RAK2470 WisNode Bridge Serial Prime

Overview
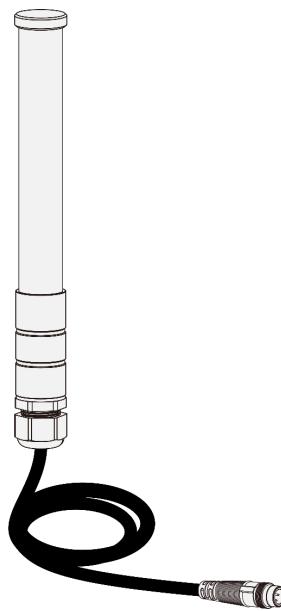
Figure 1: RAK2470 overview

Description

The **RAK2470 WisNode Bridge Serial Prime** is an RS485 to LoRaWAN converter designed for outdoor industrial applications. Utilizing the LoRaWAN network, RAK2470 wirelessly transmits RS485 data to and from end devices.

Additionally, RAK2470 WisNode Bridge Serial Prime comes with a T-type conversion cable, enabling it to link up with any RS485 equipped sensors. Both the RAK2470 and connected sensors can be powered via the DC power port.

RAK2470's default interface, the M12-4 circular connector, permits direct connection to MPPT Solar Charge Controllers, Inverters, or Inverter Integrated Machines.

Together with a RAK WisGate Gateway and LoRa Server products, RAK2470 can quickly and easily build a wireless industrial field control system. It is designed with industrial-grade protection, accommodates a wide range of voltage supplies, supports pole mounting, and facilitates field installation and use.

Features

- **LoRaWAN 1.0.3** protocol stack, supports **Class A and C**
- **Industrial grade STM MCU:** Ultra-low power (**4 μA sleep**) and wide temperature range of operation
- **Input range:** 5 ~ 12 V_{DC}
- **Mounting:** Pole
- IP67 weatherproof

Specifications

Overview

Parameter	Value	Remarks
LoRaWAN Protocol	LoRaWAN 1.0.3	

Parameter	Value	Remarks
LoRa Frequency	RU864, IN865, EU868, US915, AU915, KR920, AS923	Model specific
LoRaWAN Mode	Class A, and C	
LoRa Tx Power	20 dBm	
LoRa Antenna	Built-in fiberglass antenna	863 ~ 928 MHz VSWR < 2 Efficiency > 80% Max Gain: 3 dBi
RS485 Data Rate	115200 bps	
Input Voltage	5 ~ 12 V	
Enclosure Material	Fiberglass	
Dimensions	30 mm × 215 mm	
Protection Grade	IP67	
Installation	Pole	
Working Temperature for d.c. source	-20 ~ +70°	Typical +25° C
Working Temperature (For used with attached power adapter only)	0~40°C	
Storage Temperature	-30 ~ 85° C	

Hardware

The hardware specification covers only the interfacing and detailed parameters and functions of the RAK2470 WisNode Bridge Serial Prime.

Interfaces

The **RAK2470 WisNode Bridge Serial Prime** comes with an M12-4 circular connector (including power and RS485 data interfaces). The power interface needs to be powered by a DC power supply (5 ~ 12 V) and the voltage must be stable.

In addition, the RS485 host baud rate is 115200, and multiple devices can be connected.

Pin Definition
Definition of I/O Parameters

Type	Description
IO	Bidirectional
PI	Power input

Type	Description
N/A	Not connected

M12-4 Circular Connector Pin Definition
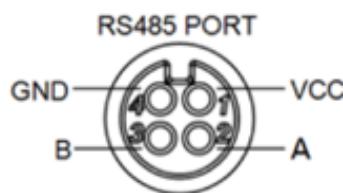
Figure 2: M12-4 connector pin definition

Pin #	Circular connector	Type	Description	Remarks
1	VCC	PI	Power In	5 ~ 12 V
2	RS485_A	IO	RS485 A+	
3	RS485_B	IO	RS485 B-	
4	GND	PI	GND	

T-Type Conversion Cable

The RAK2470 comes with a 1 m T-type conversion cable for each branch. Using this conversion cable, the RAK2470 can be connected to any RS485 equipped sensors, and power can be supplied to both the RAK2470 and the connected sensor via the DC power port.

As shown in the **Figure 3**, the T-type conversion cable consists of an L20-4 Four-core Straight-through Port for connecting RS485 sensors, an M12-4 Female-pin Port for connecting to the RAK2470, and a DC port for power supply.
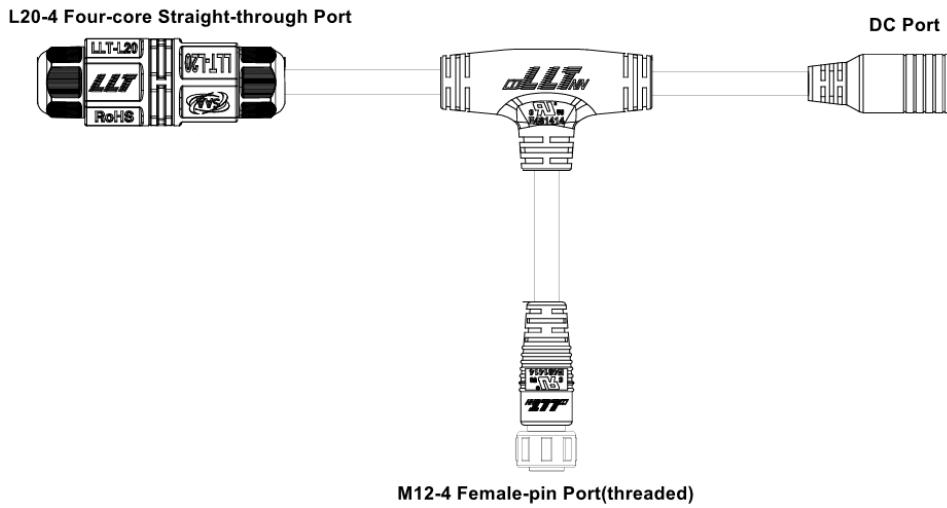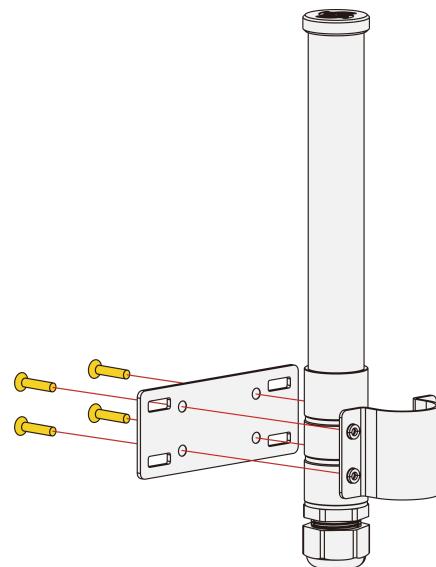

Figure 3: T-type conversion cable
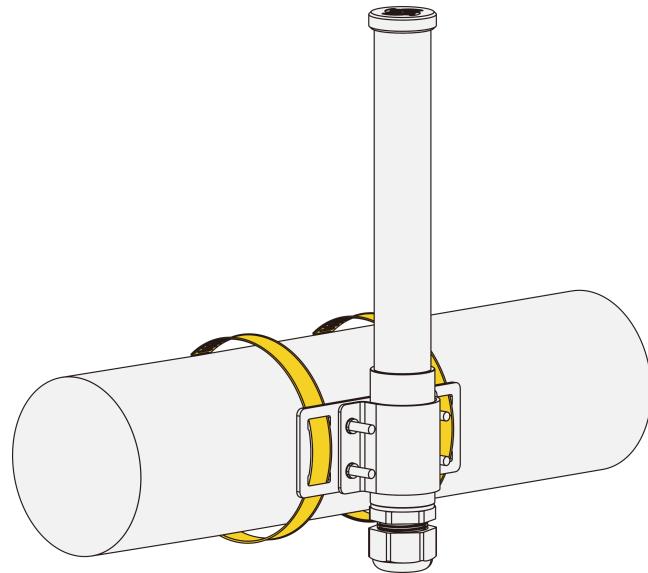
Installation

RAK2470 allows for pole mounting. Follow the provided installation steps to ensure secure mounting.

1. Fix the RAK2470 to the mounting kit with four (4) M4*20 screws.

Figure 4: Fixing the device to the mounting kit

2. Using two (2) steel strips, fasten the RAK2470 on the pole.

Figure 5: Using the steel strips

> 📝 **NOTE**
>
> The pole diameter supported by the included steel strips is 55 ~ 80 mm.

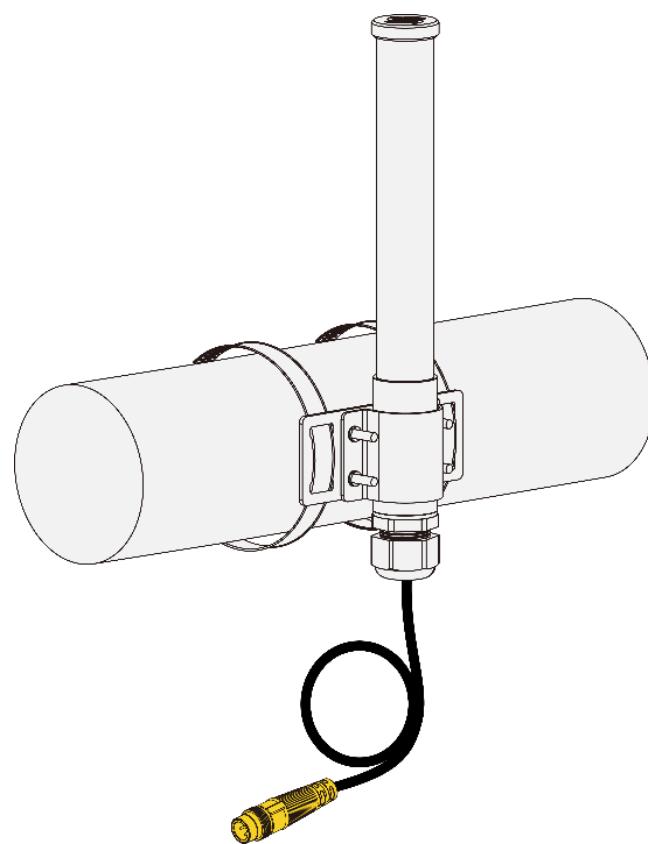3. Link the connector of the RAK2470 to the corresponding port.

Figure 6: Adding the connector

Connect to a Device

There are two ways to connect devices to RAK2470:

- When the device has its own power source (e.g. a MPPT solar charge controller), it can be directly connected to the connector on the RAK2470.

- When the device cannot provide power, it needs to be powered through the T-type conversion cable as follows:

  1. The Modbus device or RS485 sensor is connected to the L20-4 four-core straight-through port of the T-type conversion cable.
  2. RAK2470 connects to the M12-4 female-pin port (threaded) of the T-type conversion cable.
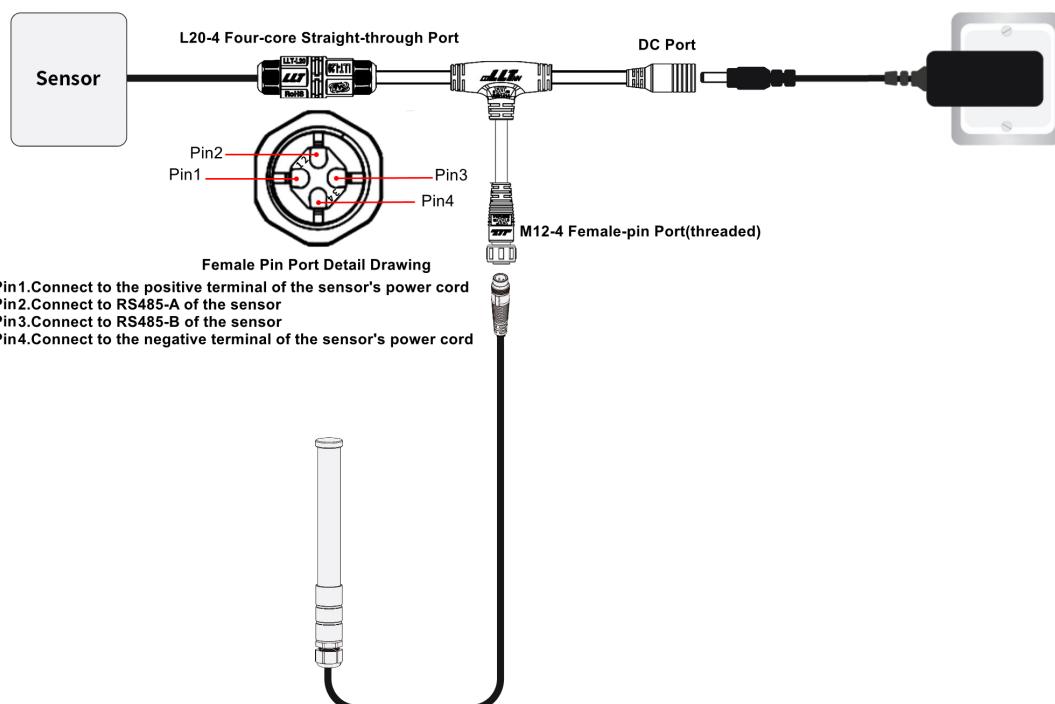 3. The DC port for connection to a power supply.

Figure 7: Connecting the bridge to a device

Always disconnect the system from power and telecommunications networks before cleaning or servicing.

• This product is intended to be powered by an external Limited Power Source (LPS) power supply. Use only the type which is supplied with this product.

• This system is considered to be Pluggable Equipment Type A. The socket outlets must be installed near the equipment and be easily accessible.

FCC:
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.

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.

FCC RF Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

ISED:
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.
L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.
Pour se conformer aux exigences de conformité CNR 102 RF exposition, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil ettoutes les personnes.