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› eletechsup ES32G15 WiFi & RS485 Expansion Board for ESP32-DevKitC Instruction Manual

eletechsup ES32G15

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Model: ES32G15

1. INTRODUCTION

The eletechsup ES32G15 is a multi-function expansion board specifically designed for use with the ESP32-DevKitC. This board integrates a variety of analog and digital input/output circuits, including NTC temperature acquisition and RS485 communication capabilities. It is intended to facilitate development and expansion of projects requiring robust I/O and communication features with an ESP32 microcontroller.



Figure 1: eletechsup ES32G15 Expansion Board (Only Board version)

2. PRODUCT OVERVIEW AND FEATURES

The ES32G15 expansion board offers a comprehensive set of resources to enhance the functionality of your ESP32-DevKitC. Key features include:

- **Multi-Function ESP32 Expansion:** Designed for ESP32-DevKitC, providing extensive analog and digital I/O, NTC temperature acquisition, and RS485 communication.
- **Wide Voltage & Low Power:** Operates with a DC 12-28V wide voltage input. Standby current is 15mA, with current consumption increasing based on relay activation (e.g., 4 relays open at 155mA).
- **Rich Onboard Resources:** Includes 2 channels of 0/4-20mA current output, 2 channels of 0-5V/10V voltage output, 2 channels of 0/4-20mA current input, 2 channels of 0-5V/10V voltage input, 4 channels of 10K NTC input (supports any B value), 4 channels of NPN digital input, 4 channels of 10A relay output, 5 free ports, and 1 RS485 port.
- **Easy Development:** Pin mapping is conveniently printed on the back of the PCB board. Basic Arduino test codes are provided for hardware verification.
- **Compact & Durable:** The board measures 121x72x19mm (board only) and weighs 95g (board only). A version with a DIN rail shell is also available, weighing 186g.

4NTC-2AO-4AI-4DI-4DO ESP32 Expansion Board

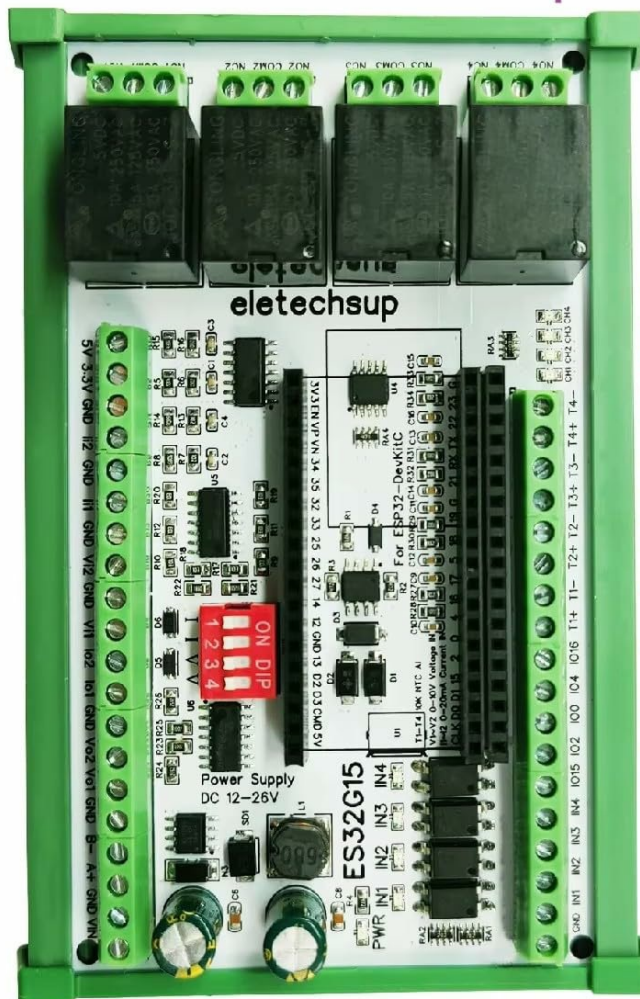
4CH Temperature acquisition

2CH Current input

2CH Voltage input

2CH Current output

2CH Voltage output



Rich Onboard Resources:

4CH 10K NTC Input

2CH 0/4-20MA Current Input

2CH 0-5V/10V Voltage Input

2CH 0/4-20MA Current Output

2CH 0-5V/10V Voltage Output

4CH NPN Digital Input

4CH 10A Relay Output

5CH Free Port

1CH RS485 Port

Figure 2: Diagram highlighting the rich onboard resources of the ES32G15.

3. SPECIFICATIONS

Parameter	Value
Working Voltage	DC 12-28V (Wide Voltage)
Standby Current	15mA
Current (1 Relay Open)	50mA
Current (2 Relays Open)	85mA
Current (3 Relays Open)	120mA
Current (4 Relays Open)	155mA

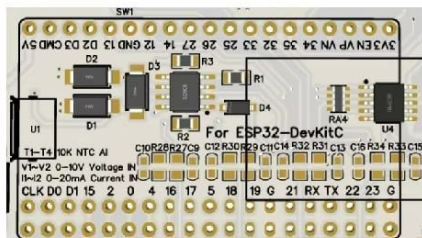
Parameter	Value
Dimensions (Board Only)	121 x 72 x 19mm
Weight (Board Only)	95g
Weight (With Shell)	186g
Analog Current Output	2-channel 0/4-20mA
Analog Voltage Output	2-channel 0-5V/10V
Analog Current Input	2-channel 0/4-20mA
Analog Voltage Input	2-channel 0-5V/10V
NTC Input	4-channel 10K NTC (Any B value)
Digital Input	4-channel NPN Digital Input
Relay Output	4-channel 10A Relay Output
Free Ports	5 channels
Communication Port	1-channel RS485 Port

4. SETUP

The ES32G15 expansion board requires a 38-pin ESP32-DevKitC board to function. It cannot operate independently. Ensure you have a compatible 38-pin ESP32 board before proceeding with the setup. If you do not have one, it must be purchased separately.

4.1 ESP32 Board Compatibility

The ES32G15 supports 38-pin ESP32 boards with two common widths: 22.5mm and 25.4mm. Carefully align the ESP32 board with the header pins on the ES32G15.



Support 38PIN ESP32 board,
two widths 22.5, 25.4MM

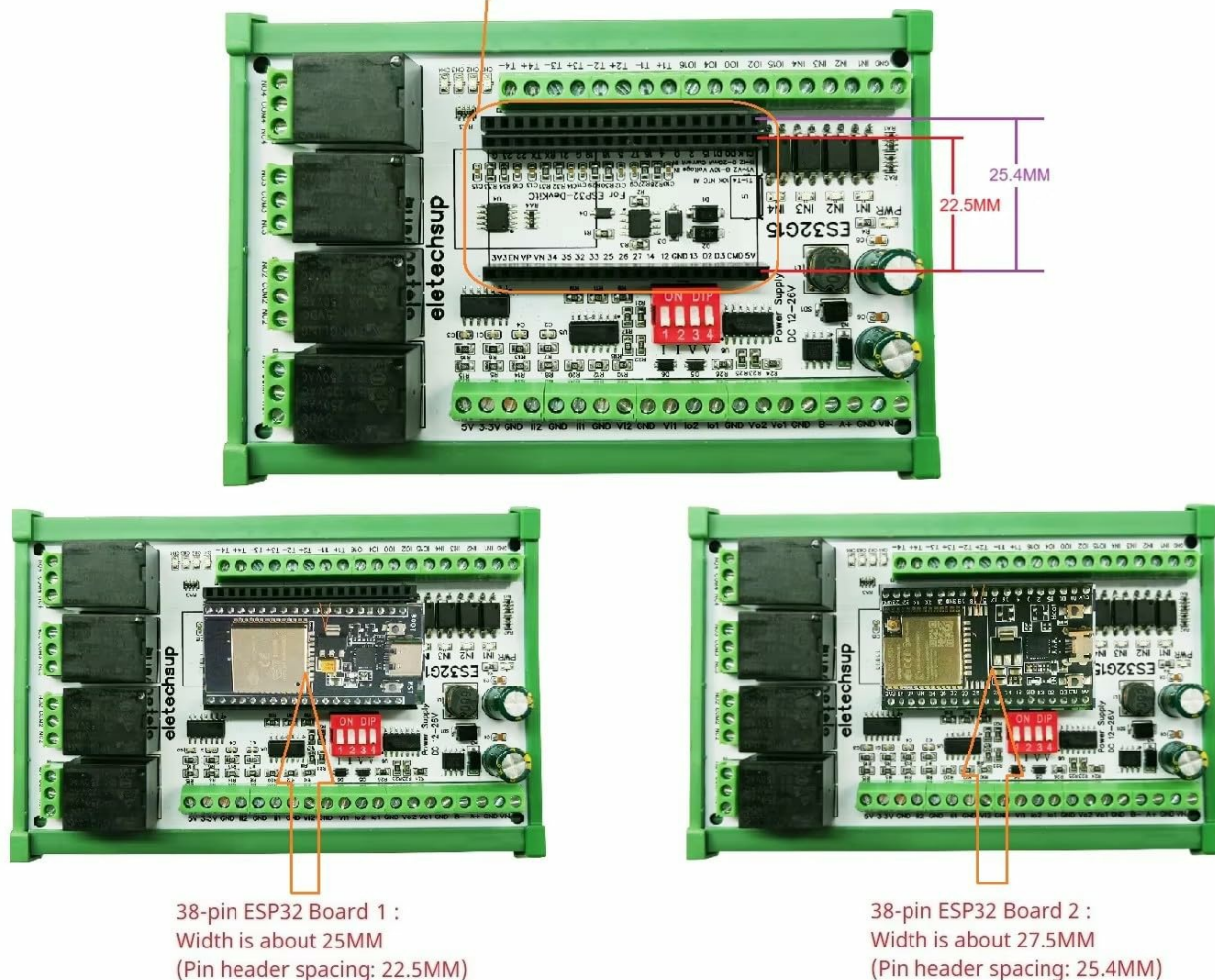


Figure 3: ES32G15 supporting 38-pin ESP32 boards of different widths.

4.2 Pin Mapping

The pin mapping between the ES32G15 expansion board ports and the 38-pin ESP32 pins is crucial for proper programming and operation. Refer to the table below and the diagram for detailed connections.

ES32G15 Expansion Board Ports	38PIN ESP32 Pin
Vo1-Vo2 (0-10V AO)	IO25/IO26
Io1-Io2 (0-20mA AO)	IO25/IO26
Vi1-Vi2 (0-10V AI)	IO36/IO39
Ii1-Ii2 (0-20mA AI)	IO34/IO35
T1-T4 (10K NTC AI)	IO14/IO27/IO33/IO32

ES32G15 Expansion Board Ports	38PIN ESP32 Pin
IN1-IN4 (NPN DI)	IO19/IO18/IO5/IO17
CH1-CH4 (Relay DO)	IO12/IO13/IO21/IO23
Free Port	IO15/IO2/IO0/IO4/IO16
RS485 Port	IO1/IO3/IO22

Pin Mapping

ES32G15 Expansion Board Ports	38PIN ESP32 PIN
Vo1-Vo2(0-10V AO)	IO25/IO26
Io1-Io2(0-20MA AO)	IO25/IO26
Vi1-Vi2(0-10V AI)	IO36/IO39
Ii1-Ii2(0-20MA AI)	IO34/IO35
T1-T4(10K NTC AI)	IO14/IO27/IO33/IO32
IN1-IN4(NPN DI)	IO19/IO18/IO5/IO17
CH1-CH4(Relay DO)	IO12/IO13/IO21/IO23
Free Port	IO15/IO2/IO0/IO4/IO16
RS485 Port	IO1/IO3/IO22

Onboard Resources

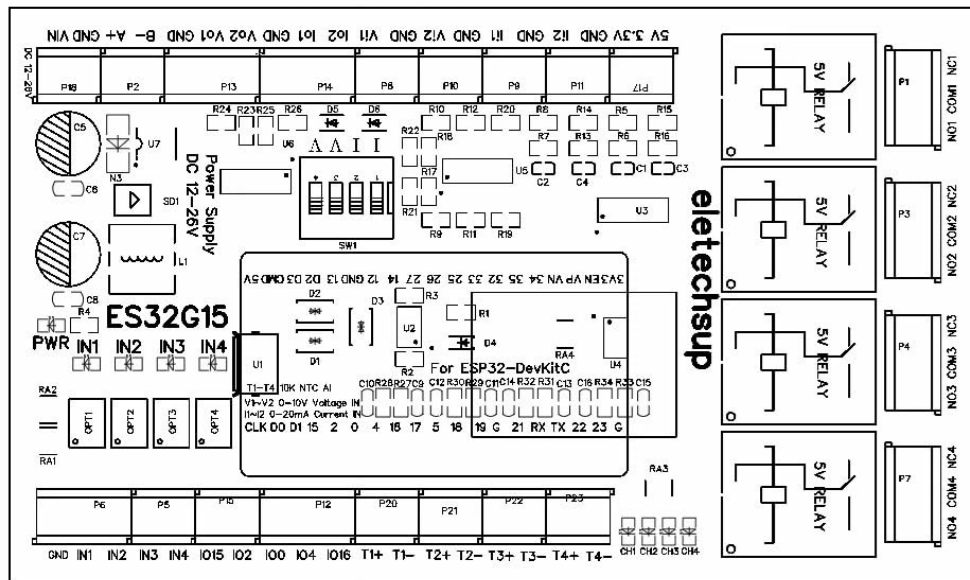


Figure 4: Pin mapping and onboard resources diagram.

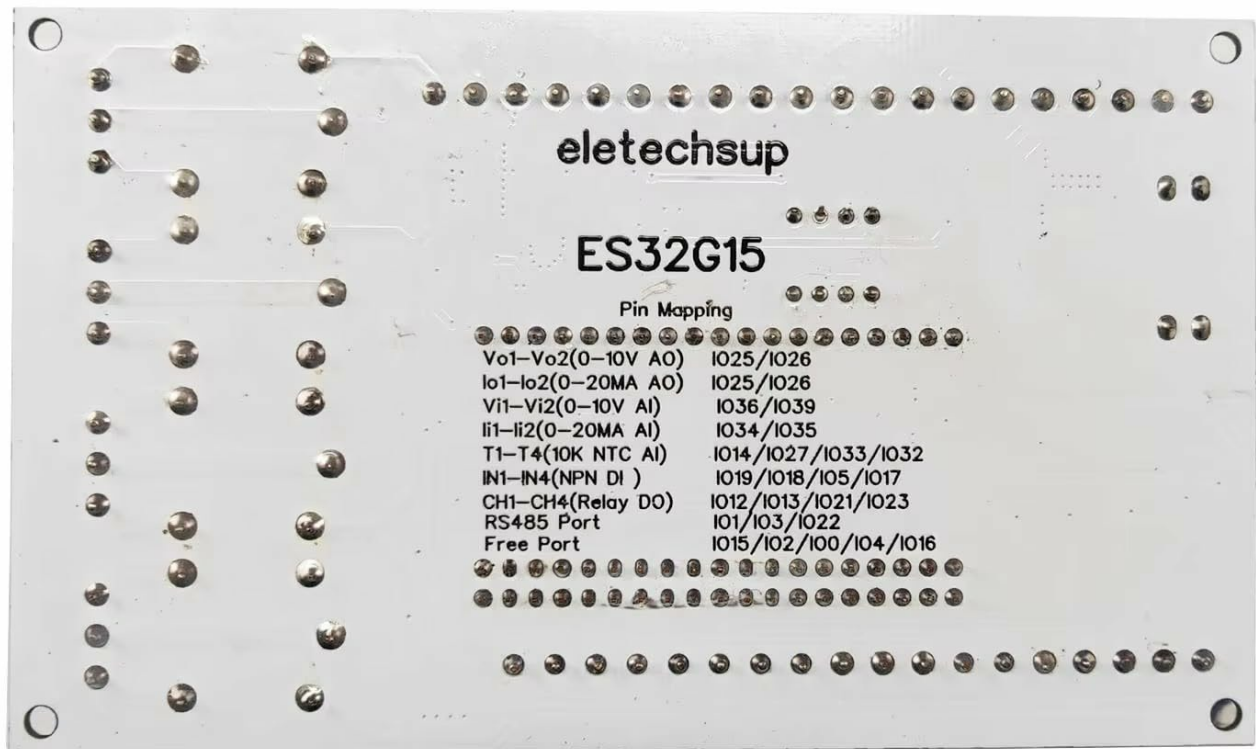


Figure 5: Back of the ES32G15 board showing printed pin mapping.

4.3 Power Connection

Connect a DC power supply within the 12-28V range to the designated power input terminals on the board. Ensure correct polarity.

4.4 Optional DIN Rail Shell Installation

If using the version with a DIN rail shell, install the board into the shell and mount it onto a compatible DIN rail. This provides protection and simplifies integration into industrial control panels.

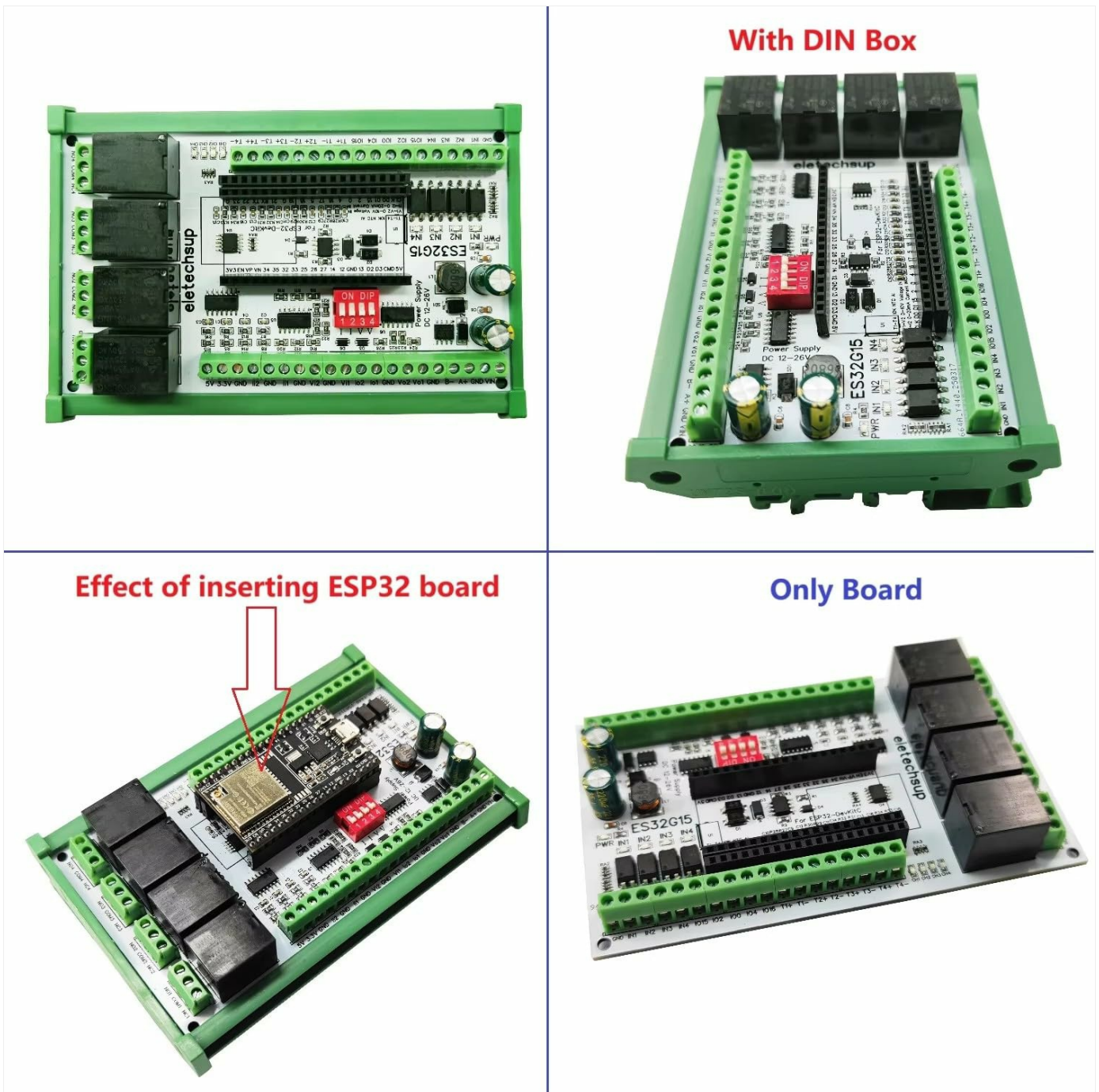


Figure 6: ES32G15 board with and without DIN box, and an ESP32 board inserted.

5. OPERATING INSTRUCTIONS

The ES32G15 board functions as an expansion module for the ESP32-DevKitC. Its operation is entirely dependent on the code uploaded to the connected ESP32 board. eletechsup provides basic Arduino codes for testing the hardware functionalities. For specific applications and advanced features, users are required to develop their own custom code.

5.1 Input/Output Configuration

The board features multiplexed output ports for voltage (V_{o1}/V_{o2}) and current (I_{o1}/I_{o2}). Only one of these output types can be enabled at a time for each channel. This selection is made via the SW1 DIP switch on the board. Refer to the detailed diagram for the location and settings of SW1.

Note: Vo1/Io1, Vo2/Io2 are multiplexed output ports, only one of them can be enabled (selected by SW1 dip switch)

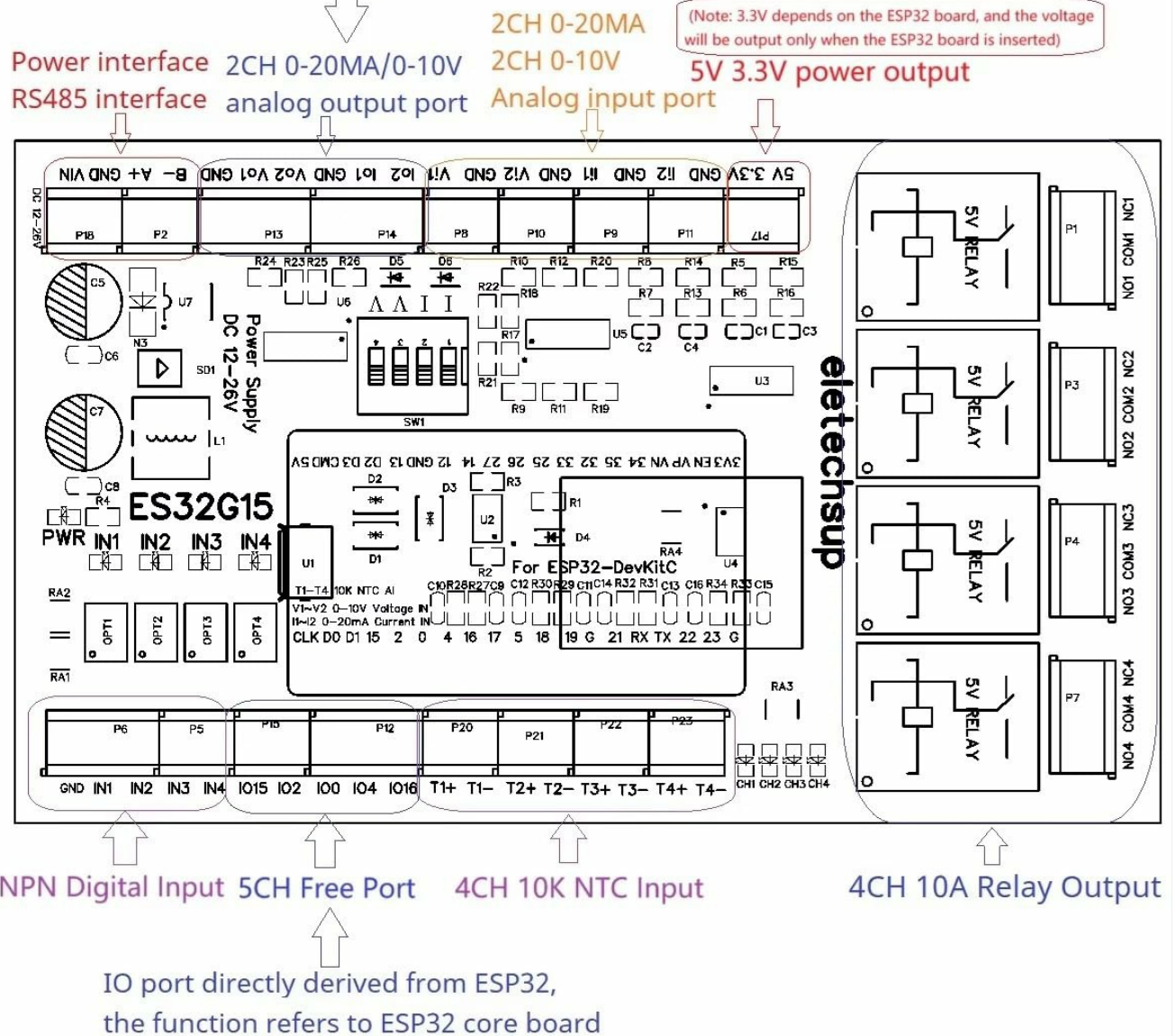


Figure 7: Detailed diagram of the ES32G15, showing power interface, RS485, analog I/O, digital I/O, NTC, relay outputs, and the SW1 dip switch for multiplexed output selection.

The 3.3V power output from the board is dependent on the connected ESP32 board and will only be active when the ESP32 board is properly inserted and powered.

5.2 Programming

Utilize the Arduino IDE or other compatible development environments to program your ESP32-DevKitC. Refer to the provided pin mapping to correctly address the various inputs and outputs of the ES32G15 board in your code.

6. MAINTENANCE

To ensure the longevity and reliable operation of your ES32G15 expansion board, follow these general maintenance guidelines:

- **Keep Clean:** Regularly clean the board to prevent dust and debris accumulation, which can affect performance. Use a soft, dry brush or compressed air.
- **Keep Dry:** Avoid exposure to moisture or high humidity environments. Water can cause short circuits and damage

components.

- **Proper Storage:** When not in use, store the board in an anti-static bag in a cool, dry place.
- **Inspect Connections:** Periodically check all wiring and connections for looseness or corrosion.

7. TROUBLESHOOTING

If you encounter issues with your ES32G15 expansion board, consider the following troubleshooting steps:

- **No Power:** Verify that the DC 12-28V power supply is correctly connected and providing the specified voltage. Check for proper polarity.
- **ESP32 Not Functioning:** Ensure the 38-pin ESP32-DevKitC board is correctly seated on the ES32G15. Confirm that the ESP32 itself is powered and programmed.
- **Incorrect I/O Readings/Outputs:** Double-check your code for correct pin assignments according to the pin mapping table. Verify the SW1 DIP switch settings for multiplexed outputs (Vo/Io).
- **Communication Issues (RS485):** Confirm RS485 wiring and termination. Check the ESP32 code for correct RS485 initialization and communication protocols.
- **Relay Malfunction:** Ensure the relay control pins are correctly configured in your ESP32 code. Check the power supply for sufficient current to activate all relays.

8. SUPPORT

eletechsup provides basic Arduino codes for testing the hardware functionalities of the ES32G15. Please note that eletechsup does not provide additional code development or technical support beyond the initial hardware testing examples. Users are responsible for developing their own application-specific code and functionalities.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

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After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question