安信可科技
Ai-Thinker

RG-01 Specification

Version V1.0

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Change History of Revision

Version	Date	Contents of Revision Change	Compilation	Verify
V1.0	20200416	Initial release	Xie Yiji	

Contents

1.Product Overview

Ai-Thinker LoRa Gateway (RG-01) is designed and developed by Ai-Thinker Technology. The gateway is used for ultra-long-distance spread spectrum communication. Built-in three RF chips SX1278 has a high sensitivity of -148dBm and a power output of + 20dBm, long transmission distance and high reliability; it can send and receive data on three RF channels at the same time. Each channel can be set with different operating frequency and rate parameters without interfering with each other. Automatically select idle channels to send and receive data when working under high load. Under the premise of low cost, three-channel communication with loRa nodes is realized, and higher communication efficiency is realized.

Support frequency hopping technology, channel idle detection, random channel delay avoidance, to prevent interference with the same channel.

Support air wake-up technology, wake up the sleeping node module.

When compared to traditional modulation techniques, LoRa ™ modulation technique also has obvious advantages in anti-blocking and rate selection, which solves the problem that traditional design solutions cannot simultaneously consider distance, anti-interference and power consumption.

The gateway and the lora node run the private communication protocol developed by the company by default, and the gateway and the node form a star network. The node module can work in three modes:

Mode A: The gateway cannot send data to the node in real time. Only when the node uploads data, the node immediately opens a short receiving window to receive the gateway data.

Mode B: The gateway and the node synchronize time. The node opens the receiving window at the agreed time, at which time the gateway can send data. The node can upload data to the gateway at any time.

Mode C: The node continues to open the receiving mode, and the gateway can deliver data to the node at any time. In this mode, the company optimizes power consumption and replaces the continuous reception mode with a CAD channel detection method, which can significantly reduce power consumption compared to continuous reception.

Comparison of power consumption in three modes: Mode A <Mode B <Mode C.

Support multiple networking functions such as 4G / WIFI / Ethernet port.

Application areas for automatic meter reading, home building automation, security systems, remote irrigation systems

Characteristic

- LoRa private concentrator protocol, flexible, simple and customizable

- The node modules in the area automatically join the gateway to form a star network, and the three working modes of Class A / Class B / Class C can be selected to join the gateway

- LoRA gateway three-channel communication, can be configured with three operating frequencies, can send and receive data of three channels at the same time

- Support WAN port, support WIFI, optional 4G module

- Support MQTT protocol to connect to cloud server, open MQTT protocol interface

- Long-distance transmission, the transmission distance can reach 3000 meters in the open air

- Using MediaTek processor MT7688, main frequency: 580MHz, 128Mb Flash, 512Mb RAM

- Support frequency hopping communication, air wake-up, CAD channel detection

- Support standard POE power supply or power adapter power supply

Main parameters

Charter 1.1 main parameters instruction

Module Name	RG-01
Size	160mm*100mm*60mm
Antenna	Extenal antenna
Frequency range	LoRa frequency range：410-525MHz
Networking method	Ethernet/WIFI/4G
Operating temperature	-20 ℃ ~ 60 ℃
Storage environment	-40 ℃ ~ 125 ℃ ，＜ 90%RH
Power supply	DC9~55V（Advised 12V,1A)/Standard POE
Power consumption	7W
Protection	IP66（The standard configuration is only suitable for indoor use, if you want to use it outdoor, please replace it with a waterproof antenna）
Shell material	aluminum
Indicator light	Power supply、Wi-Fi、4G、WAN port and Lora indicator light
Button	Hardware reset and factory reset button
4G	Support range:Mobile / Unicom / Telecom 2/3 / 4G Full Netcom
	SIM 卡:Support medium card
	Antenna：External antenna
Lora	Protocol: Ai-Thinker private procotal
	Frequency range:410MHz~525MHz
	Channel: 3 channels
	Antenna：Extenal antenna

WIFI	Antenna：Extenal antenna
Ethernet	10/100M WAN

2.Electrical Parameters

Electrical characteristics

Parameter	Name	Min	Typ	Max	Unit
Operating Temperature	TOPR	−20	−	60	℃
Supply voltage	VDD	9	12	55	V

LoRa Frequency

Description	Typ	Unit
Operating Frequency	410~525	MHz

3.Appearance size

4.Product structure
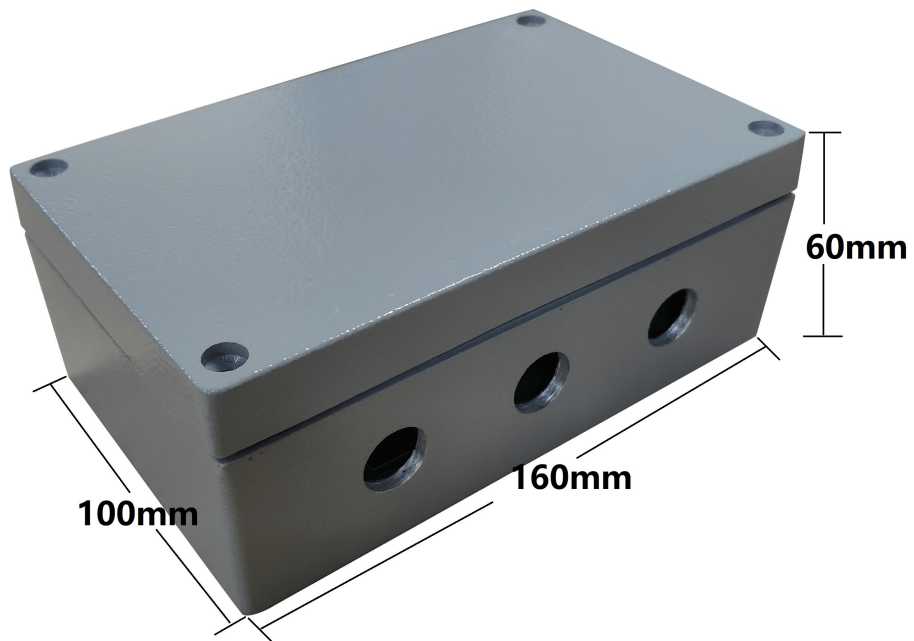
5.Product Interface

No.	Name	Describtion
①	Connection port	Connect the network cable/power cable
②	External 433 antenna	LoRa antenna
③	External 433 antenna	LoRa antenna
④	External 433 antenna	LoRa antenna
⑤	External 2.4G antenna	WiFi antenna
⑥	External 433 antenna	4G antenna

6.Package Information

Package of RG-01（Untetermined).

7.Contact us

Company Website：https://www.ai-thinker.com

Development DOCS：https://docs.ai-thinker.com

Official Forum：http://bbs.ai-thinker.com

Sample Purchase：https://anxinke.taobao.com

Business：sales@aithinker.com

Technical Support：support@aithinker.com

Company Address：410, Building C, Gufeng Huafeng Smart Innovation Port, Xixiang, Baoan District,

Shenzhen

Tel：0755-29162996