WisDuo LPWAN Module

RAK3172

User Manual

Product Description

RAK3172 Low-Power Long Range Transceiver module that is based on STM32WLE5CC chip. It provides an easy to use, small size, low-power solution for long range wireless data applications. This module complies with Class A, B & C of LoRaWAN 1.0.3 specifications. It can easily connect to different LoRaWAN server platforms like TheThingsNetwork (TTN), Chirpstack, Actility, etc. It also supports LoRa Point to Point (P2P) communication mode which helps you in implementing your own customized long-range LoRa network quickly.

You can configure the mode and operation of the module using AT commands via a UART interface. RAK3172 also offers low power features which is very suitable for battery-powered applications.

Product spec

- Based on **STM32WLE5CC55**
- **LoRaWAN 1.0.3** specification compliant
- **Supported bands**: EU433, CN470, IN865, EU868, AU915, US915, KR920, RU864, and AS923
- LoRaWAN Activation by OTAA/ABP
- LoRa Point to Point (P2P) communication
- Easy to use AT Command Set via UART interface
- Long-range - greater than 15 km with optimized antenna
- Arm Cortex-M4 32-bit
- 256 kbytes flash memory with ECC
- 64 kbytes RAM
- Ultra-Low Power Consumption of 1.69 μA in sleep mode
- **Supply Voltage**: 2.0 V ~ 3.6 V
- **Temperature Range**: -40° C ~ 85° C

Detailed Datasheet for the modules are available in the RAKwireless Documentation Center:

https://docs.rakwireless.com/Product-Categories/WisDuo/RAK3172-Module/Datasheet/

RAK3172 Quick Start Guide

Hardware Tools

1. RAK3172 WisDuo LPWAN Module
2. Windows PC
3. USB cable

Software Tools

1. RAK Serial Port Tool

Interfacing with RAK3172

RAK3172 module can be configured using AT commands via UART interface. You need a USB to UART TTL adapter to connect the RAK3172 to PC's USB port and a serial terminal tool. It is highly recommended to use RAK Serial Port Tool (opens new window)so you can easily send AT commands and view the replies from the console output.

Connect to the RAK3172

1.Mount the RAK3172 Core module on a RAK5005-O Base board.
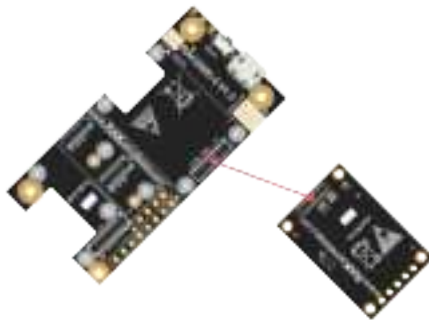
2.Connect the Base board with the computer using USB cable

3.Any serial communication tool can be used; but, it is recommended to use the RAK Serial Port Tool (opens new window).

4.Configure the serial communication tool by selecting the proper port detected by the computer and configure the link as follows:

- Baud Rate: **9600 baud**
- Data Bits: **8 bits**
- Stop Bits: **1 stop bit**
- Parity: **NONE**

#Configuring RAK3172

To enable the RAK3172 module as a LoRa P2P module or a LoRaWAN end-device, the module must be configured and parameters must be set by sending AT commands.

The first step is to connect the RAK3172 module to the USB-UART converter computer as described in the previous section. Using a serial communication tool, you can now send commands to the RAK3172. For example, sending the AT will display OK. For the details of all supported AT commands, refer to AT Commands for RAK3172.
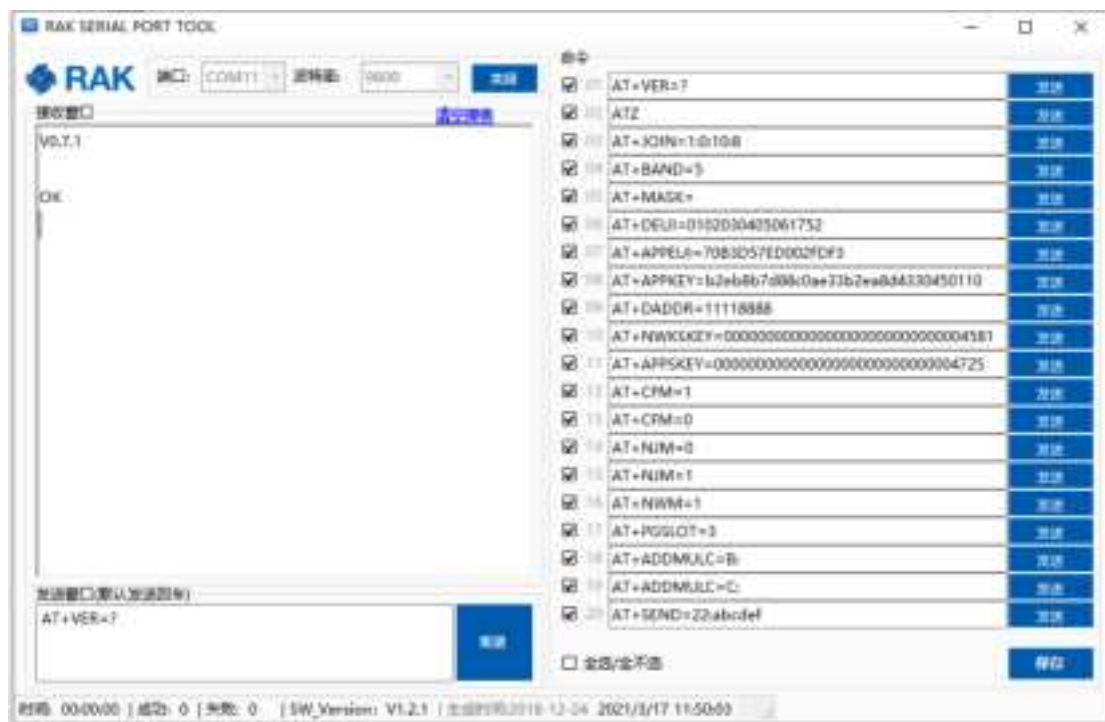
Detailed Quick Start Guides for the modules are available in the RAKwireless Documentation Center:

https://docs.rakwireless.com/Product-Categories/WisDuo/RAK3172-Module/Quickstart/#prerequisites

CERTIFICATION WARNING:

CE:

Hereby, [Shenzhen RAKwireless Technology Co.,Ltd.] declares that the radio equipment type [designation of type of radio equipment] is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: ********

Operating frequency range: 863-870 MHz

Max. output power: 14dBm

Correct Disposal of this product. This marking indicates that this product should not be disposed of with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

Manufacture name and address:****

Shenzhen RAKwireless Technology Co.,Ltd.

Room 506, Bldg B, New Compark, Pingshan First Road, Taoyuan Street, XiLi Town Nanshan District, Shenzhen, China

Importer name and address:

Company	Address
Allnet	Maistr. 2, Munich 82110 Germering, Germany

FCC/ISED:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution:

Changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

FCC Statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions,

may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:1. This device may not cause interference. 2. This device must accept any interference, including interference that may cause undesired operation of the device.

Ce dispositif contient des émetteurs exonérés de permis(s)/récepteurs)s qui sont conformes aux RSS (s) exemptés de licence du Canada. L'opération est soumise aux deux conditions suivantes : 1. Cet appareil peut ne pas causer d'interférences. 2. Ce dispositif doit accepter toute interférence, y compris les interférences qui peuvent provoquer un fonctionnement indésirable de l'appareil.

RSS-102 Statement:

FCC and Innovation, Science and Economic Development RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.

Cet émetteur doit être installé pour fournir une distance de séparation d'au moins 20 cm de toute personne.

The proposed FCC IC label format is to be placed on the module. If it is not visible when the module is installed into the system, "Contains FCC ID: 2AF6B-RAK3172, Contains IC: 25908-RAK3172" shall be placed on the outside of final host system.

Labelling

— This radio transmitter [25908-RAK3172] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list and have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
— Le présent émetteur radio [25908-RAK3172] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés cidessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont trictement interdits pour l'exploitation de l'émetteur.

Antenna info

Antenna type: IPEX Antenna
Manufacturer: Shenzhen RAKwireless Technology Co., Ltd.
Model name: 501-0132-X1
Antenna gain: 2.3dBi