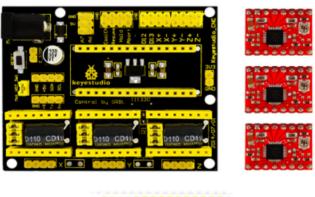
Ks0096 keyestudio CNC Kit / CNC Shield V4.0 + Nano 3.0+3pcs a4988 Driver / GRBL Compatible

From Keyestudio Wiki

Contents

- 1 Arduino CNC kit / CNC Shield V4.0 + nano 3.0+3pcs a4988 driver / GRBL compatible
- 2 Introduction
- 3 Specification
- 4 Kit list
- 5 Connection Diagram
- 6 5. Install Driver Software and Development Environment Software IDE
 - 6.1 Install Diver Software
 - 6.2 Install development environment software IDE
- 7 Using Method
 - 7.1 Test Main Board
 - 7.2 Install Firmware and Grbl Controller
- 8 Resources
- 9 Buy from

Arduino CNC kit / CNC Shield V4.0 + nano 3.0+3pcs a4988 driver / GRBL compatible







Introduction

keyestudio CNC Shield V4

Keyestudio CNC shield v4.0 needs to work with Keyestudio nano ch340 . It can be used as driver expansion board for engraving machines. It has in total 3 channel slots for A4988 stepper motor driver modules (not included) for driving 3 channel of stepper motors. Each channel of stepper motor only needs 2 IO ports, which means 6 IO ports is sufficient to manage 3 stepper motors. This shield can make quick work for managing stepper motors in your project.

keyestudio nano ch340

keyestudio nano ch340 controller is a small, complete board based on the ATmega328. It's a open source Simple I/O platform with 12 Digital I/O Pins (of which 6 provide PWM output), 8 Analog Input Pins, pin 0 (RX) and 1 (TX) used to receive (RX) and transmit (TX) TTL serial data, a Mini-B USB connection, an ICSP header and a reset button.

Specification

- 1.3 axis stepper motor driver
- 2.Compatible with micro-drive laser engraving machine, three-axis CNC engraving machine.
- 3.2A can be controlled within the two-phase four-wire stepper motor.
- 4. Released the digital IO interface, easy to connect to other modules, such as ENDSTOP.
- 5.Released the I2C interface, you can connect to the LCD I2C or other I2C module.
- 6.power DC5v interface, 7.5-12V voltage input.
- 7.GRBL compatible
- 8.worked with arduino nano.

Kit list

1x CNC Shield V4.0 1x nano board 3x A4988 driver 1x USB cable

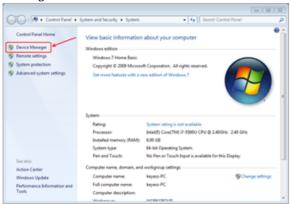
Connection Diagram



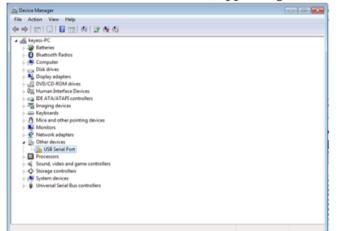
5. Install Driver Software and Development Environment Software IDE

Install Diver Software

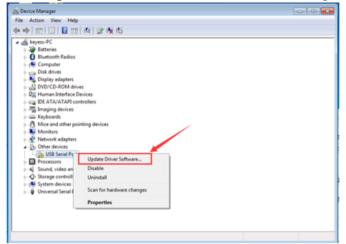
A. Connect the main board with computer, and then right click "Computer" to enter "Device Manage".



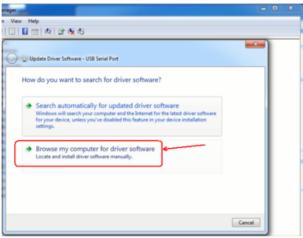
B. Double click "Other devices", appearing "USB Serial Port".



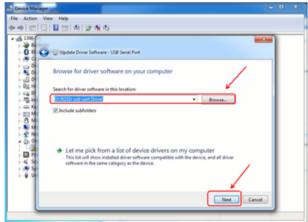
Then, right click "USB Serial Port" and select "Update Driver Software" to install driver software.



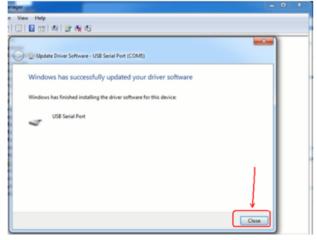
After that, select "Browse my computer for driver software" to find the file.



Browse to search for driver software.



After your driver software updated, click "Close" to finish.

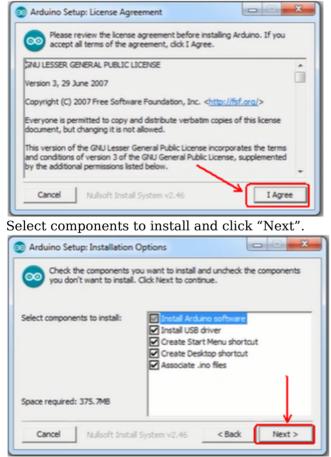


C. Finally, installation is done, and double click "Ports" in "Device Manager", you can see "USB Serial Port".

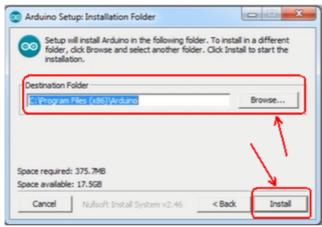
Microsoft Management Console	
File Action View Help	
(中)回回回风 () () () () () () () () () () () () ()	
> - ₩ Universal Serial Bus controllers:	
1000	

Install development environment software IDE

Double click arduino-1.5.6-r2-windows to start. Select "I Agree" to accept license agreement.



Click "Browse" and select another folder. Click "Install" to start the installation.



Finally, wait for a few minutes to finish.

💿 Arduino Setup: Installing	
Extract: sam3x8_sram.ld	
Show details	
Cancel Nullsoft Install System v2.46 < Back	Close

Using Method

Test Main Board

First, write below code in IDE to test whether main board, shield and three motors work normally.

Explanation

1. If you properly reduce the value 800 in delayMicroseconds(800) to increase the frequency of input PWM signal, you can increase the rotation speed of stepper motor. The change of value cannot be too much or the motor will stop moving.

2. Rotate the knob on A4988, you can adjust the output current of the motors to change the torque.

Code

```
#define EN
                  8
                          // stepper motor enable, low level effective
#define X_DIR
                          //X axis, stepper motor direction control
                  5
#define Y_DIR
                  6
                          //y axis, stepper motor direction control
#define Z_DIR
                  7
                           //zaxis, stepper motor direction control
#define X_STP
#define Y_STP
#define Z_STP
                  2
                          //x axis, stepper motor control
                  3
                           //y axis, stepper motor control
                          //z axis, stepper motor control
                  4
// Function: step
                    -control the direction and number of steps of the stepper motor
// Parameter: dir -direction control, dirPin corresponds to DIR pin, stepperPin corresponds to
step pin, steps is the number of steps.
// no return value
void step(boolean dir, byte dirPin, byte stepperPin, int steps)
1
  digitalWrite(dirPin, dir);
  delay(50);
for (int i = 0; i < steps; i++) {</pre>
    digitalWrite(stepperPin, HIGH);
```

```
delavMicroseconds(800):
      digitalWrite(stepperPin, LOW):
      delayMicroseconds(800);
   }
:}
void setup(){// set the IO pins for the stepper motors as output
    pinMode(X_DIR, OUTPUT); pinMode(X_STP, OUTPUT);
    pinMode(Y_DIR, OUTPUT); pinMode(Y_STP, OUTPUT);
   pinMode(Z_DIR, OUTPUT); pinMode(Z_STP, OUTPUT);
   pinMode(EN, OUTPUT);
   digitalWrite(EN, LOW);
'n,
void loop(){
   step(false, X_DIR, X_STP, 3200); // x axis motor rotates CCW for 1 circle, as in 200 steps
step(false, Y_DIR, Y_STP, 3200); // y axis motor rotates CCW for 1 circle, as in 200 steps
step(false, Z_DIR, Z_STP, 3200); // z axis motor rotates CCW for 1 circle, as in 200 steps
   delay(1000);
   step(true, X_DIR, X_STP, 3200); // X axis motor rotates CW for 1 circle, as in 200 steps
step(true, Y_DIR, Y_STP, 3200); // y axis motor rotates CW for 1 circle, as in 200 steps
   step(true, Z_DIR, Z_STP, 3200); // z axis motor rotates CW for 1 circle, as in 200 steps
   delay(1000);
```

Install Firmware and Grbl Controller

a. Write test program to keyestudio UNO R3 copy the folder GRBL_Arduino_Library_keyes in the data packet and paste it into to the folder libraries, in your Arduino IDE document installation.

Code

```
#include <grblmain.h>
void setup(){
startGrbl();
}
void loop(){}
//Burn the code above to keyestudio UNO R3
```

b. Install GrblController361 Software Grbl Controller is a piece of software which is used to send GCode to CNC Machines. Run Grbl Controller361 Setup in your installation packet, the interface below will come out:



For a license agreement, please check I accept the agreement and click Next.

ense Agreement	
Please read the following important in	formation before continuing.
Please read the following License Agre agreement before continuing with the	eement. You must accept the terms of this installation.
GrblController	
	IO WARRANTY OF ANY KIND, INCLUDING THE ABILITY AND FITNESS FOR A PARTICULAR
PURPOSE.	
I accept the agreement	

When you are ready to continue with Setup, click Next.

When you are read	ly to continue with Setup, click Next.
GrblController 3 -	Control your Grbl Arduino and other basic CNC 3-axis systems.
Installs a EXE file a using GCode.	and support DLLs that communicate via COM port to Grbl Arduino
by Zapmaker	
Released under G	1.3.0
1	

To continue, click Next. If you would like to select a different folder to install, click Browse.

Setup - Grbl Contro	oller
Select Destination Location Where shculd Grbl Controli	
	irbl Controller into the following folder. you would like to select a different folder, click Browse.
c:\Program Files\Grbl Cont	
At least 1d Q MD of free di	ek en see is sam skad
At least 14.8 MB of free dis	sk space is required.
	<back next=""> Cancel</back>

To continue, click Next. If you would like to select a different folder to place program's shortcuts, click Browse.

Setup - Grbl Controller	
Select Start Menu Folder Where should Setup place the program	i's shortcuts?
4 <u></u>	's shortcuts in the following Start Menu folder. we to select a different folder, click Browse.
Grbl Controller	Browse
Don't create a Start Menu folder	
	< <u>Back</u> <u>N</u> ext > Cancel

Select the additional tasks you would like Setup to perform while installing Grbl Controller, then click Next.

Select Additional Tasks		
Which additional tasks should be perfo	ormed?	Ċ
Select the additional tasks you would Controller, then click Next.	like Setup to perform while installing (ārbl
Additional icons:		
Create a desktop icon		
Create a Quick Launch icon		

Click Install to continue with the installation.

eady to Install	the Controller on the control to the	
Setup is now ready to begin installing G	rbi Controller on your computer.	¢
Click Install to continue with the installa change any settings.	tion, or click Back if you want to rev	iew or
Destination location: c:\Program Files\Grbl Controller		~
Start Menu folder: Grbl Controller		
C		<u>v</u>
<u>N</u>		

Click Next.

Setup - Grbl Controller	
Information Please read the following important information before continuing.	
When you are ready to continue with Setup, click Next.	
Thanks! Please visit <u>www.zapmaker.org</u> to give feedback.	
Media	7
<u>N</u> ext >	

At last, click "Finish" to finish the installation.

15 Setup - Grbl Contr	oller 🗧 🗖 🗙
	Completing the Grbl Controller Setup Wizard Setup has finished installing Grbl Controller on your computer. The application may be launched by selecting the installed icons. Click Finish to exit Setup. I Launch Grbl Controller
	< <u>B</u> ack <u>Einish</u>

c. Test G-Code on Grbl Controller

Power the main board using a USB cable and connect correctly all your external devices, then run Grbl Controller.

Choose Port name the same as IDE COM port and click "Open" to open the series port, connecting CNC Machines with computer.

■ Grbl Controller 3.6.1 Zile Ieols Help	
Pert name 2083 M	Waching Coordinates (ms) York Coordinates (ms)
Last State:	Y 0 0
Chenne file Degin Step File program (34	Z Aris Centrel Virusliner Advanced
Querued Commands 0 Dustine:	
Command V	
	pot Z Jog
	0
	Absolute coordinates after adjust Step Size
	Earo Position Go Hose Refresh Pos

After opening the series port, the "Open" button change into "Close/Reset" and get red! At this time you can click the X axis, Y axis, Z axis as shown in below diagram to adjust the motion direction of motors.

e <u>T</u> ools <u>H</u> elp				
rt name COM3			Machine Coordinates (mm)	Work Coordinates (mm)
Close / Reset	Baud Rate 9600 -	Х	4.000	4.000
Send File		Y	<u> 3000</u>	3.000
Choose file	Begin Stop	Ζ	4.000	4.000
File progress	0%	Axi	s Control Visualizer Adv	vanced
Queued Commands Buntine: mmand	•		axis y	
G91 G01 X-1 G91	*		◀ ▼ ▶	z Jog axis z
G01 X1 G01 X1			axis x	
G01 Y-1			Absolute coordinates after adj	just Step Size
G91 G01 Y-1			Spindle On	1 •
e	•	Zero	Position Go Home Refre	sh Pos

Notes: after adjusting the axies, before beginning G-Code file, you must close and open again . Now, it is time to have a try! Click "Choose file" to choose one G-Code file named cn. to test in the data packet for a beginner, and the interface will come out: GrblController .

<u>File</u> Jools <u>H</u> elp			
Port name COM3 -		Machine Coordinates (mm) W	ork Coordinates (mm)
Close / Reset Baud Rate 9600 -	Х	1 (336)	1 (336)
Send File	Y	19264	19,264
E./加学室请机就成G优售/增.mc Choose file Begin Stop	Ζ		(000)
File progress 16%		s Control Visualizer Adva 769 mm (Width-X: 29,934 F	nced
Runtime: 00:00:23		EN.	3
<pre>> X10.325Y25.799 > X9.954Y25.608 > X9.569Y25.445 > X0.173Y25.311</pre>		13	R
> X8.769Y25.206 > X8.360Y25.133	0		29.934
> X7.919Y25.082	Zero	O Position Go Nome Refres	Pox

Click "Begin" , and you can see how the motors move on coordinates.

Resources

```
Arduino IDE Download
https://www.arduino.cc/en/Main/Donate
GRBL_Arduino_Library_keyes (Firmware) Download
https://drive.google.com/open?id=1JzJwVoO0xkxWDXvDlgE8X8atBzl2SJdw
Driver usb_ch341_3.1.2009.06 Download
https://drive.google.com/open?id=1FJ2beDCUNKTNzWsCGDx7JyI_ZDRCl_ry
G-Code for Testing Download
https://drive.google.com/open?id=1BWS4MXaZ-xCg5v_bz4NP3lxg9tbOuZ4r
Grbl Controller361 Setup Download
https://drive.google.com/open?id=1JSCtHr7FLF7UMxXeVGpwMbWn3BVZo7jh
```

PDF

https://drive.google.com/open?id=1KBUZFZUAur71cUTBaiqWdkmQPUyjECxK

Buy from

Official Website

http://www.keyestudio.com/arduino-cnc-shield-v4-0-3-axis-stepper-motor-driver-board-grbl-compatible.html

Retrieved from "http://wiki.keyestudio.com/index.php?title=Ks0096_keyestudio_CNC_Kit_/_CNC_Shield_V4.0_%2B_Nano_3.0%2B3pcs_a4988_Driver_/_GRBL_Compatible&oldid=5058"

Category: 3D Printer

• This page was last modified on 14 November 2017, at 11:44.