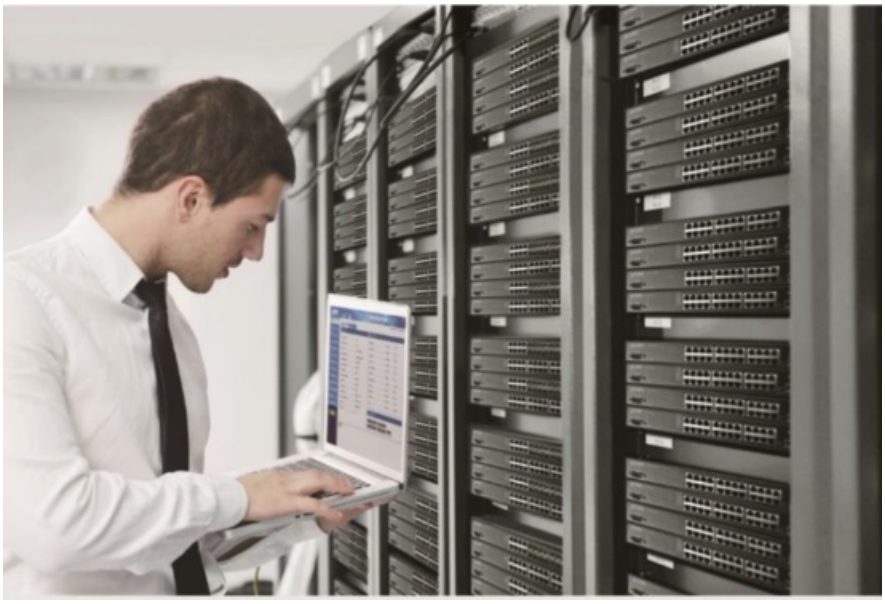
# planet LN501 Lora Node Controller User Manual



**User Manual**
**LoRa Node Controller**


**LN501**



Contents



## LN501 Lora Node Controller



**FCC Compliance Statement**

This Equipment has been tested and found to comply with the limits for a Class A 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 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.

**CE mark Warning**

CE The is a class A device, In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

**WEEE**

 To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossedout wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

**Trademarks**
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**Revision**
User's Manual of PLANET LoRa Node Controller
Model: LN501
Rev.: 2.0 (December, 2023)
Part No. EM-LN501_v2.0

## Chapter 1. Product Introduction

Thank you for purchasing PLANET LoRa Node Controller, LN501. The descriptions of these models are as follows:

| | |
|---|---|
| LN501 | Outdoor IP67 LoRa Node Controller with Solar Panel |

"LN501" mentioned in the manual refers to the above models.

### 1.1 Package Contents
The package should contain the following:

**LN501**

- LoRa Node Controller x 1
- Quick Installation Guide x 1

- Data Cables x 2
- Mounting Bracket x 1
- Wall Mounting Kits x 1
- Hose Clamps x 2
- 2550 mAh Battery x 2

 If any of the above items are missing, please contact your dealer immediately.

**1.2 Overview**

**Feature-rich Sensor Hub for Connecting Sensors**

PLANET LN501 is an outdoor LoRa node controller used for data acquisition from multiple sensors. It contains different I/O interfaces such as analog inputs, digital inputs, digital outputs, serial ports and so on to simplify the deployment and replacement of LoRaWAN networks. The LN501 can be easily and quickly configured by NFC or wired USB port. For outdoor applications, it provides solar or built-in battery power supply and is equipped with IP67-rated enclosure and M12 connectors to protect itself from water and dust in harsh environments.

**LoRaWAN-based Controller with Rich Industrial Interfaces**

The LN501 is LoRaWAN compatible and is with built-in multiple industrial interfaces to connect to all types of sensors, meters and other appliances. It also bridges Modbus data between serial and Ethernet network via LoRaWAN. The LN501 supports LoRaWAN class A and C protocol to be in full compatibility with standard LoRaWAN gateways including PLANET LCG-300 series.

- RS232
- RS485
- GPIO
- Analog Input
- SDI-12

The LN501 is ideal for large-scale IoT application deployments, such as projects for building automation, smart metering, HVAC system, etc. With multiple interfaces, PLANET LN501 can perfectly help retrofit legacy assets into IoT enablement.

**1.3 Features**

**Key Features**

**LN501**

- Easy to connect with multiple wired sensors through GPIO/AI/RS232/RS485/SDI-12 interfaces
- Long transmission distance up to 11km with line of sight
- Waterproof design including IP67 case and M12 connectors
- Solar powered and built-in battery (optional)
- Quick wireless configuration via NFC
- Compliant with standard LoRaWAN gateways and network servers

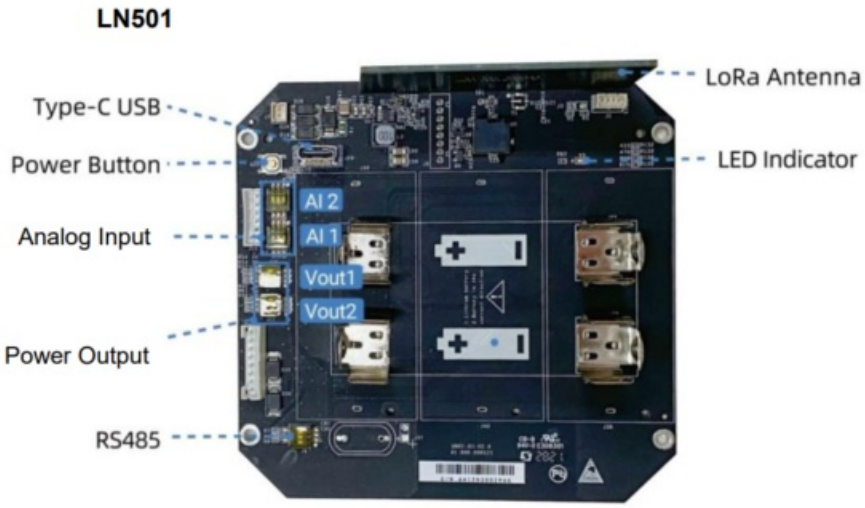
**1.4 Product Specifications**

| | | |
|---|---|---|
| **Product** | **LN501** | |
| **Wireless Transmission** | | |
| **Technology** | LoRaWAN | |
| **Antenna** | Internal Antenna | |
| **Frequency** | LN501-868M: IN865, EU868, RU864<br>LN501-915M: US915, AU915, KR920, AS923 | |
| **Tx Power** | 16dBm(868)/20dBm(915) | |
| **Sensitivity** | -137dBm @300bps | |
| **Work Mode** | OTAA/ABP Class A, Class C | |
| **Data Interfaces** | | |
| **Interface Type** | M12 A-Coded Male | |
| **IO** | Ports | 2 × GPIO |
| | Logical Level | Low: 0~0.9V, High: 2.5~3.3V |
| | Maximum Current | 20 mA |
| | Work Mode | Digital input, digital output, pulse counter |
| **Serial Port** | Ports | 1 × RS232 or RS485 (Switchable) |
| | Baud Rate | 1200~115200 bps |
| | Protocol | Transparent (RS232), Modbus RTU (RS485) |
| **Analog Input** | Ports | 2 × Analog input |
| | Resolution | 12 bit |
| | Input Range | 4~20mA or 0~10V (Switchable) |
| **SDI-12** | Ports | 1 × SDI-12 |
| | Protocol | SDI-12 V1.4 |
| **Power Output** | Ports | 2 × 3.3 V, 2 × 5/9/12 V (Switchable) |
| | Power Time Before Data Collection | 0~10 minutes |
| **Operation** | | |
| **Power On & Off** | NFC, power button (Internal) | |
| **Configuration** | PC software (via USB Type C or NFC) | |
| **Physical Characteristics** | | |
| **Operating Temperature** | -20°C to +60°C | |
| **Ingress Protection** | IP67 | |
| **Dimensions** | 116 × 116 × 45.5 mm | |

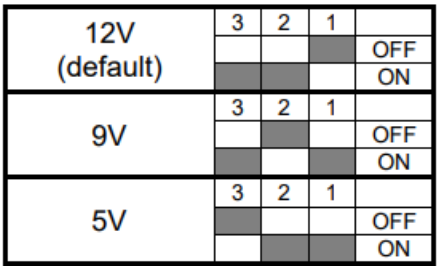
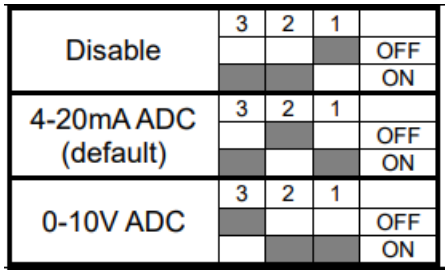
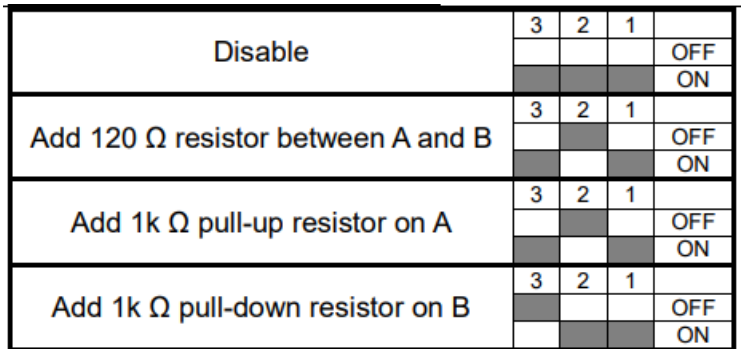
| | |
|---|---|
| **Power Connector** | 1 × M12 A-coded Male Interface |
| **Power Supply** | Solar powered + 2 x 2550mAh battery backup + 5-24 VDC |
| **Installation** | Desktop or wall mounting |
| **Standards Conformance** | |
| **Regulatory Compliance** | CE, FCC |

## Chapter 2. Hardware Introduction

### 2.1 Physical Descriptions




**DIP Switch:**

| Interface | DIP Switch |
|---|---|
| Power Output |  |
| Analog Input |  |
| RS485 |  |

Note

1. Please turn off the device before changing an analog input or power output via DIP switch.
2. Analog inputs are set to 4-20mA by default, power outputs are set to 12V by default.
3. Power output on interface 1 is used for powering analog devices, power output on interface 2 is used for powering serial port devices and SDI-12 devices.

**Power Button:**

| **Function** | **Action** | **LED Indication** |
|---|---|---|
| Turn On | Press and hold the button for more than 3s. | Off → On |
| Turn Off | Press and hold the button for more than 3s. | On → Off |
| Reset | Press and hold the button for more than 10s. | Blinks. |
| Check On/Off Status | Quickly press the power button. | Light On: Device is on.<br>Light Off: Device is off. |

**Data Interface:**
**Data Interface 1**

| Pin | Description |
|---|---|
| 1 | 5V/9V/12V OUT (Switchable)<br>12V (default): 3 2 1 — OFF: 1 | ON: 3 2<br>9V: 3 2 1 — OFF: 2 | ON: 3 1<br>5V: 3 2 1 — OFF: 3 | ON: 2 1 |
| 2 | 3.3V OUT, max. 100mA |
| 3 | GND |
| 4 | Analog Input 1 |
| 5 | Analog Input 2 |
| 6* | 5-24V DC IN |


*When both DC external power and batteries are connected, external power will be the preferred power supply option.

**Data Interface 2**

| Pin | Description |
|---|---|
| 1 | 5V/9V/12V OUT (Switchable)<br>12V (default): 3 2 1 — OFF: ■ ■ □ / ON: □ □ ■<br>9V: 3 2 1 — OFF: ■ □ ■ / ON: □ ■ □<br>5V: 3 2 1 — OFF: □ □ ■ / ON: ■ ■ □ |
| 2 | 3.3V OUT, max. 100mA |
| 3 | GND |
| 4 | GPIO1 |
| 5 | GPIO2 |
| 6 | RS232(Tx)/RS485(A) |
| 7 | RS232(Rx)/RS485(B) |
| 8 | SDI-12 |


**2.2 Hardware Installation**

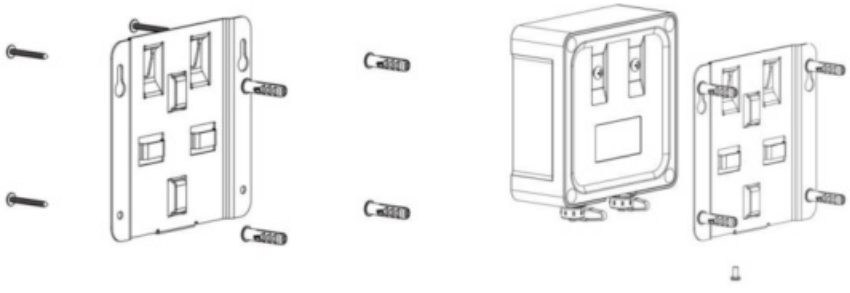
Refer to the illustration and follow the simple steps below to quickly install your LoRa Node.

**2.2.1 Wall Mounting**

Make sure you have a wall mounting bracket, bracket mounting screws, wall plugs, wall mounting screws and other required tools.

**Step 1:** Mark the four holes on the wall you prefer to place the device and drill the marked four holes for the wall plugs (anchors). Then place the mounting bracket over the holes with the wall plugs inside, and tighten it with the screws.

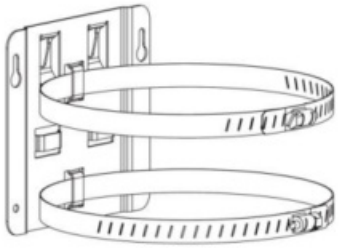
**Step 2:** Place the device on the mounting bracket and put the small screw into the hole found on the bottom of the device and then tighten the screw to finish the job.

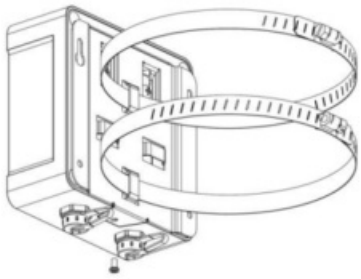


**2.2.2 Pole Mounting**

**Step 1**: Straighten out the clamp and slide it through the rectangular rings in the mounting bracket, and wrap the clamp around the pole. Then use a screwdriver to tighten the clamp by turning it clockwise.

**Step 2:** Place the device on the mounting bracket and put the small screw into the hole found on the bottom of the device and then tighten the screw to finish the job.





Please make sure the screws are tightly fixed.

## Chapter 3. Preparation

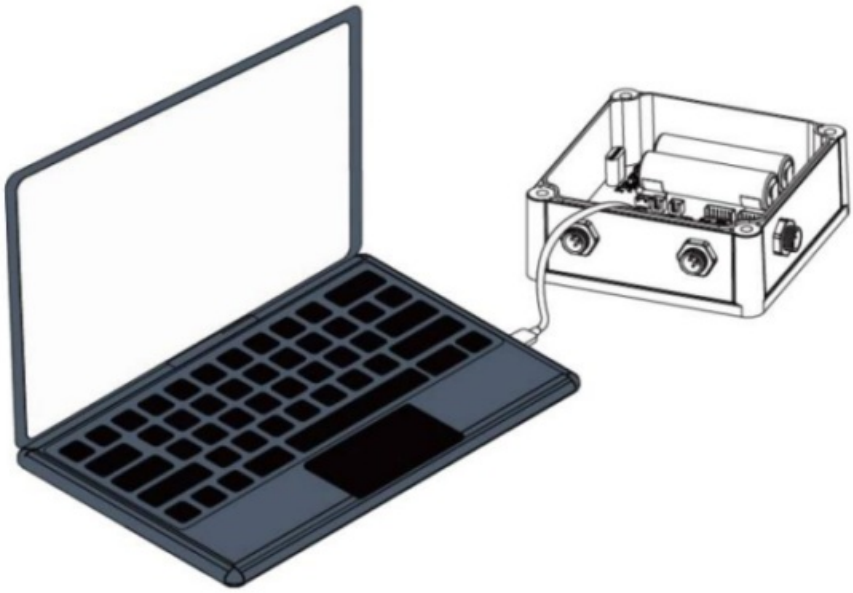
Before accessing the LoRa node controllers, user has to install utility tool for operation.

### 3.1 Requirements

- Workstations running Windows 10/11
- Type C USB cable for LN501

### 3.2 Managing LoRa Node

1. Download ToolBox software from Planet web site.
2. https://www.planet.com.tw/en/support/downloads?&method=keyword&keyword=LN501&view=6#list
3. Power on the LoRa Node device and then connect it to computer via micro USB port.



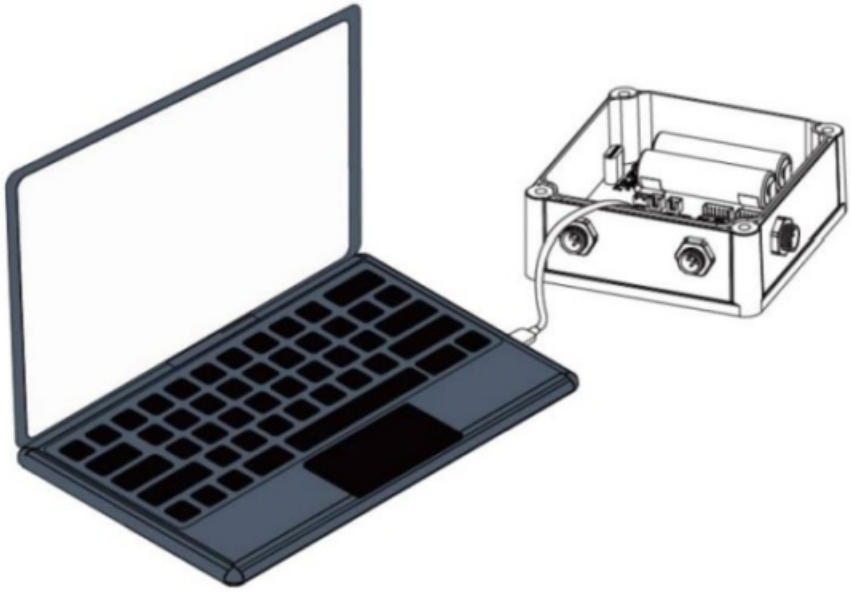
4. Open the ToolBox and select “Type” and then “General”, and then click password to log in ToolBox. (Default password: 123456)

## Chapter 4. Operations Management

This chapter provides operations details of the LoRa node controller.

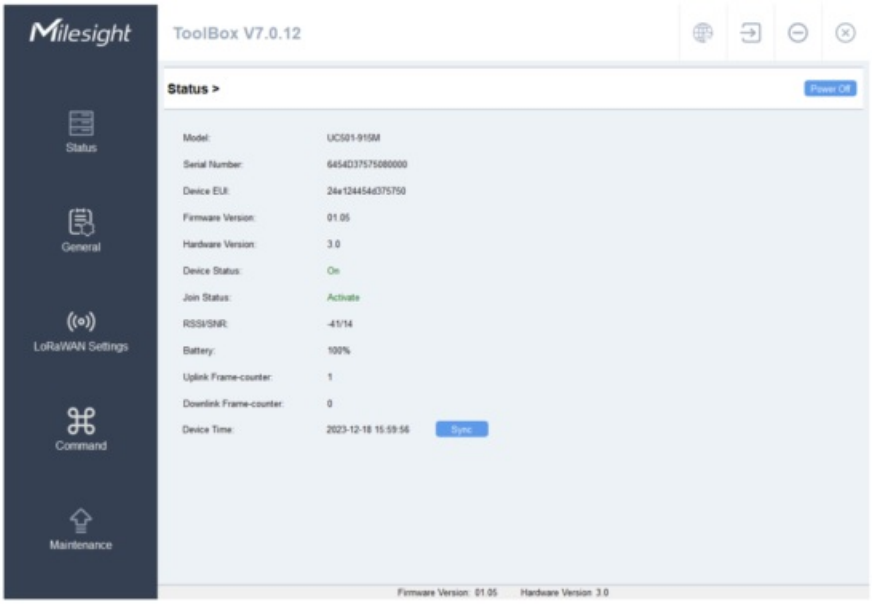
### 4.1 Managing LoRa Node

1. Download ToolBox software from Planet web site.
2. https://www.planet.com.tw/en/support/downloads?&method=keyword&keyword=LN501&view=6#list
3. Power on the LoRa Node device and then connect it to computer via micro USB port.



4. Open the ToolBox and select “Type” and then “General”, and then click password to log in ToolBox. (Default password: 123456)


5. After logging in the ToolBox, you can click “Power On” or “Power Off” to turn on/off device and change other settings.

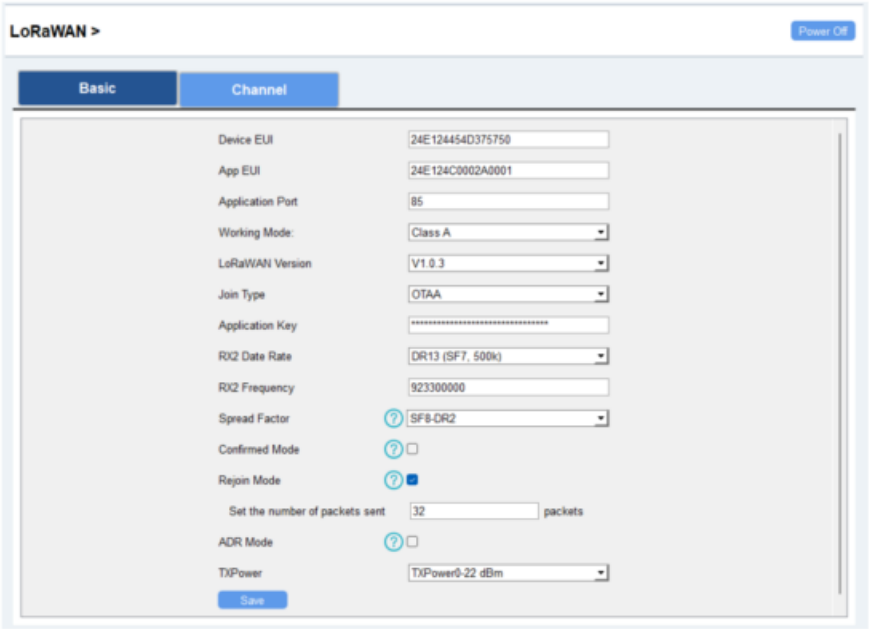



### 4.2 LoRaWAN setting

LoRaWAN setting is used for configuring the transmission parameters in LoRaWAN ® network.

Basic LoRaWAN Settings:

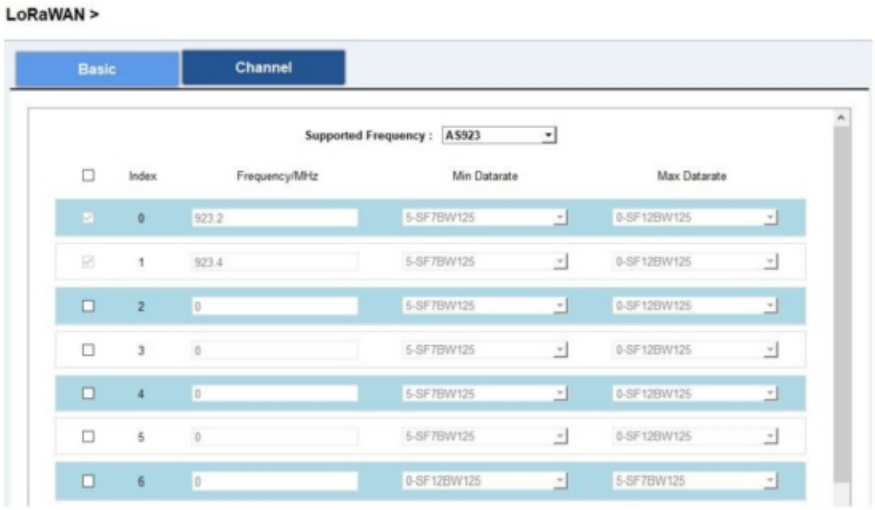
Go to “LoRaWAN -> Basic” of ToolBox software to configure join type, App EUI, App Key and other information. You can also keep all settings by default.




| Object | Description |
|---|---|
| **Device EUI** | Unique ID of the device which can also be found on the label. |
| **App EUI** | Default App EUI is 24E124C0002A0001. |
| **Application Port** | The port is used for sending and receiving data; default port is 85.<br>**Note**: RS232 data will be transmitted via another port. |
| **Working Mode** | Class A and Class C are available |
| **LoRaWAN Version** | V1.0.2, V1.0.3 are available. |

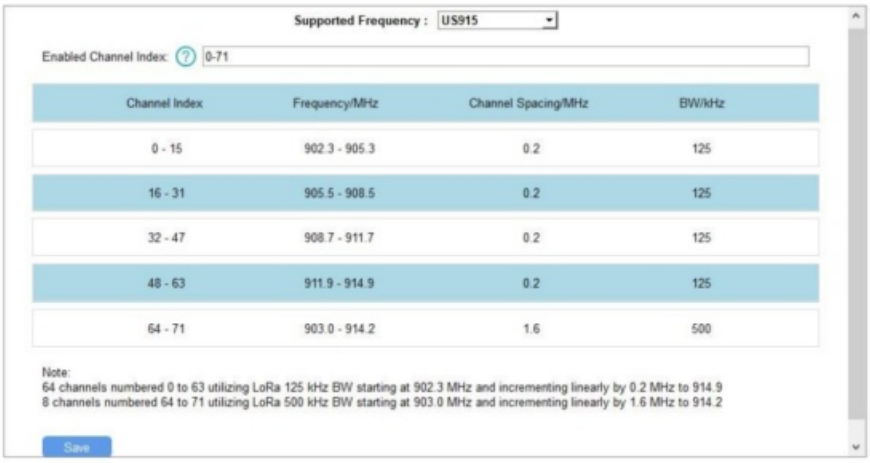
| | |
|---|---|
| **Join Type** | OTAA and ABP mode are available |
| **Application Key** | Appkey for OTAA mode; default is 5572404C696E6B4C6F52613230313823. |
| **Device Address** | DevAddr for ABP mode, default is the 5th to 12th digits of SN. |
| **Network Session Key** | Nwkskey for ABP mode, default is 5572404C696E6B4C6F52613230313823. |
| **Application Session Key** | Appskey for ABP mode, default is 5572404C696E6B4C6F52613230313823. |
| **RX2 Data Rate** | RX2 data rate to receive downlinks. |
| **RX2 Frequency** | RX2 frequency to receive downlinks. Unit: Hz |
| **Spread Factor** | If ADR is disabled, the device will send data via this spread factor. |
| **Confirmed Mode** | If the device does not receive ACK packet from network server, it will rese nd data 3 times at most. |
| **Rejoin Mode** | Reporting interval ≤ 35 mins: the device will send specific mounts of LoR aMAC packets to check connection status every 30 mins; If no reply after specific packets, the device will re-join.<br>Reporting interval > 35 mins: the device will send specific mounts of LoR aMAC packets every to check connection status every reporting interval; If no reply after specific packets, the device will re-join. |
| **Set the number of packets sent** | When rejoin mode is enabled, set the number of LinkCheckReq packets sent.<br>**Note:** the actual sending number is Set the number of packet sent + 1. |
| **ADR Mode** | Allow network server to adjust datarate of the device. |
| **Tx Power** | Tx power of the device. |

**LoRaWAN Frequency Settings:**
Go to “LoRaWAN -> Channel” of ToolBox software to select supported frequency and select channels to send uplinks. Make sure the channels match the LoRaWAN gateway.



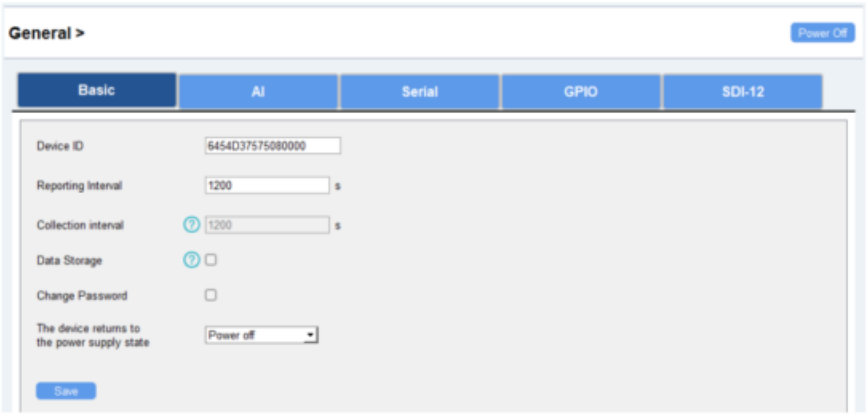

If frequency is one of AU915/US915, you can enter the index of the channel that you want to enable in the input box, making them separate by commas.
Examples:

1, 40: Enabling Channel 1 and Channel 40
1-40: Enabling Channel 1 to Channel 40
1-40, 60: Enabling Channel 1 to Channel 40 and Channel 60
All: Enabling all channels
Null: Indicates that all channels are disabled




### 4.3 Interface setting

LN501 supports data collection by multiple interfaces including GPIOs, analog inputs and serial ports. Besides, they can also power the terminal devices by power output interfaces. Basic settings are as follows:
Go to “General -> Basic” of ToolBox software to change the reporting interval.




| Object | Description |
|---|---|
| **Reporting Interval** | Reporting interval of transmitting data to network server. Default: 20 mins , Range: 10-64800 s.<br>**Note**: RS232 transmission will not follow the reporting interval. |
| **Collection Interval** | The interval of collecting data when there is an alarm command. (see sec tion 4.4) This interval must be not more than reporting interval. |
| **Data Storage** | Disable or enable reporting data storage locally. (see section 4.5) |
| **Data Retransmission** | Disable or enable data retransmission. (see section 4.6) |
| **Device Returning Power Supply S tate** | If the device loses power and returns to power supply, the device will be on or off according to this parameter. |
| **Change Password** | Change the password for ToolBox software to read/write this device. |

#### 4.3.1 RS485 Settings

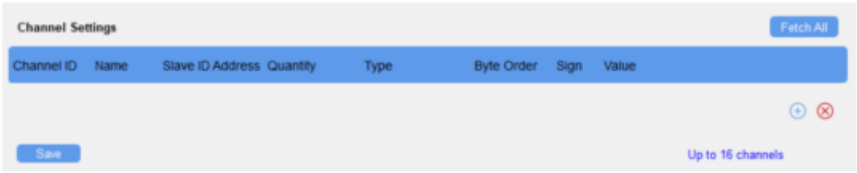
1. Connect RS485 device to RS485 port on interface 2. If you need LN501 to power the RS485 device, please connect the power cable of RS485 device to 5V/9V/12V power output on interface 2.
2. Go to “General -> Serial” of ToolBox software to enable RS485 and configure serial port settings. Serial port settings should be the same as RS485 terminal devices.


| Object | Description |
|---|---|
| **Interface 2 (Pin 1) 5V/9V/12V** | Enable 5V/9V/12V power output of interface 2 to supply power to RS485 terminal devices. It’s 12V by default and you can change DIP switches to change voltage.<br>**Power Output Time Before Collect:** power supply time before collecting data for terminal device initialization. Range: 0-600s. **Power Supply Current:** supply current as sensor required.<br>Range: 0-60mA |
| **Interface 2(Pin 2) 3.3V Output** | Enable 3.3V power output of interface 2 to supply power to RS485 terminal devices.<br>**Power Supply Mode:** Select “Continuous power supply” or “Configurable power supply time”.<br>**Power Output Time Before Collect:** power supply time before collecting data for terminal device initialization. Range: -600s.<br>**Power Supply Current:** supply current as sensor required. Range: 0-60 mA |

| | |
|---|---|
| **Power Output Time Before Collect** | LN501 will power the RS485 terminal devices for a period of time before collecting data for terminal device initialization. |
| **Baud Rate** | 1200/2400/4800/9600/19200/38400/57600/115200 are available. |
| **Data Bit** | 8 bit is available. |
| **Stop Bit** | 1 bit and 2 bit are available. |
| **Parity** | None, Odd and Oven are available. |
| **Execution Interval** | The execution interval between Modbus commands. |
| **Max. Response Time** | The maximum response time that the LN501 waits for the reply to the command. If it does not get a response after the maximum response time, it is determined that the command has timed out. |
| **Max. Retry Time** | Set the maximum retry times after device fails to read data from RS485 terminal devices. |
| **Modbus RS485 Bridge LoRaWAN** | If transparent mode is enabled, LN501 will convert Modbus RTU commands from network server to RS485 terminal devices and send Modbus reply originally back to network server.<br>Port: Select from 2-84, 86-223. |

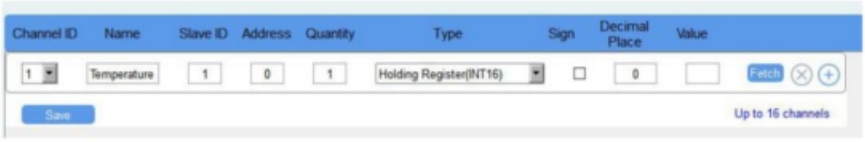
Note When you use power output to power RS485 Modbus slave devices, it only supplies power when reporting interval is coming. It's suggested to power slave devices with external power during the PoC test.

3. Click ⊕ to add Modbus channels, and then save configurations.




| Object | Description |
|---|---|
| **Channel ID** | Select the channel ID you want to configure, 16 channels selectable. |
| **Name** | Customize the name to identify every Modbus channel. |
| **Slave ID** | Set Modbus slave ID of terminal device. |
| **Address** | The starting address for reading. |
| **Quantity** | Set read how many digits from starting address. It fixes to 1. |
| **Byte Order** | Set the Modbus data reading order if you configure the type as Input Register or Holding Register. INT32/Float: ABCD, CDBA, BADC, DCBA INT16: AB,BA |
| **Type** | Select data type of Modbus channels. |
| **Sign** | The tick indicates that the value has a plus or minus sign. |
| **Fetch** | After click, the device will send Modbus read command to test if it can read correct values. |

Example: If you configure it as the following picture, LN501 will send Modbus read command to terminal device regularly: 01 03 00 00 00 01 84 0A




4. For ToolBox software, click “Fetch” to check if LN501 can read correct data from terminal devices.
You can also click “Fetch” on the top of list to fetch all channel data.


Note Please do not click “Fetch” frequently since response time to reply is different for every terminal device.

### 4.3.2 RS232 Settings

1. Connect RS232 device to RS232 port on interface 2. If you need LN501 to power the RS232 device, connect the power cable of RS232 device to 5V/9V/12V power output on interface 1.
2. Go to “General -> Serial” of ToolBox software to enable RS232 and configure serial port settings.
   Serial port settings should be the same as RS232 terminal devices.

| Object | Description |
| --- | --- |
| **Interface 2 (Pin 1) 5V/9V/12V** | Enable 5V/9V/12V power output of interface 2 to supply power to RS232 terminal devices continuously.<br>**Note**: Power output is 12V by default and you can change DIP switches t o change voltage. |
| **Interface 2(Pin 2) 3.3V Continuous Output** | Enable 3.3V power output of interface 2 to supply power to RS232 termi nal devices continuously.<br>**Power Supply Current:** supply current as sensor required.<br>Range: 0-60mA |
| **Baud Rate** | 1200/2400/4800/9600/19200/38400/57600/115200 are available. |
| **Data Bit** | 8 bit is available. |
| **Stop Bit** | 1 bit and 2 bit are available. |
| **Parity** | None, Odd and Oven are available. |
| **Port** | The port used for RS232 data transmission. |

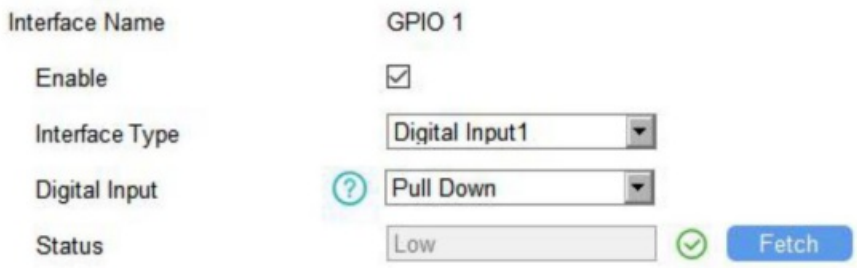
#### 4.3.3 GPIO Settings

1. Connect devices to GPIO ports on interface 2.
2. Go to “General -> GPIO” of ToolBox software to enable GPIO port.

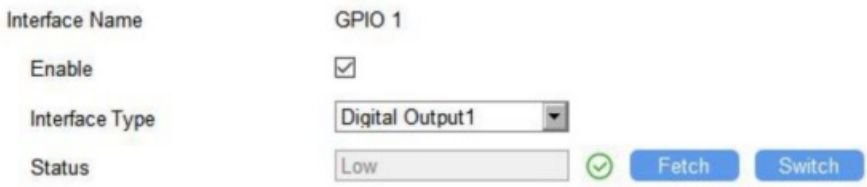

**3. Select GPIO type according to your requirements.**

- Digital Input: detect high or low status of devices
- Digital Output: send voltage signal to trigger devices
- Counter: pulse counter.

**Digital Input:**
Select initial status of digital input. If pull up is selected, falling edge will be triggered; if pull down is selected, rising edge will be triggered. After selection, click “Fetch” to check current status of digital input.




**Digital Output:**
Click “Switch” to check if LN501 can trigger devices by digital output or click “Fetch” to check the current status of digital output.

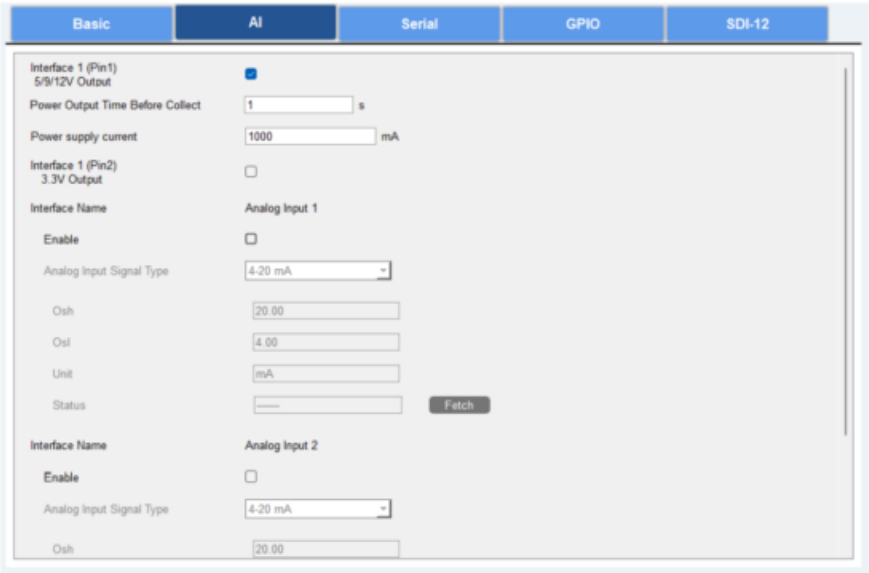



**Pulse Counter:**


| Object | Description |
|---|---|
| **Digital Input** | Initial status of counter.<br>Pull Down: Increase 1 when detecting rising edge Pull Up/None: Increas e 1 when detecting falling edge |
| **Digital Filter** | It’s recommended to enable when pulse period is greater than 250 us. |
| **Keep Last Value When Power Off** | Keep the counted values when the device powers off. |
| **Start/Stop** | Make the device start/stop counting.<br>**Note**: LN501 will send non-changeable counting values if you do not click “Start”. |
| **Refresh** | Refresh to get latest counter values. |
| **Clear** | Count the value from 0. |

#### 4.3.4 AI Settings

1. Connect analog device to analog input ports on interface 1. If you need LN501 to power the analog device, connect the power cable of analog device to 5V/9V/12V power output on interface 1.
2. Go to “General -> AI” of ToolBox software to enable analog input.



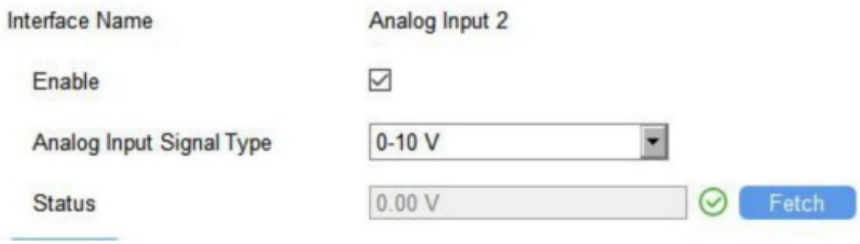

3. Select analog input type according to analog device type.

   Note Make sure DIP switch has changed before changing “Analog Input Signal Type” to 0-10V.

4. Enable “Interface 1 (Pin 1) 5V/9V/12V” and configure “Power Output Time Before Collect”, LN501 will power the analog devices for a period of time before collecting data.

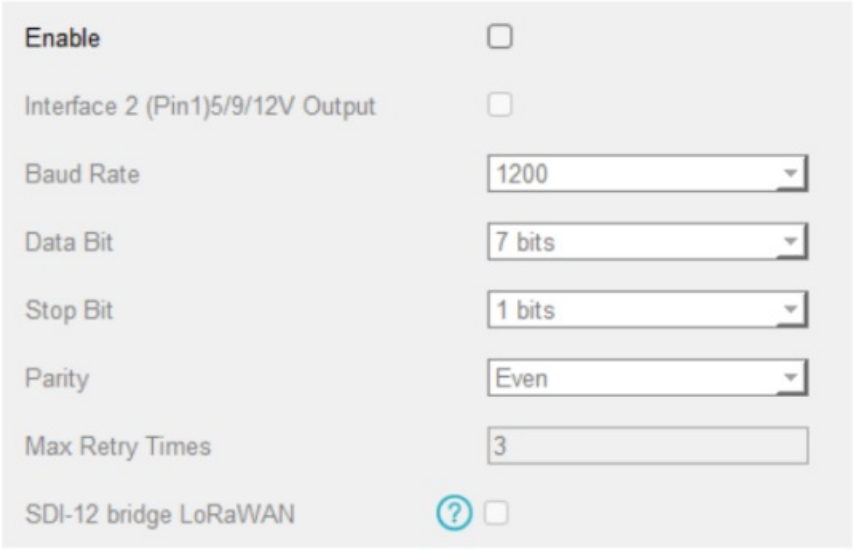

   Note When you use power output to power analog devices, it only supplies power when reporting interval is coming. It’s suggested to power slave devices with external power during the PoC test.

5. Click “Fetch” to check if LN501 can read correct data from analog devices.




#### 4.3.5 SDI-12 Settings

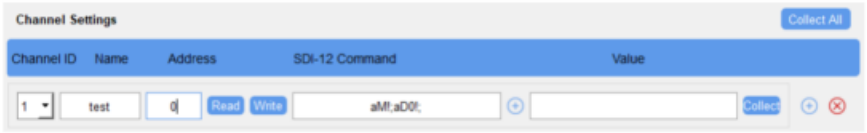
1. Connect SDI-12 sensor to SDI-12 port on interface 2. If the SDI-12 device requires power from the LN501, connect the power cable of SDI-12 device to power output on interface 2.
2. For ToolBox software, enable SDI-12 interface and configure interface settings to be the same as those of the SDI-12 sensors.




| Object | Description |
|---|---|
| **Interface 2(Pin 1) 5V/9V/12V Output** | Enable 5V/9V/12V power output of interface 2 to supply power to SDI-12 sensors. It's 12V by default and you can change DIP switches to change voltage.<br>**Power Output Time Before Collect**: power supply time before collecting data for terminal device initialization. Range: 0-600s. **Power Supply Current**: supply current as sensor required.<br>Range: 0-60mA |
| **Baud Rate** | 1200/2400/4800/9600/19200/38400/57600/115200 are available. |
| **Data Bit** | 8 bit/7 bit is available. |
| **Stop Bit** | 1 bit/2 bit is available. |
| **Parity** | None, Odd and Oven are available. |
| **Max Retry Time** | Set the maximum retry times after device fails to read data from SDI-12 sensors. |
| **SDI-12 bridge LoRaWAN** | If this mode is enabled, network server can send SDI-12 command to SDI-12 device and the device can only react according to server commands.<br>**Port:** Select from 2-84, 86-223. |

Note When you use power output to power SDI-12 sensors, it only supplies power when reporting interval is coming. It's suggested to power sensors with external power during the PoC test.

3. Click ⊕ to add channels, click Read to get the address of this sensor.
4. Click ⊕ besides the SDI-12 Command tab to add SDI-12 commands as required by the sensor.
5. Click Collect to send the commands to get sensor data, then click Fetch to check the data.

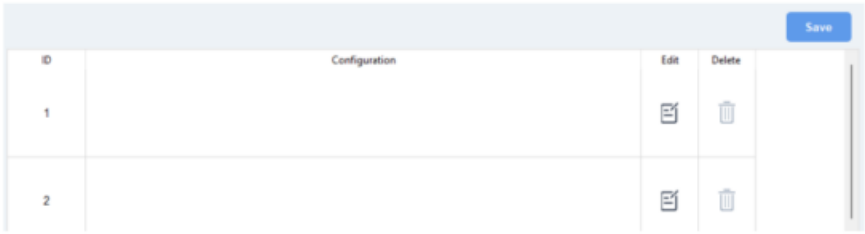



| Object | Description |
|---|---|
| **Channel ID** | Select the channel ID you want to configure from 16 channels. |
| **Name** | Customize the name of each channel to easily identify them |
| **Address** | Address of SDI-12 sensor, it is editable. |
| **Read** | Click to read the address of the SDI-12 sensor. |
| **Write** | Modify the Address and click to write a new address to SDI-12 sensor. |
| **SDI-12 Command** | Fill in the commands to send to sensors, one channel can add 16 commands at most. |
| **Collect** | Click to send commands to get sensor data.<br>**Note:** Do not click frequently since response time to reply is differ for every terminal device. |
| **Fetch** | Fetch Click to display the data on the ToolBox. |
| **Value** | Show the collected value. If it read multiple values, it will be separated by “+” or “-”. |

### 4.4 Alarm Settings

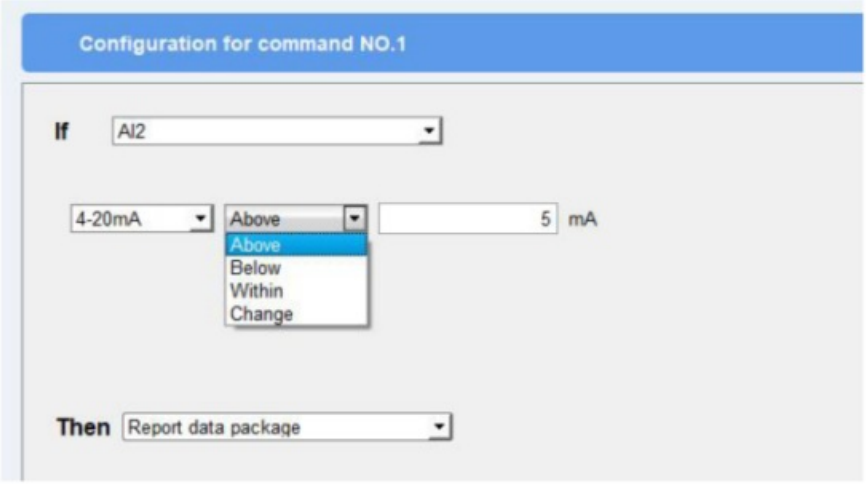
LN501 supports configuring commands to send alarm packets to network server. Each device can be added 16 threshold alarm commands at most.

1. For ToolBox software, go to Command page, click Edit to add commands.

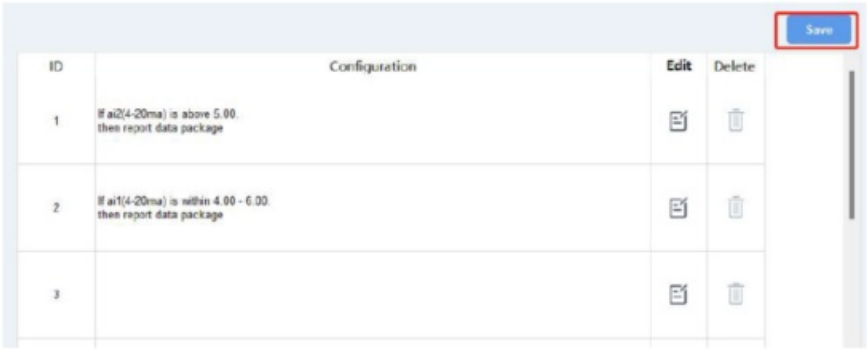



2. Set an IF condition including the analog input values or RS485 Modbus channel values. When the value matches the condition, the device will report an alarm packet.

   Note The device will only send the alarm once. Only when the value turns back to normal and triggers the condition again, it will send a new alarm.



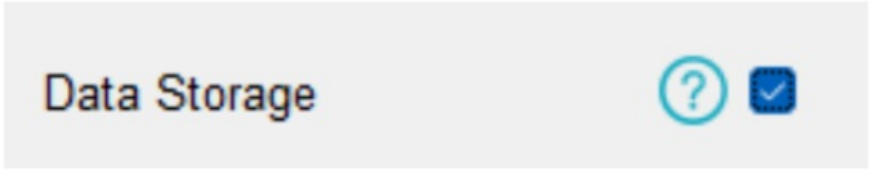

3. After setting all commands, click Save.



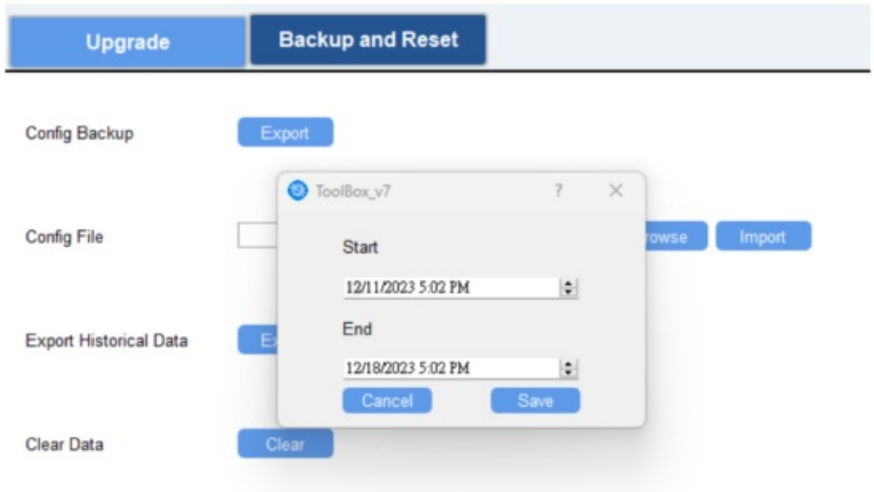

**4.5 Data Storage**

LN501 supports storing 600 data records locally and exports data via ToolBox software. The device will record the data according to the reporting interval even if it is not connected to a network.

1. Go to Status of ToolBox software to sync the device time;
2. Go to General > Basic of ToolBox software to enable data storage feature.




3. Go to Maintenance > Backup and Reset of ToolBox software, click Export, then select the data time range and click Save to export data.




4. Click Clear to clear all stored data inside the device if necessary.

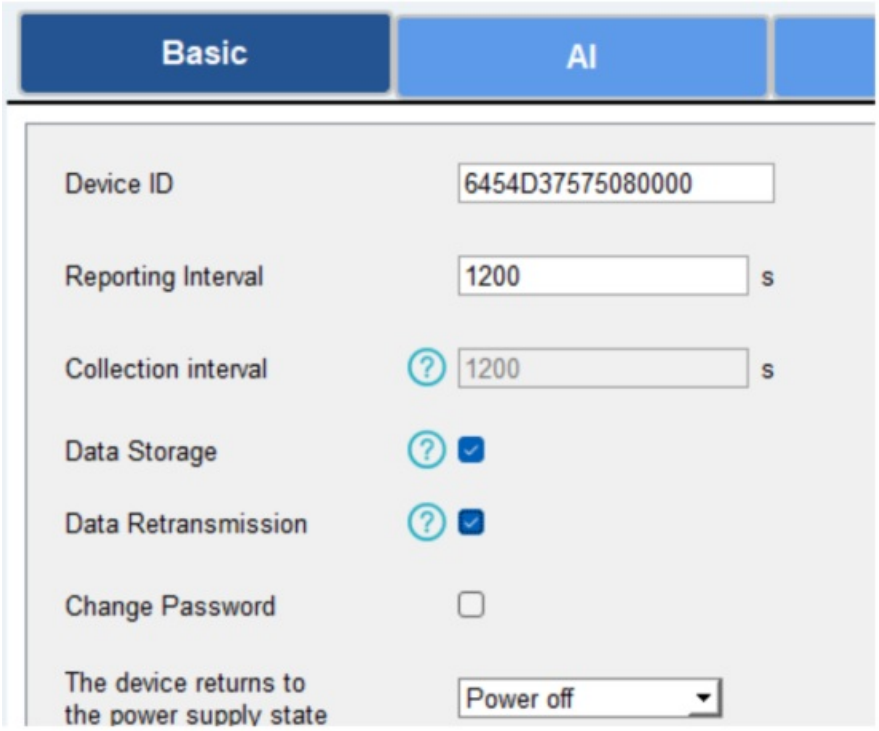
### 4.6 Data Retransmission

LN501 supports data retransmission to ensure the network server can get all data even if the network is down for some times. There are two ways to get the lost data:

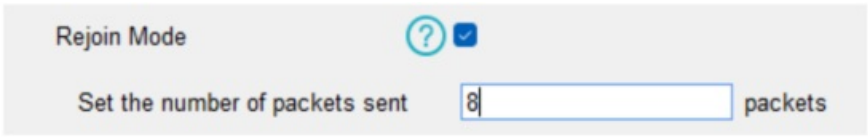
- Network server sends downlink commands to enquire the historical data for specified time range, see LN501 Communication Protocol;
- When network is down if no response from LinkCheckReq MAC packets for a period of time, the device will record the network disconnected time and re-transmit the lost data after the device re-connects the network.

**Here are the steps for data retransmission:**

1. Enable data storage feature and data retransmission feature.




2. Enable rejoin mode feature and set the number of packets sent. Take below as an example, the device will send LinkCheckReq MAC packets to the network server regularly to check if the network is disconnected; if there is no response for 8+1 times, the join status will change to de-active and the device will record a data lost time point(the time to join the network).




3. After the network connected back, the device will send the missing data, starting from the point in time when the data was lost, according to the reporting interval.

Note

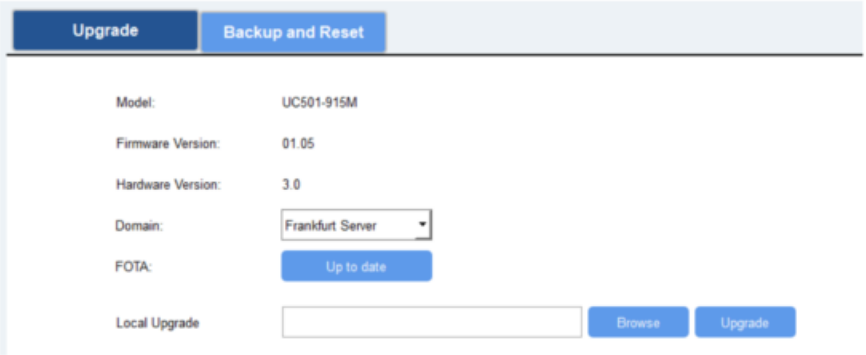
1. If the device is rebooted or powered off during data retransmission and the process is not completed, the device will resend all retransmitted data again after reconnecting to the network.
2. If the network is disconnected again during data retransmission, it will only send the latest disconnection data.
3. The retransmission data format is started with “20”, please refer to LN501 Communication Protocol.

4. Data retransmission will increase the uplinks and shorten the battery life.

### 4.7 Maintenance

#### 4.7.1 Upgrade

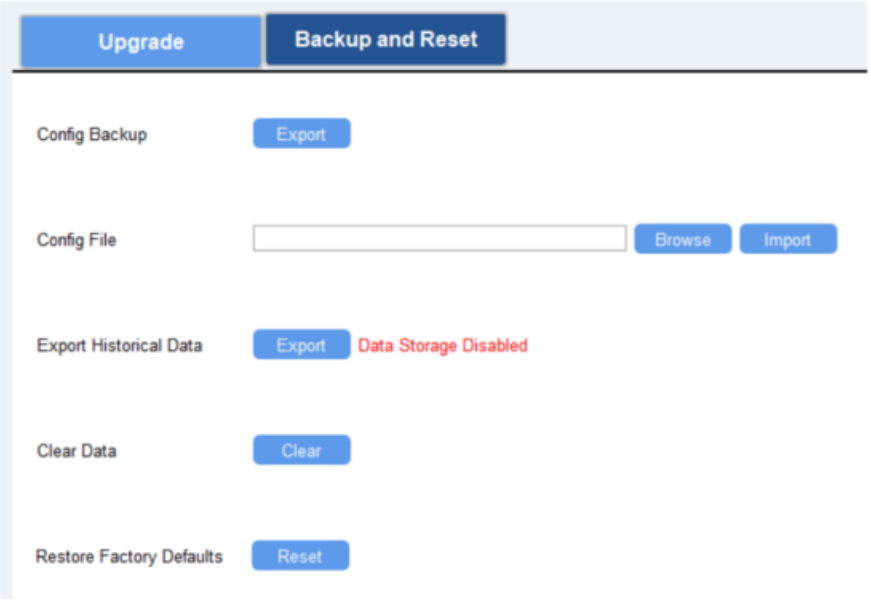
Go to “Maintenance -> Upgrade” of ToolBox software, click “Browse” to import firmware and upgrade the device. You can also click “Up to Date” to search for the latest firmware of the device and upgrade.




#### 4.7.2 Backup

LN501 devices support configuration backup for easy and quick device configuration in bulk. Backup is allowed only for devices with the same model and LoRa frequency band. Please select one of following methods to back up device:

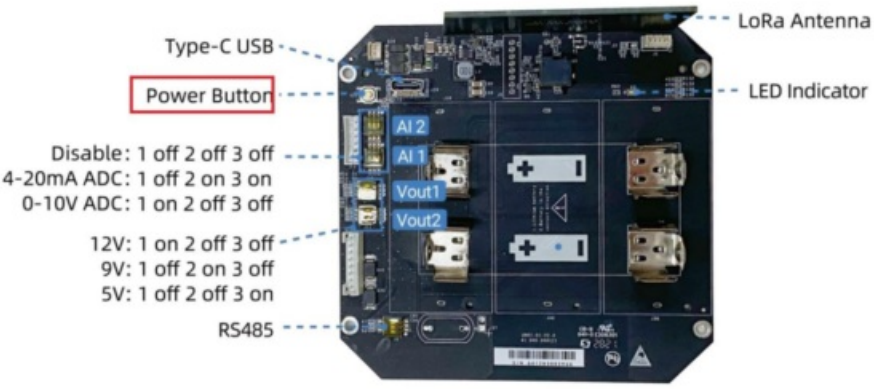
1. Go to “Maintenance -> Backup and Reset”, click “Export” to save current configuration as backup file.
2. Click “Browse” to select backup file, and then click “Import” to import the configurations.



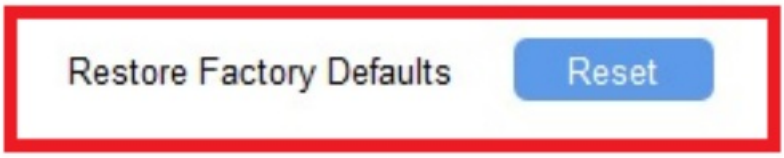

#### 4.7.3 Reset to Factory Default

Please select one of following methods to reset device:

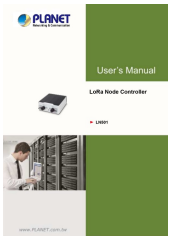
- Hardware: Open the case of LN501 and hold on power button for more than 10s.




- ToolBox Software: Go to “Maintenance -> Backup and Reset” to click “Reset”.




## Documents / Resources

| | |
|---|---|
|  | planet LN501 Lora Node Controller [pdf] User Manual<br>LN501 Lora Node Controller, LN501, Lora Node Controller, Node Controller, Controller |

## References

- User Manual