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eletechsup R4IOJ32 32DO Modbus RTU RS485 IO Expanding Board User Manual

Model: R4IOJ32 (32DO With Pin)

1. INTRODUCTION

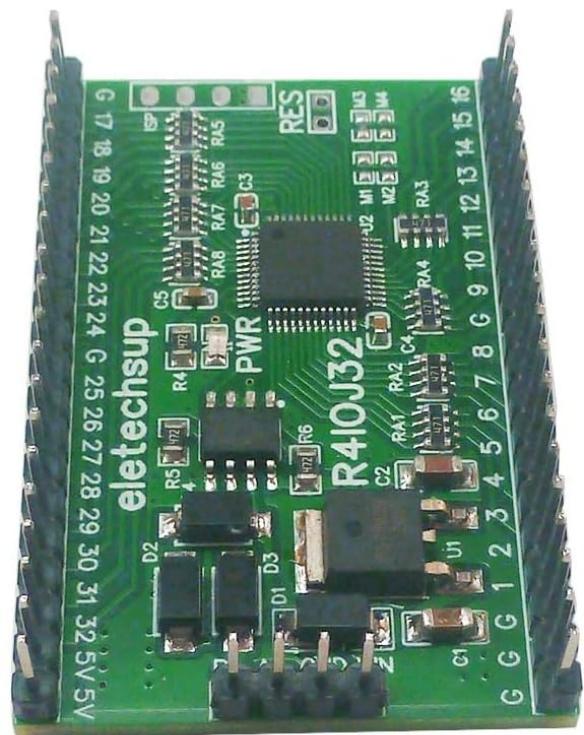
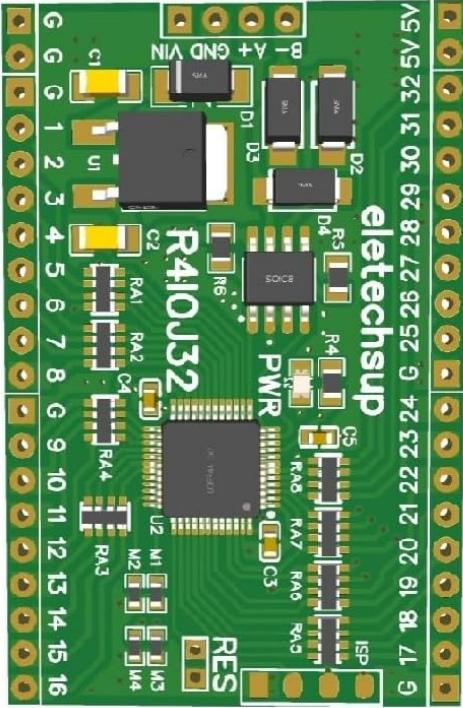
The eletechsup R4IOJ32 is a 32-channel RS485 multi-function IO core board designed for industrial control applications. This compact board supports various input/output (IO) modes, including 32DI, 32DO, 16DI-16DO, 8DI-24DO, and 24DI-8DO, configurable via jumpers. It features Modbus RTU communication, making it suitable for PLC and HMI remote IO expansion. The board allows for flexible configuration of input and output levels (NPN/PNP) through register settings. Its small form factor and 2.54mm pin header interface facilitate easy integration into custom circuit boards and systems.

2. SAFETY INFORMATION

- Ensure proper power supply voltage and polarity to prevent damage to the board.
- Avoid short circuits on any pins or terminals.
- Handle the board with care to prevent electrostatic discharge (ESD) damage.
- Disconnect power before making any connections or changes to the board.
- This device is intended for use by qualified personnel familiar with electronic components and Modbus communication protocols.

3. PRODUCT OVERVIEW

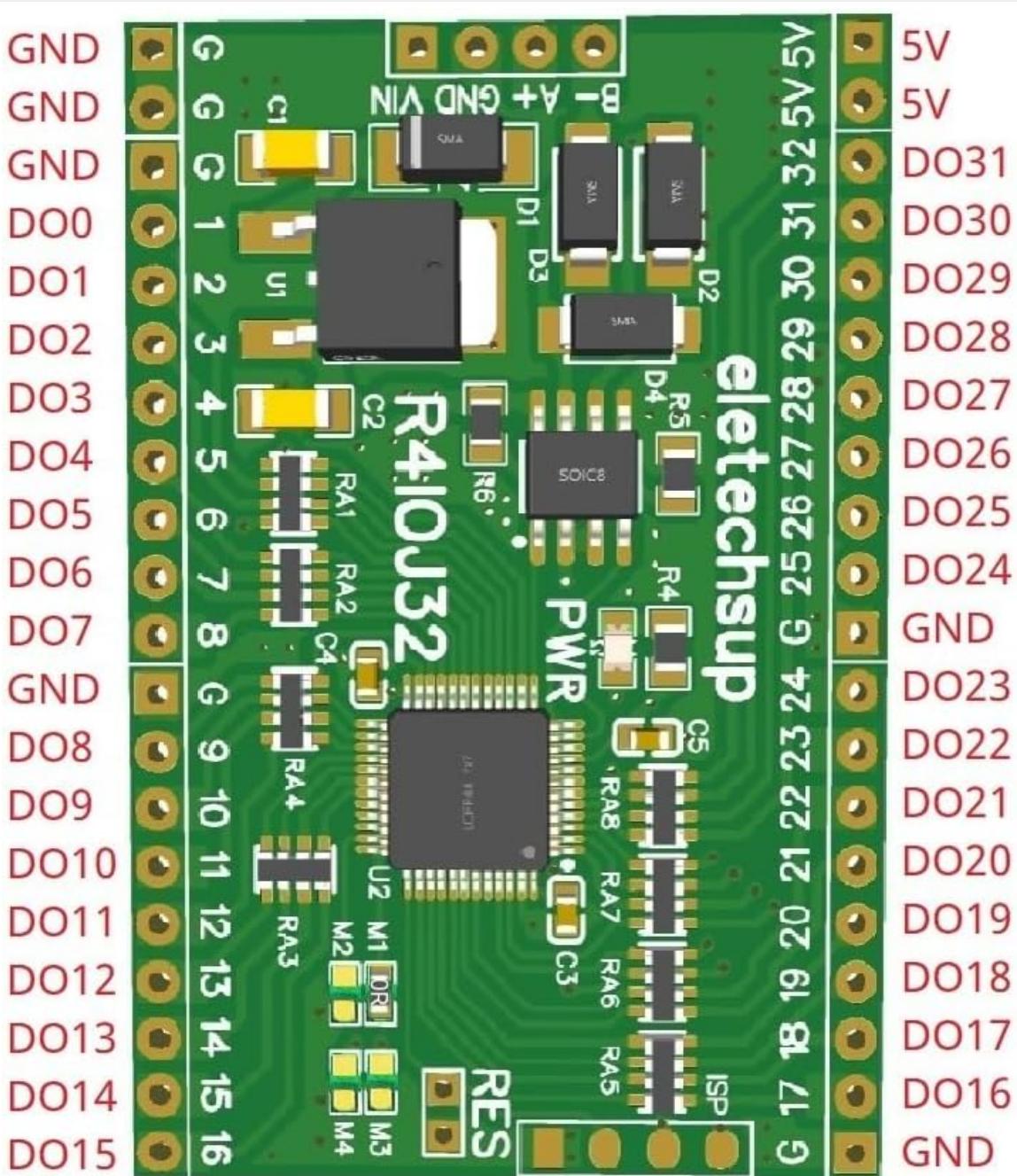
The R4IOJ32 board is available in two versions: 'Only Board' and 'With Pin'. The 'With Pin' version includes pre-soldered 2.54mm pin headers for easier breadboard or Dupont wire connections.



Only Board With Pin

Figure 3.1: R4IOJ32 'Only Board' (left) and 'With Pin' (right) versions. The 'With Pin' version includes pre-soldered pin headers for convenience.

The board features clearly labeled pins for power, ground, RS485 communication, and 32 digital input/output channels. Mode selection jumpers and a reset jumper are also present.



32DO

Figure 3.2: Top view of the R4IOJ32 board, illustrating the pinout for a 32 Digital Output (DO) configuration. Labels include GND, 5V, and DO0-DO31.

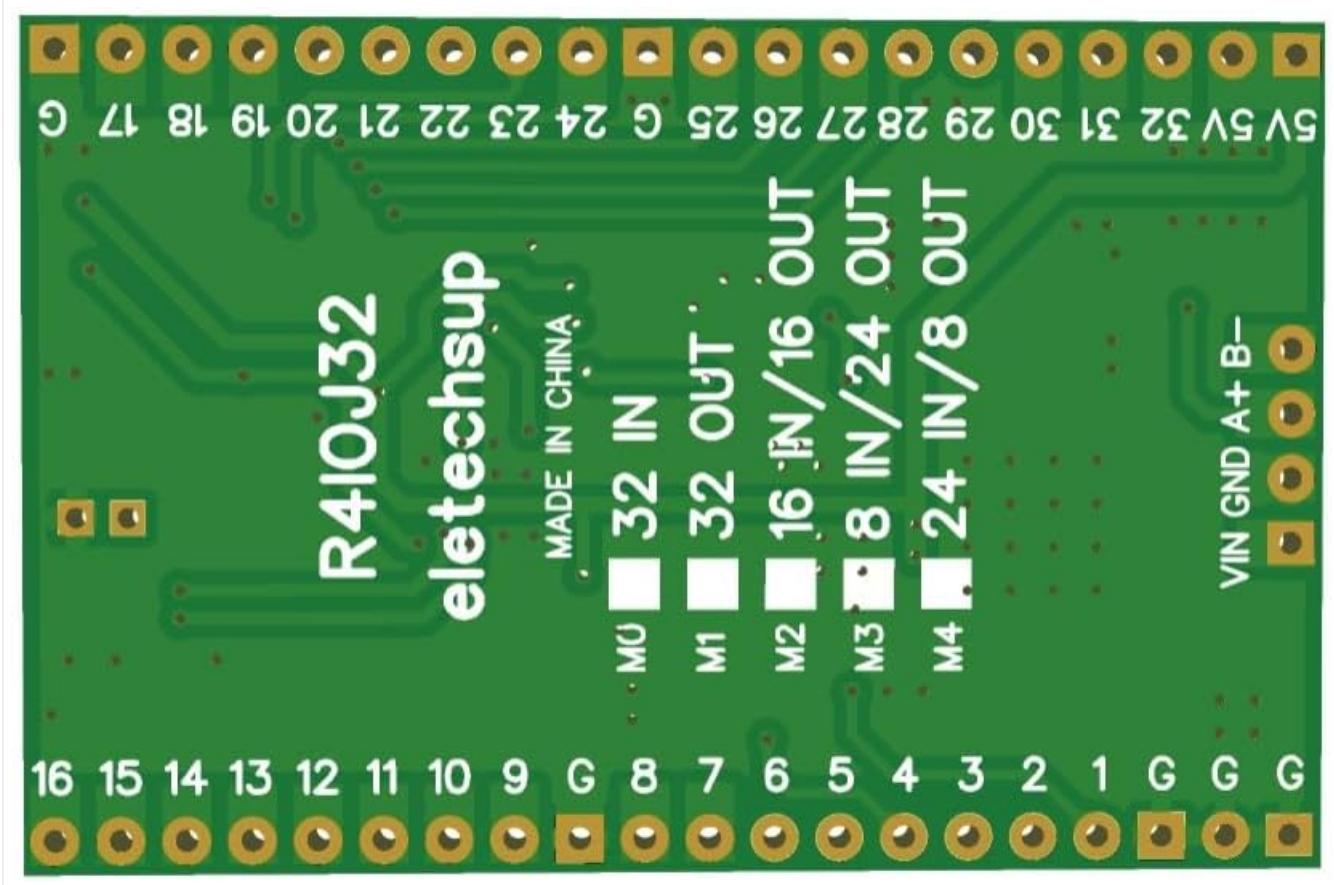


Figure 3.3: Bottom view of the R4IOJ32 board, highlighting the mode selection jumpers (M0-M4) used to configure the IO functionality.

4. SETUP

4.1 Power Supply Connection

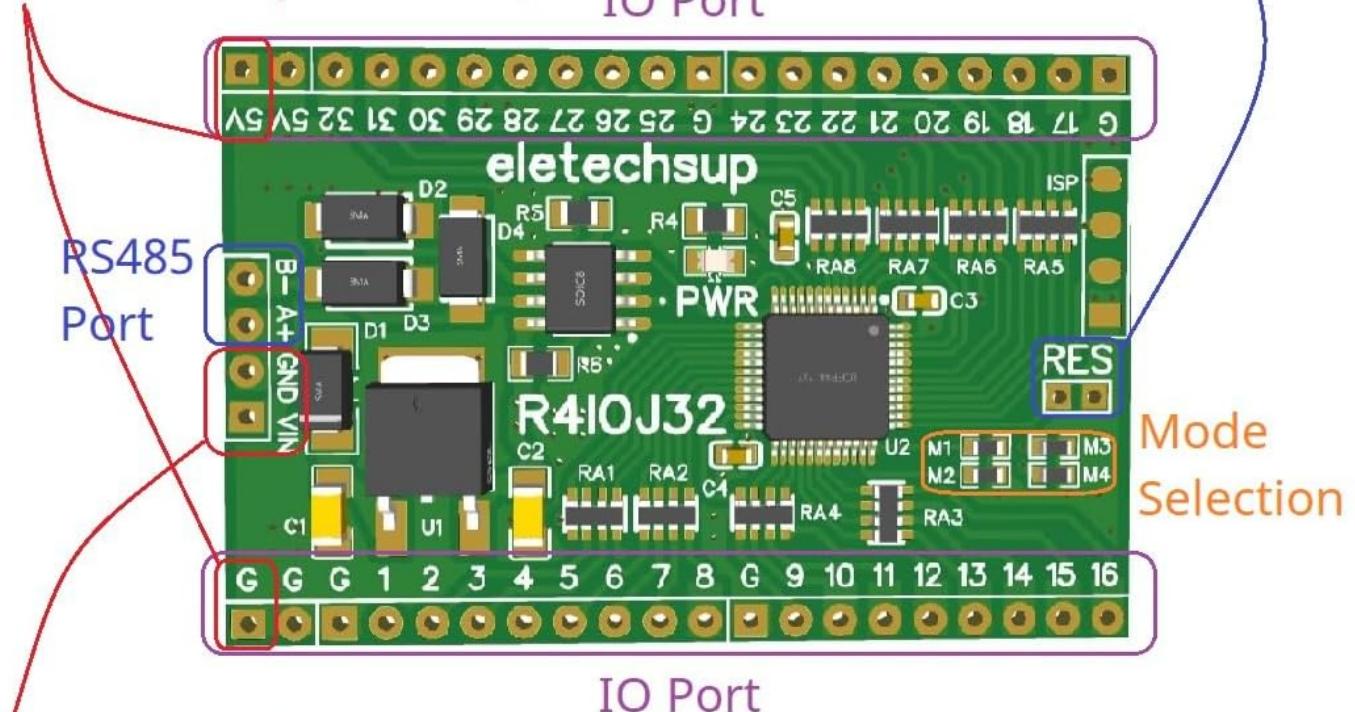
The R4IOJ32 board supports two power supply options. **Only one power supply should be used at a time.**

- **Power Supply 1:** DC 6-26V (with anti-reverse connection protection). Connect to the 'VIN' and 'GND' terminals.
- **Power Supply 2:** DC 4-5.5V (reverse connection prohibited). Connect to the '5V' and 'GND' terminals.

Power supply 2
(DC 3.3-5V Reverse
connection prohibited)

Short the RES jumper for 5 seconds
to restore the factory settings

IO Port



Power supply 1
(DC 6-25V With reverse
connection protection)

Tips:

- 1 Use only one of the two power supplies
- 2 Pin header spacing 2.54MM

Figure 4.1: Power supply connection points and RS485 port on the R4IOJ32 board. Note the two distinct power input options.

4.2 RS485 Communication Connection

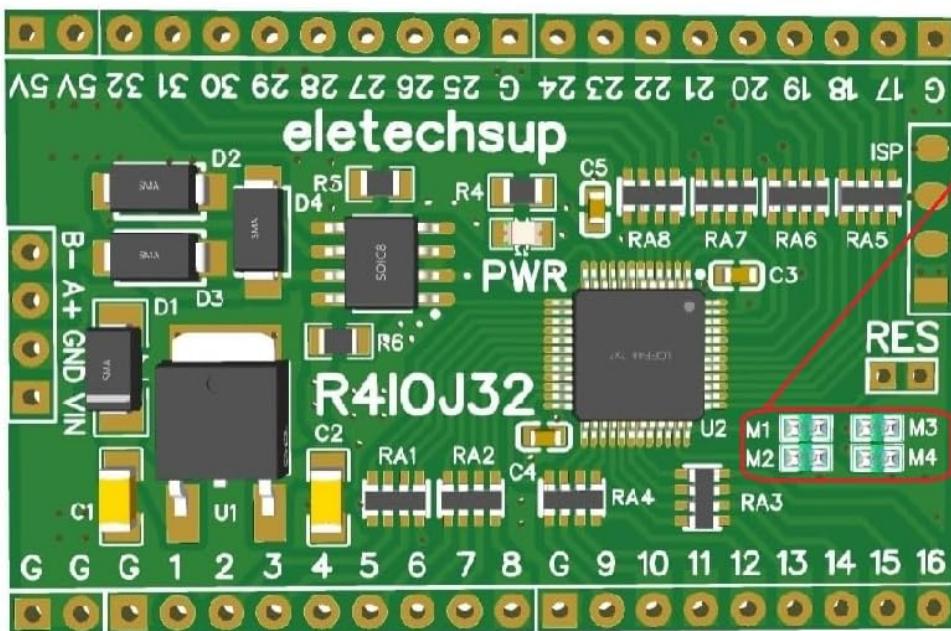
Connect the RS485 A and B lines from your master device (e.g., PLC, HMI) to the corresponding 'A' and 'B' terminals on the R4IOJ32 board. Ensure proper polarity for reliable communication.

4.3 IO Mode Selection

The R4IOJ32 board is a multi-function board, allowing you to select various IO modes (32DI, 32DO, 16DI-16DO, 8DI-24DO, 24DI-8DO) using jumpers M0-M4. These jumpers are typically 0603 0Ω resistors or wire links.

This module is a multi-function board, you can select various function modes through jumpers
 (The jumper uses 0603 0Ω resistor (or wire))

Jumper Soldering					
Function	32DI	32DO	16DI-16DO	8DI-24DO	24DI-8DO



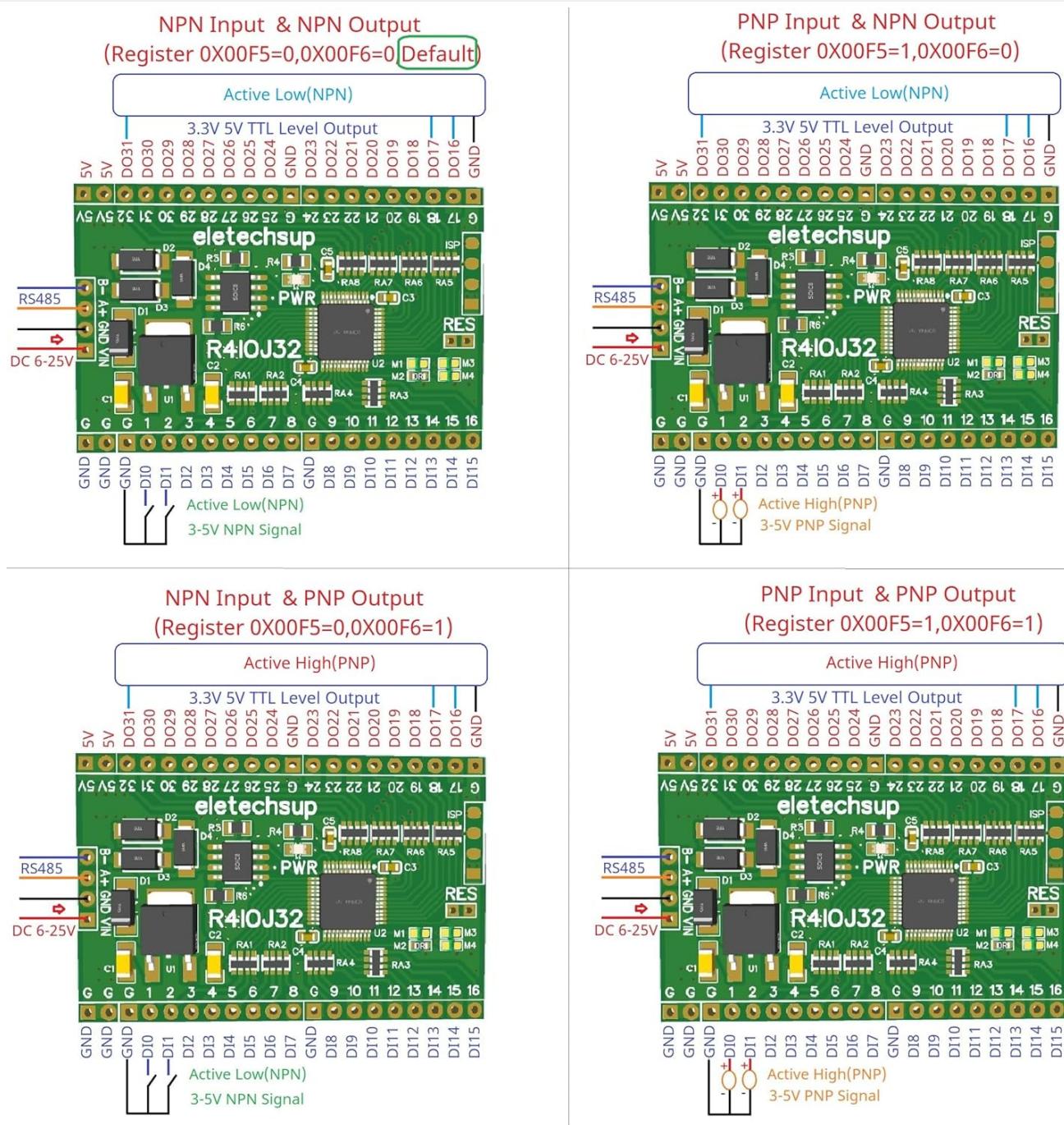


Figure 4.3: Various input and output level configurations (NPN/PNP) and their corresponding register settings (0X00F5, 0X00F6). This diagram illustrates how to connect external signals for each type.

5. OPERATING INSTRUCTIONS

5.1 Modbus RTU Communication

The R4IOJ32 communicates using the Modbus RTU protocol over RS485. It supports the following function codes:

- **Write Functions:** 05 (Write Single Coil), 06 (Write Single Register), 15 (Write Multiple Coils), 16 (Write Multiple Registers)
- **Read Functions:** 01 (Read Coils), 02 (Read Discrete Inputs), 03 (Read Holding Registers)

The board supports various baud rates and parity settings:

- **Baud Rates:** 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200 bps
- **Parity:** None, Odd, Even

In Modbus command mode, the R4IOJ32 can support up to 247 devices in parallel on the same RS485 bus.

5.2 Input Port Status

The status of the input ports can be queried by the master device (default mode) or configured for automatic reporting, depending on the specific firmware or register settings.

5.3 Abnormal Communication Settings

The board offers configurable behavior in case of abnormal communication:

- By setting register 0X00F3, the board can be configured to restart automatically when communication is abnormal.
- By setting register 0X00F4, all output ports can be configured to close (turn off) when communication is abnormal, providing a fail-safe mechanism.

6. MAINTENANCE

- **Cleaning:** Keep the board clean and free from dust and debris. Use a soft, dry brush or compressed air for cleaning. Avoid using liquids or solvents.
- **Environment:** Operate the board within its specified temperature and humidity ranges. Avoid exposure to extreme temperatures, moisture, or corrosive environments.
- **Connections:** Periodically check all wiring and connections to ensure they are secure and free from damage.

7. TROUBLESHOOTING

7.1 Common Issues

- **No Power:** Check power supply connections and voltage. Ensure only one power supply is connected.
- **Communication Failure:** Verify RS485 A/B line polarity, baud rate, and parity settings. Check for bus termination if necessary. Ensure the Modbus master is correctly configured.
- **Incorrect IO Behavior:** Review the jumper settings for IO mode selection (Section 4.3). Check the NPN/PNP configuration via registers (Section 4.4).

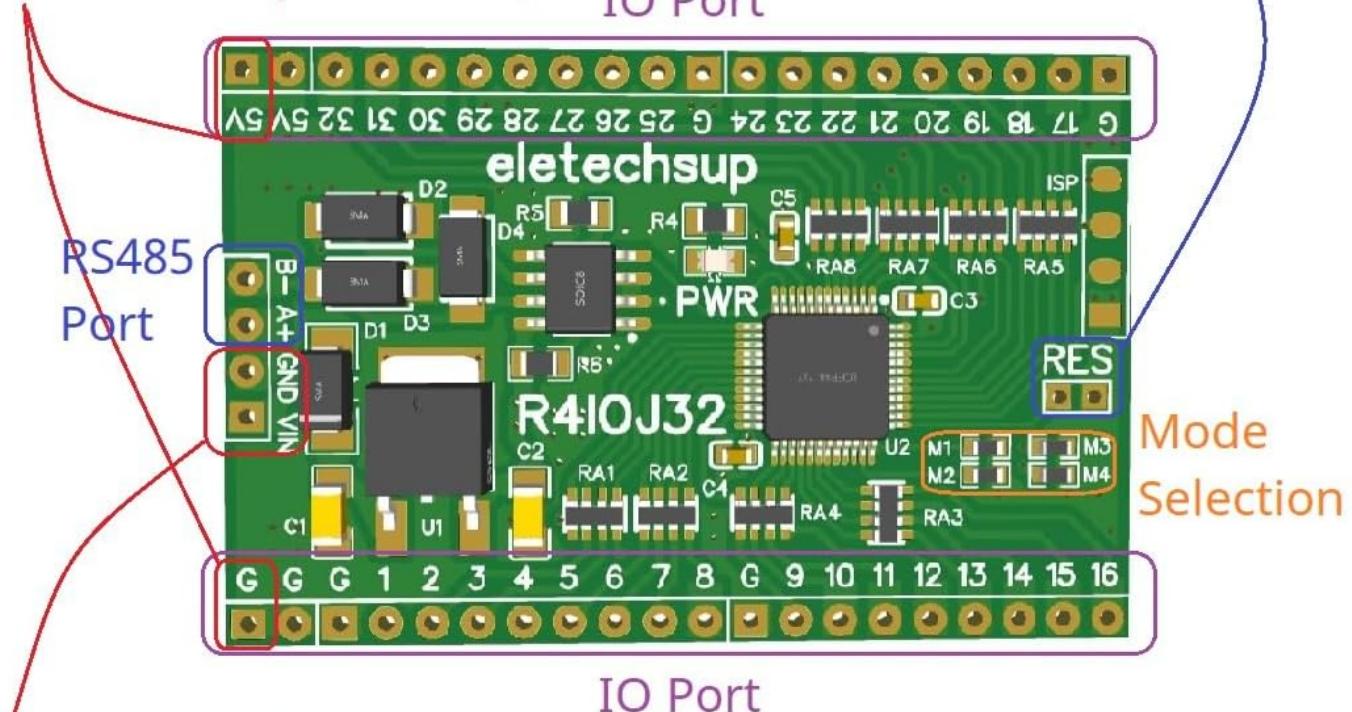
7.2 Factory Reset

To restore the board to its factory default settings, short the 'RES' jumper for approximately 5 seconds. This will reset all configurable parameters to their initial values.

Power supply 2
(DC 3.3-5V Reverse
connection prohibited)

Short the RES jumper for 5 seconds
to restore the factory settings

IO Port



Power supply 1
(DC 6-25V With reverse
connection protection)

Tips:

- 1 Use only one of the two power supplies
- 2 Pin header spacing 2.54MM

Figure 7.1: Location of the 'RES' jumper on the R4IOJ32 board, used for performing a factory reset.

8. SPECIFICATIONS

Feature	Specification
Power Supply 1	DC 6-26V (with anti-reverse protection)
Power Supply 2	DC 4-5.5V (reverse connection prohibited)
Working Current	9mA
Communication Protocol	Modbus RTU
Modbus Function Codes	Write: 05, 06, 15, 16; Read: 01, 02, 03
IO Modes (Selectable)	32DI, 32DO, 16DI-16DO, 8DI-24DO, 24DI-8DO

Feature	Specification
Input/Output Levels	NPN/PNP (configurable via registers 0X00F5/0X00F6)
Input Mode	3.3V/5V TTL level, low level (default)/high level input
Output Mode	5V TTL level, low level (default)/high level output
Max Devices (Modbus)	247
Baud Rates	1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200 bps
Parity	None, Odd, Even
Interface	2.54mm Pin Header
Dimensions	51mm x 34mm x 4mm (L x W x H)
Weight	8 grams

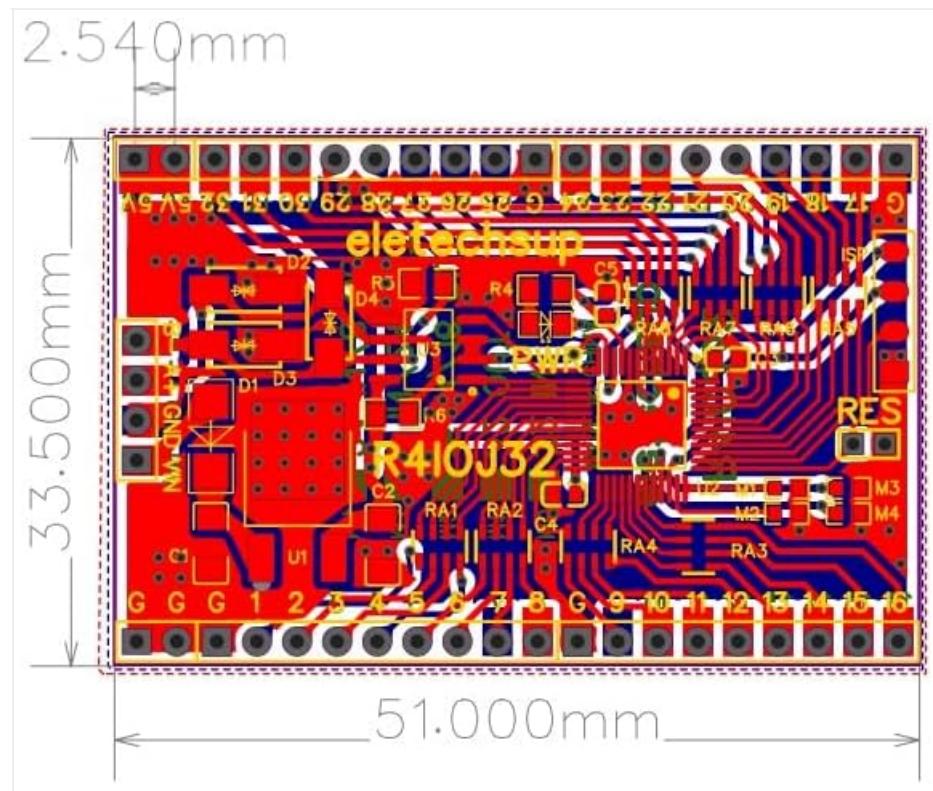
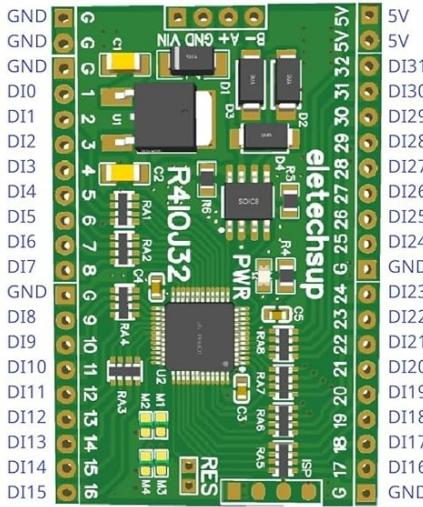
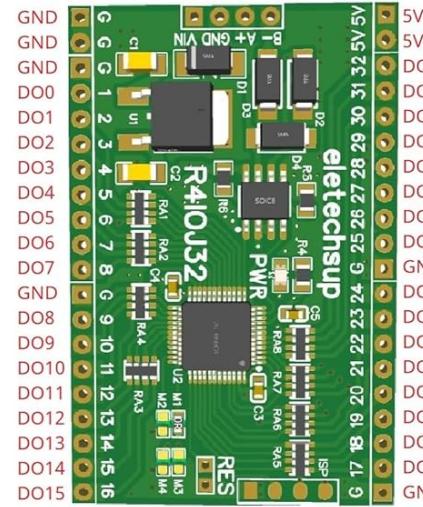


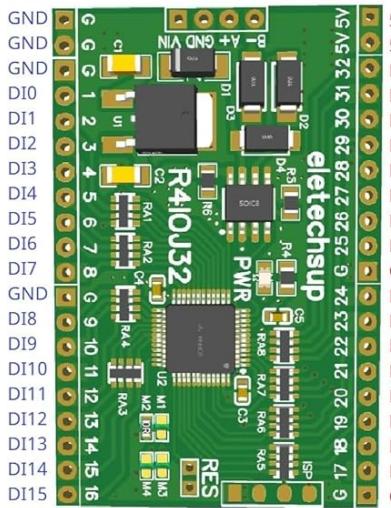
Figure 8.1: Dimensional drawing of the R4IOJ32 board, showing its compact size of 51.000mm by 33.500mm.



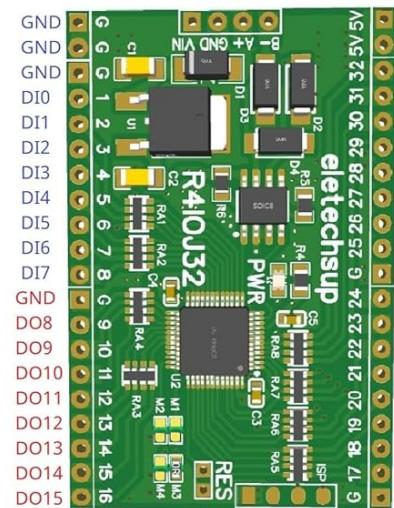
32DI



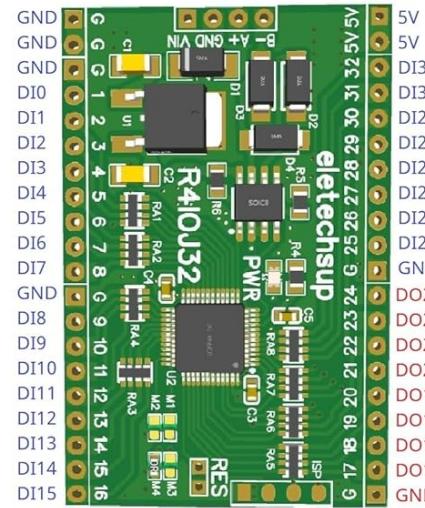
32DO



16DI-16DO



8DI-24DO



24DI-8DO

Figure 8.2: Detailed pinout diagrams for the R4IOJ32 board configured in 32DI, 32DO, 16DI-16DO, 8DI-24DO, and 24DI-8DO modes, illustrating the assignment of each pin.

9. WARRANTY AND SUPPORT

For detailed documentation, technical support, or warranty inquiries, please contact eletechsup customer service through the official channels where the product was purchased. Ensure to provide your product model (R4IOJ32) and any relevant purchase information for efficient assistance.