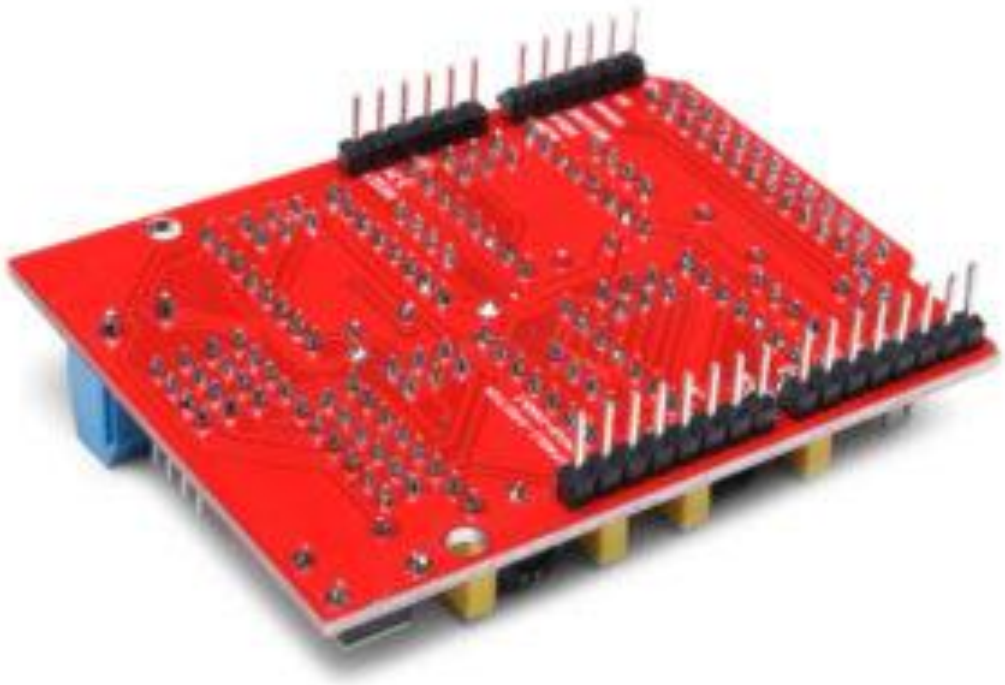
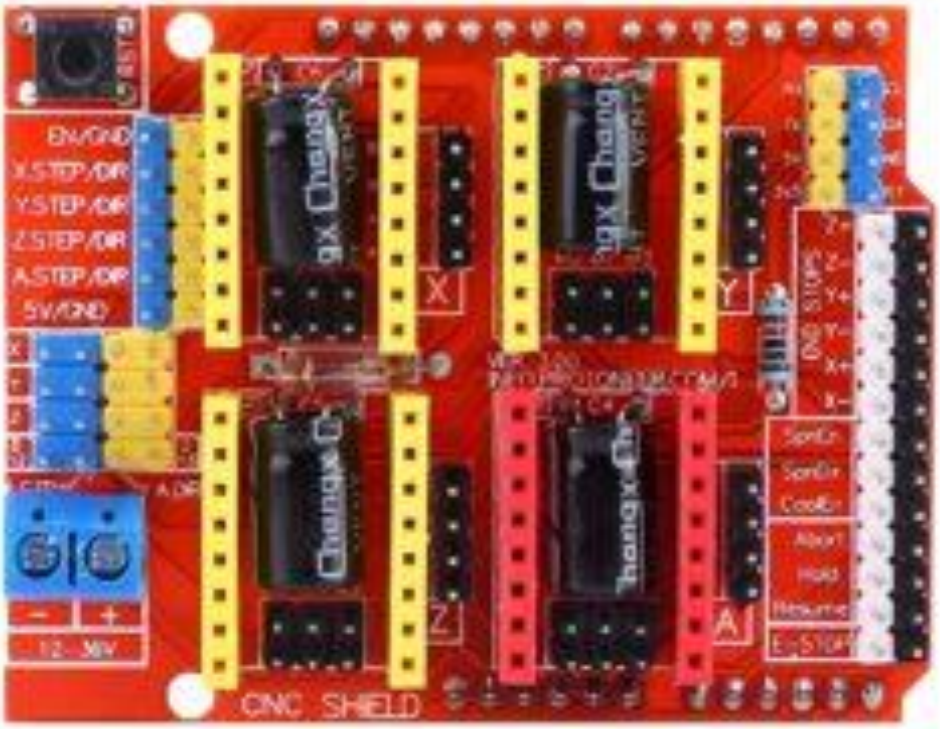
NC Shield V3 for Engraving Machine & 3D Printer – Arduino Uno Expansion Board

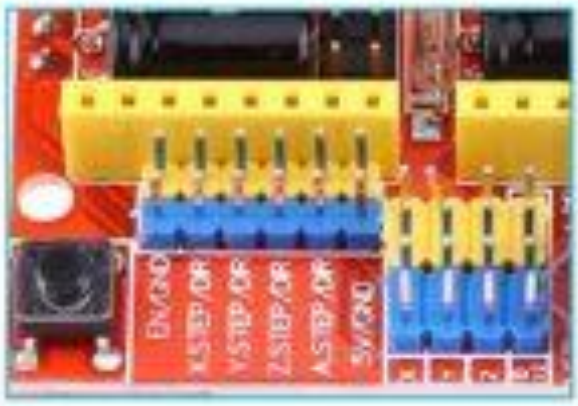
The **NC Shield V3** is a **versatile driver expansion board** designed for **engraving machines, 3D printers, and CNC projects**. It provides a **plug-and-play solution** for controlling stepper motors using **A4988 or DRV8825 drivers**, making it ideal for **Arduino Uno-based systems**. With its **compact design, high reliability, and easy setup**, this shield is perfect for hobbyists, educators, and professional makers looking to **upgrade their motion control projects**.



Key Features

- **Driver Support:** Compatible with **A4988 and DRV8825 stepper motor drivers**, allowing flexible motor control.
- **Plug-and-Play Design:** Easily fits onto an **Arduino Uno**, simplifying wiring and reducing setup time.
- **Expansion Board:** Provides **control ports for X, Y, Z, and optional extruder or additional axes**, ideal for CNC and 3D printing applications.
- **Compact & Durable:** Designed to withstand repeated use in desktop CNC and 3D printer projects.
- **Step and Direction Control:** Full support for stepper motor control signals from Arduino.
- **Multiple Driver Slots:** Supports up to **four stepper drivers simultaneously**, enabling multi-axis control.
- **LED Indicators:** Visual feedback for power and stepper signals, helping with debugging.





Technical Specifications

- **Model:** NC Shield V3 Expansion Board
- **Compatibility:** Arduino Uno R3
- **Driver Support:** A4988, DRV8825 stepper drivers
- **Axes Support:** X, Y, Z, and optional extra axis (E)
- **Operating Voltage:** 12V–36V (depends on stepper motors and drivers)
- **Step Mode:** Full, half, quarter, eighth, sixteenth step (depending on driver)
- **Interface:** Step/Direction signal input for Arduino
- **Size:** Compact PCB designed to fit directly on Arduino Uno
- **LED Indicators:** Power and signal status

Advantages of NC Shield V3

1. **Simplifies Wiring:** Plug-in design minimizes complex wiring between Arduino and stepper drivers.
2. **Versatile Driver Support:** Works with popular **A4988 or DRV8825 stepper drivers**, offering flexibility in microstepping and torque control.
3. **Multi-Axis Control:** Supports **X, Y, Z axes** plus an optional extruder, ideal for CNC machines, engraving machines, and 3D printers.
4. **Durable Construction:** High-quality PCB ensures **stable performance** in long-term projects.
5. **LED Feedback:** Provides clear visual signals for power and step activity, simplifying troubleshooting.

Applications

The **NC Shield V3 Expansion Board** is widely used for:

- **3D Printers:** Controls stepper motors for X, Y, Z axes and extruder in DIY or professional 3D printers.
- **Engraving Machines:** Provides smooth motion control for desktop CNC engraving projects.
- **CNC Machines:** Easy integration for small CNC routers, milling, and cutting machines.
- **Robotics Projects:** Stepper motor control for moving arms, sliders, or automated platforms.
- **Educational Kits:** Ideal for teaching students about stepper motor control, Arduino, and CNC/3D printer mechanics.

How It Works

The NC Shield V3 sits directly on top of an **Arduino Uno** board, providing an **organized platform for connecting stepper drivers**. Each driver slot accepts either **A4988 or DRV8825 stepper drivers**, which handle the **current and microstepping control** of stepper motors.

The Arduino sends **step and direction signals** through the shield, which are distributed to the drivers for precise motor control. The shield's **LED indicators** display power and step signal activity, helping users monitor the system during operation.

Example Project

A typical application is a **DIY 3D printer**. Using the NC Shield V3, users can control **X, Y, Z axes and the extruder stepper motors**, enabling precise 3D printing. Similarly, for a **desktop**

engraving machine, the shield can control three axes of movement for accurate engraving on wood, plastic, or metal surfaces.

It is also suitable for **CNC robotic arms** or automated conveyor systems where multiple stepper motors need precise synchronization and easy integration with Arduino Uno.

Why Choose NC Shield V3

The **NC Shield V3** simplifies **stepper motor control for Arduino Uno-based projects**. Its **plug-and-play design, driver flexibility, multi-axis support, and LED feedback** make it the ideal choice for **makers, hobbyists, and educators**. Whether building a **3D printer, CNC machine, or engraving machine**, this expansion board saves time and ensures **reliable motor performance**.

Conclusion

The **NC Shield V3 for Engraving Machines and 3D Printers** is a **versatile, reliable, and easy-to-use Arduino Uno expansion board**. With **support for A4988 and DRV8825 drivers, multi-axis control, and plug-and-play integration**, it is perfect for hobbyist, educational, and professional CNC or 3D printing projects.