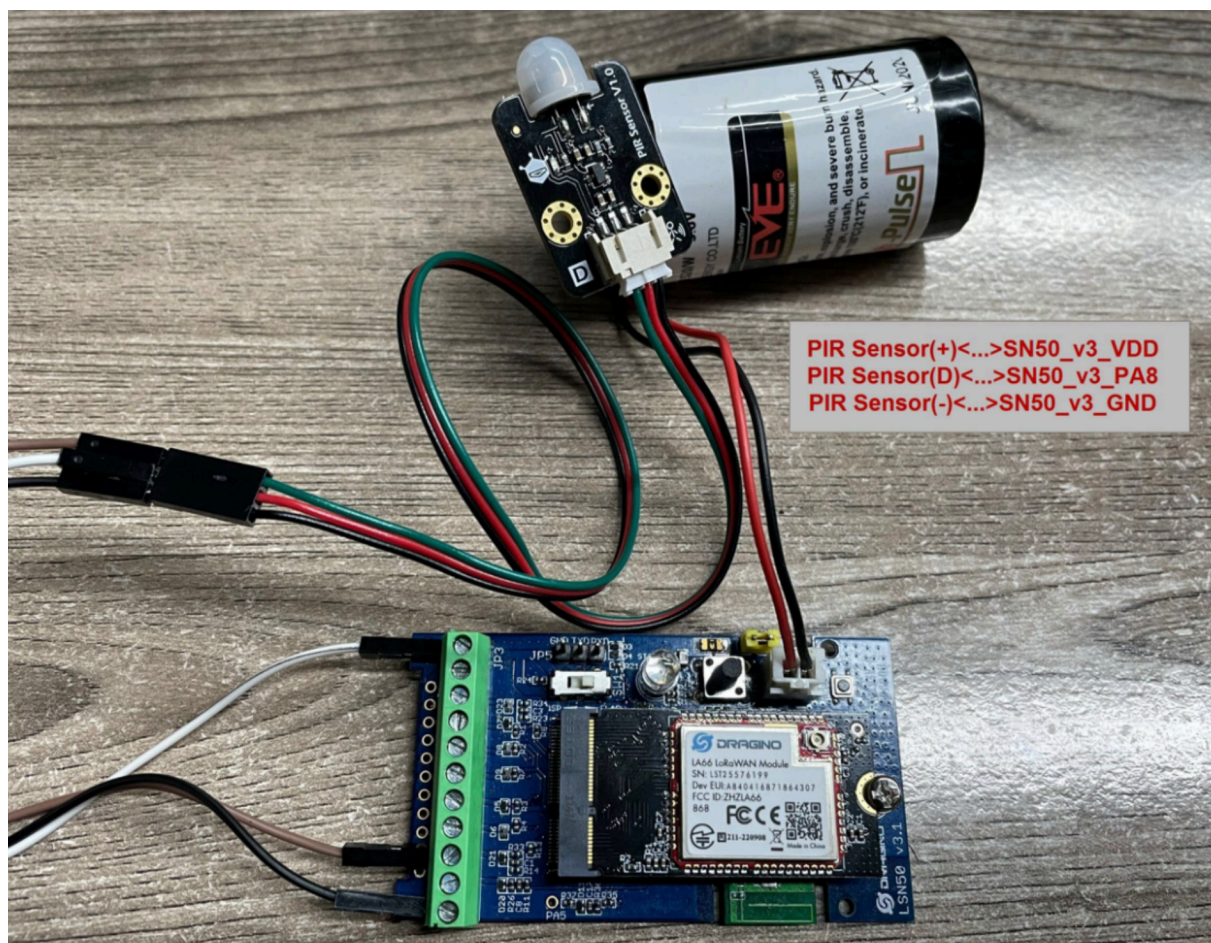
For example:

AT+GETSENSORVALUE =0

Response: Weight is 401 g

Check the response of this command and adjust the value to match the real value for thing.

Size(bytes)	2	2	2	1	4
Value	BAT	Temperature(DS18B20)(PC13)	ADC(PA4)	Digital in(PB15) & Digital Interrupt(PA8)	Weight



Note: LoRaWAN wireless transmission will infect the PIR sensor. Which cause the counting value increase +1 for every uplink. User can change PIR sensor or put sensor away of the SN50_v3 to avoid this happen.

Size(bytes)	2	2	2	1	4
Value	BAT	Temperature(DS18B20)(PC13)	ADC(PA4)	Digital in(PB15)	Count(PA8)

DevAddr: 26 0B 26 CD MAC payload: 37 E7 B8 34 BF DF B7 3D C7 D7 C9 FPort: 2 SNR: -0.8 RSSI: -110 Bandwidth: 125000

'OPEN', EXTI_Trigger: "FALSE", TempC1: 0, Work_mode: "Count" } 0C FE 00 00 01 14 14 00 00 00 00 FPort: 2 SNR: -0.8 RSSI: -110 Bandwidth: 125000

DevAddr: 26 0B 26 CD FPort: 2 MAC payload: 37 E7 B8 34 BF DF B7 3D C7 D7 C9 Bandwidth: 125000 SNR: -0.8 RSSI: -110 Raw payload: 40 CD 2

Uplink is a duplicate

DevAddr: 26 0B 26 CD FPort: 2 MAC payload: 37 E7 B8 34 BF DF B7 3D C7 D7 C9 Bandwidth: 125000 SNR: -12.8 RSSI: -130 Raw payload: 40 CD

DevAddr: 26 0B 26 CD FPort: 2 MAC payload: 37 E7 B8 34 BF DF B7 3D C7 D7 C9 Bandwidth: 125000 SNR: -0.8 RSSI: -110 Raw payload: 40 CD 2

DevAddr: 26 0B 26 CD

2.3.2.7 MOD=7 (Three interrupt contact modes)

Size(bytes)	2	2	2	1	1	1	2
Value	BAT	Temperature(DS18B20) (PC13)	ADC(PA5)	Digital Interrupt1(PA8)	Digital Interrupt2(PA4)	Digital Interrupt3(PB15)	Reserved

lsn50 ID: lsn50

Last activity 1 minute ago

Overview Live data Messaging Location Payload formatters Claiming General settings

Time Type Data preview

17:31:12 Forward uplink data message DevAddr: 26 0B 02 30 MAC payload: 0E 33 7F FF 00 39 18 00 FPort: 2 Data rate: SF7Bw125 SNR: 7.8 RSSI: -93

17:31:12 Successfully processed data DevAddr: 26 0B 02 30

Battery Info

Temperature (DS18B20)

ADC

Digital Interrupt (PA8)

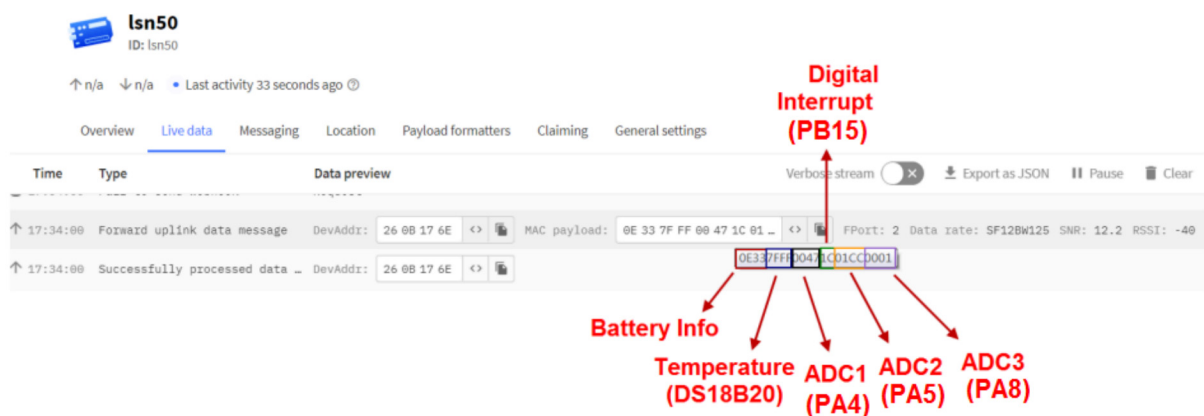
Digital Interrupt (PB15)

Digital Interrupt (PA4)

Reserved

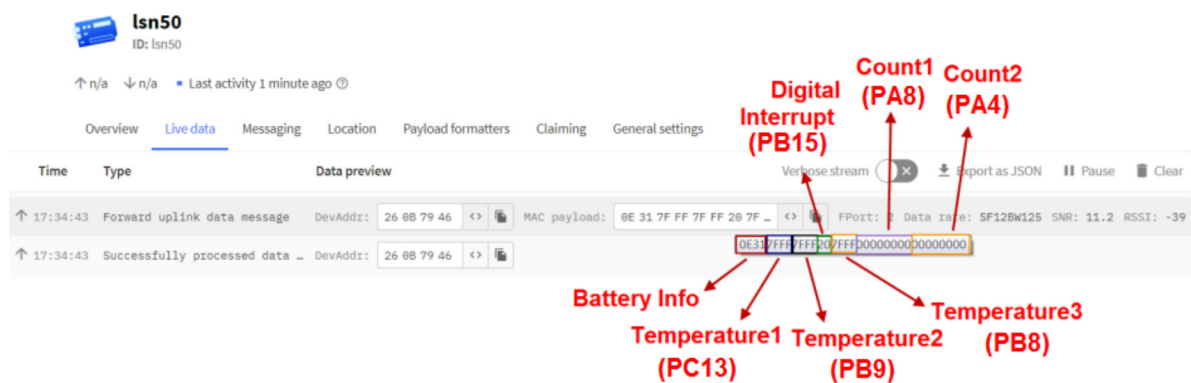
2.3.2.8 MOD=8 (3ADC+1DS18B20)

Size(bytes)	2	2	2	1	2	2
Value	BAT	Temperature(DS18B20) (PC13)	ADC1(PA4)	Digital Interrupt(PB15)	ADC2(PA5)	ADC3(PA8)



2.3.2.9 MOD=9 (3DS18B20+ two Interrupt count mode)

Size(bytes)	2	2	2	1	2	4	4
Value	BAT	Temperature (DS18B20)(PC13)	Temperature2 (DS18B20)(PB9)	Digital Interrupt (PB15)	Temperature3 (DS18B20)(PB8)	Count1(PA8)	Count2(PA4)



The newly added AT command is issued correspondingly:

AT+INTMOD1 PA8 pin: Corresponding downlink: **06 00 00 xx**

AT+INTMOD2 PA4 pin: Corresponding downlink: **06 00 01 xx**

AT+INTMOD3 PB15 pin: Corresponding downlink: **06 00 02 xx**

AT+SETCNT=aa,bb

When AA is 1, set the count of PA8 pin to BB Corresponding downlink: 09 01 bb bb bb bb

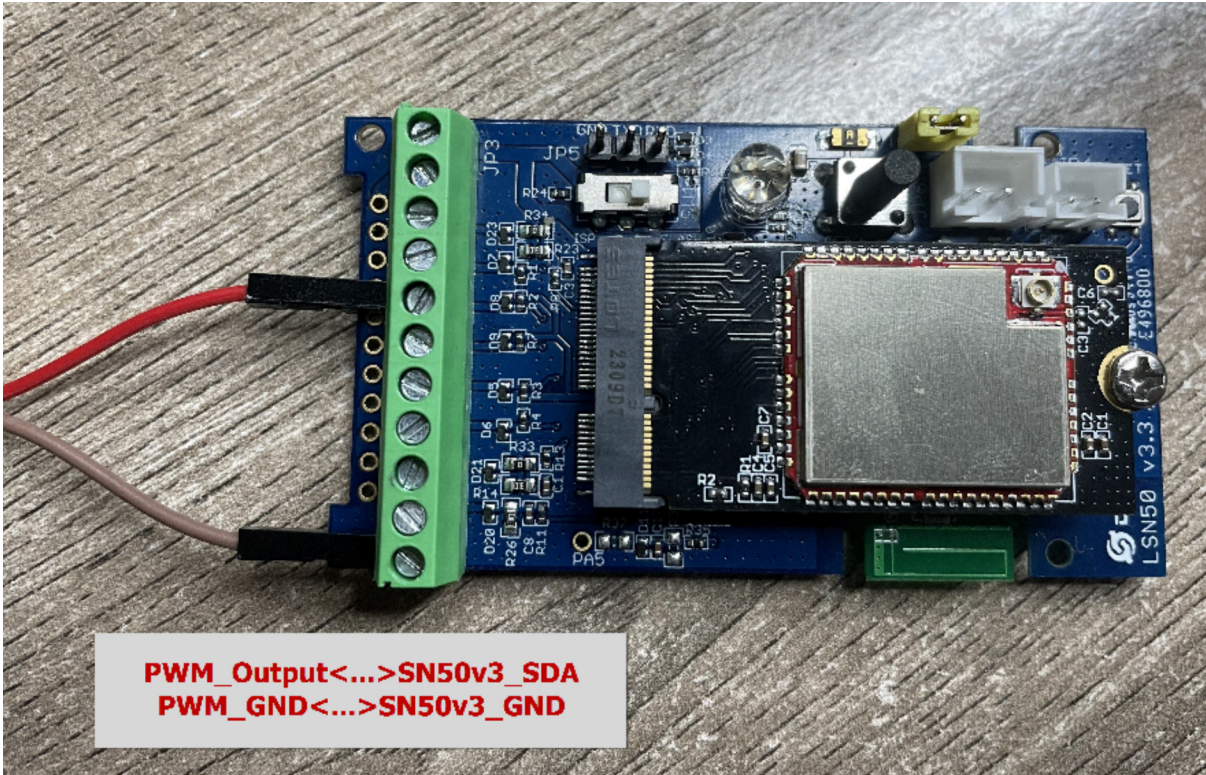
When AA is 2, set the count of PA4 pin to BB Corresponding downlink: 09 02 bb bb bb bb

2.3.2.10 MOD=10 (PWM input capture and output mode, Since firmware v1.2)

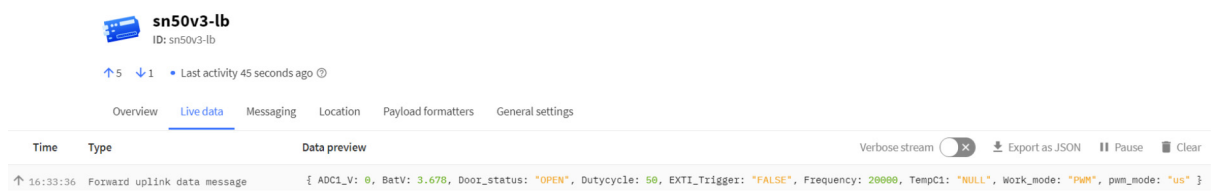
In this mode, the uplink can perform PWM input capture, and the downlink can perform PWM output.

[It should be noted when using PWM mode.](#)

2.3.2.10.a Uplink, PWM input capture



Size(bytes)	2	2	2	1	2	2
Value	Bat	Temperature(DS18B20) (PC13)	ADC(PA4)	PWM_Setting &Digital Interrupt(PA8)	Pulse period	Duration of high level



When the device detects the following PWM signal ,decoder will converts the pulse period and high-level duration to frequency and duty cycle.

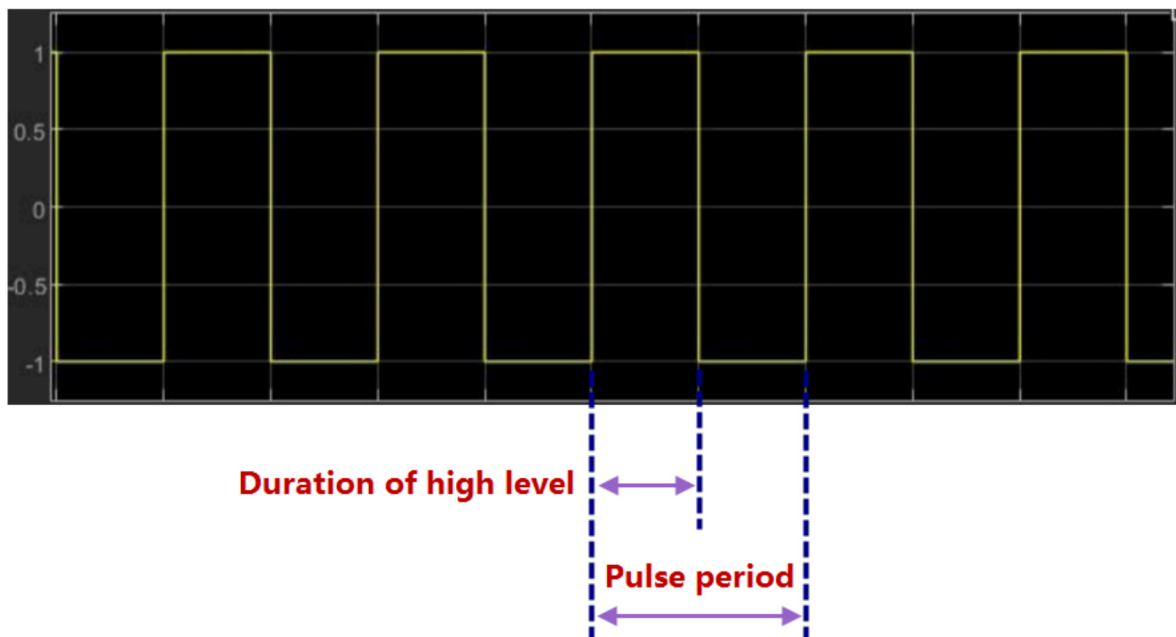
Frequency:

If **AT+PWMSET=0**, Frequency= $1000000/\text{Pulse period (HZ)}$;

If **AT+PWMSET=1**, Frequency= $1000/\text{Pulse period (HZ)}$;

Duty cycle:

Duty cycle= $\text{Duration of high level}/ \text{Pulse period} \times 100 (\%)$.



2.3.2.10.b Downlink, PWM output



Downlink: **0B xx xx xx yy zz zz**

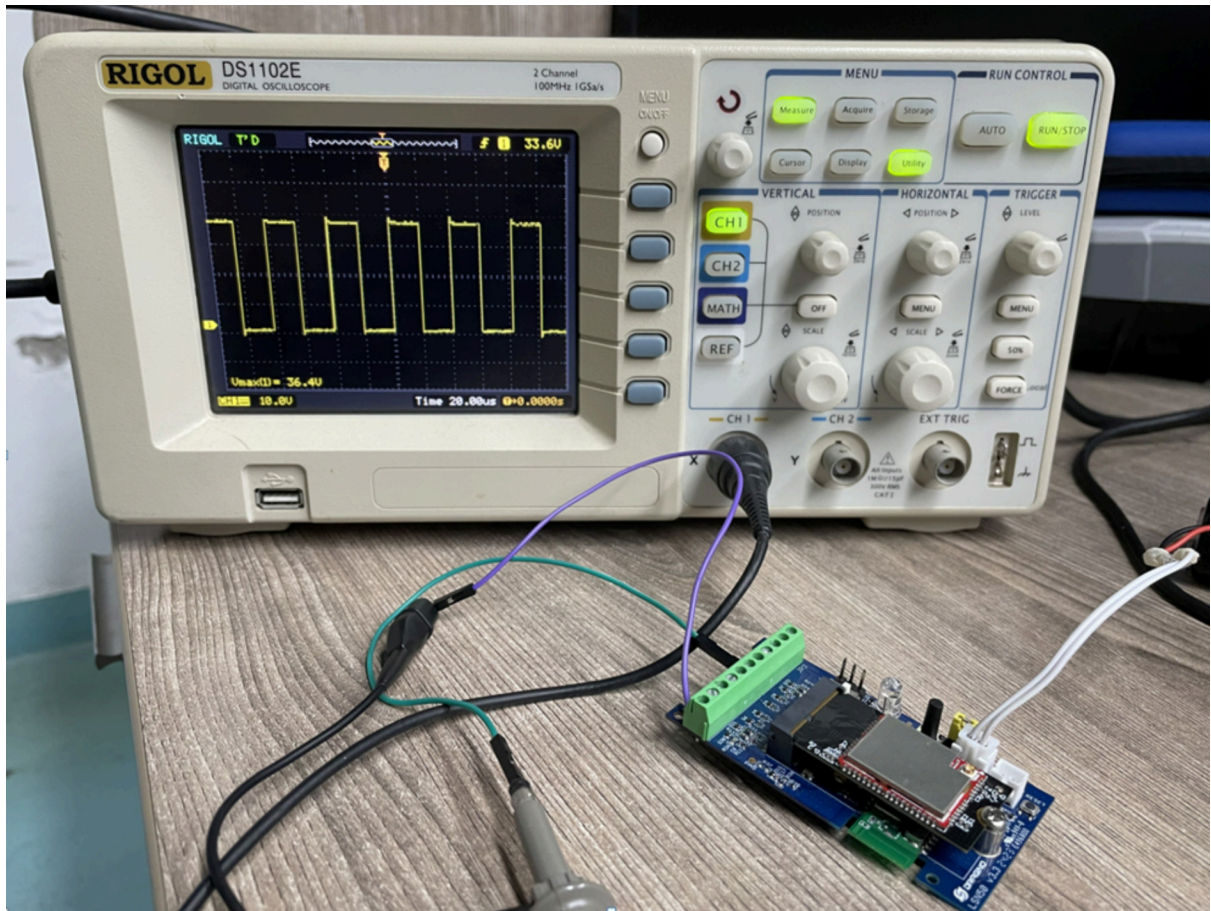
xx xx xx is the output frequency, the unit is HZ.

yy is the duty cycle of the output, the unit is %.

zz zz is the time delay of the output, the unit is ms.

For example, send a downlink command: 0B 00 61 A8 32 13 88, the frequency is 25KHZ, the duty cycle is 50, and the output time is 5 seconds.

The oscilloscope displays as follows:



2.3.3 Decode payload

While using TTN V3 network, you can add the payload format to decode the payload.