



## Wireless Bridge

## LoRa Node Development Kit





## document version

Version	Time	Description
V1.0	2021-04-01	Documents creating
V1.1	2022-01-28	Document structure update

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# 1. Description

## 1.1 Overview

WiFi and Bluetooth have been widely used in various scenarios, especially in terms of communication speed, which have obvious advantages. Almost all mobile phones now integrate WiFi and Bluetooth functions, but the communication distance is their shortcoming. Is there any hardware that can combine the long-distance advantages of LoRa with the advantages of WiFi/Bluetooth?

Wireless Bridge is such a product. Based on ESP32 and SX1276 chips, onboard 8M Byte SDRAM and 8M Byte FLASH, WiFi and Bluetooth can work at the same time. It is a bridge that converts “WiFi/Bluetooth – LoRa” signals to each other.

Wireless Bridge are available in two product variants:

Table 1.1 Product model list

No.	Model	Description
1	Wireless Bridge-L	470~510MHz working LoRa frequency, used for China mainland (CN470) LPW band.
2	Wireless Bridge-F	For EU868, IN865, US915, AU915, AS923, KR920 and other LPW networks with operating frequencies between 863~928MHz.

## 1.2 Product features

- CE Certificate;



- Microprocessor: [ESP32](#) (dual-core 32-bit MCU + ULP core), with LoRa node chip SX1276;
- 8M Byte SDRAM and 8M Byte FLASH, these features will allow WiFi and BlueTooth to work at the same time;
- +5V DC Micro USB power input, with a complete voltage regulator, ESD protection, short circuit protection, RF shielding, and other protection measures;
- SMA socket for LoRa, WiFi/BlueTooth antenna;
- Integrated CP2102 USB to serial port chip, convenient for program downloading, debugging information printing;
- Support the [Arduino development environment](#);
- We provide [ESP32 + LoRaWAN](#) protocol Arduino® library, this is a standard LoRaWAN protocol that can communicate with any LoRa gateway running the LoRaWAN protocol. In order to make this code running, a unique license is needed. it can be found on [this page](#).



## 2. Specifications

### 2.1 General specification

Table 2.1 General specification

Parameters	Description
MCU	ESP32-D0WDQ6
LoRa Chip	SX1276
WiFi	802.11b/g/n(802.11u up to 150Mbps)
Bluetooth	Bluetooth V4.2 BR/EDR and Bluetooth LE sepcification
Frequency	863~928MHz, 433~510MHz
Max. Receiving sensitivity	-135dBm
Max. TX Power	18 ± 1 dBm <sup>①</sup>
Hardware Resourse	Not cited
Memory	8MB(64M-bits) SPI FLASH, internal 520KB SRAM, 8MB(64M-bits) PSRAM
Operating temperature	-20 ~ 70 °C
Interface	Micro USB*1; LoRa Antenna interface(SMA); 2.4G Antenna interface(SMA)
Dimensions	66(+10) x 30 x 15 mm
USB to UART chip	CP2102
Battery	3.7V Lithium (SH1.25*2 interface)
Low Power	Deep sleep 800uA

<sup>①</sup> The HT-M01S -470T510 version used in mainland China has a maximum output of 22 ± 2 dBm.



## 2.2 Operating conditions

### 2.2.1 Power supply range

Table 2.2: Power supply range

Condition	Min.	Typical	Max.	Unit
USB supply power( $\geq 500\text{mA}$ )	4.70	5.00	6.00	V
Lithium battery powered	3.30	3.70	4.20	V

### 2.2.2 Power consumption

Table 2.3: Working current

Condition	Min. <sup>②</sup>	Typical value	Max. <sup>③</sup>
WiFi scan		115mA	
WiFi AP		135mA	
LoRa 10dB Output		100mA	
LoRa 12dB Output		105mA	
LoRa 15dB Output		120mA	
LoRa 19dB Output		145mA	

## 2.3 RF characteristics

The following table gives typically sensitivity level of the Wireless Bridge.

Table 2.4: LoRa RF characteristics

Signal Bandwidth/[KHz]	Spreading Factor	Sensitivity/[dBm]
125	SF12	-135

② Measured when connected to the Internet via Wi-Fi mode.

③ Measured when connected to the Internet via ethernet mode.



125	SF10	-134
125	SF7	-125

## 2.4 Operation Frequencies

Wireless Bridge(F) supports LoRaWAN frequency channels and models corresponding table.

Table3-7: Operation Frequencies

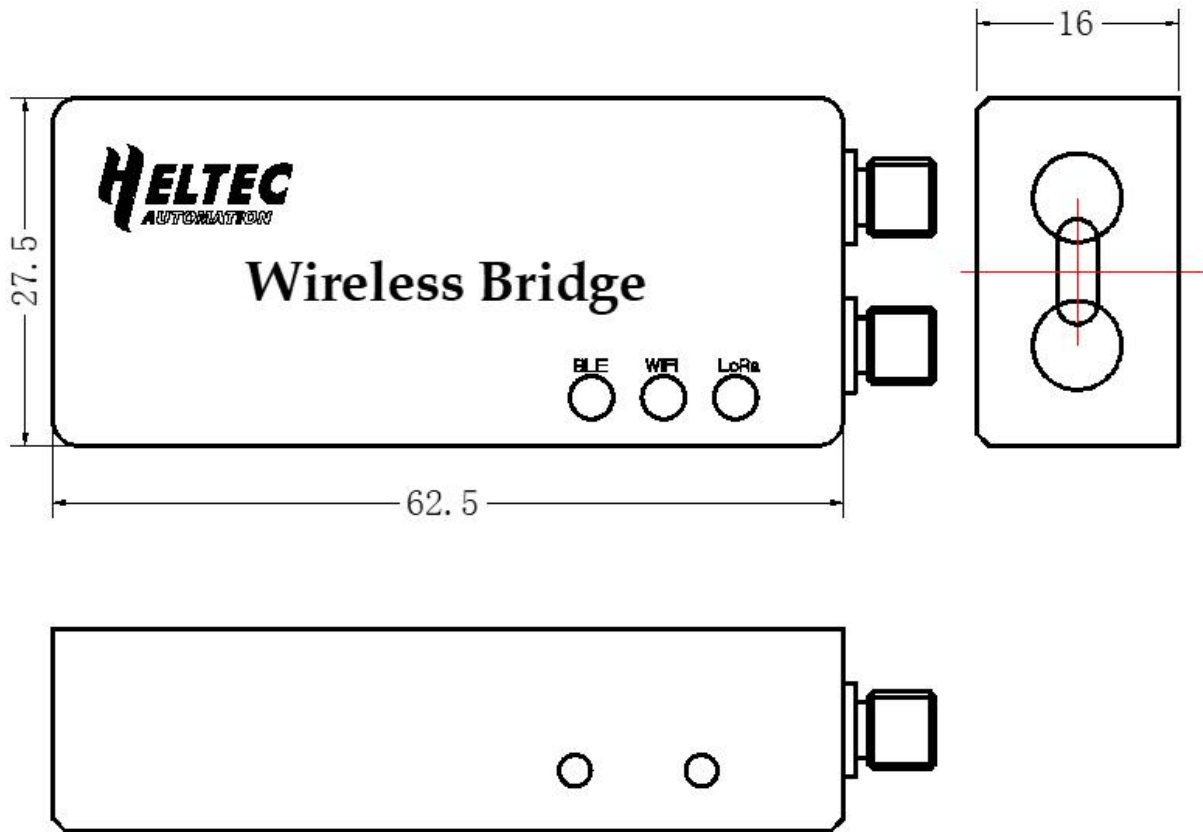
Region	Frequency (MHz)	Model
EU433	433.175~434.665	Wireless Bridge-L
CN470	470~510	Wireless Bridge-L
IN868	865~867	Wireless Bridge-F
EU868	863~870	Wireless Bridge-F
US915	902~928	Wireless Bridge-F
AU915	915~928	Wireless Bridge-F
KR920	920~923	Wireless Bridge-F
AS923	920~925	Wireless Bridge-F





### 3. Typical hardware connections

#### 3.1 Physical dimensions





## 4. Resource

### 4.1 Relevant resource

- Source Code
  - [Heltec ESP \(ESP32 & ESP8266\) framework](#) (Already included Heltec ESP32 LoRaWAN library)
  - [Heltec ESP32 library](#)
- Downloadable Resources: [listing directory /download/Wireless Bridge \(heltec.cn\)](#)

### 4.2 Heltec Contact Information

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