

Wonrabai ESP32-S3-Touch-LCD-4.3B

Wonrabai ESP32-S3 4.3-inch Capacitive Touch Display Development Board User Manual

Model: ESP32-S3-Touch-LCD-4.3B | Brand: Wonrabai

1. PRODUCT OVERVIEW

The Wonrabai ESP32-S3-Touch-LCD-4.3B is a microcontroller development board featuring a 4.3-inch capacitive touch display. It integrates a powerful 32-bit LX7 dual-core processor, Wi-Fi, and Bluetooth 5 (LE) connectivity. Designed for Human-Machine Interface (HMI) and other embedded applications, this board offers a high-resolution IPS LCD with 5-point touch support and various peripheral interfaces for versatile development.

ESP32-S3-Touch-LCD-4.3B

Integrates RGB Interface LCD With 5-Point Capacitive Touch, Multiple Peripheral Interfaces



ESP32-S3-Touch-LCD-4.3B
Standard version, without case



ESP32-S3-Touch-LCD-4.3B-BOX
With plastic case



LX7 Dual-core Processor



2.4 GHz Wi-Fi



BLE 5



4.3"



5-Point Touch



800×480 Pixels



Onboard Antenna



65K RGB

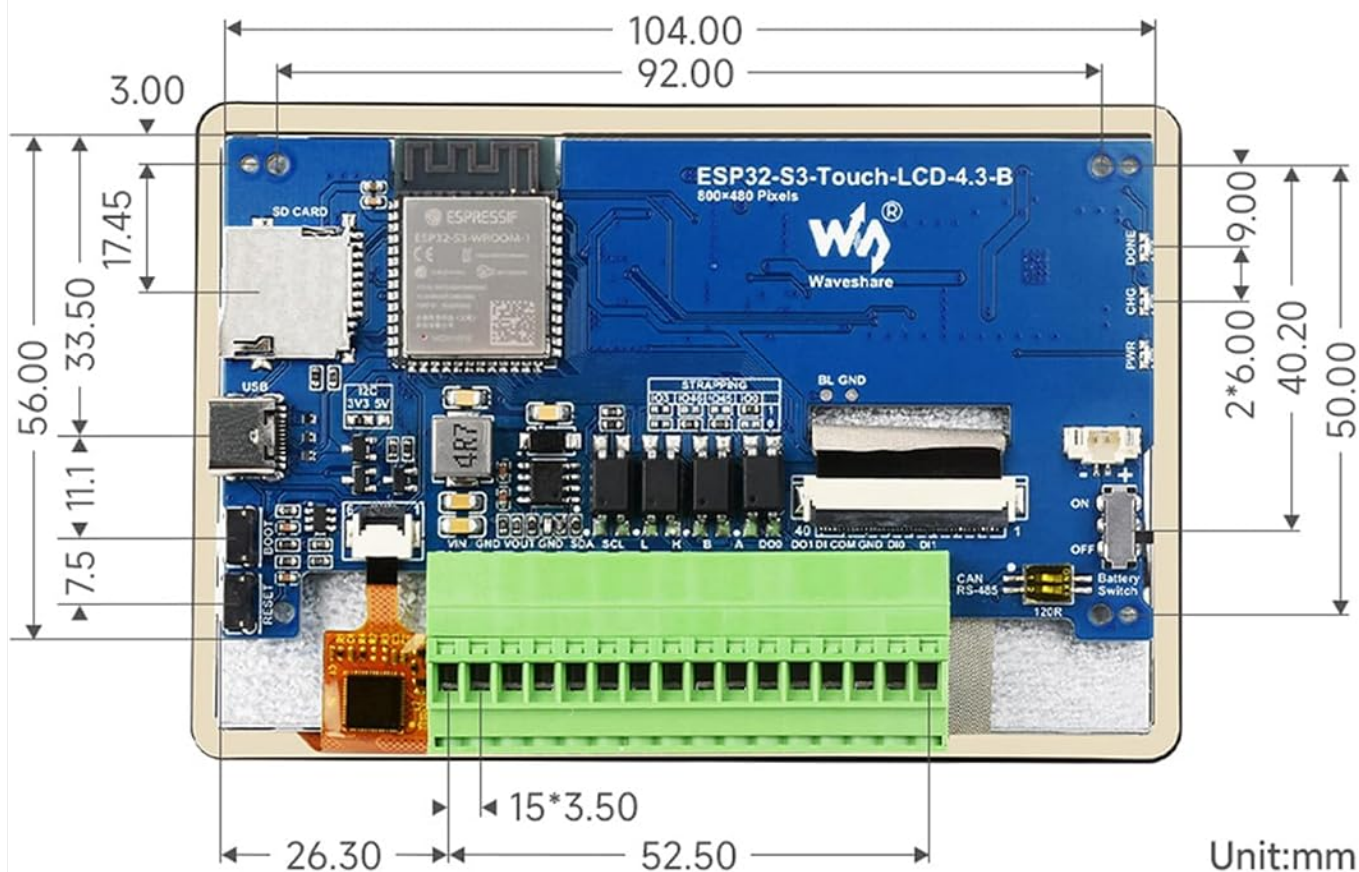
Figure 1: Overview of the ESP32-S3-Touch-LCD-4.3B Development Board with its core features.

2. WHAT'S IN THE BOX

The package includes the following components:

- ESP32-S3-Touch-LCD-4.3B Development Board (with back wiring 16PIN screw terminal) x1
- 16PIN screw terminal for bottom wiring x1

Outline Dimensions



Unit:mm

3. KEY FEATURES

- **Processor:** Xtensa 32-bit LX7 dual-core processor, up to 240MHz main frequency.
- **Connectivity:** 2.4GHz Wi-Fi (802.11 b/g/n) and Bluetooth 5 (LE) with onboard antenna.
- **Memory:** Built-in 512KB SRAM and 384KB ROM, with onboard 16MB Flash and 8MB PSRAM.
- **Display:** 4.3-inch IPS capacitive touch screen, 800×480 resolution, 65K color.
- **Touch Control:** Capacitive 5-point touch via I2C interface with interrupt support.
- **Power Supply:** Onboard voltage regulator supporting 7~36V wide range power supply.
- **RTC:** Onboard RTC chip and rechargeable battery header (battery not included) for time data retention.
- **Interfaces:** Onboard CAN, RS485, I2C interface, TF card slot, GH1.25 2P battery header, and digital isolated IO interfaces.
- **Wiring:** Supports two wiring methods (bottom or back) using screw terminals for integration into various scenarios like DIN rail or embedded devices.
- **Indicators:** Onboard LED indicators for power and battery recharging status.
- **Power Management:** Supports flexible clock and independent module power supply settings for low power consumption.

4. HARDWARE DESCRIPTION

4.1. Board Layout

Package Content

- 1.ESP32-S3-Touch-LCD-4.3B (with back wiring 16PIN screw terminal) x1
- 2.16PIN screw terminal for bottom wiring ×1

1.



2.



Back Side

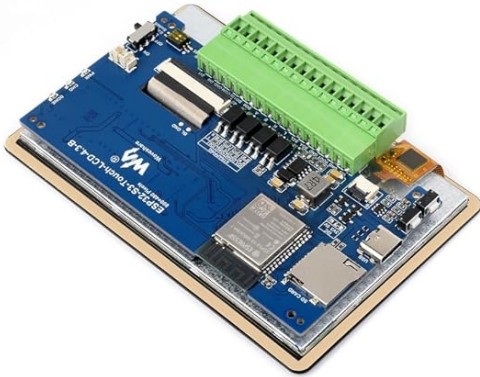


Figure 3: Detailed view of the ESP32-S3-Touch-LCD-4.3B board components.

1. ESP32-S3-WROOM-1-N16R8: SoC with Wi-Fi and Bluetooth, up to 240MHz operating frequency, integrated 8MB PSRAM and 16MB Flash
2. TF card slot
3. USB Type-C port
4. BOOT button: Press and hold while powering on for program burning
5. RESET button
6. Optocoupler isolation
7. Touch panel connector
8. 4.3-inch display panel connector
9. RS485 and CAN terminal resistors selection (close by default)
10. Battery power supply ON/OFF switch
11. 3.7V single lithium battery GH1.25 header
12. Status Indicators:
 - DONE: Lithium battery charging completed indicator
 - CHG: Lithium battery charging indicator
 - PWR: Power supply indicator (the CHG will blink and DONE will light on when connecting with DC power supply and without lithium battery connected or battery switch is OFF)
13. 7-36V DC power supply terminal

14. I2C interface terminal: VOUT pin output 5V/3.3V (switching by onboard resistor)
15. CAN interface terminal
16. RS485 interface terminal
17. Digital output: 5-36V, open-drain output, output load: 450mA per channel (MAX)
18. Input signal common terminal: NC: dry contact passive input; Connect to power supply positive: digital input low active, for NPN wet contact active input, 5V-36V DC; Connect to power supply negative: digital input high active, for PNP dry contact active input, 5V-36V DC
19. Digital input: 5-36V, supports passive / active input (NPN or PNP)

4.2. Wiring Methods

The board supports two wiring methods for the screw terminals:

- **Bottom Wiring:** Terminals are connected from the bottom of the board.
- **Back Wiring:** Terminals are connected from the back of the board.

This flexibility allows for easier integration into various application scenarios, such as DIN rail or embedded devices.

Application Scenarios



Human-machine Interface

The Human-machine Interface (also known as the user interface) is the medium of interaction and information exchange between the system and the user, it realizes the transformation between the internal form of information and the form acceptable to human beings.



LVGL GUI Development

LVGL is a free, open-source graphics library that provides everything you need to create embedded GUI with the easy-to-use graphical elements, beautiful visual effects and low memory requirement.

Figure 4: Illustration of bottom and back wiring methods.

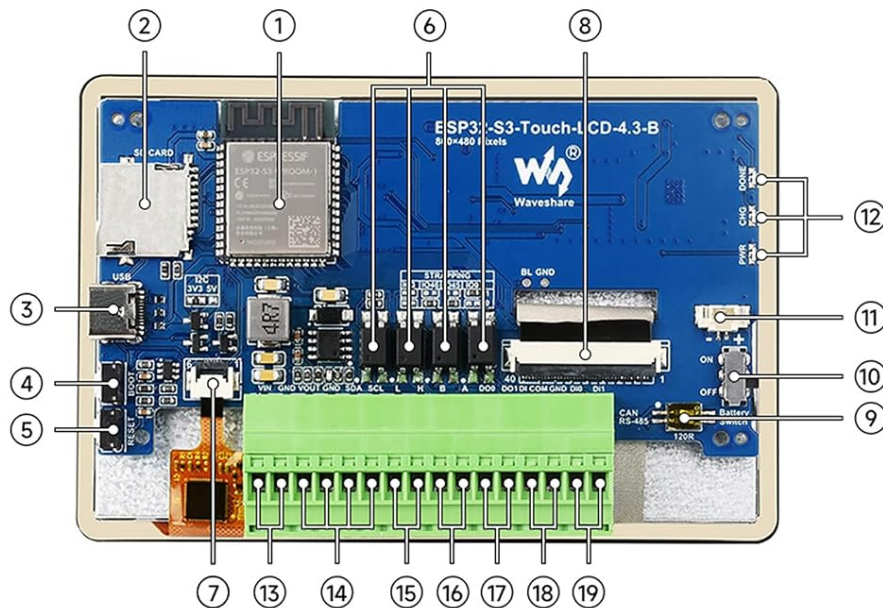
4.3. Peripheral Interfaces

The board provides multiple peripheral interfaces for expansion:

- I2C interface terminal

- CAN terminal
- RS485 terminal
- Digital Output (DO) terminal
- Digital Input (DI) terminal (supports active digital input, passive digital input)

What's On Board



1.ESP32-S3N8R8

The SoC with WiFi and Bluetooth, up to 240MHz operating frequency, integrated 8MB PSRAM and 16MB Flash

2.TF card slot

3.USB Type-C port

4.BOOT button

Press and hold while powering on for program burning

5.RESET button

6.Optocoupler isolation

7.Touch panel connector

8.4.3inch display panel connector

9.RS485 and CAN terminal resistors selection

close by default

10.Battery power supply ON/OFF

11.3.7V single lithium battery GH1.25 header

12Status Indicators

DONE: Lithium battery charging completed indicator

CHG: Lithium battery charging indicator

PWR: Power supply indicator

(the CHG will blink and DONE will light on when connecting with DC power supply and without lithium battery connected or battery switch is OFF)

13.7-36V DC power supply terminal

14.12C interface terminal

VOUT pin output 5V/3.3V (switching by onboard resistor)

15.CAN interface terminal

16.RS485 interface terminal

17.Digital output

5~36V, open-drain output, output load: 450mA per channel (MAX)

18.Input signal common terminal

NC: dry contact passive input

Connect to power supply positive: digital input low active, for NPN wet contact active input, 5V-36V DC

Connect to power supply negative: digital input high active, for PNP dry contact active input, 5V-36V DC

19.Digital input

5~36V, supports passive / active input (NPN or PNP)

Figure 5: Overview of supported peripheral interfaces and their connection diagrams.

5. SETUP AND INSTALLATION

5.1. Powering the Board

Connect a 7-36V DC power supply to the designated terminal. The board also features a 3.7V single lithium battery header (MX1.25) for portable applications. Ensure the battery power supply ON/OFF switch is in the correct position.

5.2. Initial Program Upload

To upload a program, connect the board to your computer via the USB Type-C port. Press and hold the BOOT button while powering on or resetting the board to enter programming mode.

5.3. Optional Plastic Case and Mounting

An optional plastic case is available for the development board, which supports installing a 60x30x6mm lithium battery (battery not included). The case provides multiple installation methods:

- Rail Mounting
- Wall Mounting
- Monitor Arm Mounting

The mounting hole spacing on the back of the case is 75mm.



Figure 6: The optional plastic case and its features.



Figure 7: Various installation methods for the cased development board.

6. OPERATING INSTRUCTIONS

6.1. Touch Display Interaction

The 4.3-inch capacitive touch screen supports 5-point touch, allowing for intuitive interaction with GUI programs such as LVGL. The display offers excellent performance with a 160° wide viewing angle.

IPS Display Panel

Excellent Display Performance, 160° Wide Viewing Angle



Capacitive 5-Point Touch

Supports Touch Function With I2C Interface, 5-Point Touch For Flexible Operation And Smooth Multi-Point UI Interaction



Figure 8: IPS Display Panel with 160° wide viewing angle.

Supports Two Wiring Methods

Comes With Two Types Of Screw Terminals, Allowing For Bottom Or Back Wiring, Which Is More Convenient To Integrate Into Various Application Scenarios Such As DIN Rail Or Embedded Devices

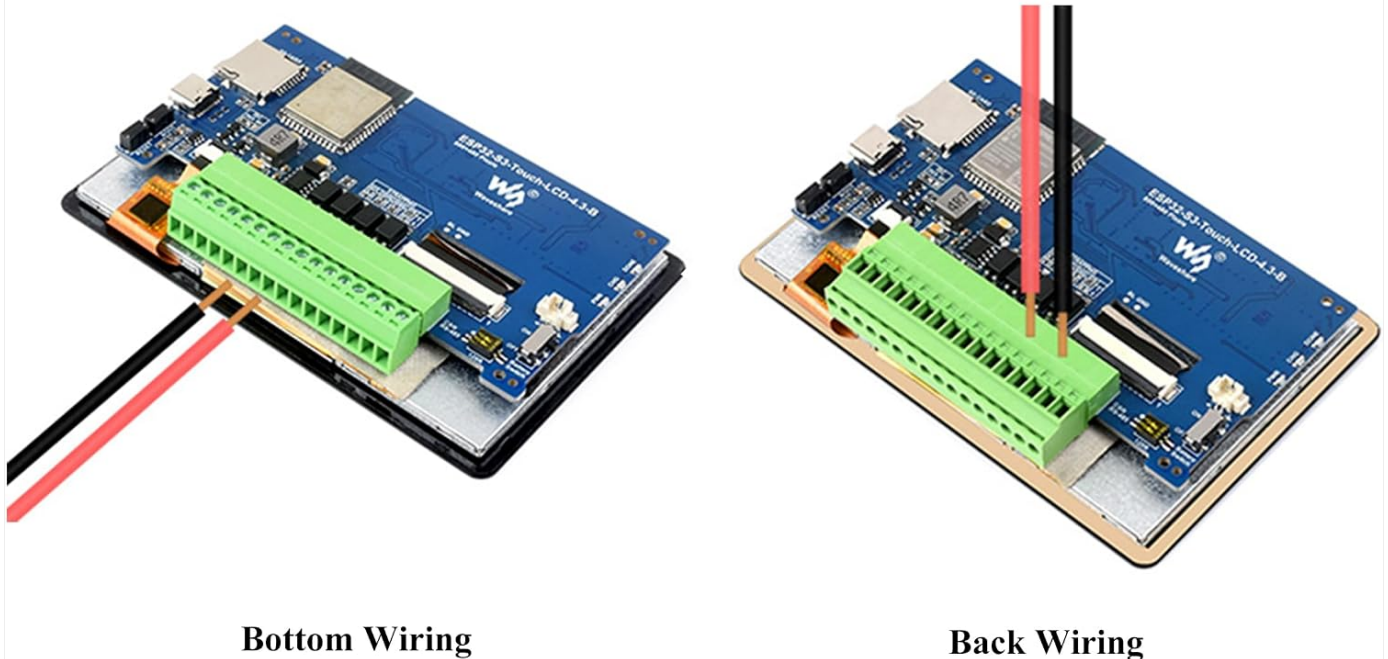


Figure 9: Demonstrating 5-point capacitive touch functionality.

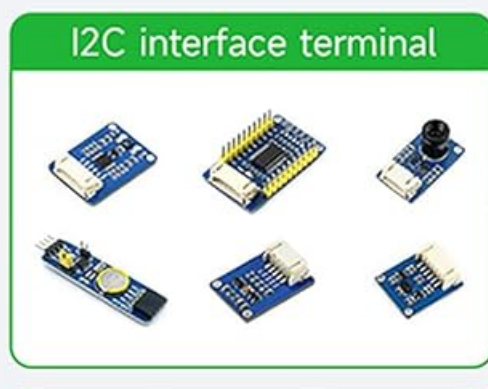
6.2. Application Scenarios

The ESP32-S3-Touch-LCD-4.3B is suitable for various applications, including:

- **Human-Machine Interface (HMI):** For interactive control and information display in industrial or home automation systems.
- **LVGL GUI Development:** A platform for creating embedded graphical user interfaces with low memory requirements.

Supports Multiple Peripherals

Supports The Expansion Of Multiple Peripherals Via CAN, RS485, I2C And Isolated IO Interfaces



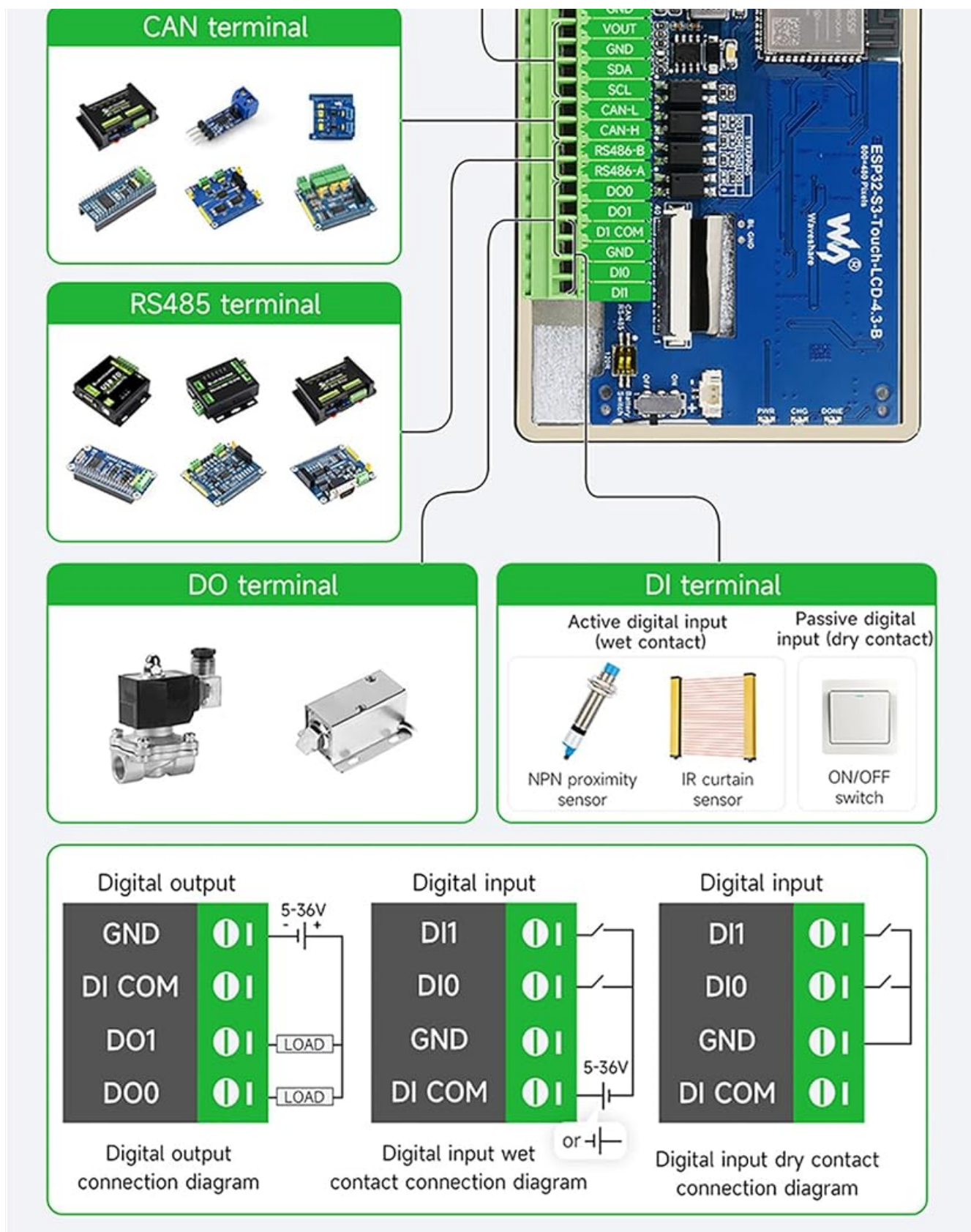


Figure 10: Common application scenarios for the development board.

6.3. Video Demonstration

Watch this video for a demonstration of the ESP32-S3 4.3-inch Touch LCD Development Board's features and capabilities.

Video 1: ESP32-S3 4.3-inch Touch LCD 800x480 Development Board Overview. This video demonstrates the touch screen functionality, processor capabilities, and various interfaces of the development board.

7. SPECIFICATIONS

Specification	Value
Standing screen display size	4.3 Inches
Processor	Xtensa 32-bit LX7 Dual-Core, 240 MHz
RAM	8 MB PSRAM
Memory Storage Capacity	16 MB Flash
Wireless Type	802.11b (Wi-Fi), Bluetooth 5 (LE)
Operating System	FreeRTOS (typical for ESP32)
Item Weight	0.48 ounces
Product Dimensions	0.12 x 2.76 x 1.57 inches
Manufacturer	Wonrabai

7.1. Outline Dimensions



Figure 11: Outline dimensions of the development board in millimeters.

8. TROUBLESHOOTING

This section provides general troubleshooting tips. For specific issues, refer to the online tutorial and development resources.

- **Board not powering on:** Ensure the power supply is within the 7-36V range and correctly connected. Check the battery power supply ON/OFF switch if using a battery. Verify the PWR LED indicator.
- **Program upload failure:** Ensure the USB Type-C cable is functional and properly connected. Confirm the BOOT button is pressed and held during power-on/reset to enter programming mode. Check your development environment settings.
- **Display not working:** Verify the display panel connector is securely attached. Check power supply.
- **Touch screen unresponsive:** Ensure the touch panel connector is secure. Verify I2C communication in your

software.

- **Wi-Fi/Bluetooth connectivity issues:** Check antenna connection. Verify software configuration for Wi-Fi/Bluetooth. Ensure no interference from other devices.

9. WARRANTY AND SUPPORT

For detailed online tutorial usage guides and development resources, please visit: n9.cl/ocbd8

For warranty information and technical support, please contact Wonrabai customer service through the platform of purchase.

ASK A QUESTION ABOUT THIS MANUAL

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