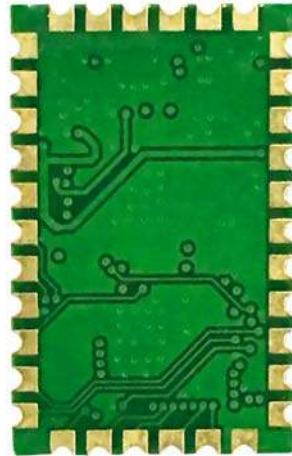
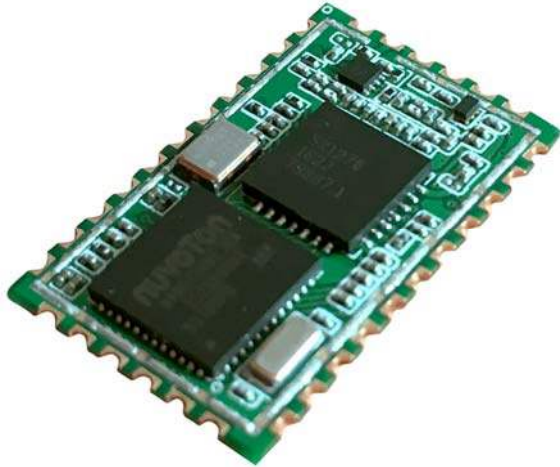




Pi Supply



## **RAK811 LoRa / LoRAWAN module (based on SX1276) 868/915MHz up to 3km range**

### **RAK811 LoRa Module**

LoRaWAN module base on SX1276 LoRa spread spectrum.

- Embedded LoRaWAN protocol class A&C. Easily connects to LoRa technology gateway.
- LoRaWAN protocol stack ready in system
- Full certification by region
- Long Range - Greater than 15 km
- Simple ASCII command set
- Serial Port AT Command
- Automatic modification of frequency points supported

## **RAK811 LoRa Technology**

RAK811 is a wireless transparent communications module, based on the Semtech SX1276. LoRa technology utilises a spread spectrum modulation in the Sub-GHz band to enable long range (greater than 10 miles) coverage, low power consumption (up to 10 years battery power), high network capacity (up to 1 million nodes), robust communication, and localisation capability. With strength of RF hardware capability by RAK, RAK811 communication distance maintains to 3000m with improved receive sensitivity. Moreover, RAK811 fully supports and conforms to the specifications of LoRaWAN Class A&C protocol, facilitating an easy access to LwM2M IoT platforms such as Activity.

LoRa technology applies physical layer or wireless modulation to build long distance communication links. Based on LFM SS modulation, it maintains the same low power consumption as of FSK modulation, but significantly prolongs communication distance.

LoRaWAN defines communication protocol and system architecture of networking aiming at some core requirements of IoT, such as safe two-way communications, mobility, and local service. The technology does not require local complex configuration to allow seamless interoperability among smart devices, releasing the operating authority to the users, developers and enterprises of IoT.

LoRaWAN protocol gives you...


- **Universality** - LoRaWAN specifications have been formulated in Europe and North America. It's impact is widening with more developers and resources getting behind it.
- **Safety** - The protocol uses strict encryption algorithm assuring more stringent safety in its own private protocol module.
- **Network roaming** - LoRaWAN includes detailed protocol planning of roaming to smoothen your network.
- **Business advantage** - LoRaWAN protocol has been adopted in LoRa networks of Japan, South Korea, and Singapore with outstanding business prospect.

## Super Strong Anti-interference

**LoRa spread spectrum technology Super Strong Anti-interference**


Traditional communications – fixed single frequency communications

Interfered single frequency  
cannot receive data normally



LoRa spread spectrum communications – multi-channel communications

Multi-channel communications has enhanced anti-interference capability



The diagram illustrates the difference between traditional and LoRa communication. In the top section, 'Traditional communications – fixed single frequency communications' shows two black antennas connected to a single horizontal line representing a single frequency. A red circle with a diagonal slash is placed over this line, with the text 'Interfered single frequency cannot receive data normally' above it. In the bottom section, 'LoRa spread spectrum communications – multi-channel communications' shows two green antennas connected to multiple horizontal lines representing multiple channels. A red circle with a diagonal slash is placed over the top channel, while green checkmarks are placed over the other channels, with the text 'Multi-channel communications has enhanced anti-interference capability' above it.

## Access LoRaWAN Platform

**Access LoRaWAN Platform**

ThingPark Wireless, platform from Actility (based on LoRaWAN specification)

More is in Coming.....




The diagram shows a network topology with several green nodes connected by lines, representing a LoRaWAN network. Below the network is a LoRa module with various certification logos (PFC, CE, etc.) and the text 'LoRaWAN' and 'LoRa' visible on its surface.


## Point to point/Broadcasting

**Launch mode: Point to point/Broadcasting**

**Point to point communications**  
- Sender: objective address + objective channel + data  
Receiver: data  
Can help you quickly establish your own remote private LoRa network



**Broadcasting communications**  
- Sender: data  
Receiver: data  
Can help you quickly build group networking



Easy to user: Serial Port AT Commands

UART interface and serial port AT command provided makes it easy to use.

**Easy to use Serial Port AT Commands**

UART interface and serial port AT command provided, easy to use,  
AT command built on the UART interface; UART baud rate and air rate online change supported



## Features of the module

- LoRaWAN protocol supported / global license free ISM band / full certification by region.
- remote LoRaWAN band: 868MHz / 915MHz
- Easy to use UART interface / serial port AT command / baud rate and air rate online change supported / simple ASCII command set.
- Maximum output power 100mW (20dBm) / adjustable from 5 to 20dBm
- High sensitivity: -148dBm enabling extremely long range connectivity.
- Long range: Greater than 15 km
- High capacity of up to 1 million nodes
- Low power consumption / 500nA on standby / in-air wake-up supported
- Multi-channel, dual data buffer (256 bytes each)
- LoRa/FSK/GFSK/OOK modulation bidirectional two way communications
- Long battery life - over 10 years
- LoRa technology is capable of demodulating 20dB below noise level, significantly improving immunity to the interference when combined with integrated forward error correction.



<https://uk.pi-supply.com/products/rak811-lora-lorawan-module> 9-17-18