LoRaWAN FAQ

1.What is LoRa?

LoRa is a wireless RF communication technology developed by Semtech, and its name "LoRa" stands for Long Range Radio.

2.What are the characteristics of LoRa?

LoRa expands 3-5 times the distance of traditional wireless radio communication at the same power consumption. LoRa uses unlicensed frequency bands to build a secure and controllable private IoT.

3.What is the difference between LoRa and LoRaAWN?

LoRa is a modulation technology, and LoRaWAN is a set of communication protocols and system architecture based on LoRa modulation technology. The relationship between the two is that LoRa is the PHY layer, and LoRaWAN is the MAC layer.

4.What steps are required to deploy a LoRaAWN network?

Gateway deployment: you can purchase and build the gateway yourself, or use the LoRaWAN base station provided by the relevant operator. LoRaWAN server deployment: use open source servers or access mature platforms; Node development: import the network access credential information obtained from the LoRaWAN server. Online application: start data acquisition and remote control.

5.Will there be conflicts when multiple devices report at the same time?

The LoRaWAN node will use the frequency hopping mechanism when going upstream. If there is a concurrent situation of the same frequency, there is a possibility of packet loss. In actual use, you can reduce the possibility of concurrency by setting the message confirm or adding a random delay time based on the reporting interval.

6.How to understand Adaptive Date Rate(ADR)?

Adaptive Date Rate(ADR) is a technology that adjusts the data transmission rate to ensure reliable data transmission, optimize network performance, and expand network capacity. When the node is close to the gateway, the data transfer rate can be faster and the transmit power can be lower. However, nodes at the edge of the link budget have slower data transmission rates and higher transmit power. The ADR method can adapt to different network structures and support different path losses.

7.What is the node capacity that the RG-02 gateway can carry?

The number of nodes that the gateway can access is related to the data reporting interval, data packet length and other factors. Relevant actual test parameters: 20min reporting interval under the condition of 200+ nodes and stable communication. The theoretical capacity is 62500 under the condition of 1h interval.

8.What are the node working modes supported by the RG-02 gateway?

RG-02 supports nodes to work in ClassA/ClassC mode.

9.What is the communication distance among the nodes of Ra-08 series module?

Distance and communication speed are usually inversely proportional. By adjusting the spreading factor, bandwidth, coding rate and other parameters of the communication node, the actual sending and receiving distance and communication speed of the device will be affected. The Ra-08 module has a measured distance of 4.6km+ under the condition of 125Kz SF12.

10.How to know the applicable LoRaWAN frequency band in the user's area?

The latest version of the LoRaWAN band document is available on the LoRa Alliance official website Homepage LoRa Alliance® (lora-alliance.org)

11.What are the requirements for voltage ripple of Ra-08 series modules?

Recommended voltage ripple is less than 30mV.

12.What are the common factors that affect the communication distance of nodes?

There are obstacles in the straight line, and metal objects interfere. Influenced by temperature and humidity, weather and other natural factors: when the air is dry, the communication distance is longer. When the air is humid (rain, snow), the communication distance&quality will be disturbed to a certain extent. Co-channel interference may increase the packet loss rate. Deploy close to the ground.

13.How does the node improve the near-frequency interference or cross-frequency problem?

Monitor the busy condition of the channel and switch the channel

14.What is the development method of Ra-08 series modules?

AT command: please refer to the AT command set of Ai-Thinker's DOCS https://docs.ai-thinker.com/lorawan

SDK： https://github.com/Ai-Thinker-Open/Ai-Thinker-LoRaWAN-Ra-08

15.How does the node access the network and what is the difference?

There are two ways for the node to access the network: OTAA and ABP. OTAA will send a network access request every time it accesses the network. After the NS verification is passed, the device addr and app skey,nwkkey are obtained to achieve network access. ABP uses the pre-configured method, and the node is pre-configured with a communication key without sending a network access request. OTAA has higher security because it sends a network application to refresh the key every time. However, ABP is simpler in terms of network access overhead.

16.What is the difference among the node working modes ClassA/B/C?

Class A: The user controls the reporting time of the node. The node briefly opens the receiving window after reporting the information to obtain the data sent by the gateway. This mode is the most power efficient. Class B: By agreeing with the gateway to receive a time slot, the receive window is periodically opened to reduce the communication delay. Moderate power consumption. Class C: Keeping the receiving window open can ensure the real-time nature of the message, but it will also consume more power.

17.What LoRaWAN frequency bands are supported by Ra-08 series modules?

Currently, the Ra-08 series modules have two versions, "Ra-08" (low frequency) and "Ra-08H" (high frequency). The low-frequency version can be flashed into CN470 AT firmware (applicable to China), and the high-frequency version can be flashed to EU868 and US915 (applicable to Europe and America)

18.When the Ra-08 series module report data to the NS during debugging, there is an ERROR occurs in the background report log?

Click the log details to find the cause of the error. The data exception may be caused by the frame count error. This situation can be resolved by refreshing or canceling the frame count function.