

AYWHP Nano V3.0 Board

AYWHP Nano V3.0 Board with Cable User Manual

Model: Nano V3.0 Board | Brand: AYWHP

1. INTRODUCTION

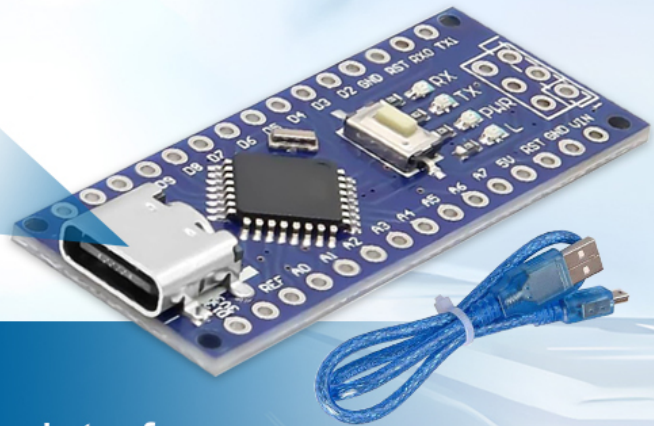
The AYWHP Nano V3.0 Board is a compact microcontroller board designed for various electronic projects and prototyping. It is compatible with Arduino Nano and features an ATmega328P microcontroller and a CH340G USB-to-serial converter chip, along with a modern USB-C port for connectivity. This manual provides essential information for setting up, operating, and maintaining your Nano V3.0 board, ensuring a smooth and efficient user experience.

2. PRODUCT OVERVIEW

The Nano V3.0 board offers a robust platform for embedded development. Key features include:

- **Microcontroller:** ATmega328P, providing ample processing power for most projects.
- **USB-to-Serial Chip:** CH340G, ensuring broad compatibility with various operating systems.
- **Connectivity:** USB-C port for convenient power and data transfer.
- **Power Options:** Can be powered via USB-C, an unregulated external supply (6-12V), or a regulated external 5V supply. The board automatically selects the higher potential power source.
- **I/O Pins:** 14 digital I/O pins (6 with PWM capability) and 6 analog input pins.
- **Clock Speed:** 16MHz quartz oscillator for precise timing.
- **Additional Features:** Includes an ICSP port for in-circuit serial programming and a reset button.
- **Compatibility:** Fully compatible with Windows, Mac, and Linux operating systems.
- **Design:** Breadboard-friendly design for easy integration into prototypes.

NANO V3 DEVELOPMENT BOARD WITH CABLE



Chip: ATmega328P
Upgraded Version: Type-c interface

Image 2.1: Detailed view of the Nano V3.0 board highlighting the USB-C port, ATmega328P microcontroller, and reset button.

3. SPECIFICATIONS

Feature	Specification
Microcontroller	ATmega328P
USB Chip	CH340G
Operating Voltage	5V
Input Voltage (recommended)	7-12V (unregulated), 5V (regulated)
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	30 mA
Flash Memory	32 KB (ATmega328P)
SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
Dimensions (LxWxH)	1.69 x 0.71 x 0.71 inches
Weight	1.44 ounces
Operating Systems	Windows, Mac, Linux

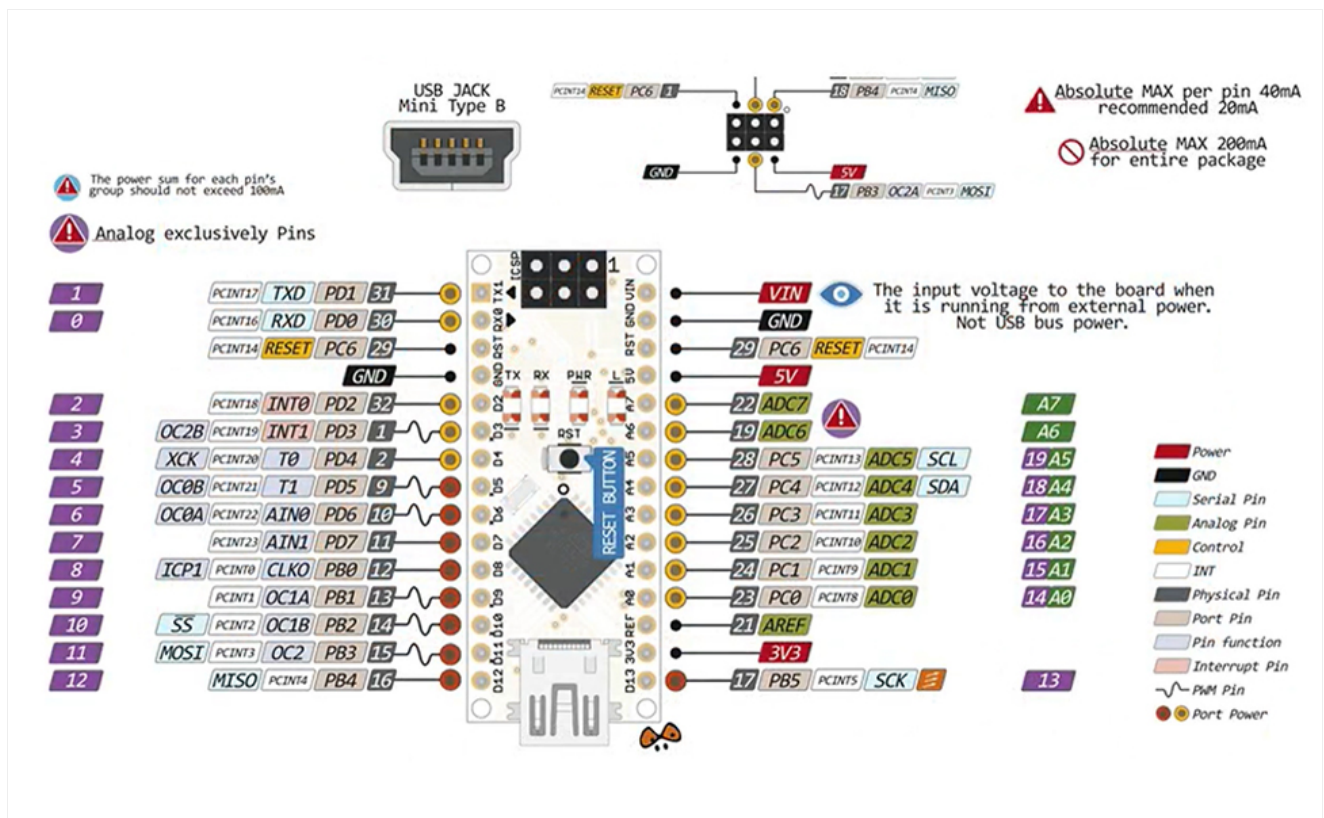


Image 3.1: Technical specifications of the Nano V3.0 board, including pin counts and communication protocols.

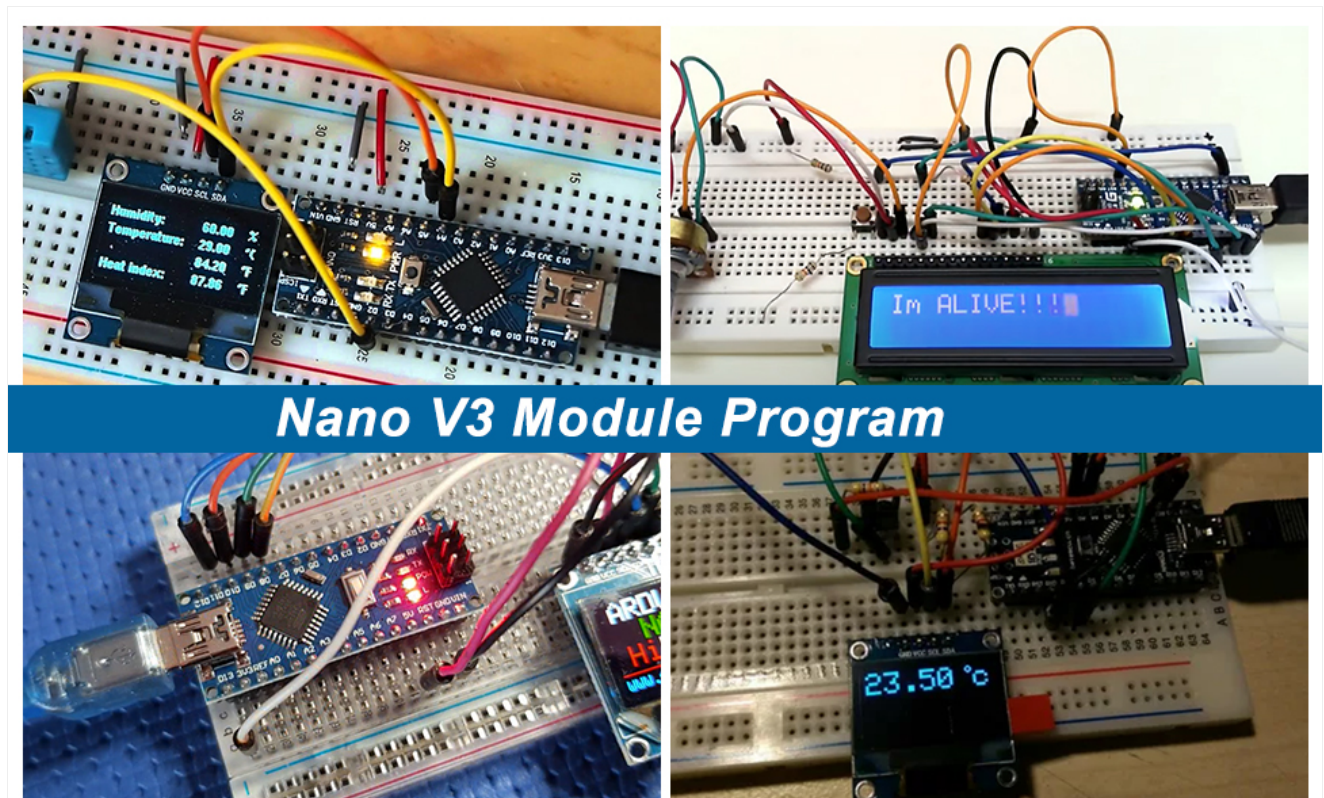


Image 3.2: Physical dimensions of the Nano V3.0 board and included USB cable.

4. SETUP

To begin using your AYWHF Nano V3.0 board, follow these steps:

- 1. Install USB Chip Driver:** The Nano V3.0 board uses the CH340G USB-to-serial converter chip. You may need to download and install the appropriate CH340G driver for your operating system (Windows, Mac, Linux).

In many cases, the driver will install automatically upon first connection. Search online for "CH340G driver" if automatic installation fails.

2. **Connect the Board:** Plug the Nano V3.0 board into your computer using the provided USB-C cable.
3. **Open Arduino IDE:** Launch the Arduino Integrated Development Environment (IDE). If you don't have it, download it from the official Arduino website.
4. **Select Board:** In the Arduino IDE, navigate to **Tools > Board** and select **"Arduino Nano"**.
5. **Select Processor:** Under **Tools > Processor**, select **"ATmega328P (Old Bootloader)"** or **"ATmega328P"** depending on your specific board's bootloader version. If you encounter upload errors, try the other option.
6. **Select COM Port:** Go to **Tools > Port** and select the COM port corresponding to your connected Nano V3.0 board. This port will typically appear after the CH340G driver is successfully installed.
7. **Upload a Test Sketch:** Open a simple example sketch, such as **File > Examples > 01.Basics > Blink**. Upload this sketch to your board to verify proper setup. The onboard LED should start blinking.



Image 4.1: Connection diagrams for burning a bootloader onto the Nano V3.0 board using another Arduino or Nano board.

5. OPERATING INSTRUCTIONS

Once your Nano V3.0 board is set up, you can begin programming and interacting with it.

5.1 Powering the Board

- **USB-C:** Connect the board to your computer via the USB-C cable. This provides both power and data communication.
- **External Unregulated Power:** Connect a 6-12V DC power supply to the VIN pin.
- **External Regulated Power:** Connect a 5V DC power supply to the 5V pin.

The board automatically switches to the power source with the highest voltage potential.

5.2 Programming the Board

Use the Arduino IDE to write and upload your sketches (programs) to the Nano V3.0 board. Ensure the correct board and port are selected as described in the Setup section.

5.3 Using I/O Pins

- **Digital Pins (D0-D13):** Can be configured as inputs or outputs using `pinMode()`, `digitalWrite()`, and `digitalRead()` functions.
- **PWM Pins:** Pins D3, D5, D6, D9, D10, D11 support Pulse Width Modulation (PWM) for analog-like output using `analogWrite()`.

- **Analog Input Pins (A0-A5):** Used to read analog sensor values using `analogRead()`.

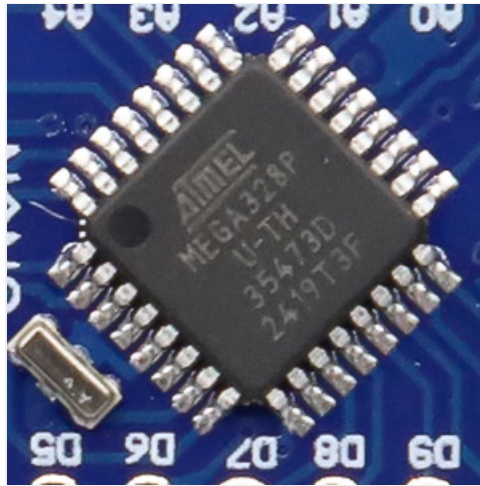


Image 5.1: Comprehensive pinout diagram for the Nano V3.0 board, detailing digital, analog, power, and communication pins.

5.4 Communication

- **Serial (UART):** Pins D0 (RX) and D1 (TX) are used for serial communication with a computer or other devices.
- **I2C (TWI):** Pins A4 (SDA) and A5 (SCL) support I2C communication for connecting to various sensors and modules.
- **SPI:** Pins D10 (SS), D11 (MOSI), D12 (MISO), and D13 (SCK) are used for SPI communication.

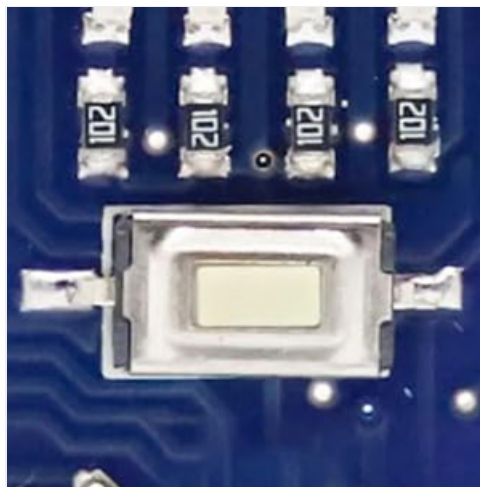


Image 5.2: Examples illustrating the versatility of the Nano V3.0 board in different electronic projects, such as robotics and sensor integration.

6. MAINTENANCE

Proper care and maintenance will extend the lifespan of your Nano V3.0 board.

- **Handling:** Always handle the board by its edges to avoid touching components, especially the pins, which can be sensitive to static electricity.
- **Storage:** Store the board in an anti-static bag or container when not in use, away from dust, moisture, and extreme temperatures.
- **Cleaning:** If necessary, gently clean the board with a soft, dry brush or compressed air to remove dust. Avoid using liquids or abrasive materials.
- **Power Supply:** Ensure that the power supply voltage and current are within the specified limits to prevent damage to the board.

7. TROUBLESHOOTING

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

- **Board Not Recognized:**

- Verify that the CH340G driver is correctly installed. Check your computer's Device Manager (Windows) or System Information (Mac) for the USB-SERIAL CH340 device.
- 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.

- **Upload Errors:**

- Ensure the correct board (**Arduino Nano**) and processor (**ATmega328P** or **ATmega328P (Old Bootloader)**) are selected in the Arduino IDE.
- Confirm that the correct COM port is selected.
- Check for syntax errors in your code.
- Press the reset button on the Nano board just before or during the upload process if uploads consistently fail.

- **Power Issues:**

- If using external power, ensure the voltage is within the 6-12V range for VIN or exactly 5V for the 5V pin.
- Check all power connections for proper polarity and secure contact.

- **Component Malfunction:** If individual components or pins are not responding, carefully inspect for any visible damage, solder bridges, or cold solder joints.

For further assistance, consult online Arduino communities and forums, which often have solutions for common issues.

8. WARRANTY AND SUPPORT

Specific warranty information for the AYWHP Nano V3.0 Board is not provided in this manual. Please refer to the retailer or manufacturer's website for details regarding warranty coverage and return policies.

For technical support, driver downloads, or additional resources, please visit the official AYWHP support channels or relevant online communities for Arduino-compatible boards.