



# Pilot Gateway Pro RAK7243

WisDevice RAK72x Series

LoRa Gateway Kit with Cellular & GPS



## Package Content



Pilot Gateway Pro  
(1x)



LoRa Antenna  
(1x)



LTE Antenna  
(1x/2x)



GPS Antenna  
(1x)



Power Adapter  
(1x)

## Product Description

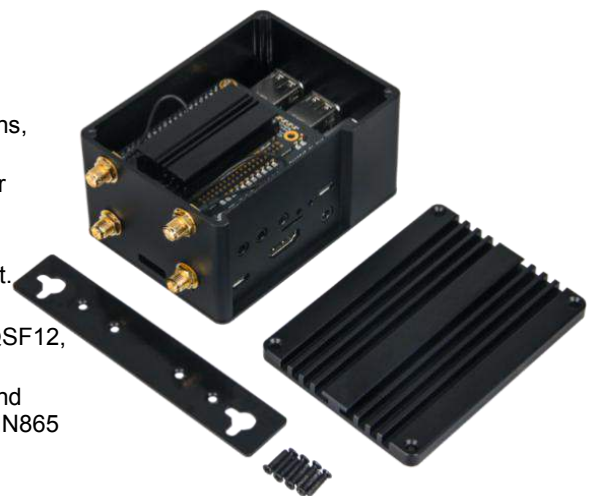
The RAK7243 Pilot Gateway Pro is a device that consists of Raspberry Pi 3B+, RAK2245 Pi HAT which includes a GPS module and a Heat Sink for better performance and thermal heat dissipation management, and an optional RAK2013 Cellular Pi HAT. And its housing is built with an aluminum casing.

For the build-in RAK2245 Pi HAT, it uses the SX1301 chip from Semtech which built-in LoRa concentrator IP core is a powerful digital signal processing engine. It is able to receive up to 8 LoRa packets simultaneously sent with different spreading factors on different channels and available in multiple variants so it can be used for international standard bands. This unique capability allows to implement innovative network architectures advantageous over other short range systems. For the build-in RAK2013 Cellular Pi HAT, it supports optional QUECTEL BG96 / EG91 / EG95 which can support NB-IOT / CAT-M / CAT1 LTE / CAT4 LTE. It follows Raspberry Pi specifications and is easy to mount with Raspberry Pi and RAK2245 Pi HAT module.

Pilot Gateway Pro is ideal for prototyping, proof-of-concept demonstration or for the evaluation. It includes a ready to use LoRaWAN Gateway OS that can be connected to a LoRaWAN server. Also it is developer friendly and simple even for no-so-techy users to set up LoRaWAN system. It has to be the best value and function for connectivity to address a variety of applications like Smart Grid, Intelligent Farm and other IoT enterprise applications.

## Product Overview

- Computing with Raspberry Pi 3B+(Linux).
- SX1301 base band processor, emulates 49 x LoRa demodulators 10 programmable parallel demodulation paths, support 8 uplinks channel, 1 downlink channel.
- Support optional cellular module(Quectel BG96 or EG91 or EG95) for NB-IOT / CAT-M / CAT1 LTE / CAT4 LTE.
- Built-in the Ublox MAX-7Q GPS Module.
- Built-in Heat Sink for thermal heat dissipation management.
- Supports 5V/2.5A power supply.
- TX power up to 27dBm, RX sensitivity down to -139dBm@SF12, BW 125KHz.
- LoRa frequency supports global license-free frequency band (EU433, CN470, EU868, US915, AS923, AU915, KR920, IN865 and AS920).
- Housing with top cover, body, bottom cover with riveted motherboard standoff.
- Includes Pi ready 'ID EEPROM', GPIO setup and device tree can be automatically configured from vendor information.
- Supports fully open source code connected to a LoRaWAN server.



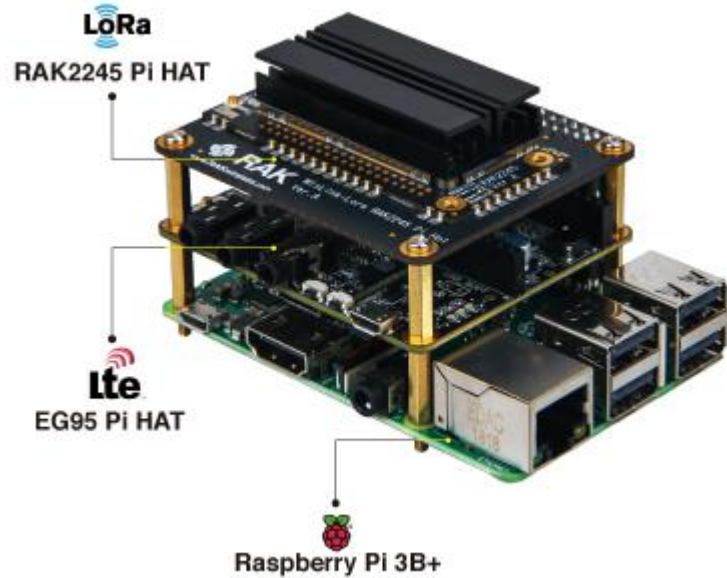


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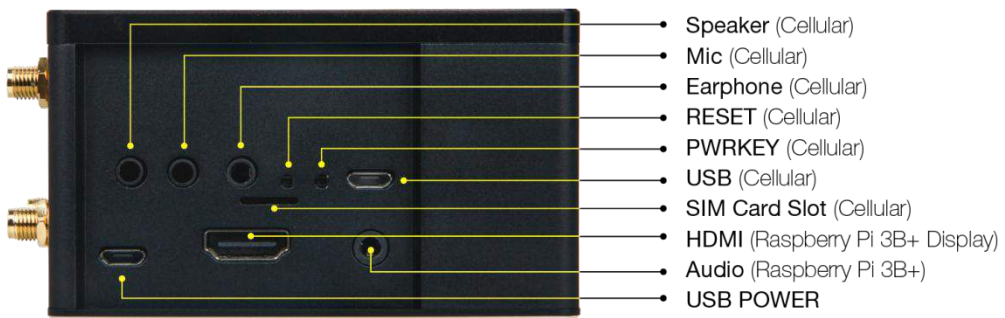
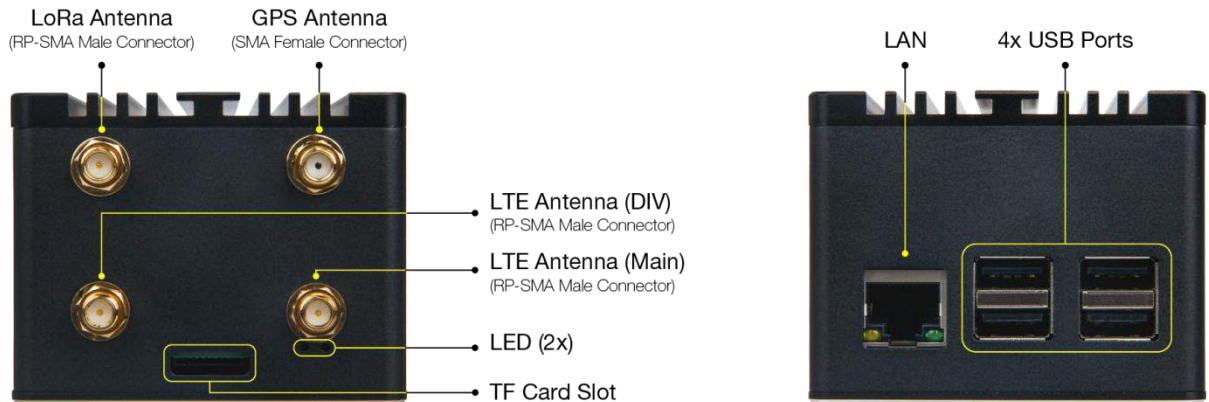
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## Internal Structure



## Hardware Interfaces



*Note: All Quectel BG96,EG91,EG95 are option . Anyone or Even None. LTE Antenna only for BG96 / EG91 / EG95 version. LTE Antenna(DIV) is only using for the EG91 / EG95 Version and reserved for BG96 Version.*



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## Key Features

<b>Computing</b>	<ul style="list-style-type: none"> <li>Raspberry Pi 3B+(Linux)</li> </ul>
<b>LoRa Module</b>	<ul style="list-style-type: none"> <li>RAK2245 Pi HAT LoRa Concentrator Board with heat sink (1 x Semtech SX1301 transceiver concentrator and 2 x Semtech SX125X highly integrated RF front end I/Q transceivers)</li> </ul>
<b>Cellular Module</b>	<ul style="list-style-type: none"> <li>RAK2013 Cellular Module (Optional Quectel BG96 or EG91 or EG95)</li> <li><b>Cellular Standard and Bands</b></li> <li>With BG96: NB-IOT/ CAT-M Cat M1/Cat NB1: LTE FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B26/B28 LTE TDD: B39 (For Cat M1 Only) EGPRS: 850/900/1800/1900MHz</li> <li>With EG91: LTE CAT 1</li> <li>With EG95: LTE CAT 4</li> <li>Variant for Europe LTE FDD: B1/B3/B7/B8/B20/B28A; WCDMA: B1/B8; GSM: 900/1800MHz</li> <li>Variant for North America LTE FDD: B2/B4/B5/B12/B13; WCDMA: B2/B4/B5</li> </ul>
<b>GPS Module</b>	<ul style="list-style-type: none"> <li>Ublox MAX-7Q</li> </ul>
<b>LoRa 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, Suburb: 5~10km, Open Area: &gt;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>27dBm (Max), typical 25 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>5V / 2.5A</li> </ul>
<b>Interfaces</b>	<ul style="list-style-type: none"> <li>Front: USB power(Pi), HDMI(Pi Display), Audio(Pi), Earphone, MIC, Speaker, RESET, PWRKWHY button, USB port(Cellular).</li> <li>Left: GPS Antenna, LoRa Antenna, 1 x TF Card, 2 x LED(indication the status of LoRa TX or RX), 2 x LTE Antenna</li> <li>Right: 1xLAN, 2xDual USB Port</li> </ul>
<b>Antenna Interface</b>	<ul style="list-style-type: none"> <li>1* RP-SMA Male connectors for LoRa Antenna</li> <li>1* SMA Female connectors for GPS Antenna</li> <li>1* RP-SMA Male connectors for LTE Antenna(MAIN)</li> <li>1* RP-SMA Male connectors for LTE Antenna(DIV)</li> </ul>
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>Depending on the operating mode peak current up to 3500mA</li> </ul>
<b>Working Environment</b>	<ul style="list-style-type: none"> <li>Indoor</li> </ul>
<b>Physical Dimension</b>	<ul style="list-style-type: none"> <li>Dimension (L x W x H): 92mm x 68.3mm x 53.5mm</li> <li>Weight: Approximately 10.64 oz</li> </ul>
<b>Temperature Range</b>	<ul style="list-style-type: none"> <li>Normal Operation Temperature: -20°C ~ +65°C</li> <li>Extended Temperature: -40°C ~ +85°C</li> <li>Storage Temperature:- 40°C ~ +85°C</li> </ul>
<b>Relative Humidity</b>	<ul style="list-style-type: none"> <li>20%~75% non condensing</li> </ul>
<b>Housing</b>	<ul style="list-style-type: none"> <li>Top cover, body, bottom cover with riveted motherboard standoff</li> </ul>
<b>Compliance</b>	<ul style="list-style-type: none"> <li>FCC, CE</li> </ul>

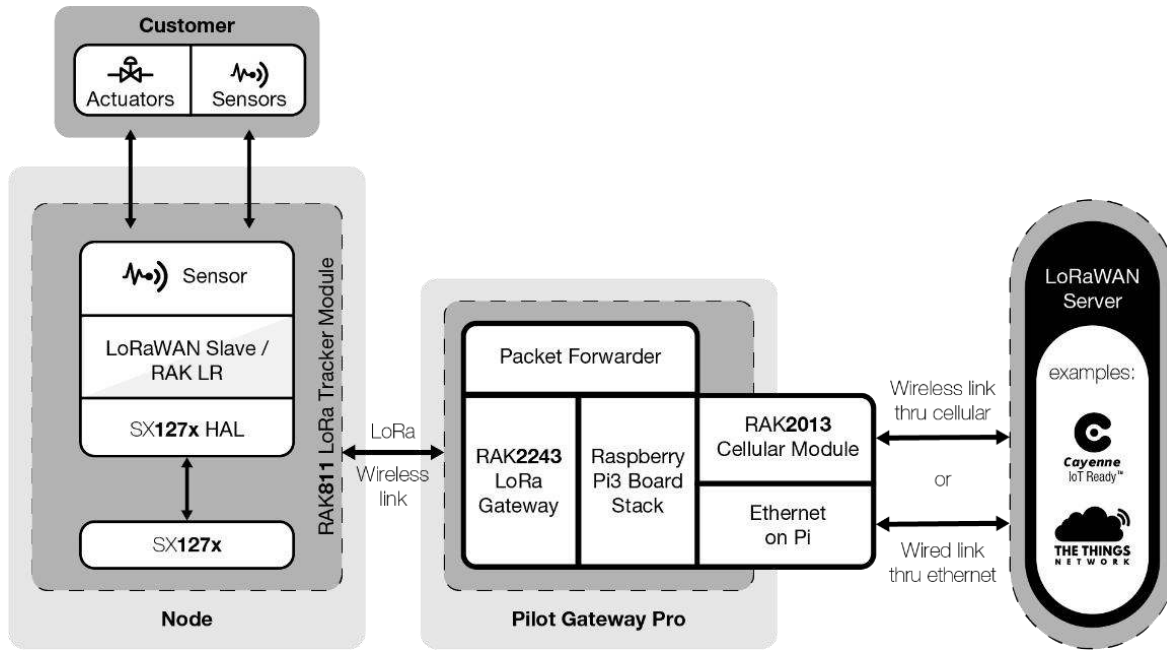


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## Block Diagram



## Order Information

Part Number	Package	Description
RAK7243-1x-142	With 1x LoRa Antenna, 1x GPS Antenna, 2x LTE Antenna, 1x Power Adapter and 1x SD card	EG95-E version for Cat 4 Cellular, GPS and for EU433 / CN470 / IN865 / EU868 / US915 / AU915 / AS920 / AS923 / KR920 regions
RAK7243-1x-141	With 1x LoRa Antenna, 1x GPS Antenna, 2x LTE Antenna, 1x Power Adapter and 1x SD card	EG95-NA version for Cat 4 Cellular, GPS and for US915 / AU915 / AS920 / AS923 / KR920 regions
RAK7243-0x-000	With 1x LoRa Antenna, 1x GPS Antenna, 1x Power Adapter and 1x SD card	Without Cellular version for EU433 / CN470 / IN865 / EU868 / US915 / AU915 / AS920 / AS923 / KR920 regions



### 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. For more information, visit RAKwireless website at [www.rakwireless.com](http://www.rakwireless.com).

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