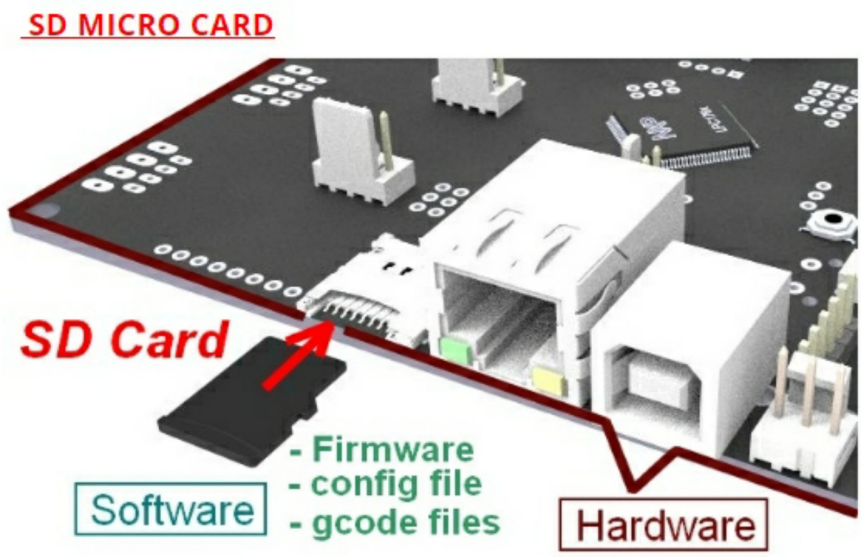
Change setting of CNC Formosa

When you need change setting of machine ?

In beginning when you build the machine
When you add a function for the machine

For example :
- the axis move wrong direction
- The homing don't work
- I whant add a button switch to start spindle
- i whant add 4th rotaring axis

1 Change fonction in CNC Formosa is change setting inside smoothieboard



We can separate the smoothieboard controler in

Software part :
Firmware —> can be update
config file —> setting of smoothieboard
Gcode files —> machining path

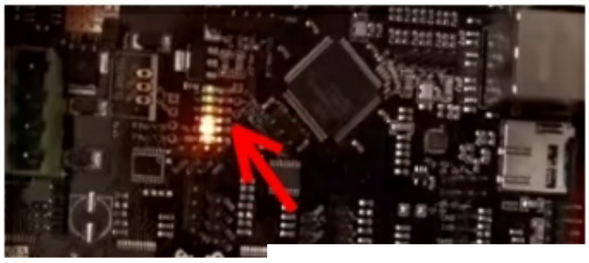
Hardware électronic board with :
32-bit Cortex-M3 LPC1769 processor
with 512kB flash and 64kB RAM
Ethernet and USB connections
Various inputs and outputs for extensibility

Without Sd-card the smoothieboard can't works

Important

If the smoothieboard can't read the two file more important config and Firmware.cur, the smoothieboard don't start.

If have problem with sd-card or firmware inside sd-card.
Can see with color of led.



Don't mix smoothieboard firmware and config with gcode file.
Create special folder '**gcode**" for exemple to put machining file inside.
If you don't can do mistake and delete sometimes important file.

For change setting inside config file can use editor like notepad++

https://notepad-plus-plus.org/zh/

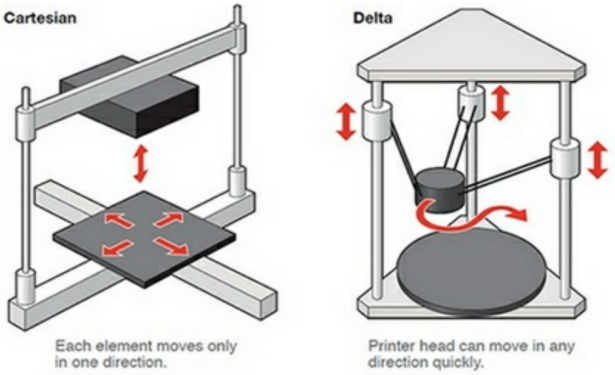
For more information about
- copy the sd-card
- what mean color of leds
follow the QR Code

2 The axis of smoothieboard in config file

Label on the Smoothieboard	M1	M2	M3
Axis in a cartesian machine	**X** (left-right)	**Y** (front-back)	**Z** (up-down)
Greek letter **in config setting**	**α** (alpha)	**β** (beta)	**γ** (gamma)

```
# Arm solution configuration : Cartesian robot. Translates mm positions
# See http://smoothieware.org/stepper-motors     into stepper positions
alpha_steps_per_mm        80        # Steps per mm for alpha ( X ) stepper
beta_steps_per_mm         80        # Steps per mm for beta ( Y ) stepper
gamma_steps_per_mm        1600      # Steps per mm for gamma ( Z ) stepper
```

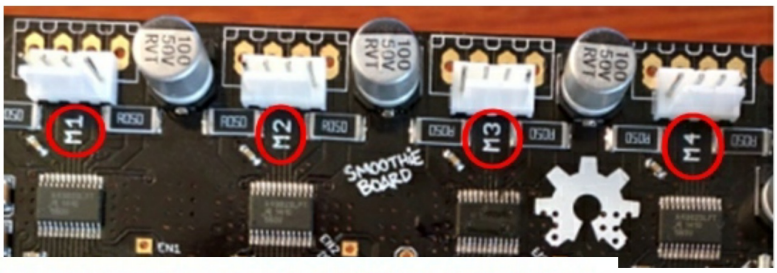
In the config file alpha match with M1 motor axis
beta match with M2 motor axis
gamma with M3 motor axis

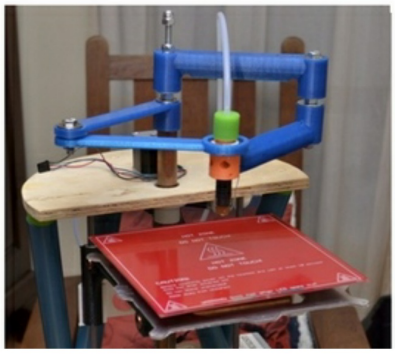


Smoothiesboard is universal for all CNC machine, no need have different electronic board for CNC Milling machine other for Laser cut machine etc. ...

Alpha --- M1 motor ----- X for cartesian machines
Beta ----- M2 motor ----- Y for cartesian machine
Gamma ---- M3 motor ----- Z for cartesian machine

The config file already have inside the different function for all machine
Just change the setting about your kind of machine.





my_pin_name **number of the pin (option)**

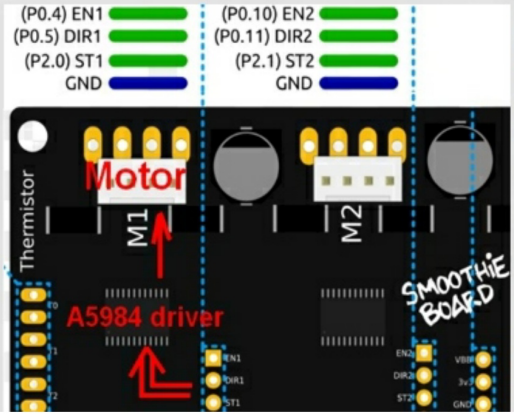
For example : **signalalpha_dir_pin** **0.5!**

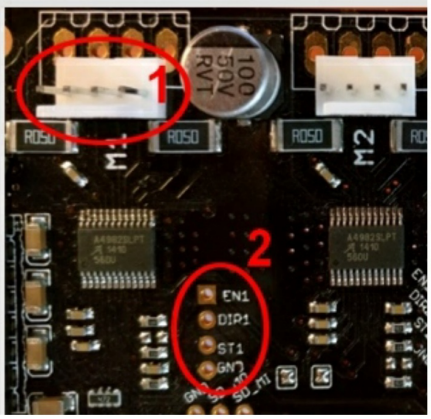
alpha_min_endstop **1.24^**

n find in

3 Options in the config file

```
alpha_step_pin          2.0     # Pin for alpha stepper step signal
signalalpha_dir_pin     0.5     # Pin for alpha stepper direction, add '!' to reverse direction
directionalpha_en_pin   0.4     # Pin for alpha stepper enable
alpha_current           1.5     # X stepper motor current
alpha_max_rate                  30000.0     # mm/min
```





In smoothieboard, for control steppers motors, can use :

Internal stepper driver : A5984 stepper drivers with 1/32 microstepping
2A max

External stepper driver : The reason to use external is when people need more power for example 3A 4A 7A

When use internal stepper driver the motor is connect to plug **write 1**

When use external driver, the external driver is connect to place **write 2** with **EN STEP DIR** and **GND** pin

All options of pin

!	invert pin
o	set pin to open drain
^	set pin to pull up (Default on most pins)
v	set pin to pull down
-	to set no pullup
@	to set repeater mode

my_pin_name **number of the pin (option)**

For example : **signalalpha_dir_pin** **0.5!**

alpha_min_endstop **1.24^**

4 Change the direction turn of motors

signalalpha_dir_pin 0.5 # Pin for alpha stepper

Direction of steppers motors

signalalpha_dir_pin **0.5!** # Pin for alpha stepper

When the motor don't turn in correct direction, no need change the wire, **just add** **!** after the pin number

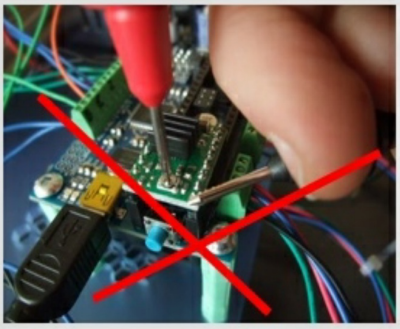
Invert the 2 last wire of Z motor axis

The direction now for Z in pronterface is wrong
So open config file with notepad and invert the direction for this motor with correct parameter

5 Change setting of limit of current (A) for stepper drivers

Limit of current (Ampere) setting in driver of motor

alpha_current 1.5 # X stepper motor current



With smoothieboard, no need use screwdriver and turn potentiometer to setting with difficulty the limit of current, like drivers of a lot of 3d printer.

All internal stepper drivers have digital potentiometer.

Just write 1.5 in alpha_current setting and stepper driver works to 1.5A

The limit without cooling system (fan) is **1.6A**

1.6 to 2A (max) need use fan on top of electronic.