AYWHP Nano V3.0 Board

AYWHP Nano V3.0 Board ATmega328P Microcontroller Instruction Manual

Model: Nano V3.0 Board

1. Introduction

The AYWHP Nano V3.0 Board is a compact microcontroller development board designed for various electronic projects. It is compatible with Arduino Nano and features an ATmega328P microcontroller, a CH340G USB-to-serial converter chip, and a modern USB C interface for programming and power. This board is suitable for both beginners and experienced users due to its versatility and ease of integration into breadboards.

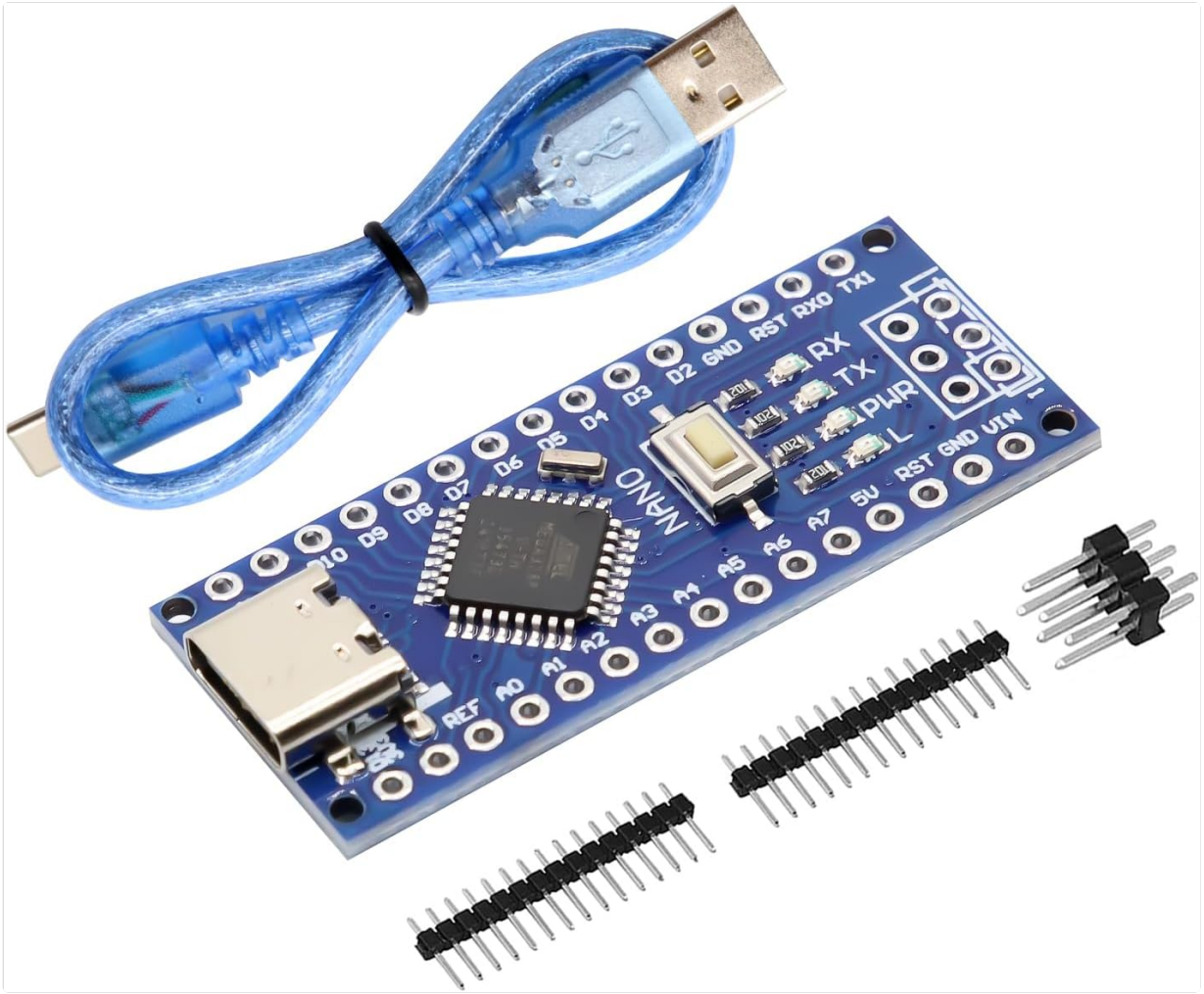


Figure 1: The AYWHP Nano V3.0 Board with included USB C cable and pin headers.

2. Setup

2.1 Driver Installation

The Nano V3.0 board utilizes the CH340G chip for USB communication. Before connecting the board, ensure the appropriate CH340G drivers are installed on your computer. These drivers are typically available for Windows, macOS, and Linux operating systems and can be found through a quick online search for 'CH340G driver'.

2.2 Arduino IDE Setup

This board is compatible with the Arduino IDE. Follow these steps to configure the IDE:

1. Download and install the latest version of the Arduino IDE.
2. Open the Arduino IDE.
3. Go to **Tools > Board > Arduino AVR Boards** and select **Arduino Nano**.
4. Go to **Tools > Processor** and select **ATmega328P (Old Bootloader)** if you encounter upload issues, otherwise use **ATmega328P**.
5. Go to **Tools > Port** and select the serial port corresponding to your connected Nano board.

2.3 Connecting and Powering the Board

Connect the Nano V3.0 board to your computer using the provided USB C cable. The board can be powered via:

- **USB C Connection:** Provides 5V power and enables programming.
- **Unregulated External Power Supply:** 6-12V connected to the VIN pin.
- **Regulated External Power Supply:** 5V connected to the 5V pin.

The board automatically detects and switches to the power source with the higher potential.

3. Operating Instructions

3.1 Programming the Board

Once the Arduino IDE is set up and the board is connected, you can upload sketches (programs) to the Nano V3.0 board. Write your code in the IDE, then click the 'Upload' button. The TX and RX LEDs on the board will blink during the upload process.

3.2 Pin Overview

The Nano V3.0 board offers a variety of pins for interfacing with other components:

- **Digital I/O Pins:** 14 pins (D0-D13), 6 of which can be used as Pulse Width Modulation (PWM) outputs.
- **Analog Input Pins:** 6 pins (A0-A5).
- **Power Pins:** 5V, 3.3V, GND, VIN.
- **Communication Interfaces:** UART (RX/TX), I2C (A4/A5), SPI (D10-D13).

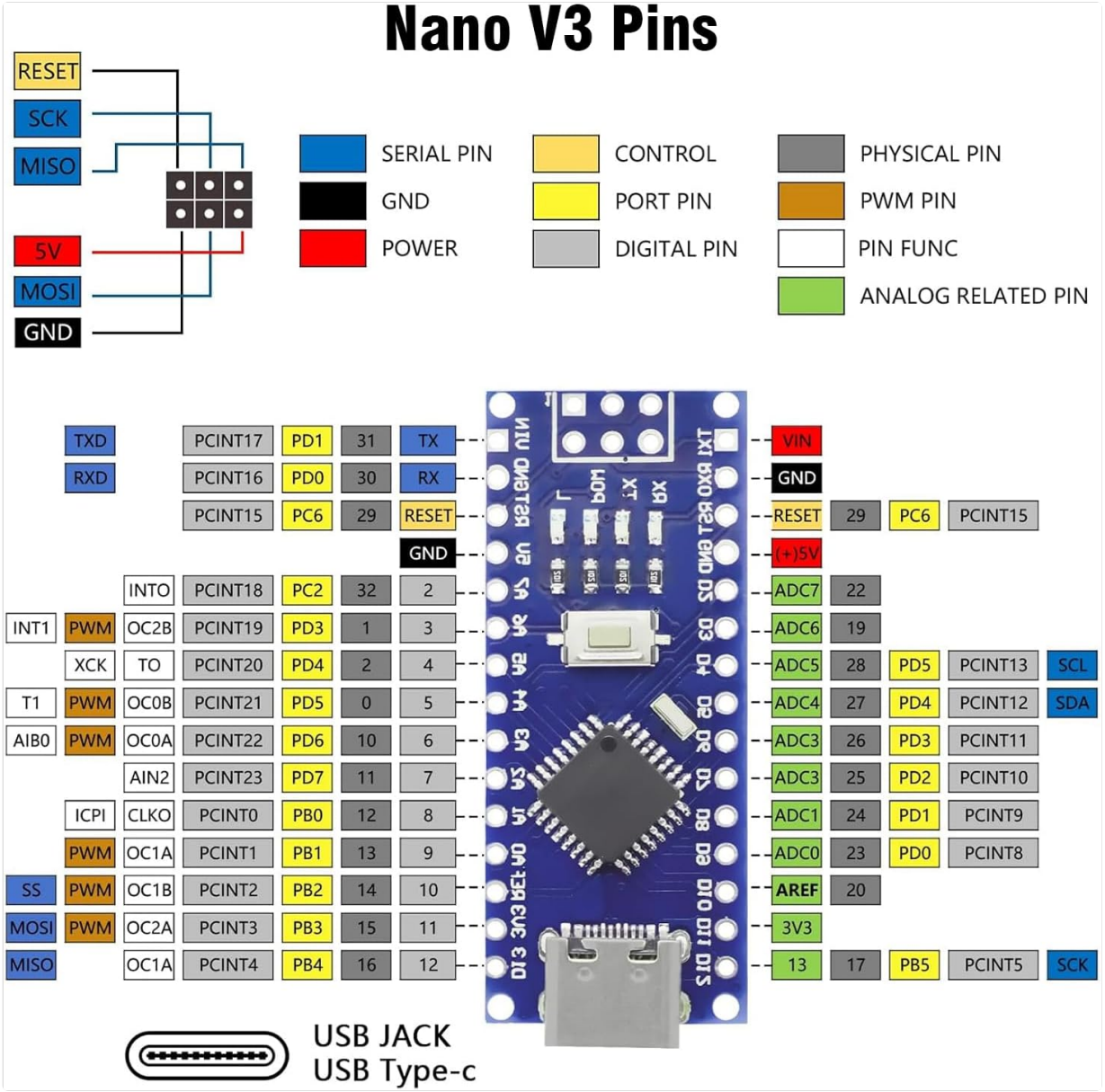


Figure 2: Pinout diagram for the Nano V3.0 board, detailing digital, analog, power, and communication pins.

3.3 Bootloader Burning (Advanced)

In some cases, you may need to burn or re-burn the bootloader. This can be done using another Arduino board as an In-System Programmer (ISP) or another Nano board. Refer to the diagram below for connection details.

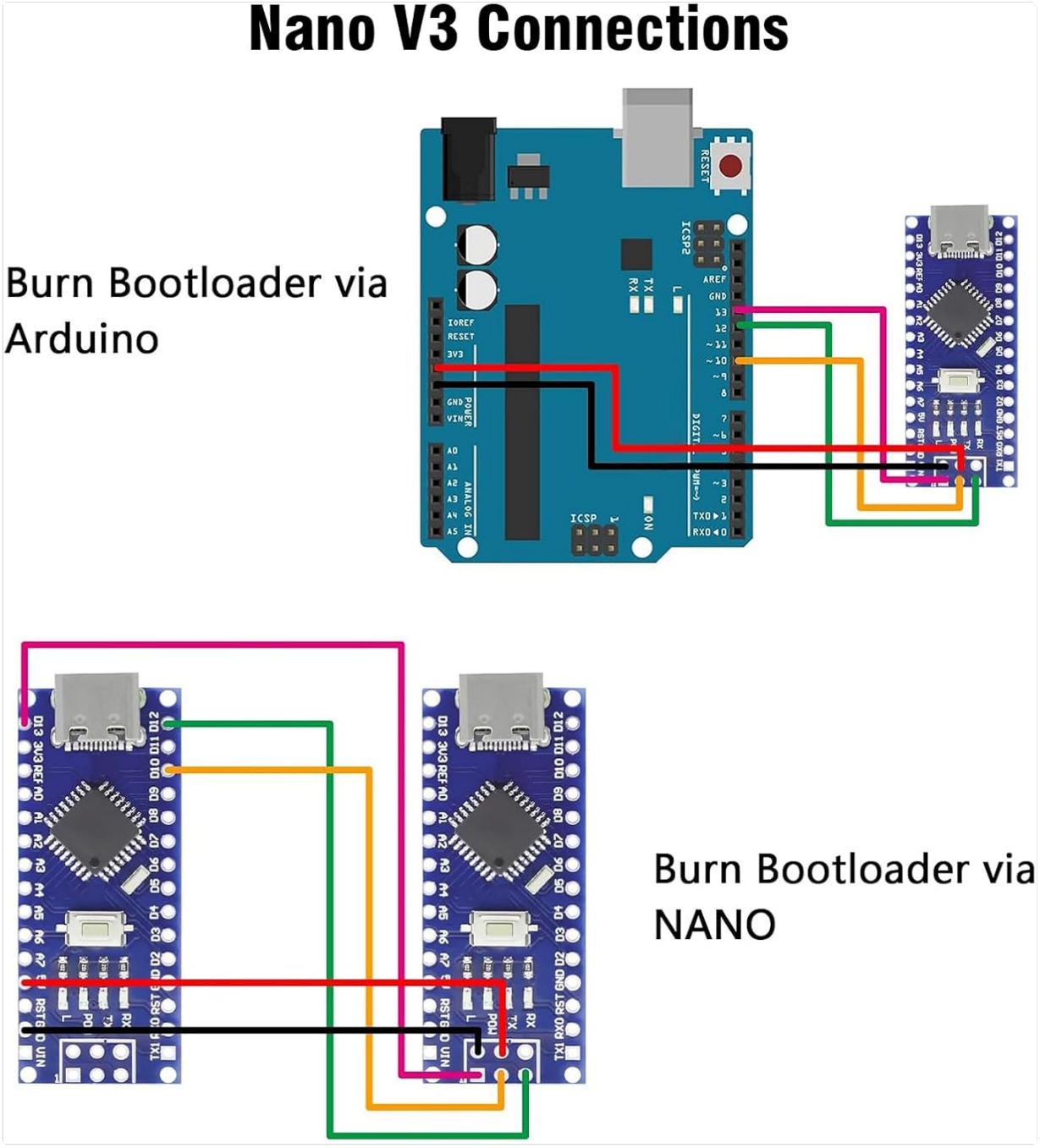


Figure 3: Diagram illustrating methods for burning the bootloader onto the Nano V3.0 board using either an Arduino board or another Nano board.

3.4 Application Examples

The Nano V3.0 board can be used in a wide range of applications, from simple LED blinking to complex robotics and sensor data acquisition. Its small form factor makes it ideal for embedding into projects.

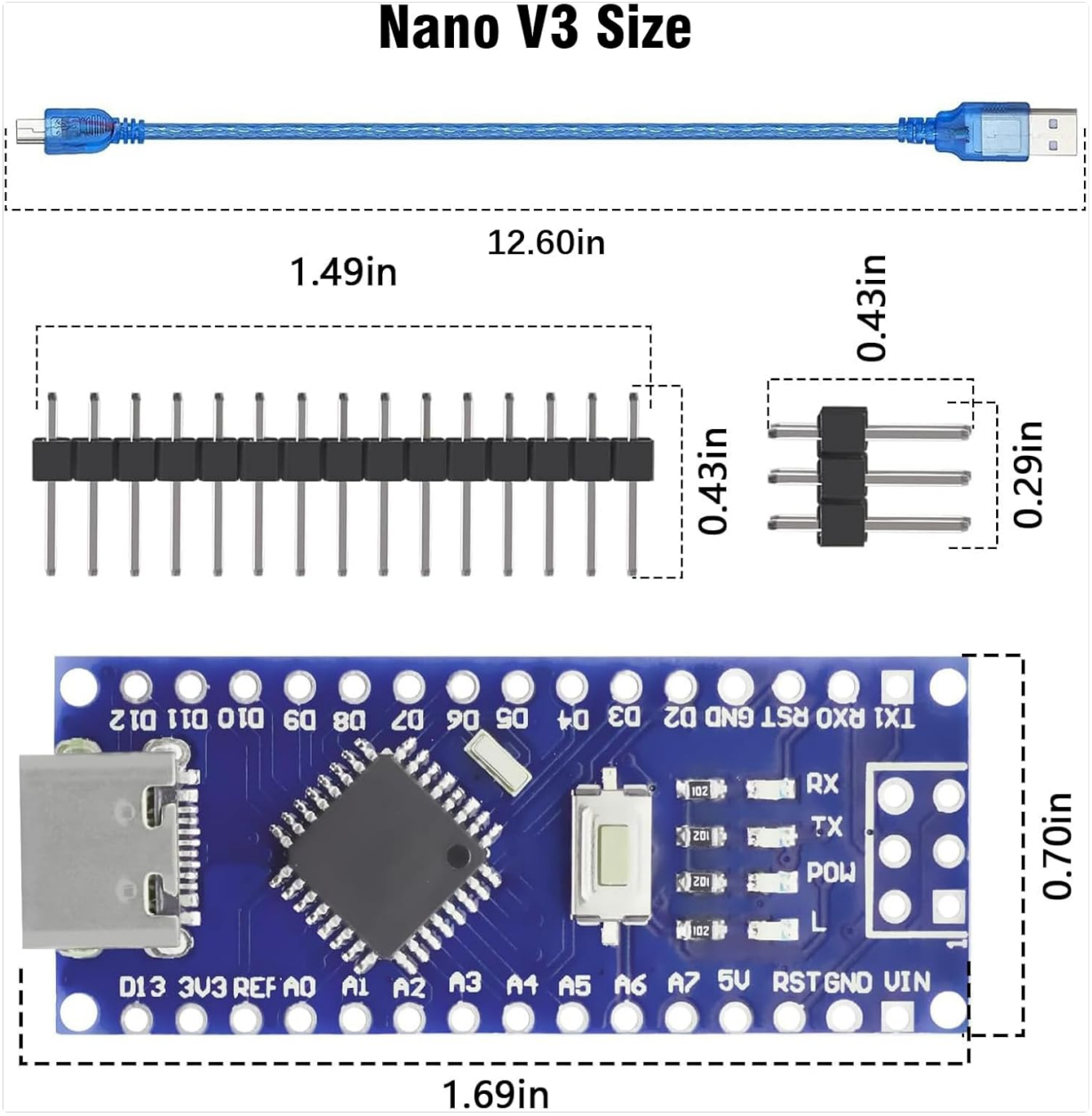
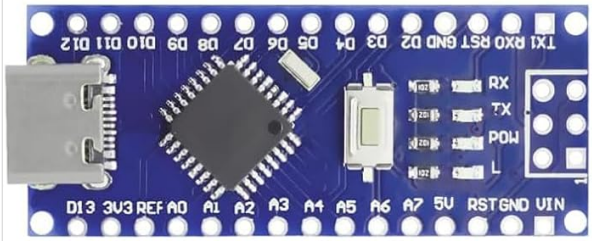


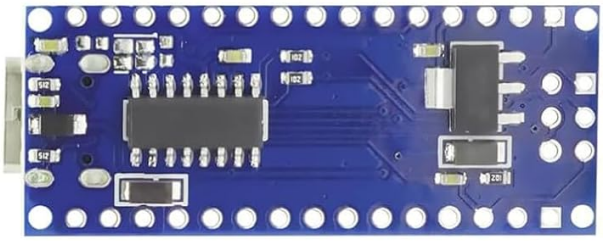
Figure 4: Examples of Nano V3.0 board applications, including integration into various electronic projects.

4. Specifications

Below are the detailed technical specifications for the AYWHP Nano V3.0 Board:

Nano V3 Information





Technical Specifications		
Board	Name	Nano
	Microcontroller	LGT8F QFP33
Connector	Type-C USB	
Pins	Built-in LED Pin	D14
	Digital I/O Pins	15
	Analog input pins	9
	PWM pins	10
Commun -ication	UART	RX/TX
	13C	A4(SDA) A6(SCL)
	SWD	HAVE
	SPI	D11(COPI) D12(CIPO) D14(SCK)
		Use any GPIO for Chip Select(CS)
Power	I/O Voltage	6V
	Input voltage(nominal)	7-13V
	DC Current Per I/O Pin	30mA (6 of them support 81mA high current)
Clock speed	Processor	Internal 16MHZ (Maximun 33MHZ)
Memory		2KB SRAM,32K(1K for boot,2k for emulated errom) 2KB EEPROM

Figure 5: Technical specifications for the Nano V3.0 board, including microcontroller, pins, communication interfaces, and clock speed.

Feature	Detail
Microcontroller	ATmega328P
USB Chip	CH340G
Operating Voltage	5V
Input Voltage (recommended)	7-12V (VIN pin)
Digital I/O Pins	14 (6 PWM outputs)
Analog Input Pins	6
DC Current per I/O Pin	20 mA
Flash Memory	32 KB (ATmega328P) of which 2 KB used by bootloader

SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
Connectivity	USB C
Dimensions	Approximately 45mm x 18mm (1.69 x 0.70 inches)


WARNING
Manufacturer:
Shenzhen Xinmeng United Trading Co., Ltd
Address:
118 Xin'an Third Road, Dalang Community, Xin'an Street,
Bao'an District, Shenzhen
Shenzhen, Guangdong,China
Email: 18124671250@163.com
EC REP
SUALMU GmbH
Adresse:Am Waldfriedhof 4,
Baden-Württemberg, Stutensee
Tel/Fax:+49 01629253178
E-mail:
EUVERTRETERSUALMUGMBH@outlook.com
RoHS
MADE IN CHINA
FR
BARQUETTE
+ETUI
BAC DE TRI
X0024IU7JD
Entwicklungsplatine mit USB-I
XDUS010
Batch Number:XM-2024-11-1

Figure 6: Dimensions of the Nano V3.0 board and its accompanying USB C cable and pin headers.

5. Maintenance

The AYWHP Nano V3.0 Board is a robust electronic component, but proper care ensures its longevity and reliable operation:

- **Handle with Care:** Avoid dropping the board or applying excessive force to its components.
- **Static Discharge:** Microcontrollers are sensitive to electrostatic discharge. Handle the board on an anti-static mat or by touching a grounded object first.
- **Cleanliness:** Keep the board free from dust, dirt, and moisture. Use a soft, dry brush or compressed air for cleaning if necessary.
- **Storage:** Store the board in an anti-static bag in a dry environment when not in use.
- **Power Supply:** Always ensure the power supply voltage is within the recommended range (5V via USB C, 6-12V via VIN).

6. Troubleshooting

If you encounter issues with your AYWHP Nano V3.0 Board, consider the following troubleshooting steps:

- **Board Not Recognized by Computer:**
  - Ensure CH340G drivers are correctly installed.
  - Try a different USB C cable. Some cables are for charging only and do not support data transfer.
  - Test with a different USB port on your computer.
  - Restart your computer.
- **Upload Errors in Arduino IDE:**
  - Verify that the correct board (Arduino Nano) and processor (ATmega328P or ATmega328P (Old Bootloader)) are selected under **Tools**.
  - Confirm the correct serial port is selected under **Tools > Port**.
  - Check for syntax errors in your code.
  - Ensure no other software is using the serial port.
- **Digital or Analog Pins Not Functioning:**
  - Double-check your wiring connections.
  - Ensure the pins are correctly defined and used in your sketch.
  - Verify that the board is receiving adequate power.
  - Test with a simple sketch (e.g., blinking an LED) to isolate the issue.
- **Power LED (PWR) Not Lighting Up:**
  - Check your USB C cable connection.
  - Verify your external power supply is providing the correct voltage and is properly connected.

7. Warranty and Support

For warranty information and technical support, please refer to the documentation provided with your purchase or contact AYWHP customer service through the retailer where the product was acquired. Ensure

you have your purchase details and product model number available for faster assistance.