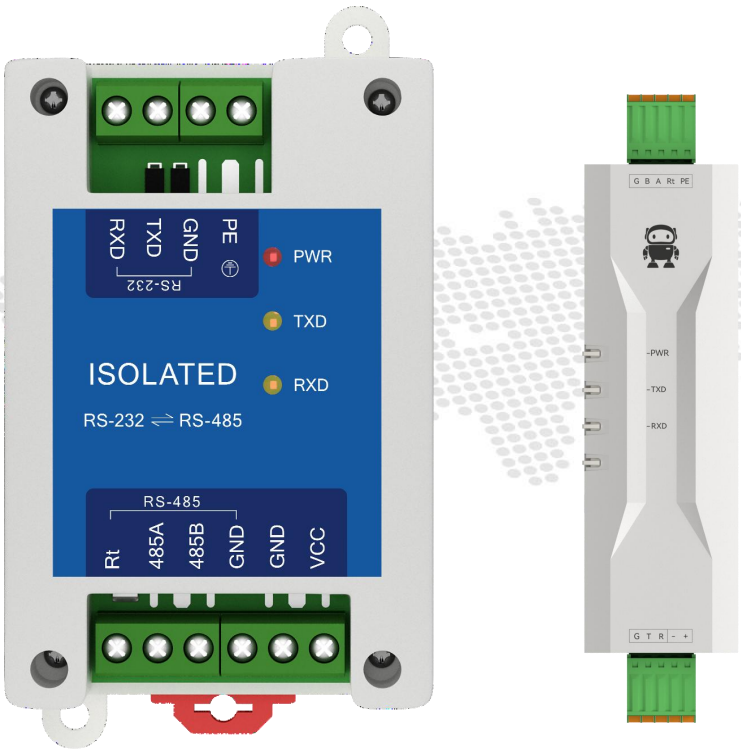
Chengdu Ebyte Electronic Technology Co.,Ltd

# Wireless Modem

## User Manual

E810-Z01/E810-Z01M
RS232 to RS485 isolation converter




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# Chapter 1 Overview

## 1.1 Introduction

E810-Z01/E810-Z01M is an RS232 to RS485 isolation converter launched by Chengdu EBYTE Electronic Technology Co., Ltd., which supports the conversion between three-wire RS232 interface and two-wire RS485 interface. Photoelectric isolation technology is used to protect both parties of communication from interference. The circuit is designed according to EMC level 3 standard, with 1.5KV isolation voltage, electrostatic protection contact discharge 4KV, air discharge 8KV, and differential mode 1KV and common mode 2KV lightning surge protection, which can effectively isolate the damage caused by lightning and static electricity to the equipment. No configuration is required, and transparent data transmission between the master and slave interfaces.

This product is suitable for integrated communication systems such as automation control systems, monitoring systems, alarms, access control systems, IC card charging, meter reading, all -in-one card , parking lot charging, etc.

## 1.2 Features

- The power supply supports DC 8~28V wide voltage input and has overcurrent and reverse connection protection
- Conversion between three-wire RS232 interface and two-wire RS485 interface
- No configuration required, ready to use
- The signal interface has static electricity, lightning strike, and surge protection
- The signals and power supplies of both communication parties are completely isolated
- Using super strong anti-interference and high-speed isolation devices, the baud rate can reach up to 460800bps
- RS485 supports up to 32 nodes

| Parameter name | Parameter Value | description |
|---|---|---|
| General parameters | Data Interface | RS-485 interface/RS232 interface |
| | Baud rate | 300 ~ 460800bps, support custom baud rate |
| | Operating voltage | DC 8 ~ 28V |
| | Protection level | Industrial EMC Level 3 |
| | Isolation voltage | 2.5KV |
| | Electrostatic protection level | Contact 4 KV, Air 8KV |
| | Pulse surge | Differential mode 1KV, common mode 2KV |
| | Working temperature and humidity | -40 ~ 85℃, 5% ~ 95% (no condensation) |
| | Storage temperature and humidity | -40 ~ 105℃, 5% ~ 95% (no condensation) |

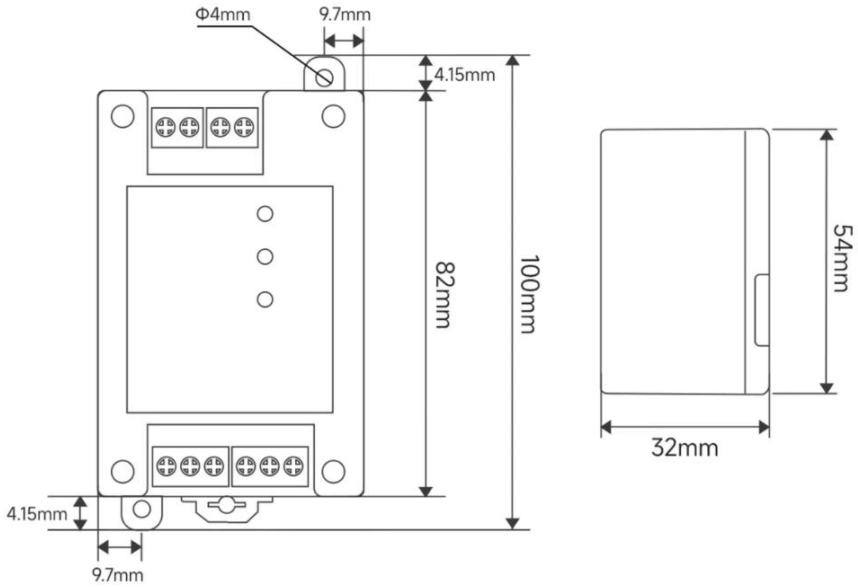

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| | | |
|---|---|---|
| | Ground terminal | support |
| | Product size | R810-Z01:100×54×32mm<br>R810-Z01M:106×28×27mm |
| | Product Weight | R810-Z01:70±5g<br>R810-Z01M:35±5g |
| | Interface standards | R810-Z01: 5.08mm copper pin terminal<br>R810-Z01M: 2.54mm plug-in spring terminal |

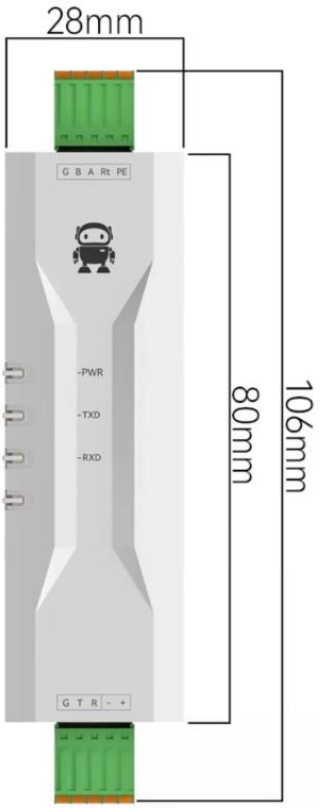
1.1 System Parameters

## 1.3 Product size





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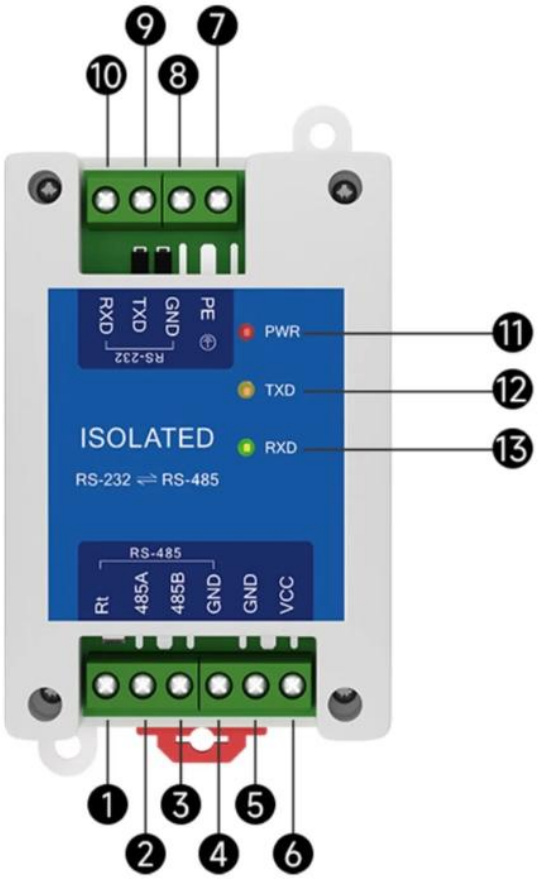




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# 1. 4 Pin Definition



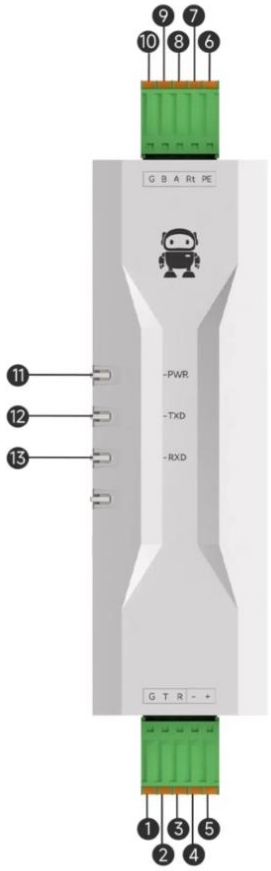

| Serial number | name | illustration |
|---|---|---|
| 1 | R | 5.08mm Terminal Block<br>After Rt is short-circuited with A, a 120 ohm matching resistor is connected in parallel between A and B |
| 2 | 485A | 5.08mm terminal block, RS485-A interface<br>After Rt is short-circuited with A, a 120 ohm matching resistor is connected in parallel between A and B |
| 3 | 485B | 5.08mm terminal block , RS485-B interface |
| 4 | GND | 5.08mm terminal block , RS485 digital signal ground |
| 5 | GND | 5.08mm terminal block, connect to DC 8~28V power input V-level |
| 6 | VCC | 5.08mm terminal block, DC 8~28V power input V+ level |
| 7 | PE | 5.08mm terminal block, earth terminal |
| 8 | GND | 5.08mm terminal block, RS232 digital signal ground, not interoperable with RS485 digital signal ground |
| 9 | TXD | 5.08mm terminal block, RS232-TXD interface |
| 10 | RxD | 5.08mm terminal block, RS232-RXD interface |
| 11 | LED- PWR (Blue) | Power indicator |



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| | | |
|---|---|---|
| 12 | LED- TXD (yellow) | The RS232 interface sends data to the RS485 interface. The indicator light flashes when there is data. |
| 13 | LED -RXD (green) | The RS485 interface sends data to the RS232 interface. The indicator light flashes when there is data. |




| Serial number | name | illustration |
|---|---|---|
| 1 | G | 2.54mm spring terminal block, RS232 digital signal ground, not interoperable with RS485 digital signal ground |
| 2 | TXD | 2.54mm spring terminal block, RS232-TXD interface |
| 3 | RXD | 2.54mm spring terminal block, RS232-RXD interface |
| 4 | - | 2.54mm spring terminal block, connect to DC 8~28V power input V-level |
| 5 | + | 2.54mm spring terminal block, connect to DC 8~28V power input V-level |
| 6 | PE | 2.54mm spring terminal, earth terminal |
| 7 | R | 2.54mm spring terminal block<br>After Rt is short-circuited with A, a 120 ohm matching resistor is connected in parallel between A and B |


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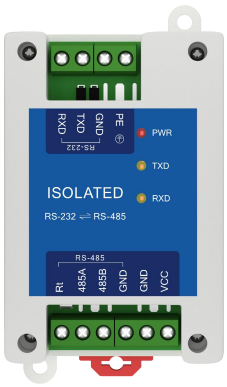
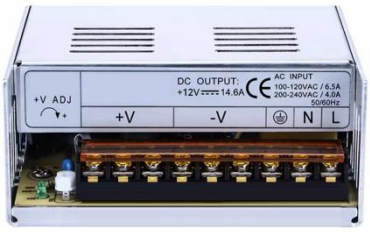
| | | |
|---|---|---|
| 8 | A | 2.54mm spring terminal block<br>After Rt is short-circuited with A, a 120 ohm matching resistor is connected in parallel between A and B |
| 9 | B | 2.54mm spring terminal block, RS485-B interface |
| 10 | G | 2.54mm spring terminal block, RS485 digital signal ground<br>Not interoperable with RS232 terminal signal ground |
| 11 | LED- PWR (Blue) | Power indicator |
| 12 | LED- TXD (yellow) | The RS232 interface sends data to the RS485 interface. The indicator light flashes when there is data. |
| 13 | LED -RXD (green) | The RS485 interface sends data to the RS232 interface. The indicator light flashes when there is data. |


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# Chapter 2 Quick Start

## 2.1 Hardware Preparation

Note: The usage of E810-Z01 and E810-Z01M is exactly the same. Here we take E810-Z01 as an example
The hardware required for this test is as follows:

| | | |
|---|---|---|
|  |  |  |
| E810-Z01 host 1 unit | 12V switching power supply | 1 USB to RS-232 debugger |
|  |  | |
| 1 USB to RS-485 debugger | Several connecting wires | |

1. Connect the device host to the 12V switching power supply, connect the device VCC to the positive pole (V+) of the switching power supply, and connect the device GND to the negative pole (V-) of the switching power supply;

2. Use USB to RS-485 to connect to the 485 end of the device, connect device 485A to the A end of the USB to RS-485, and connect device 485B to the B end of the USB to RS-485;

3. Use USB to RS-232 to connect to the RS232 terminal of the device, connect the device TXD to the USB to RS-232 RXD terminal, connect the device RXD to the USB to RS-232 TXD terminal, and connect the device GND to the USB to RS-232 GND terminal;

4. Connect the USB to the computer (the corresponding USB to serial port driver needs to be installed);

5. Turn on the power supply;



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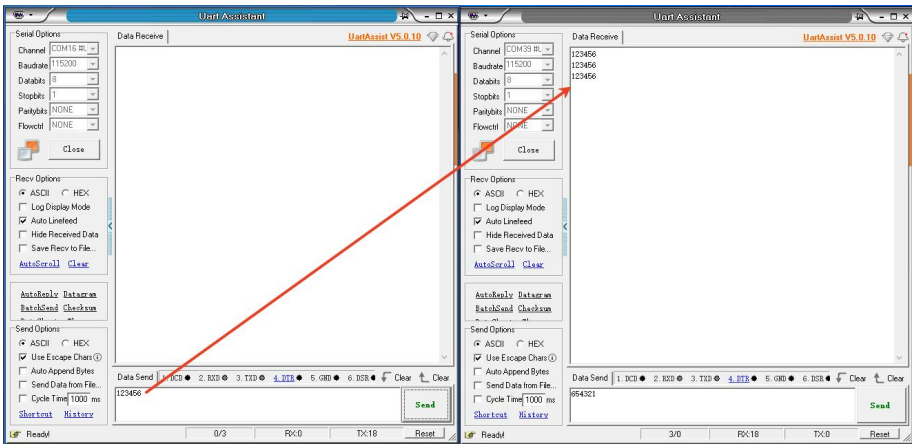
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6. Open the USB to RS485 and USB to RS232 serial ports respectively.

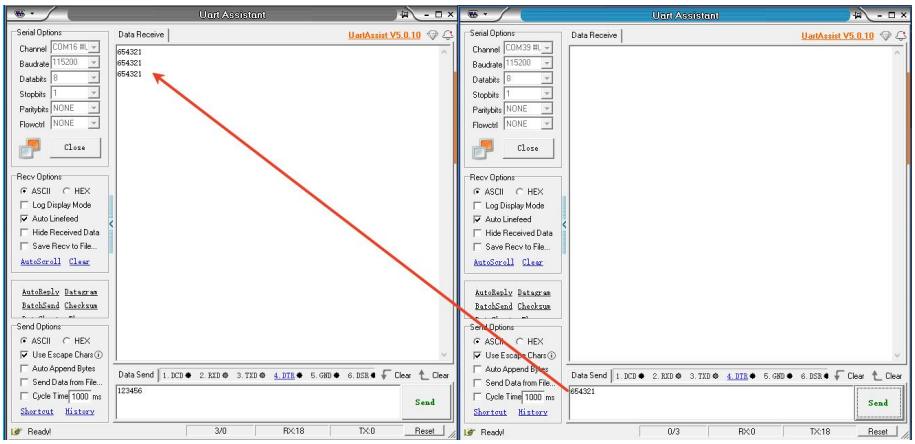
## 2.2 Software Preparation

Only two-way communication is demonstrated here, taking the serial port tool as an example.

1、RS232 sends data, RS485 receives data




2、RS485 sends data, RS232 receives data




Note: The baud rate of both communicating parties must be consistent.



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# Chapter 3 Wiring Considerations

## 3.1 RS485 bus wiring specifications

1. Use standard RS485 bus wiring method, commonly known as hand-in-hand connection method, and try to avoid star connection method.

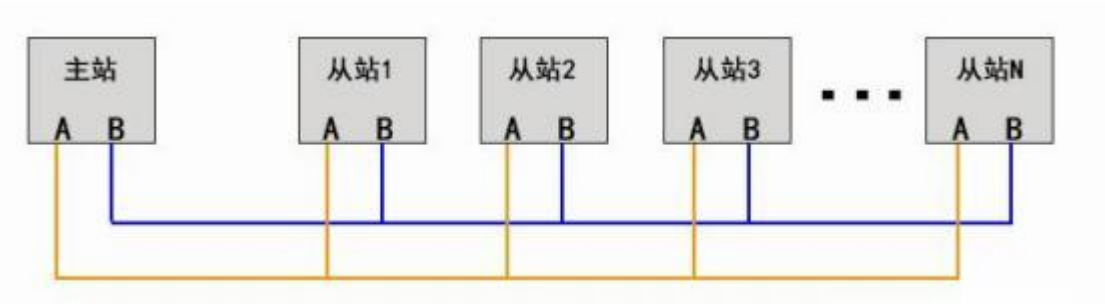
2. Use 2-core shielded twisted pair cable, the bus length shall not exceed 1200 meters, the number of bus-mounted devices shall not exceed 32, and the branch line length shall not exceed 10 meters.

3. Communication lines should be kept as far away from interference sources as possible. Communication lines should be laid in weak-current wells and should not be laid in parallel with strong-current or radio-frequency signal lines. If parallel laying is necessary , the distance should not be greater than 0.5 meters.

## 3.2 RS485 Wiring Precautions

1. The maximum communication distance of the 485 communication standard is 1200 meters, but in actual applications, this distance is less than that, and the higher the baud rate, the shorter the communication distance. Generally, if the communication distance exceeds 500 meters, a 485 signal repeater needs to be added.

2. To avoid signal reflection when there are many devices connected to the bus, a 120-ohm matching resistor should be connected between the communication ports AB of the farthest device.




3 , the shielding wire of the communication line should be connected to the ground wire, which is the earth, not the negative pole of the power supply.

**Wire selection recommendation table**

| Wiring distance | Wire |
|---|---|
| Less than 200 rice | 2*0.5 Two-core shielded twisted pair cable |
| 200-500 rice | 2*0.75 Two-core shielded twisted pair cable |
| Greater than 500 rice | 2*1.0 Two-core shielded twisted pair cable |



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# Revision History

| Version | Revision Date | Revision Notes | Maintainer |
|---|---|---|---|
| 1.0 | 2025-1-9 | Initial release | LYL |
| | | | |

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