

# **User Guide of Nano-Gateway V1.1**

**CMIC**

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**Revision History**

<b>Version</b>	<b>Description</b>	<b>Date</b>
V1.0	Initial version	12-21-2023
V1.1	Update: Supplement Data Rate configuration	1-04-2024

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# 1 Introduction

## 1.1 Overview

Nano-Gateway is a small, low-cost LoRa gateway. It can connect to the user's device through Type-C and BLE. The Nano-Gateway enables the secure connection of existing equipment to the network via Cellular, Ethernet, or WiFi. It is configured through Android mobile app “Nano”.

## 1.2 Product features

- **Northbound interface:**
  - ◆ Cellular(Optional): Cat-M1
  - ◆ WiFi: 2.4G
  - ◆ Ethernet: 10 Base-T/100 Base-TX
- **Southbound interface:**
  - ◆ Dual-channel LoRa.
- **Bluetooth (for APP configuration only)**
- **Support buzzer alarm**
- **Support one-key restore to factory settings**
- **3 LEDs: APP LED、 BLE activity LED、 PWR LED**
- **Power: Type-C (5V 2A)**
- **Size: 95mm\*95mm\*25mm**
- **Enclosure: Mountable, Dark blue**

- **Operating temperature: -10 °C to 60 °C**

## 2 Hardware environment

Device appearance description as shown in Figure1.



Figure1.Device appearance description

The back of Nano-Gateway as shown in Figure2.



Figure2.The back of Nano-Gateway

The front of Nano-Gateway as shown in Figure3.



Figure3.The front of Nano-Gateway

Table1.

Number	Details
①	Lora connector
②	Power slot (Type-C)
③	ETH slot
④	Reset button
⑤	4G connector
⑥	SIM card slot
⑦	LEDS

## 3 Configuration

Nano-Gateway's configuration through phone by Nano app. Nano app only supports Android version 8.0 or later.

### 3.1 Install APP

Download and install the Nano-Gateway APP to Android phone. Downloads link:

[https://dev.changhong.us/app\\_download/Nano.apk](https://dev.changhong.us/app_download/Nano.apk)

### 3.2 Connection

Running APP, the connection page as shown in Figure4.

**San QR code:** Scan the QR code generated by Bluetooth MAC of Nano-Gateway.

**Show BLE list:** Select the Nano-Gateway manually by getting the phone's Bluetooth list.

**Note:** Bluetooth name of Nano-Gateway is "EG1000-xxxxxx". "xxxxxx" is the last six places of BLE MAC.

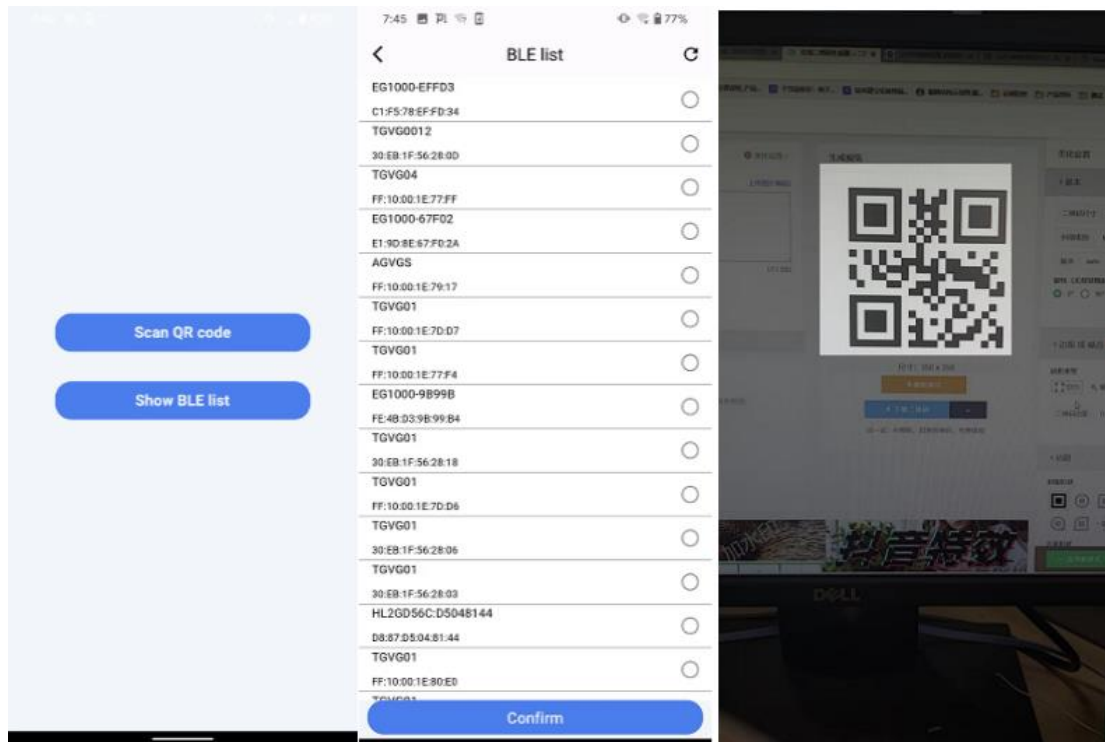


Figure4. Connection

### 3.3 Device details

If the connection is successful, the device details page will be displayed, as shown in Figure5. All information about the device is displayed on this page. Details are as follows:

- **Basic Info:** Basic information of the device.
- **Network:** Current networking mode.
- **NS Server:** The Server address and ports of the link.
- **LoRa:** Information about LoRa.
- **Others:** Buzzer alarm.



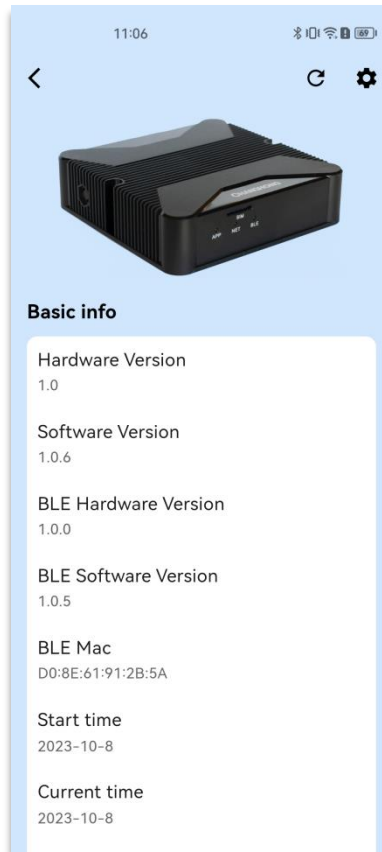


Figure5. Detail page

### 3.4 Parameter configuration

Click the setting button in the upper right corner of the details page to enter the setting page as shown in Figure6.

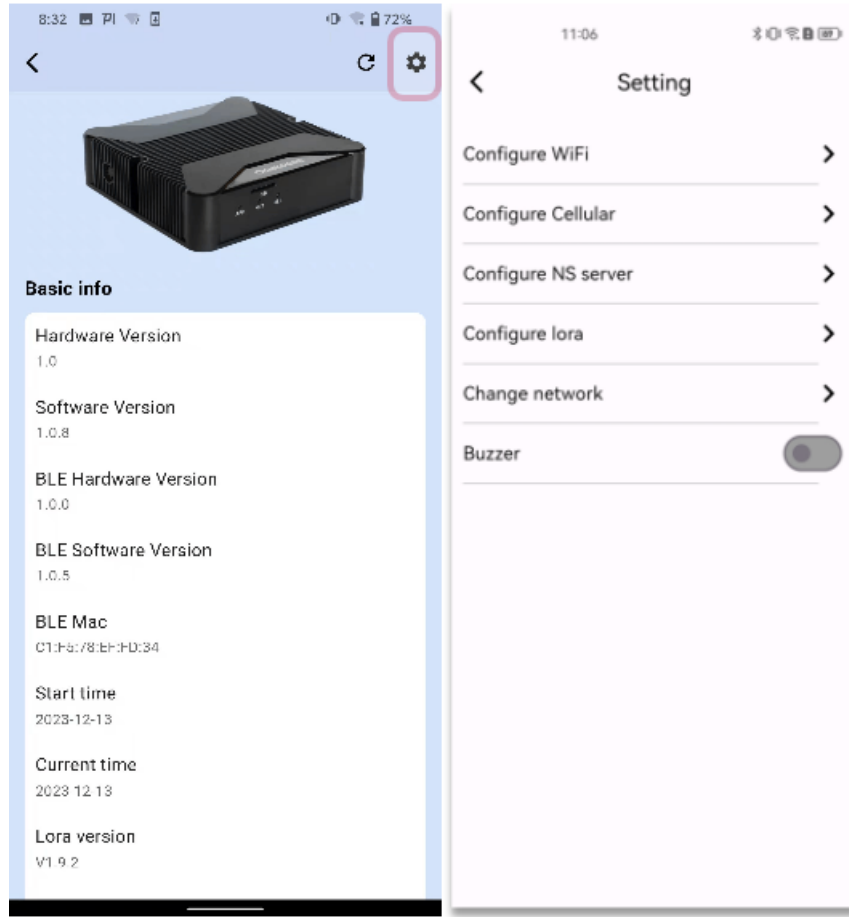


Figure6. Setting page

### 3.4.1 Configure WiFi

Select "Configure WiFi" and jump to the WiFi configuration page as shown in Figure7. Choose WiFi Access Point, and input WiFi password. Click “Confirm” button, the device will switch to the configured WiFi.

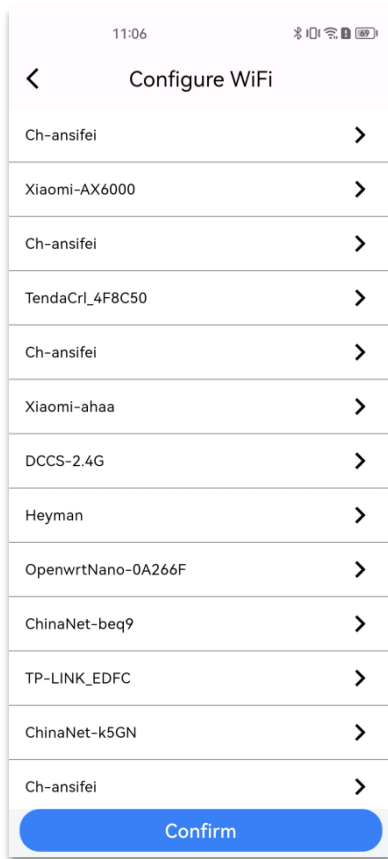


Figure7.Configure WiFi

### 3.4.2 Configure Cellular

Insert the SIM card into the SIM card slot. And the app select "Configure Cellular" and jump to the Cellular configuration page as shown in Figure8.

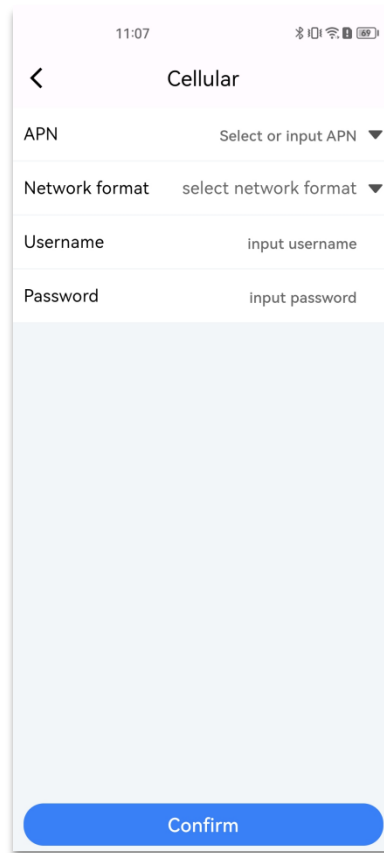
**APN:** Select or input APN. The optional list includes T-Mobile, AT&T and so on.

**Network format:** Select the matching network format from GSM, LTE\_M, LTE\_NB, AUTO.

**Username and Password:** The username and password must be set according to carrier rules.

Then click "Confirm". This configuration will be sent to the device for saving.

**Note:** If you want to switch to Cellular, please refer to section 3.4.5



The screenshot shows a mobile application interface for configuring cellular settings. At the top, the time is 11:07 and there are icons for Bluetooth, Wi-Fi, and cellular signal. Below the title 'Cellular', there are four rows of configuration options, each with a dropdown arrow: 'APN' with the text 'Select or input APN', 'Network format' with 'select network format', 'Username' with 'input username', and 'Password' with 'input password'. A large blue button labeled 'Confirm' is positioned at the bottom of the screen.

Figure8.Configure Cellular

### 3.4.3 Configure NS Server

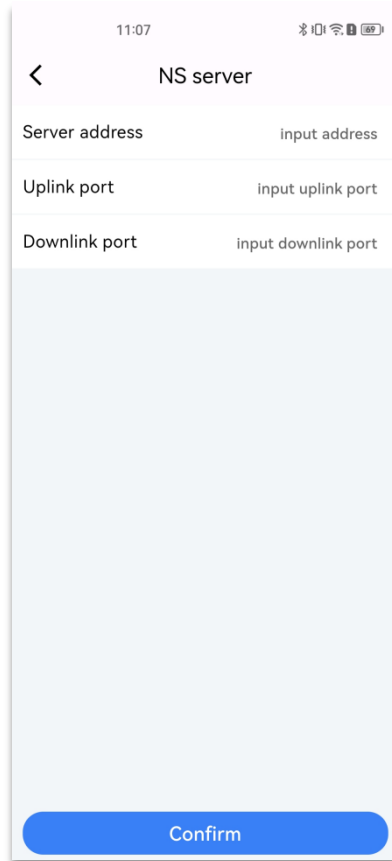
Select "Configure NS Server" and jump to the "NS Server" page as shown in Figure9.

**Server address:** Enter NS server address pr IP address.

**Uplink port:** Enter uplink port.

**Downlink port:** Enter downlink port.

Click "Confirm". The configuration information is sent to device.



11:07 100% 100% 100%

< NS server

Server address input address

Uplink port input uplink port

Downlink port input downlink port

Confirm

Figure9.Configure NS Server

### 3.4.4 Configure LoRa

Select "Configure LoRa" and jump to the LoRa configure page as shown in Figure10.

**channel:** Nano-Gateway is dual-channel device. There have two channels to be selected.

- “0” is channel 0. All LoRa configurations are for channel 0.
- “1” is channel 1. All LoRa configurations are for channel 1.

**Receiving frequency:** Enter frequency. Nano-Gateway support EU868, US915.

<p><b>EU868</b></p>	<ul style="list-style-type: none"> <li>● The frequency range is 863-870MHz.</li> <li>● All devices must support three frequency points communication 868.10MHz, 868.30MHz and 868.50MHz.</li> <li>● If other frequency points are required, configure them according to the standard LoRaWAN protocol.</li> </ul>
<p><b>US915</b></p>	<ul style="list-style-type: none"> <li>● The frequency range is 902-927MHz.</li> <li>● There are 64 uplink channels and 8 downlink channels. The uplink channel is the receive frequency.</li> <li>● Uplink channel 0-63: <math>f=902.3+0.2*n(0 \leq n \leq 63)</math></li> <li>● Uplink channel 64-71: <math>f=903.0+1.6*(n-64)(64 \leq n \leq 71)</math></li> <li>● Downlink channel 0-7: <math>f=923.3+0.6*n(0 \leq n \leq 7)</math></li> </ul>

**Band width:** Support 125KHz, 250KHz, 500KHz.

**Data rate:** Nano-Gateway support sf7,sf8,sf9,sf10 and rate-adaptive in the US915 and EU868 band.

**Complication rate:** Support CR4/5, CR4/6, CR4/7, CR4/8.

**Preamble:** The range of preamble is [8,65535].

**CRC enable:** Turn on switch is enable CRC verification . Turn off switch does not allow CRC verification.

After configuring the information, click confirm.

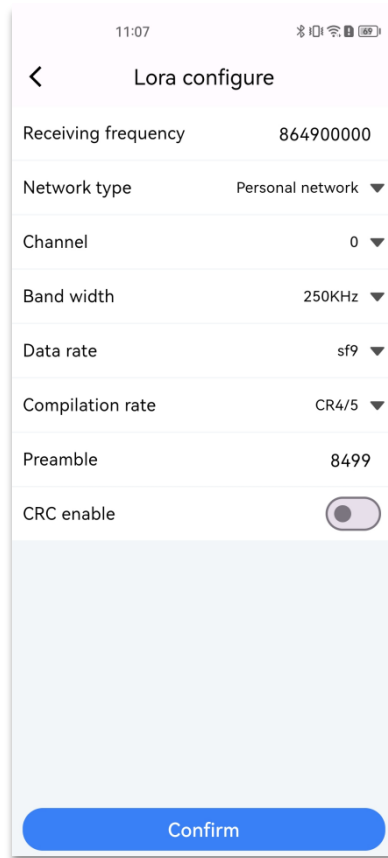


Figure10.Configure LoRa

### 3.4.5 Change network

Select "Change Network" to change the network type as shown in Figure11. Choose "WiFi", "Ethernet", "Cellular" or "Auto" and click "Confirm". The APP will send a change network type command to the device.

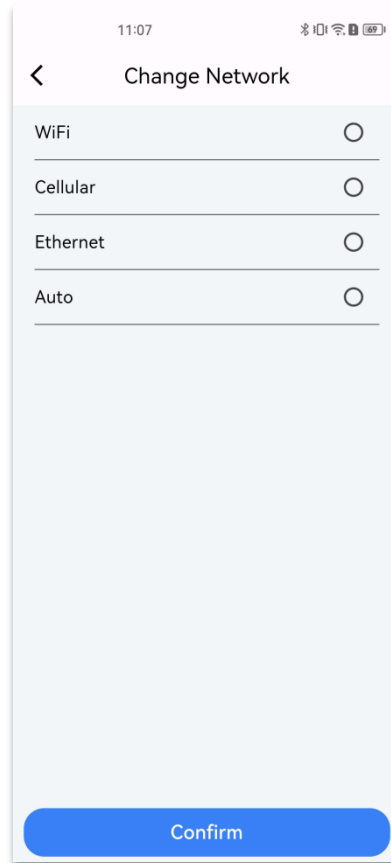


Figure11.Change Network

### 3.4.6 Buzzer

The on-off key of Buzzer controls the buzzer.

**Turn on:** the buzzer will keep ringing;

**Turn off:** the buzzer sounds off.

## 4 Liabilite disclaimer

CMIIC reserves right to make changes without further notice to the product to improve reliability, function or design. CMIIC does not assume any liability arising out of the application or use of any product or circuits described herein. Complete



product reports and latest version statement can be found on our website

<https://www.changhong.us/>

## 5 Support

For all general, partnership, career, and/or press inquiries, please contact us through email or phone number:

Email: [crl@changhong.us](mailto:crl@changhong.us)

Phone: 1-408-970-0349

Address: 2580 North First Street, Suite 100, San Jose, CA 95131

### FCC Caution:

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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.