LR1262 LoRaWAN Node Board DataSheet

V1.0

Table of Contents

1 Overview

1.1 Product Description

The LR1262 node board uses RP2040 as the main controller and is paired with the LR1262 module to realize LoRa transceiver functions. It not only supports point-to-point transparent transmission and LoRaWAN network, but also can be flexibly combined with four types of Crowtail sensor modules, namely Ax2, Dx2, IICx1, and UARTx1, to quickly build LoRa nodes. At the same time, it provides two firmware versions of 868/915MHZ, which can adapt to the needs of different scenarios.

Considering outdoor application scenarios, the module has a built-in lithium battery charging and discharging circuit and is equipped with a solar panel charging interface, which greatly facilitates the deployment and use of outdoor nodes. It has six interfaces and can be adapted to common sensors such as temperature and humidity, air quality, light, and PM2.5, providing strong support for the rapid construction of projects such as LoRa weather stations, smart homes, smart factories, and smart logistics. In addition, the module is equipped with a 20-pin header, and the accessories also include a double-row header. Users can choose whether to weld according to their needs, which expands more development possibilities.

1.2 Core Features

➤ **Powerful main control performance:** Adopts RP2040 as the main controller, equipped with two 32-bit ARM Cortex M0+ processor cores (dual-core), providing stronger performance support for device operation.

➤ **Wide frequency band support:** Integrates the LR1262 node module, supporting the 803MHz-930MHz frequency band, covering EU868 and US915 frequency bands.

➤ **Rich interface resources:** Has abundant external interfaces, compatible with more than 150 types of Crowtail series modules, with strong expandability.

➤ **Flexible transmission methods:** Supports both LoRa point-to-point transparent transmission and LoRaWAN network usage, meeting different transmission needs.

➤ **Multiple system compatibility:** Compatible with Arduino/MicroPython, facilitating easy application development in different projects.

1.3 Functions and Application Scenarios

Through LoRa wireless technology, the module can transmit data such as temperature, humidity, position, air quality, and ultraviolet rays collected by various sensors in a low-power and long-distance manner. It is suitable for scenarios such as smart environmental monitoring (e.g., weather stations, outdoor environment detection) and IoT sensor networks (smart homes, agricultural IoT data collection). With the help of the LoRaWAN network, it can also realize remote data upload and management.
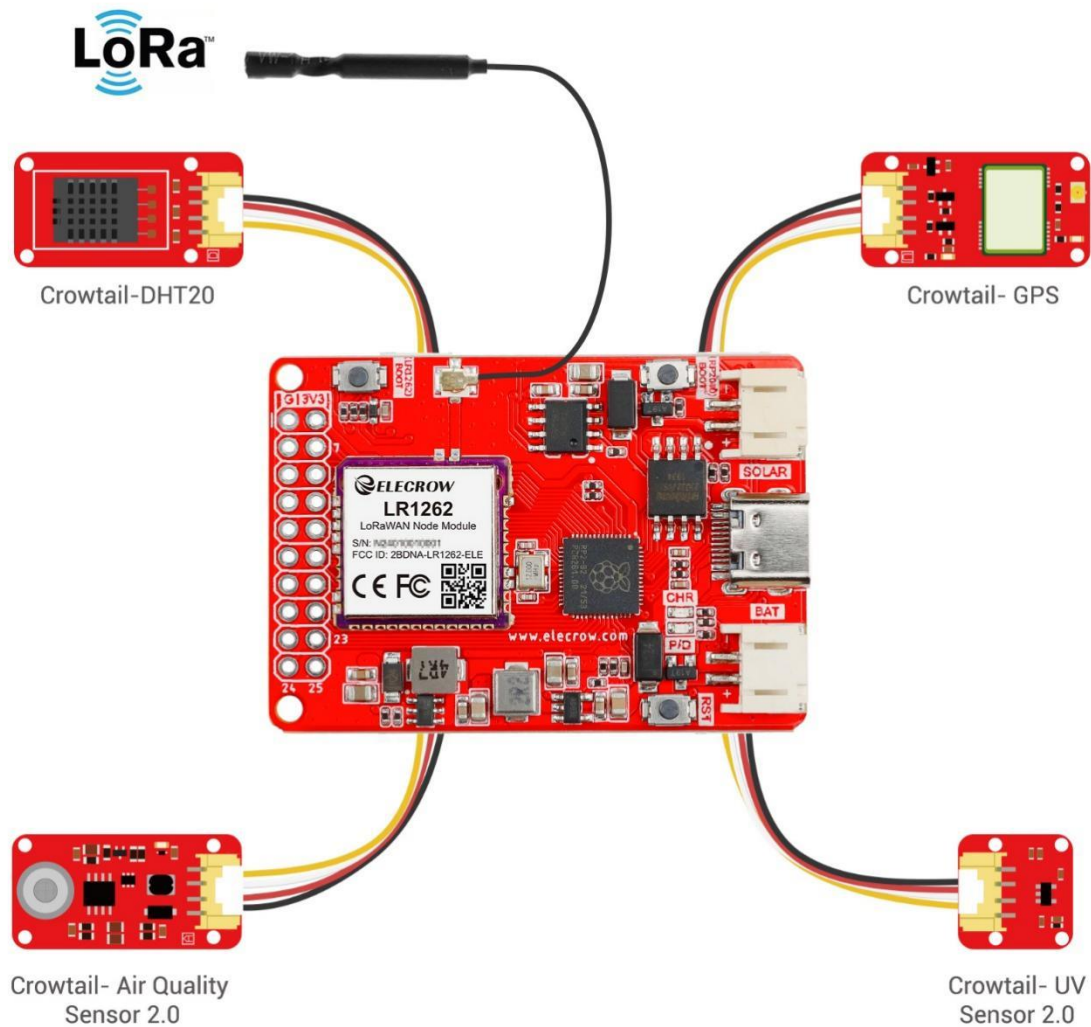

Figure 1:Function Application Diagram

2 Network Topology Diagram
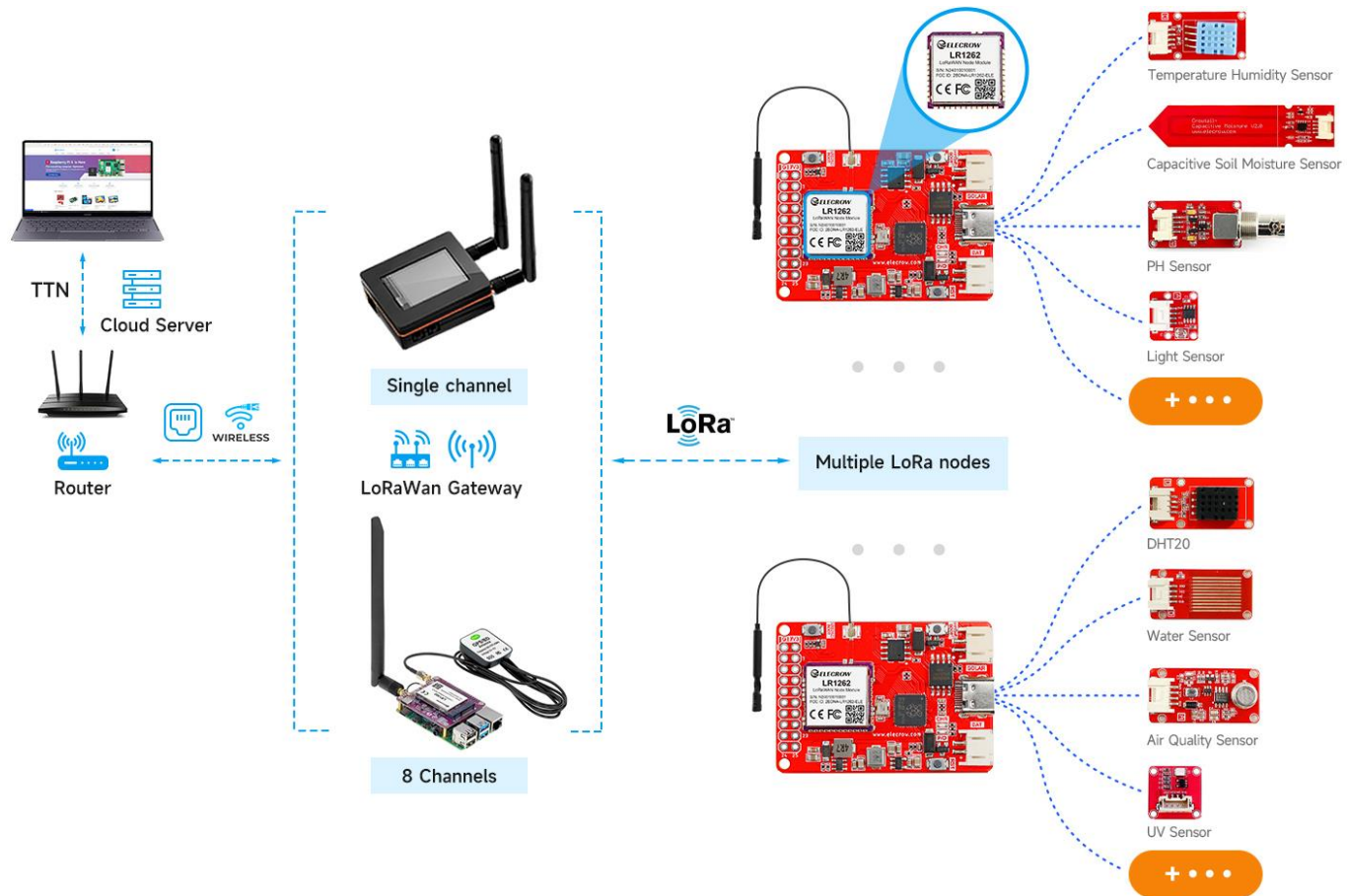
Figure 2:Network Topology Diagram

3 Product Appearance Diagrams

Figure 3:Front View

Figure 4:Side View

Figure 5:Back View

4 Dimension Diagram

Figure 6:Dimension Diagram
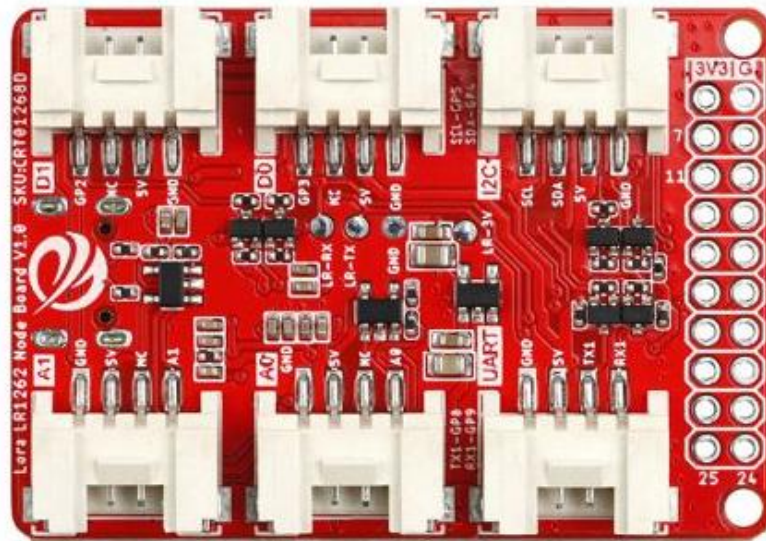
5 System Block Diagram
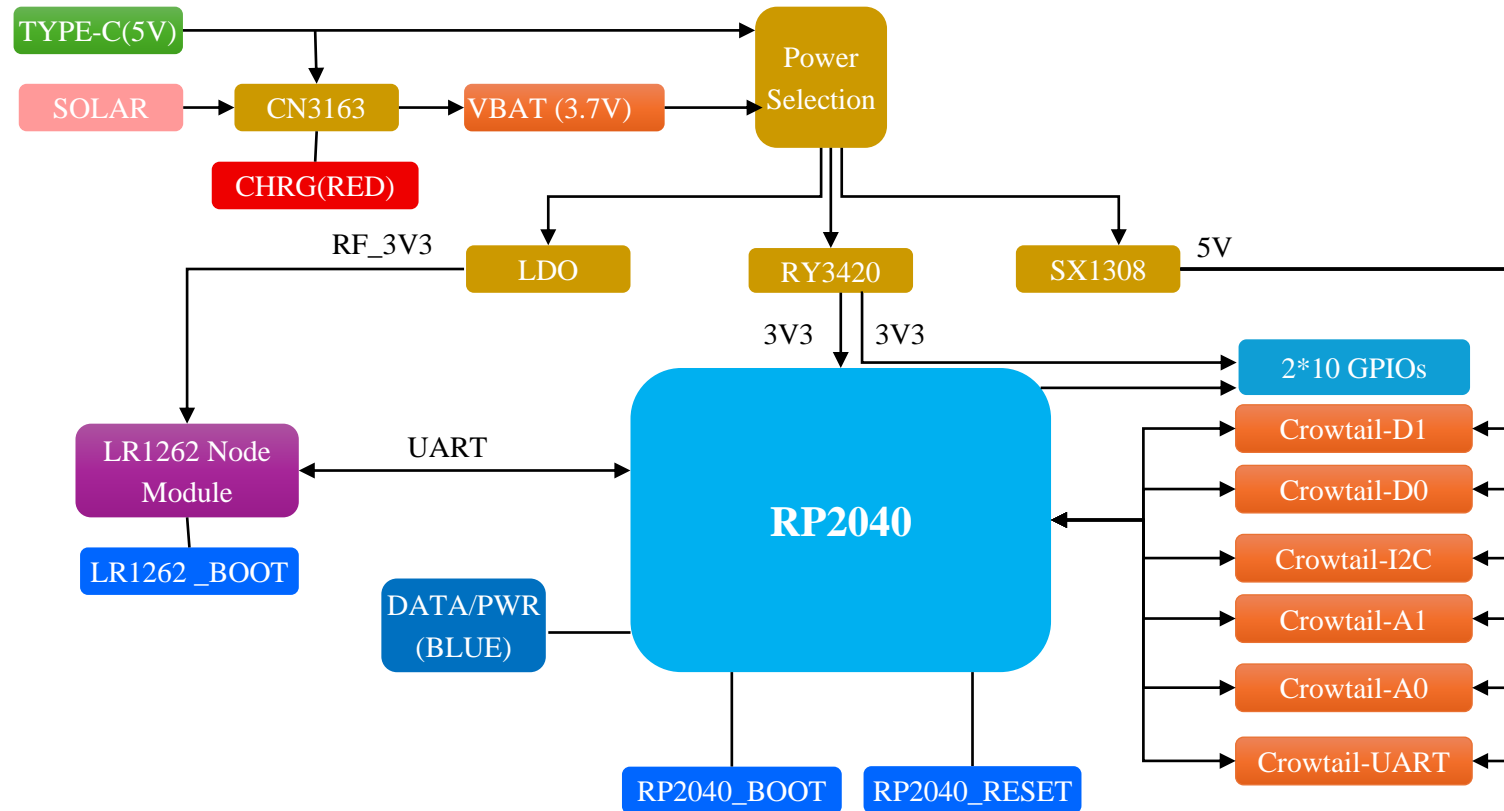
Figure 7:System Block Diagram of LR1262 Node Bo

6 Hardware Overview

The hardware overview discusses the pin definitions and function descriptions of the LR1262 node board, covering the corresponding relationships and specific descriptions of pins for buttons/indicators and various interfaces.

Figure 8:Schematic Diagram of LR1262 Node Board Interfaces

6.1 Pin Definitions and Functions of Buttons/Indicators
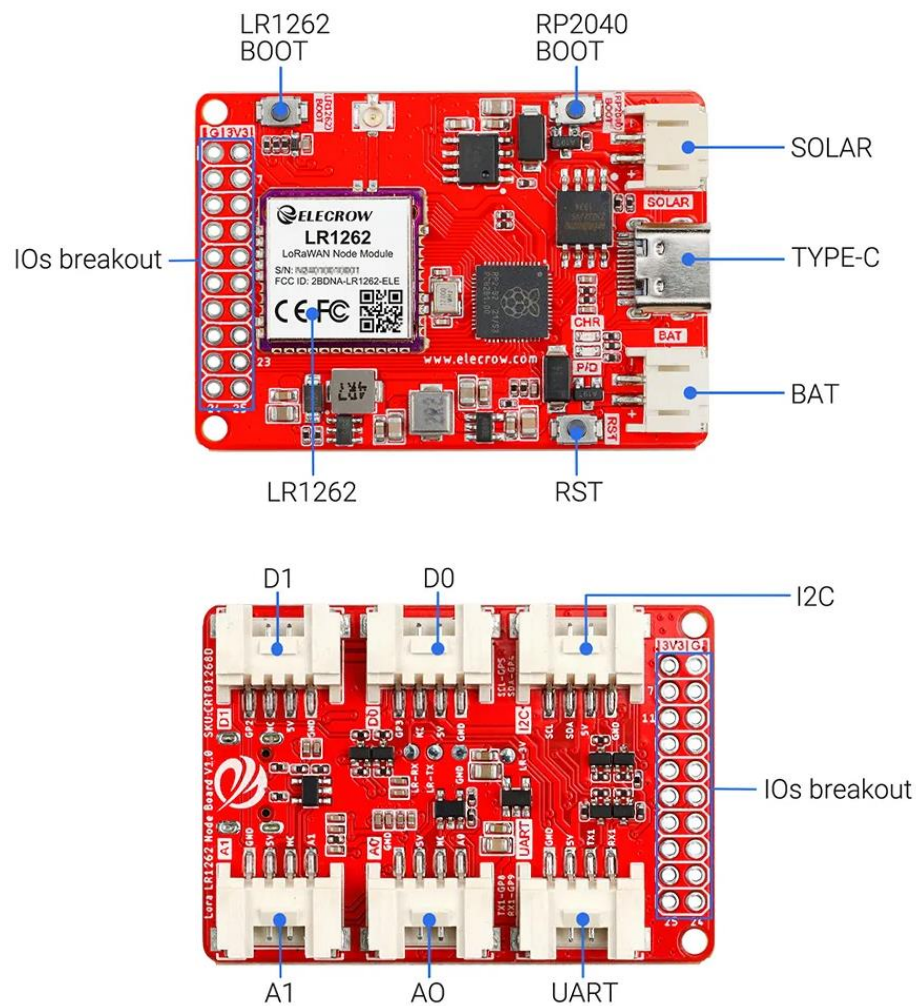
NO.	Button/Indicator Name	Silkscreen	State	Pin	RP2040 Pin	Description
1	LR1262 BOOT	LR1262 BOOT	Press once briefly	LR1262_BOOT	/	Press the (LR1262) BOOT button, then press the NRST button once, and finally release the BOOT button to put the LR1262 module into programming mode.
2	RP2040 BOOT	RP2040 BOOT	Press once briefly	BOOT	/	After the development board is connected to USB, if the "RPI - RP2 (X:)" virtual drive does not appear when connecting to the computer for the first time, long-press the (RP2040) BOOT button on the development board, then press the RST button to put the development board into a recognizable state and start the firmware download mode.
3	RST	RST	Press once briefly	RESET	RUN	Reset button. Press this button to reset the system.
4	DATA/PWR Indicator	P/D	BLUE	D25	GPIO25	Blue power indicator/LR1262 node module data transceiver indicator, normally on by default, indicates when LR1262 node module communicates with the outside (needs to be set by the user).
5	CHRG Indicator	CHR	RED	CHRG	/	Red indicator, used to indicate the charging status; it stays on during charging and turns off when fully charged. It indicates during charging. Charging can be done by connecting a power cord via the USB interface or using a solar panel; the red light is on when the battery is charging and turns off when fully charged.

6.2 Pin Definitions and Functions of Interfaces

NO.	Interface Name	Silkscreen	Pin	RP2040 Pin	Voltage	Description
1	Type-Cinterface	/	DP DN USB_D- USB_D+	USB_D- USB_D+	5V	USB-C interface, which serves as the power supply for the node board, the communication interface between the PC and RP2040, and charges the lithium battery when an external lithium battery is connected.
2	SOLAR	SOLAR	SOLAR	/	5V	PH2.0-5V solar panel interface, which can be used to connect an external solar panel to charge the lithium battery.
3	BAT	BAT	VBAT	/	3.7V	PH2.0-3.7V lithium battery interface, which can be used to connect an external 3.7V lithium battery.
4	D1	D1	D2_H	GPIO2	5V	External Crowtail-5V - HY-4P-2.0 port. It can be used to connect 5V Crowtail sensors or modules with digital signals.
5	D0	D0	D3_H	GPIO3	5V	External Crowtail-5V - HY-4P-2.0 port. It can be used to connect 5V Crowtail sensors or modules with digital signals.
6	I2C	I2C	D4/SDA0_H D5/SCL0_H	GPIO4 GPIO5	5V	External Crowtail-5V - HY-4P-2.0 port. It can be used to connect 5V Crowtail sensors or modules with I2C interface

						communication (such as temperature and humidity, GPS, etc.), and realize digital signal acquisition through RP2040 control.
7	IOs breakout	3V3|G	D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 D25	GPIO6 GPIO7 GPIO8 GPIO9 GPIO10 GPIO11 GPIO12 GPIO13 GPIO14 GPIO15 GPIO16 GPIO17 GPIO18 GPIO19 GPIO20 GPIO21 GPIO22 GPIO23 GPIO24 GPIO25	3.3V	20-pin general-purpose GPIO interface, supporting the expansion of more peripherals.
8	A1	A1	A1_IN	ADC1	5V	External Crowtail-5V - HY-4P-2.0 port. It can be used to connect 5V Crowtail sensors or modules with analog signals (such as ultraviolet, air quality). The signals are amplified and conditioned by the SGM321YN5 operational amplifier, and then collected through the ADC pin of RP2040 to ensure data accuracy.
9	A0	A0	A0_IN	ADC0	5V	External Crowtail-5V - HY-4P-2.0 port. It can

						be used to connect 5V Crowtail sensors or modules with analog signals (such as ultraviolet, air quality). The signals are amplified and conditioned by the SGM321YN5 operational amplifier, and then collected through the ADC pin of RP2040 to ensure data accuracy.
10	UART	UART	D8/TX1_H D9/RX1_H	GPIO8 GPIO9	5V	External Crowtail-5V - HY-4P-2.0 port. It can be used to connect 5V Crowtail sensors or modules with UART serial communication (such as temperature and humidity, GPS, etc.), and realize digital signal acquisition through RP2040 control.
11	LR1262 Node Module	/	D0/TX0 D1/RX0	GPIO0 GPIO1	3.3V	It communicates with RP2040 via the UART interface (LPUART-TX/RX pins) to wirelessly transmit data collected by sensors, thereby constructing a LoRa IoT link.

7 Technical Specifications

NO.	Item Group	Item	Parameter
1	Raspberry Pi Chip RP2040	Processor	Dual-core Arm Cortex-M0+ @ 133MHz
2		SRAM	264KB
3		Flash	4M
4	LR1262 Node Module	RF Module	LR1262 Module
5		TX Transmission Power	+20dBm(Max)
6		RX Receiving Sensitivity	-125dBm@SF7
7		LoRaWAN® Protocol	Supports Class A/Class B/Class C (compliant with LoRaWAN 1.0.3 specification)
8		Supported Frequency Bands	EU8685、US915
9		Frequency Range	803 MHz to 930 MHz
10		Signal Modulation Modes	LoRa®、（G）FSK、（G）MSK 、BPSK
11		Operating Voltage	5V/1A
12		Supported Interface	IPEX-1
13	Mechanical Characteristics	Size	35*50mm
14	Interfaces	Communication Interfaces	➢ 1*USB-C interface (DC 5V/1A) ➢ 6*5V Crowtail interfaces (2 analog interfaces, 2 digital interfaces, 1 UART interface, 1 I2C interface) ➢ 2x10 general-purpose GPIO interfaces ➢ 1*battery interface (3.7V-4.2V) ➢ 1*solar interface (4.4V-6V)
15		External Antenna	External LoRa Antenna (868MHz/915MHz)

8 Environmental Characteristics

8.1 Extreme Operating Conditions

NO.	Item	Description	Minimum Value	Maximum Value	Unit
1	VCCmr	Supply Voltage	3.7	5.5	V
2	Tmr	Ambient Temperature	-40	+85	°C

8.2 Normal Working Conditions

NO.	Item	Description	Minimum Value	Typical Value	Maximum Value	Unit
1	VCCop	Supply Voltage	3.7	5	5.5	V

9 Related Documents

➢ **LR1262 Node Board Product Link**
➢ **LR1262 LoRaWAN Node Module Datasheet**
➢ **SX1261/2 Datasheet**

10 Revision History

Date	Version	Release Notes
2025/8/31	V1.0	First release