

BIGTREETECH/BIQU SKR V1.3 instruction guide by Jupa Creations

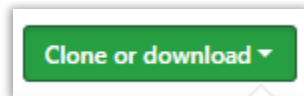
All official information like schematics and hardware about this 32 bits 3D printer mainboard can be found on the [BIGTREETECH official GITHUB site](#).

This instruction guide is to show you how to install Marlin 2.0 firmware to the SKR V1.3 board in general. It does not take in account machine and other hardware specific settings!

You can use VSCode or Atom.IO + Platform IO to compile Marlin2.0 to BIGTREETECH/BIQU SKR V1.3

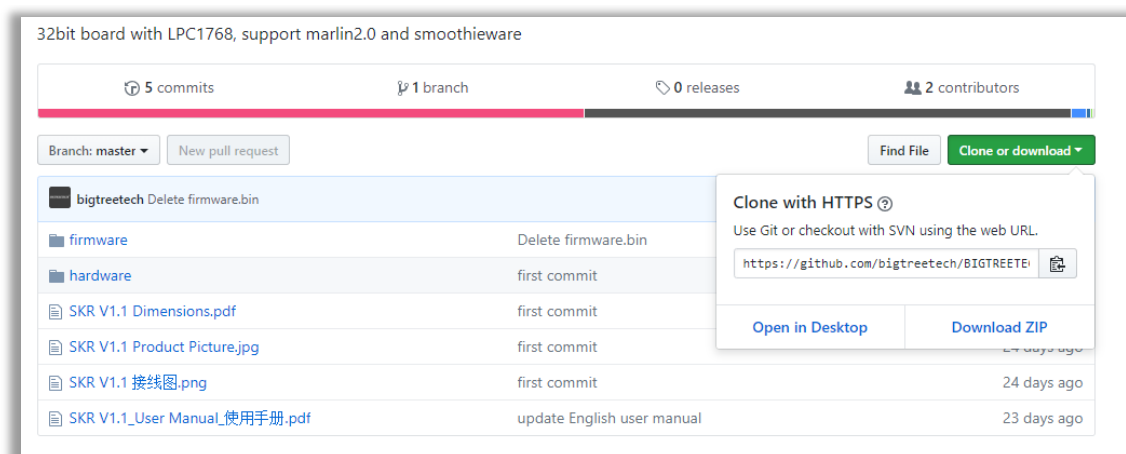
Intended for use with a REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER 128x64 LCD display by standard with two 10 wire ribbon cables.

Download the Marlin2.0 firmware from [Marlin 2.0 github firmware version](#) and click.



Click "Download ZIP"

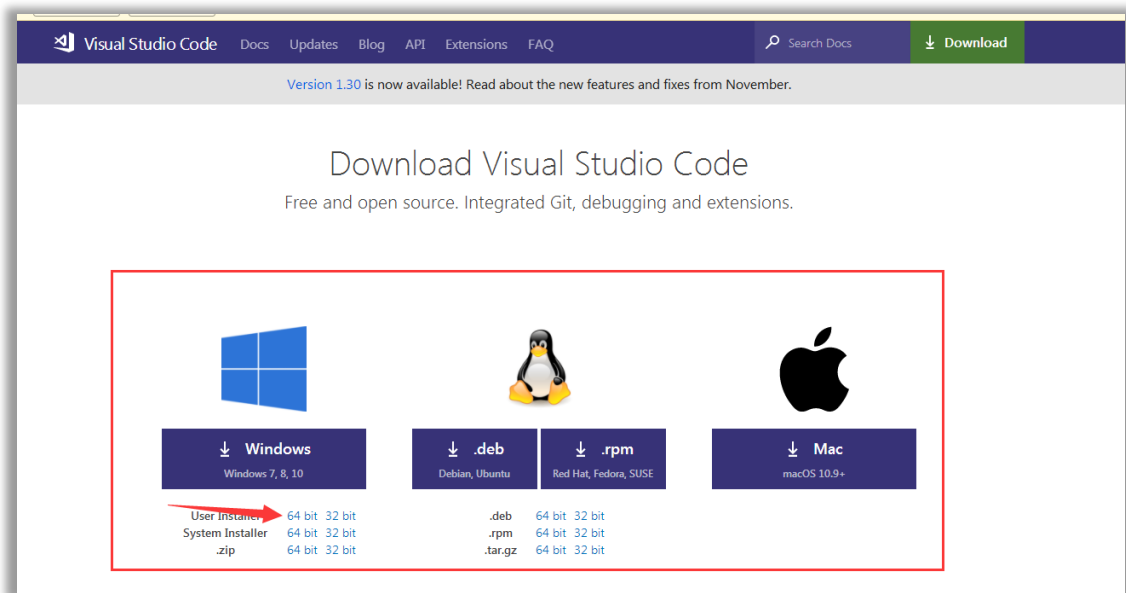
Remark if you use Octoprint, do not use the BIGTREETECH firmware version itself but download [Marlin 2.0 github firmware version](#) and modify it to your needs.



When the download is complete, unzip the file to a known place.

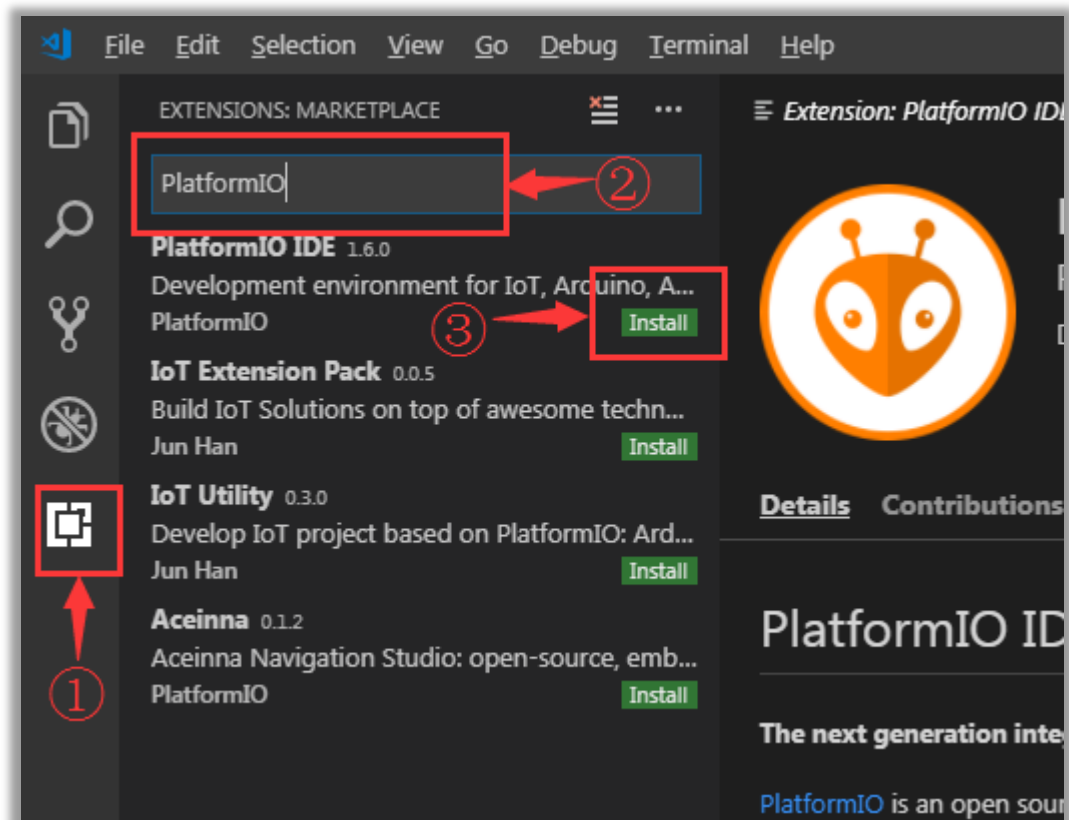
In this example we use VSCode

Download the VSCode from <https://code.visualstudio.com/Download>.
Choose the version which is compliant with your PC operating system.

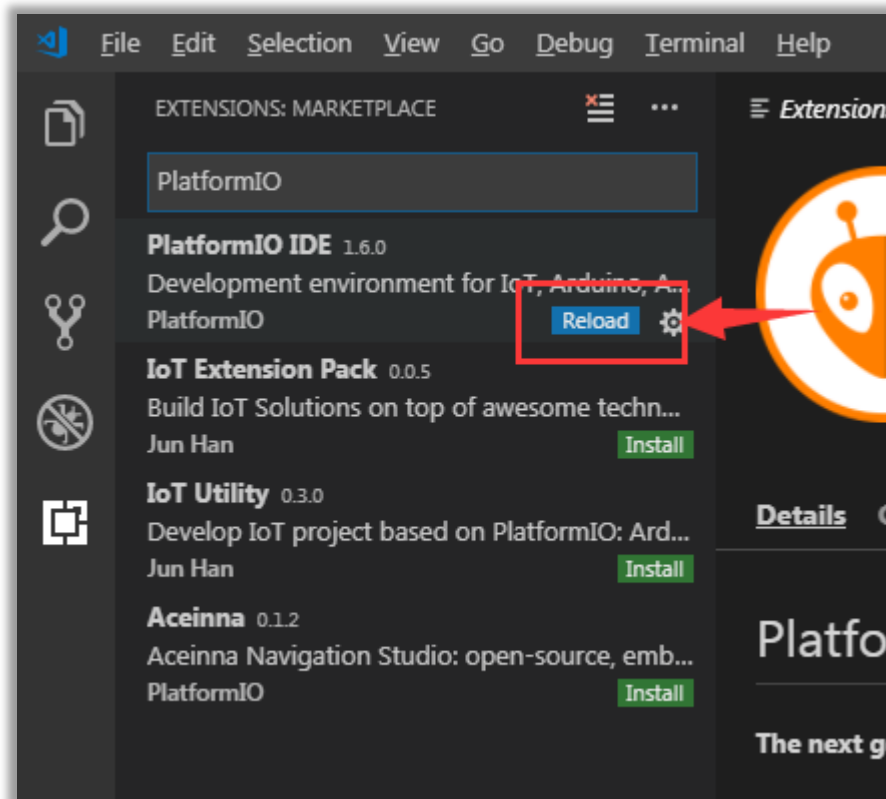


After the download is completed, double-click the installation. After the installation, open VSCode.

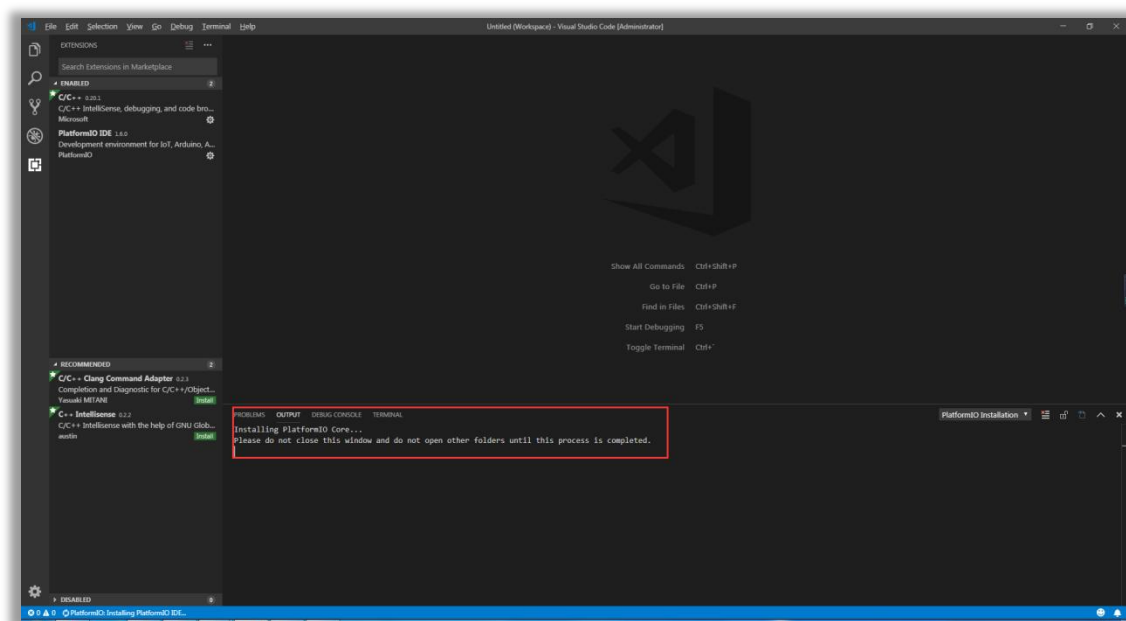
You also need to install the PlatformIO plugin, click on the steps below . Click on the step 1 in the figure below, enter PlatformIO in step 2 and click step 3 Install to install.



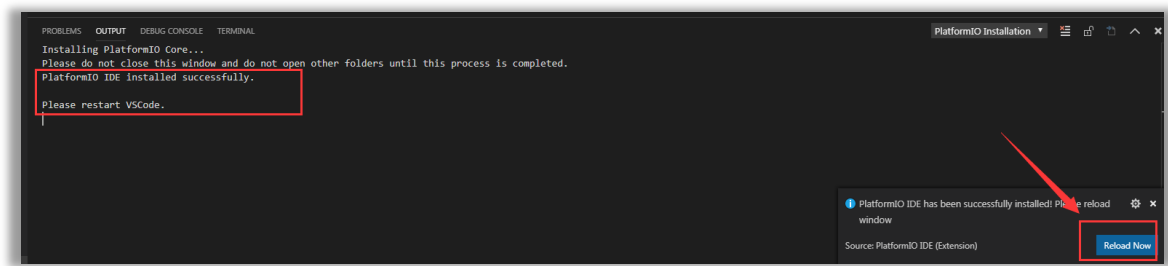
After the download is complete, you need to Reload.



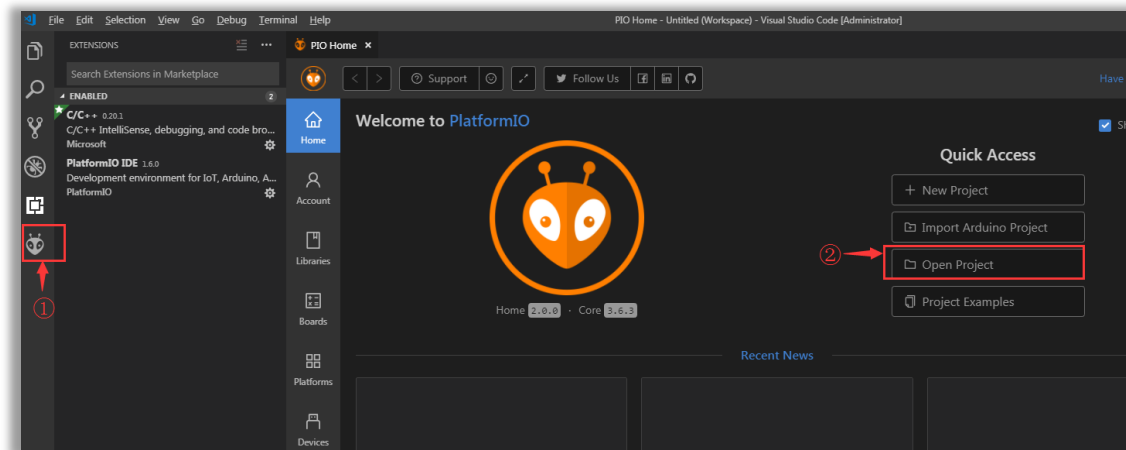
After Reload, you will be prompted to install PlatformIO Core. Please wait.



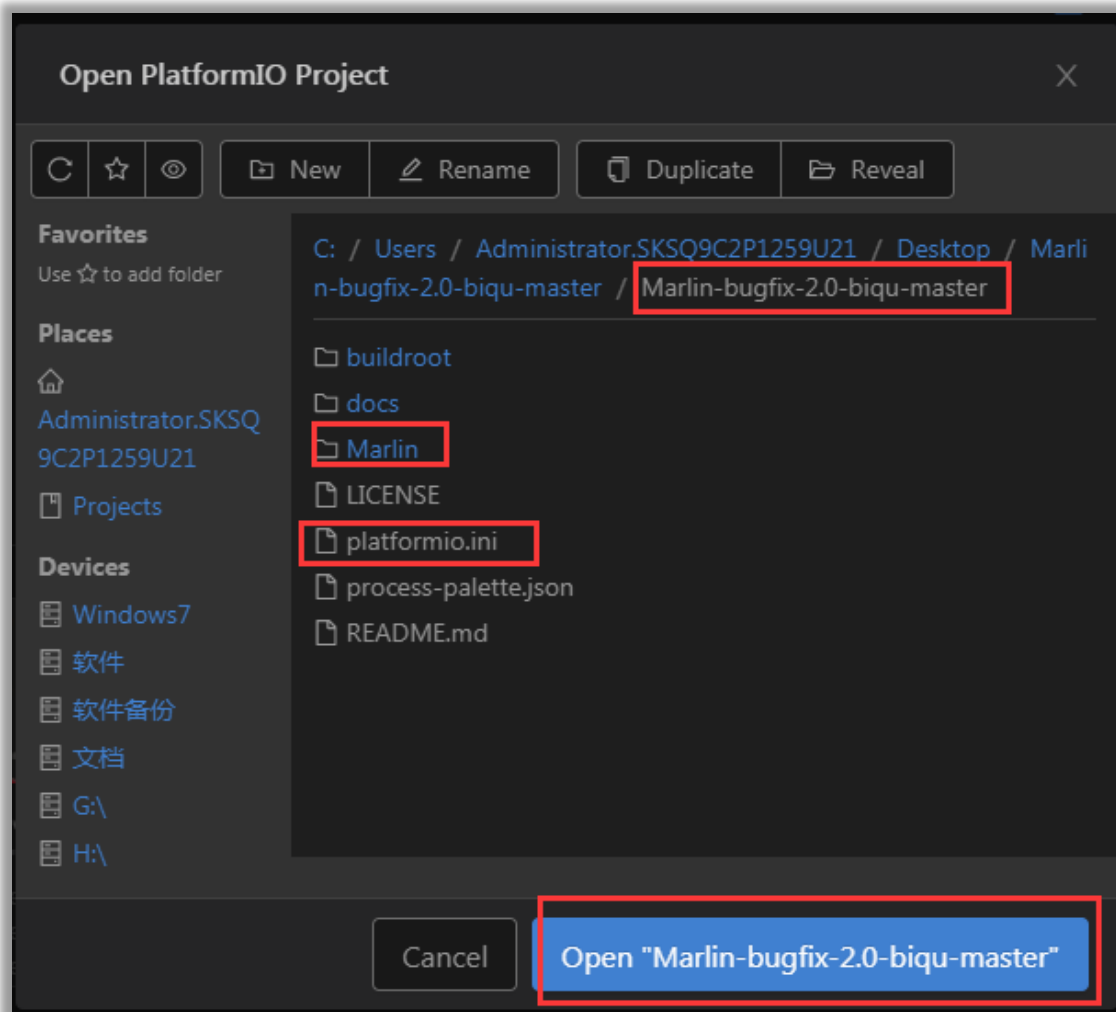
After the installation is successful, you need to Reload it again, and then PlatformIO is installed.



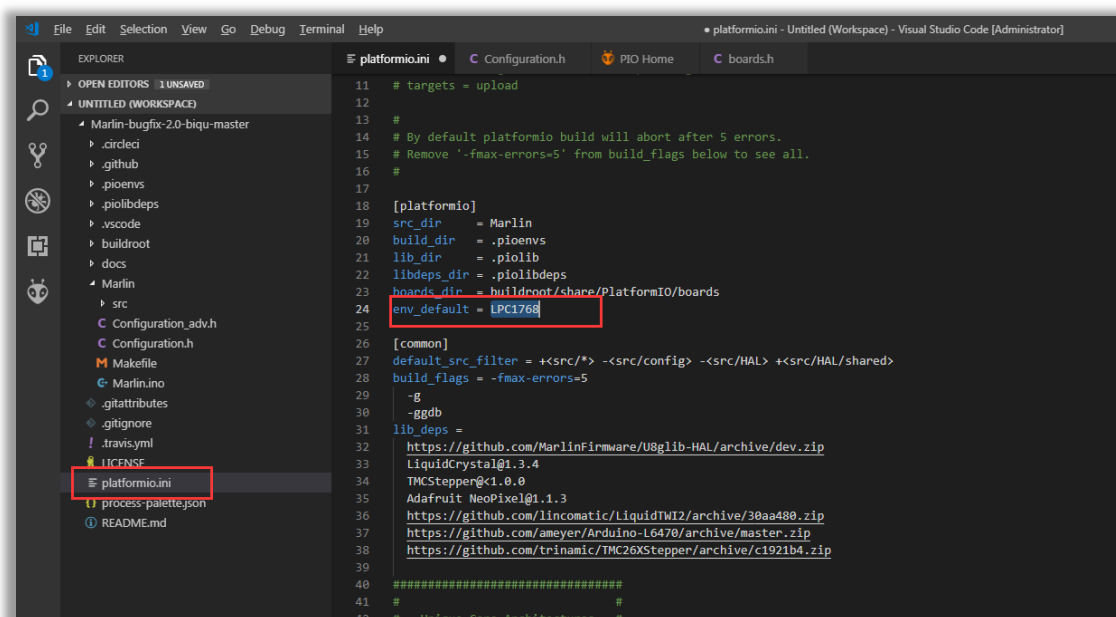
In the lower left corner of VSCode, you can see the icon (1), which is PlatformIO plug-in. Click (2) Open Project to Open the Project.



Find the marlin2.0 source directory where you extracted in the very first step, and click Open.



After opening the project, go to the PlatformIO.ini file and change the default environment from megaatmega2560 to LPC1768, `env_default = LPC1768`. The next steps might be already done.



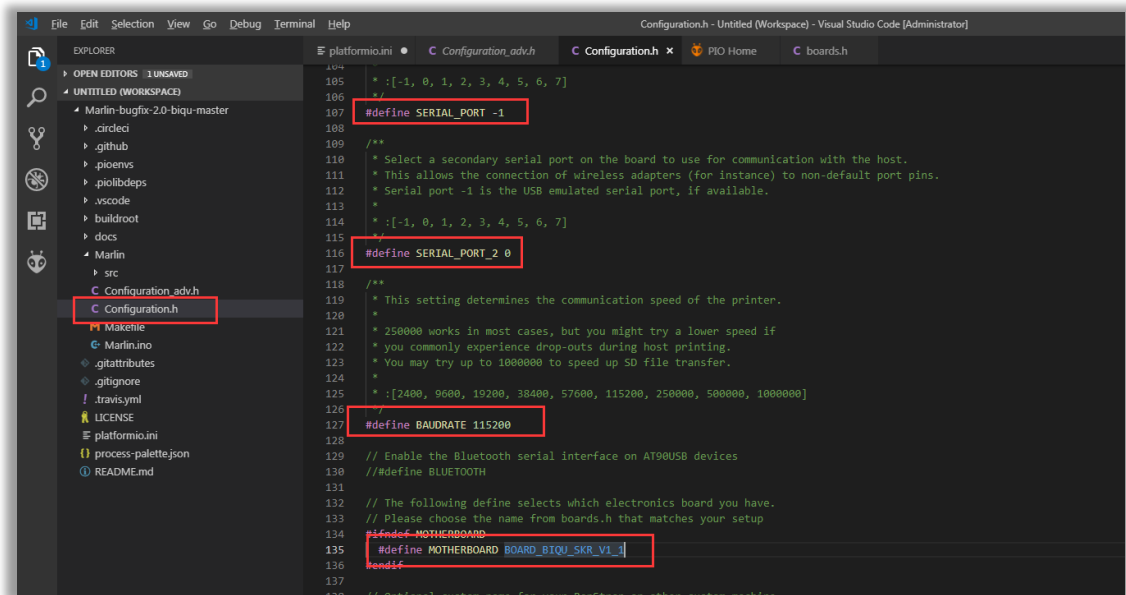
Then go to the configuration.h file and if not yet done modify it to

```
#define SERIAL_PORT 0
```

```
#define SERIAL_PORT_2 -1
```

```
#define BAUDRATE 115200
```

```
#define MOTHERBOARD BOARD_BIQU_SKR_V1_3
```



If you like to use a BL-touch you have to change some code.

In the same Configuration.h

Modify the following lines:

```
//#define BLTOUCH and change to  
#define BLTOUCH
```

```
//#define AUTO_BED_LEVELING_BILINEAR and change to  
#define AUTO_BED_LEVELING_BILINEAR
```

```
// #define Z_SAFE_HOMING and change to  
#define Z_SAFE_HOMING
```

```
// #define ENCODER_PULSES_PER_STEP 4 and change to  
#define ENCODER_PULSES_PER_STEP 4
```

```
// #define REVERSE_ENCODER_DIRECTION and change to  
#define REVERSE_ENCODER_DIRECTION
```

```
//#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER and change to  
#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER
```

If you like to activate Babystepping switch to Configuration_adv.h

```
//#define BABYSTEPPING and change to  
#define BABYSTEPPING
```

```
//#define DOUBLECLICK_FOR_Z_BABYSTEPPING and change to  
#define DOUBLECLICK_FOR_Z_BABYSTEPPING
```

```
//#define BABYSTEP_ZPROBE_OFFSET and change to  
#define BABYSTEP_ZPROBE_OFFSET
```

```
//#define BABYSTEP_ZPROBE_GFX_OVERLAY and change to  
#define BABYSTEP_ZPROBE_GFX_OVERLAY
```

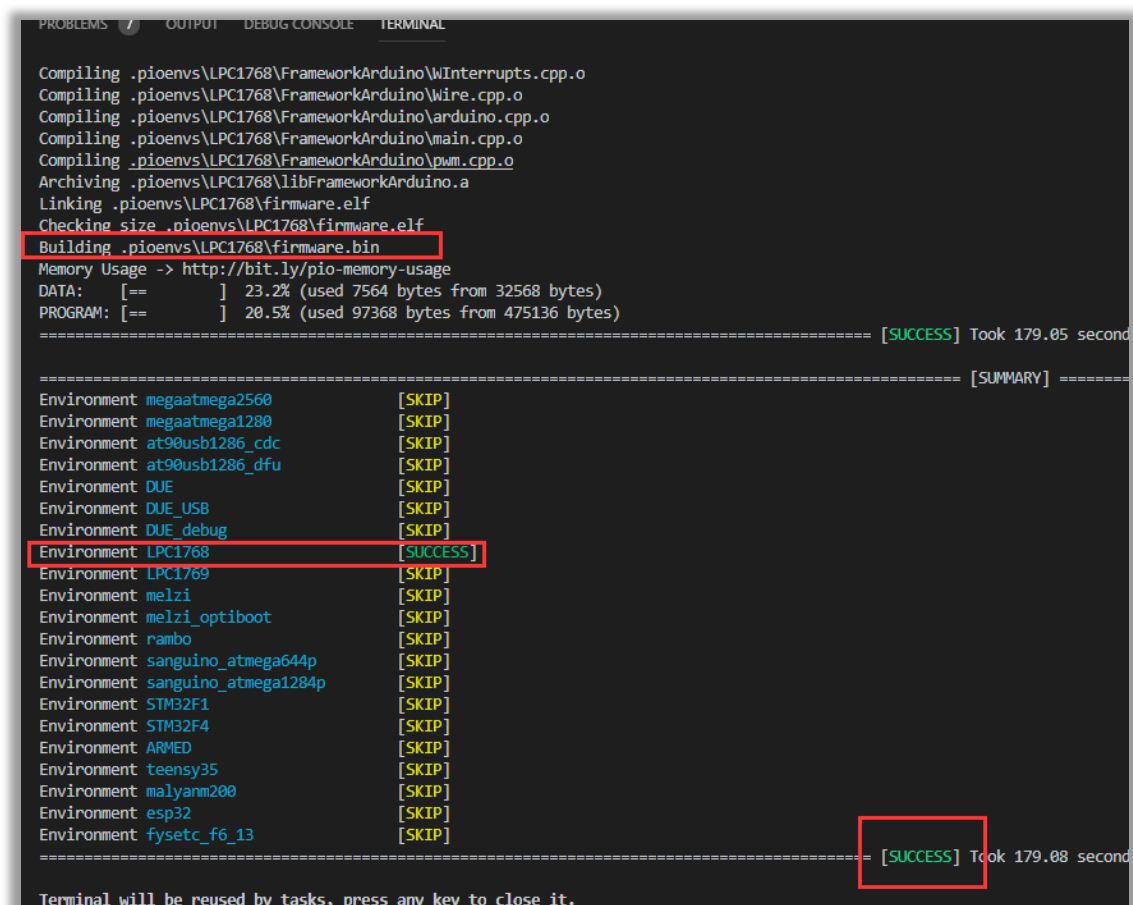
```
#define BABYSTEP_MULTIPLICATOR 1 and change to  
#define BABYSTEP_MULTIPLICATOR 20
```

If your original BL-touch, clone TL-touch or clone BT-touch is dropping the pin during printing switch to Marlin/src/inc/conditionals_LCD.h and change the following code:

```
#define BLTOUCH_STOW 100 // was 90  
#define BLTOUCH_SELFTEST 130 // was 120
```

After the modification is completed, for VSCode press the Ctrl+Shift+B keys to start compiling. PlatformIO will automatically download the compile component and then compile.

Compiling can take up to 5 minutes, so be patient.



```
PROBLEMS 7 OUTPUT DEBUG CONSOLE TERMINAL

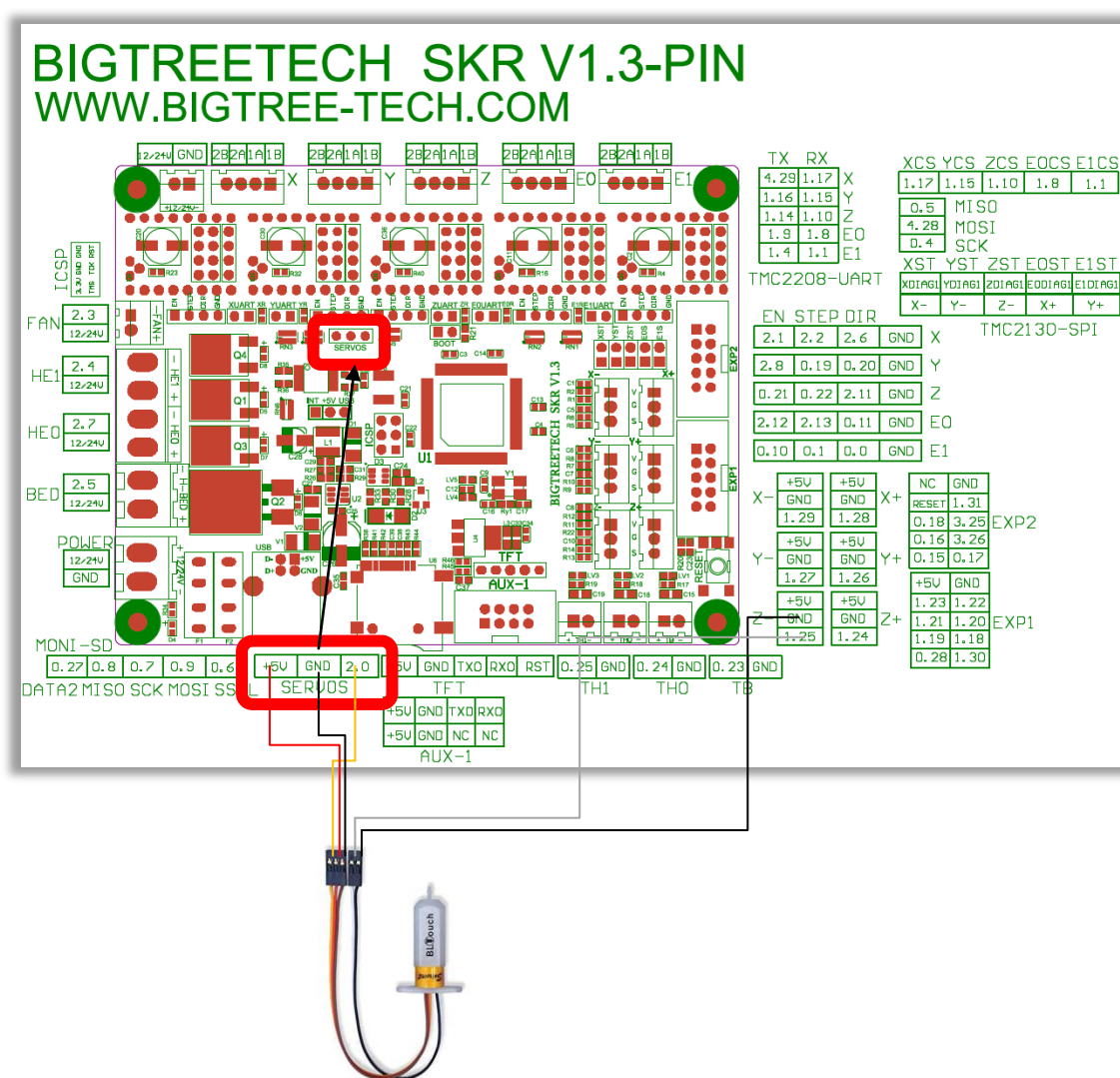
Compiling .pioenvs\LPC1768\FrameworkArduino\WInterrupts.cpp.o
Compiling .pioenvs\LPC1768\FrameworkArduino\Wire.cpp.o
Compiling .pioenvs\LPC1768\FrameworkArduino\arduino.cpp.o
Compiling .pioenvs\LPC1768\FrameworkArduino\main.cpp.o
Compiling .pioenvs\LPC1768\FrameworkArduino\pwm.cpp.o
Archiving .pioenvs\LPC1768\libFrameworkArduino.a
Linking .pioenvs\LPC1768\firmware.elf
Checking size .pioenvs\LPC1768\firmware.elf
Building .pioenvs\LPC1768\firmware.bin
Memory Usage -> http://bit.ly/pio-memory-usage
DATA:  [==] 23.2% (used 7564 bytes from 32568 bytes)
PROGRAM: [==] 20.5% (used 97368 bytes from 475136 bytes)
===== [SUCCESS] Took 179.05 second

===== [SUMMARY] =====
Environment megaatmega2560 [SKIP]
Environment megaatmega1280 [SKIP]
Environment at90usb1286_cdc [SKIP]
Environment at90usb1286_dfu [SKIP]
Environment DUE [SKIP]
Environment DUE_USB [SKIP]
Environment DUE_debug [SKIP]
Environment LPC1768 [SUCCESS]
Environment LPC1769 [SKIP]
Environment melzi [SKIP]
Environment melzi_optiboot [SKIP]
Environment rambo [SKIP]
Environment sanguino_atmega644p [SKIP]
Environment sanguino_atmega1284p [SKIP]
Environment STM32F1 [SKIP]
Environment STM32F4 [SKIP]
Environment ARMED [SKIP]
Environment teensy35 [SKIP]
Environment malyanm200 [SKIP]
Environment esp32 [SKIP]
Environment fysetc_f6_13 [SKIP]
===== [SUCCESS] Took 179.08 second

Terminal will be reused by tasks, press any key to close it.
```

After the compiling is successful, a “firmware.bin” file will be generated in the \pioenvs\LPC1768 directory. Copy this file to the TF card of the motherboard and reset or powercycle the motherboard, so that the firmware is burned into the motherboard.

Pin diagram by BIGTHREETECH



BL-Touch

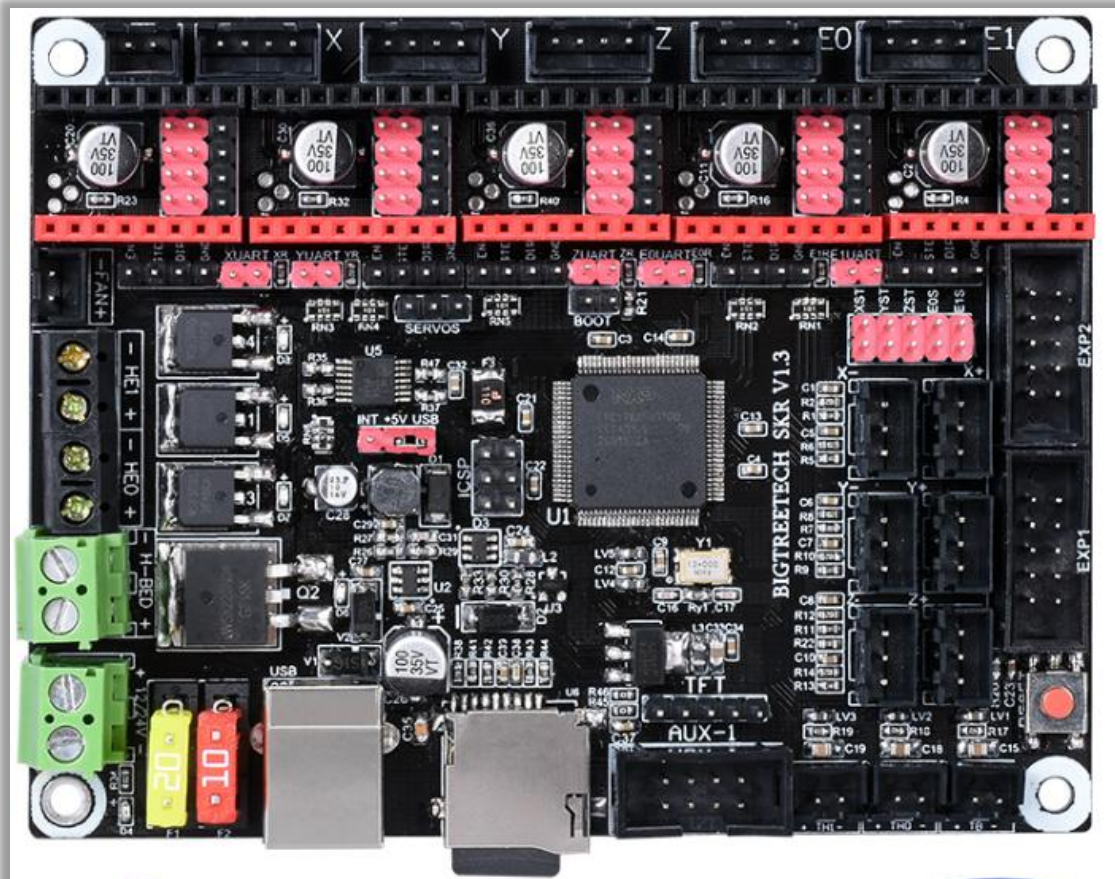
The SKR V1.3 board has a dedicated Servo port.

Wire connections need to be checked before use!

For connecting the ANTCLABS BL-touch three wire cable to Servo port.

SKR V1.3 Board servo port = (+)(-)(puls) and BL-touch = (-)(+)(puls)

Positive (+) and Minus (-) need to be swapped in the BL-Touch connector or an intermediate connection cable need to be made. The two wire sensor cable connects to the (Z-) port.



LCD

If your REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER is not working check following:

If the back-lit is illuminated on the display but no characters are shown you have selected the wrong display in the firmware configuration.h file. Please change.

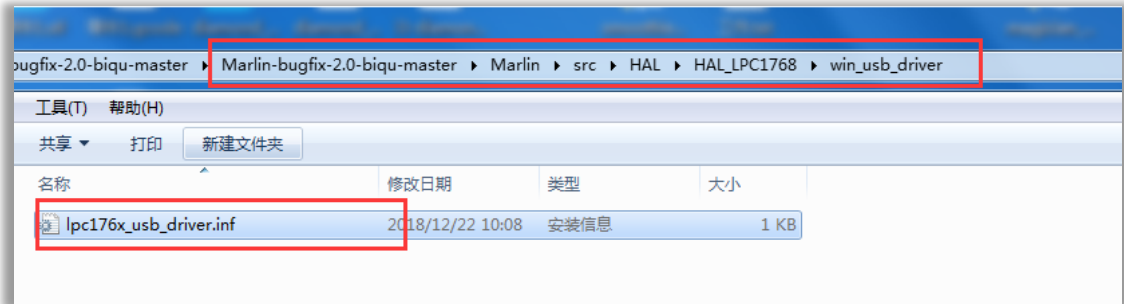
If the display stays dark you might have connected EXP1 to EXP2. Connect EXP1 to EXP1

If the display stays dark and EXP1 is connected to EXP1 remove the lock tab from the EXP1 and EXP2 connectors at one side so you can place them reversed in the connector. You cannot blow the board or LCD by wrong orientation of the connectors.

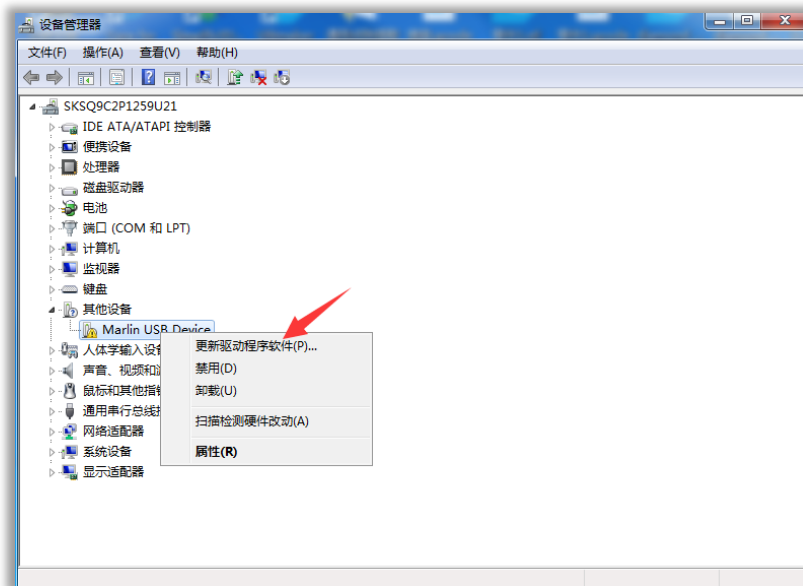


In Windows 10 a driver called MARLIN will be automatically installed by plug & play when a USB cable is connected to the motherboard. It will show as a MARLIN port. Do not install any other USB driver or Smoothie drivers while using Windows 10!

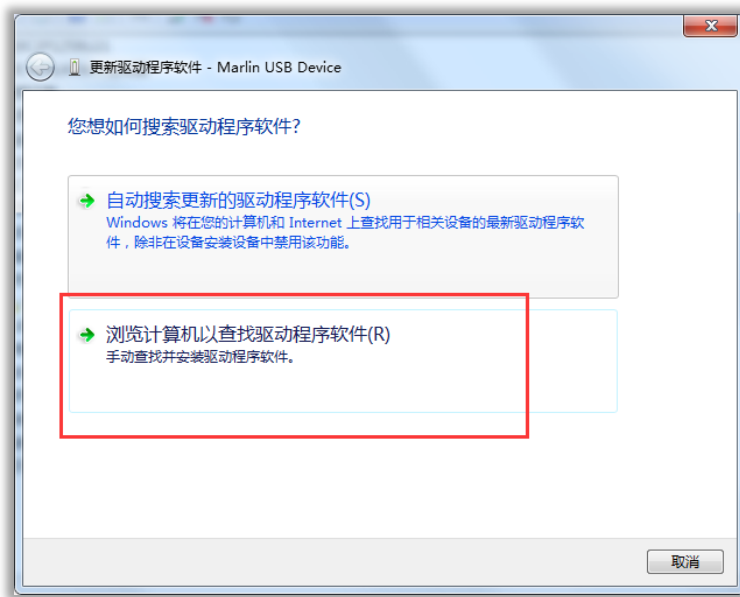
For other Windows operating systems the computer identification motherboard needs to install USB to serial port driver manually in the directory of the firmware as shown below. Because its path is too long, copy it to an easy to find location like to the desktop.



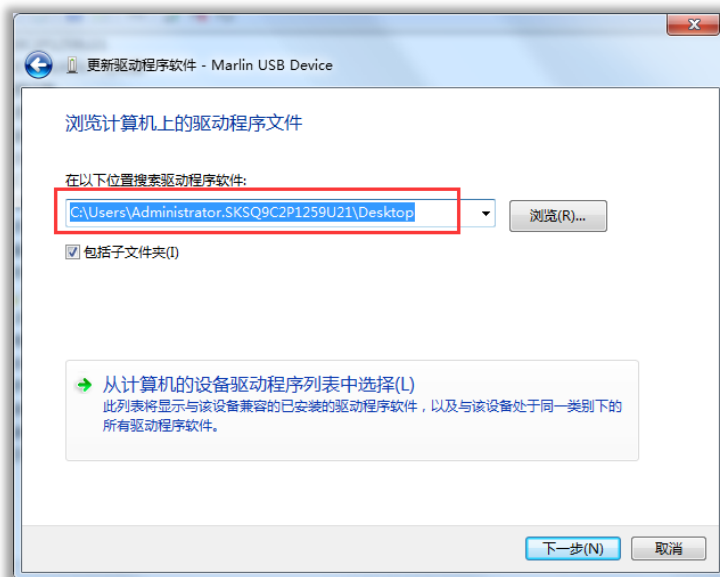
Open the Device manager, you can see that there is an unrecognized Marlin USB Device, click to update the driver software.



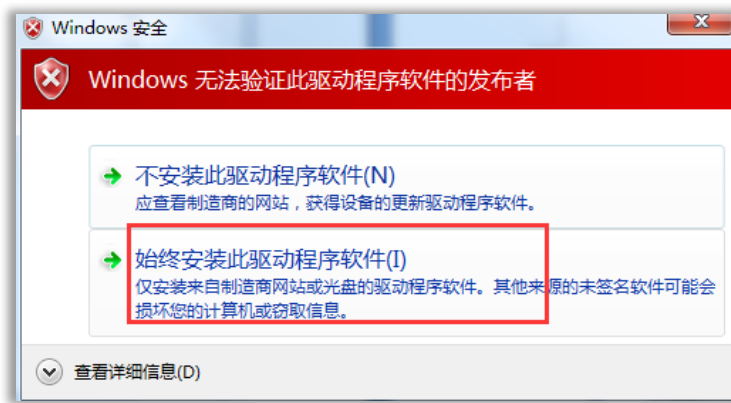
Browse the computer to find the driver software.



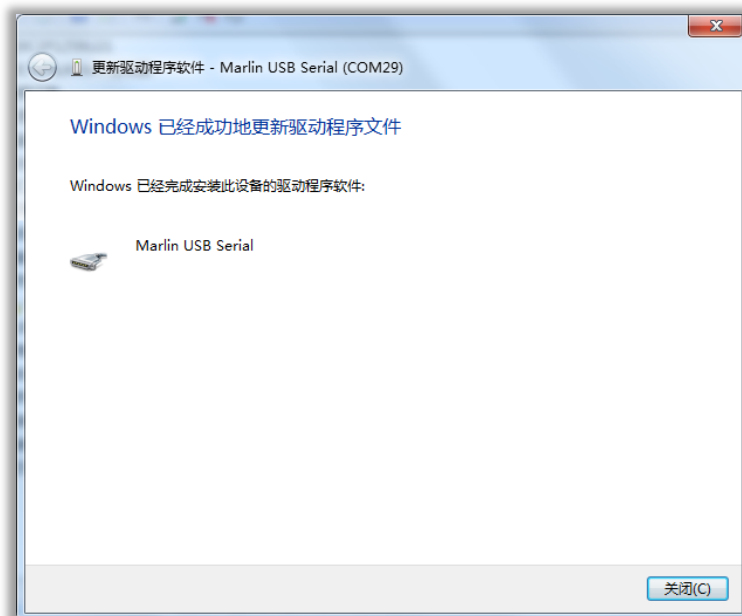
Select the path as the directory where the lpc176x_usb_driver.inf driver is located. We copied it to the desktop before, so select the desktop location: C:\Users\ (Users Name)\Desktop and click Next. Check with the below picture.



If you have firewall alerts, choose to always install this driver software.



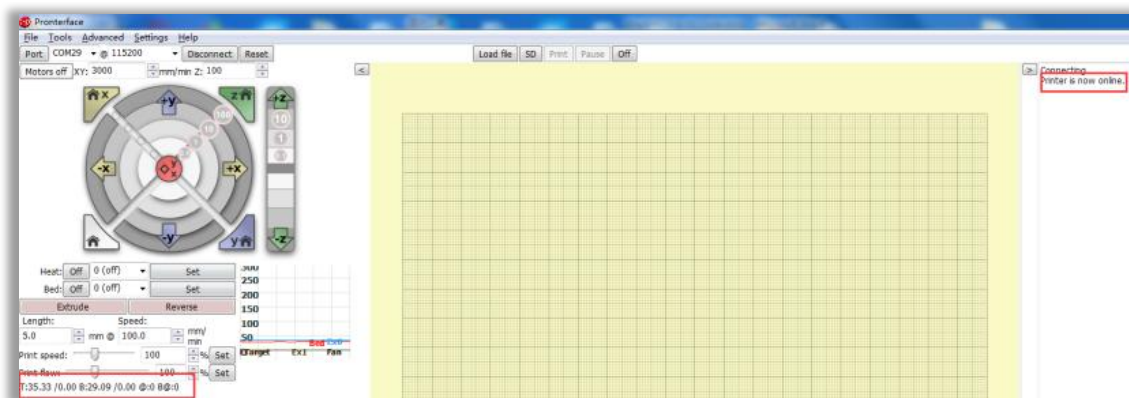
If the install was successful, then the driver has been selected successfully. Remember the port number.



Open the Prinrun/Pronterface online printing software as an example, select your com Port @115200, and then click Connect. Your COM port may be a different number.



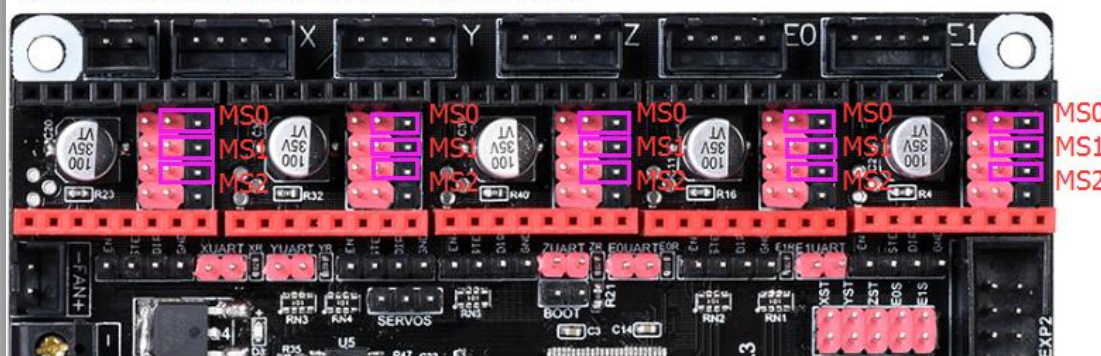
On the right, you can see the printer is now online. This means that you have successfully connected to the printer. Now you can use your computer to control the printer



Driver jumper settings for standalone usage (No UART or SPI)

STEP/DIR Mode

Contrast with various stepper motor drive subdivision selection tables, connect the purple frame in the figure below with short-circuit cap. MS0, MS1, MS2 can also be expressed as MS1, MS2, MS3. Different driver numbers are different but use method is the same.



Note TMC drivers are controlled by 3 states

0 = pin needs to be connected to Ground with jumper

1 = pin needs to be connected to V+ with jumper

OPEN = no jumper used

TMC2100	steps	MS0	MS1	MS2	Interpolation	Mode
	Full	0	0	Open	No	Spreadcycle
	1/2	1	0	Open	No	Spreadcycle
	1/4	Open	1	Open	1/256	Spreadcycle
	1/16	0	1	Open	No	Spreadcycle
	1/4	1	1	Open	No	Spreadcycle
	1/4	Open	1	Open	1/256	Spreadcycle
	1/16	0	1	Open	1/256	Spreadcycle
	1/4	1	Open	Open	1/256	Stealthchop1
	1/16	Open	Open	Open	1/256	Stealthchop1

TMC2208	steps	MS0	MS1	MS2	Interpolation	Mode
	1/2	1	0	Open	1/256	Stealthchop2
	1/4	0	1	Open	1/256	Stealthchop2
	1/8	0	0	Open	1/256	Stealthchop2
	1/16	1	1	Open	1/256	Stealthchop2

TMC2130	steps	MS0	MS1	MS2	Interpolation	Mode
	Full	0	0	Open	No	Spreadcycle
	1/2	1	0	Open	No	Spreadcycle
	1/2	Open	1	Open	1/256	Spreadcycle
	1/4	0	1	Open	No	Spreadcycle
	1/16	1	1	Open	No	Spreadcycle
	1/4	Open	1	Open	1/256	Spreadcycle
	1/16	0	Open	Open	1/256	Spreadcycle
	1/4	1	Open	Open	1/256	Stealthchop1
	1/16	Open	Open	Open	1/256	Stealthchop1

A4988	steps	MS0	MS1	MS2	Interpolation	Mode
	Full	0	0	0	No	None
	1/2	1	0	0	No	None
	1/4	0	1	0	No	None
	1/8	0	1	0	No	None
	1/16	1	1	0	No	None

DRV8825	steps	MS0	MS1	MS2	Interpolation	Mode
	Full	0	0	0	No	None
	1/2	1	0	0	No	None
	1/4	0	1	0	No	None
	1/8	1	1	0	No	None
	1/16	0	0	1	No	None
	1/32	1	1	1	No	None


ST820	steps	MS0	MS1	MS2	Interpolation	Mode
	Full	0	0	0	No	None
	1/2	0	0	1	No	None
	1/4	1	0	0	No	None
	1/8	0	1	1	No	None
	1/16	1	0	0	No	None
	1/32	1	0	1	No	None
	1/128	1	1	0	No	None
	1/256	1	1	1	No	None

LV8729	Steps	MS0	MS1	MS2	Interpolation	Mode
	Full	0	0	0	No	None
	1/2	0	0	1	No	None
	1/4	1	0	0	No	None
	1/8	0	1	1	No	None
	1/16	1	0	0	No	None
	1/32	1	0	1	No	None
	1/64	1	1	0	No	None
	1/128	1	1	1	No	None

Windows 10: Disable Signed Driver Enforcement

How can I install drivers that are not digitally signed?

Windows 10 enforces driver signatures by default. This can be disabled to install drivers that are not digitally signed. Use the following steps to disable driver signature enforcement.

1. Click the **Start**  menu and select **Settings**.
2. Click **Update and Security**.
3. Click on **Recovery**.
4. Click **Restart now** under **Advanced Startup**.
5. Click **Troubleshoot**.
6. Click **Advanced options**.
7. Click **Startup Settings**.
8. Click on **Restart**.
9. On the Startup Settings screen press 7 or F7 to disable driver signature enforcement.

Your computer will restart and you will be able to install non-digitally signed drivers. If you restart your computer again the driver signature enforcement will be re-enabled.

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