



# WisLink-LoRa Concentrator Module

Mini-PCle Edition  
RAK2247 SPI/USB

## Package Content



RAK2247 board  
(1x)



iPEX Antenna  
(1x)

## Product Description

RAK2247 is a LoRa concentrator module with mini-PCle form factor based on SX1301. This enables easy integration to existing routers and other network equipment with LoRa Gateway capabilities, and can be used in any embedded platform offering mini-PCle slot with SPI or USB connection.

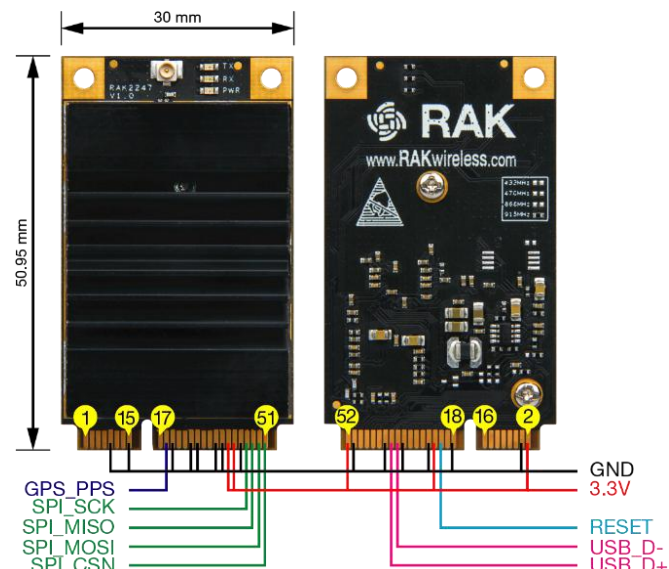
This module is a complete and cost efficient LoRa gateway solution offering up to 10 programmable parallel demodulation paths. It targets smart metering fixed networks and Internet-of-Things (IoT) applications, covering up to 500 nodes per square kilometer in an environment with moderate interference. The modules have the industry standard PCI Express Mini Card form factor, which enables easy integration into an application board and is also ideal for manufacturing of small series.

## Product Features

- Compatible with Mini PCI-e Edition specification with heat sink.
- SX1301 base band processor emulates 49 x LoRa demodulators, 10 parallel demodulation paths. It supports 8 uplinks channel and 1 downlink channel.
- 2 x SX125x Tx/Rx front-ends high/low frequency.
- Built-in FT232H to convert SPI interface of SX1301 to USB 2.0.
- Voltage of Mini PCI-e is 3.3 V, compatible with 3G/LTE card of Mini PCI-e type.
- Tx power up to 25 dBm, Rx sensitivity down to -139 dBm @ SF12, BW 125 kHz.
- Supports latest LoRaWAN 1.0.2 protocol.
- Supports global license-free frequency band (EU433, CN470, EU868, US915, AS923, AU915, KR920, IN865 and AS920).
- Supports optional SPI or USB interfaces.

## Pin Configurations

| Item     | Pin(s)                                               |
|----------|------------------------------------------------------|
| GND      | 4, 9, 15, 18, 21, 26, 27, 29, 34, 35, 37, 40, 43, 50 |
| 3.3V     | 2, 24, 39, 41, 52                                    |
| 1PPS     | 19                                                   |
| RESET    | 22                                                   |
| USB_D-   | 36                                                   |
| USB_D+   | 38                                                   |
| SPI_SCK  | 45                                                   |
| SPI_MISO | 47                                                   |
| SPI_MOSI | 49                                                   |
| SPI_CSN  | 51                                                   |





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## Key Features

|                            |                                                                                                                                                                  |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LoRa Module</b>         | <ul style="list-style-type: none"><li>• SX1301 base band processor, support 8 uplinks channel, 1 downlink channel</li></ul>                                      |
| <b>Heat Sink</b>           | <ul style="list-style-type: none"><li>• Metal Material</li></ul>                                                                                                 |
| <b>Frequency</b>           | <ul style="list-style-type: none"><li>• EU433, CN470, EU868, US915</li><li>• AS923, AU915, KR920, IN865, AS920</li></ul>                                         |
| <b>LoRaWAN Version</b>     | <ul style="list-style-type: none"><li>• LoRaWAN V1.0.2</li></ul>                                                                                                 |
| <b>Range</b>               | <ul style="list-style-type: none"><li>• Urban: 2~4km</li><li>• Suburb: 5~10km, Open Area: 15km</li></ul>                                                         |
| <b>Node Numbers</b>        | <ul style="list-style-type: none"><li>• 500 nodes/km2</li></ul>                                                                                                  |
| <b>TX Power</b>            | <ul style="list-style-type: none"><li>• 25dBm (Max), typical 23 dBm</li></ul>                                                                                    |
| <b>RX Sensitivity</b>      | <ul style="list-style-type: none"><li>• -139dBm(Min)@SF12, BW 125KHz</li></ul>                                                                                   |
| <b>Power Supply</b>        | <ul style="list-style-type: none"><li>• DC 3.3V</li></ul>                                                                                                        |
| <b>Hardware Interface</b>  | <ul style="list-style-type: none"><li>• Mini-PCIE</li></ul>                                                                                                      |
| <b>Software Interface</b>  | <ul style="list-style-type: none"><li>• SPI/USB</li></ul>                                                                                                        |
| <b>LED</b>                 | <ul style="list-style-type: none"><li>• 1* Green LED for PWR status</li><li>• 1* Green LED for TX status</li><li>• 1* Green LED for RX status</li></ul>          |
| <b>USB</b>                 | <ul style="list-style-type: none"><li>• USB2.0</li><li>• USB-to-SPI bridge: FT2232H</li></ul>                                                                    |
| <b>Antenna Interface</b>   | <ul style="list-style-type: none"><li>• 1* UFL connectors for LoRa</li></ul>                                                                                     |
| <b>Power Consumption</b>   | <ul style="list-style-type: none"><li>• TX (Max): 440 mA</li><li>• RX(All channels): 470mA</li><li>• Idle: 68 uA</li></ul>                                       |
| <b>Working Environment</b> | <ul style="list-style-type: none"><li>• Indoor/Outdoor</li></ul>                                                                                                 |
| <b>Physical Dimension</b>  | <ul style="list-style-type: none"><li>• Dimension (L x W x H): 50.95 x 30 x 10.4mm(includes the heat sink)</li><li>• Weight: Approximately 0.59~0.6 oz</li></ul> |
| <b>Temperature Range</b>   | <ul style="list-style-type: none"><li>• Operation Temperature: -40°C ~ +85°C</li><li>• Storage Temperature:- 40°C ~ +85°C</li></ul>                              |
| <b>Compliance</b>          | <ul style="list-style-type: none"><li>• FCC, CE</li></ul>                                                                                                        |

## Order Information

| Part Number    | Package                                   | Description                                  |
|----------------|-------------------------------------------|----------------------------------------------|
| RAK2247-0X-R01 | 1x board and 1x Antenna retail package    | RAK2247-SPI, 433/470/868/915/923/920/865 MHz |
| RAK2247-0X-C10 | 10-piece board and Antenna carton package | RAK2247-SPI, 433/470/868/915/923/920/865 MHz |
| RAK2247-1X-R01 | 1x board and 1x Antenna retail package    | RAK2247-USB, 433/470/868/915/923/920/865 MHz |
| RAK2247-1X-C10 | 10-piece board and Antenna carton package | RAK2247-USB, 433/470/868/915/923/920/865 MHz |



### About RAKwireless:

RAKwireless is the pioneer in providing innovative and diverse cellular and LoRa connectivity solutions for IoT edge devices. It's easy and modular designs can be used in different IoT applications and accelerate time-to-market turnover. For more information, visit RAKwireless website at [www.rakwireless.com](http://www.rakwireless.com).

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