Installation, configuration and use of Bigtreetech's ADXL345 sensor on Btt pi V1.2

Site internet : https://papy-3d-factory.xyz

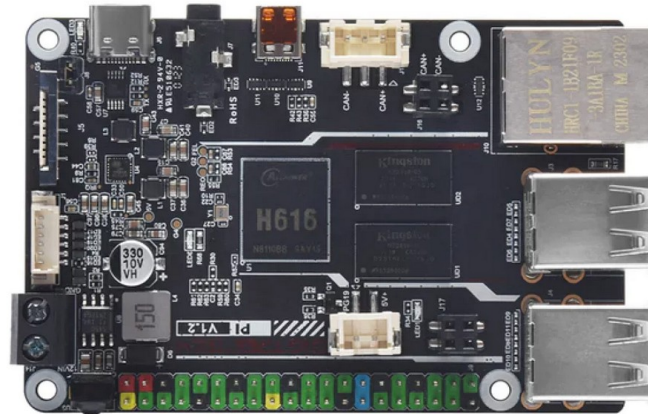Tiktok : https://www.tiktok.com/@papy_3d_factory

Github : https://github.com/Papy-3D-Factory?tab=repositories/

In this tutorial we will see how to install,
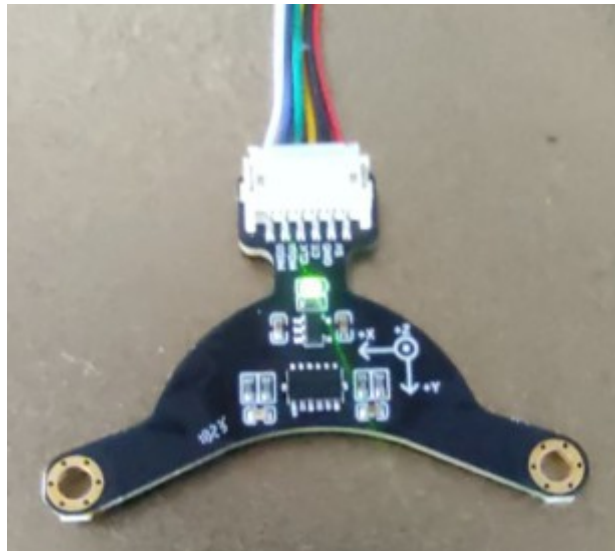
To do this we will need:
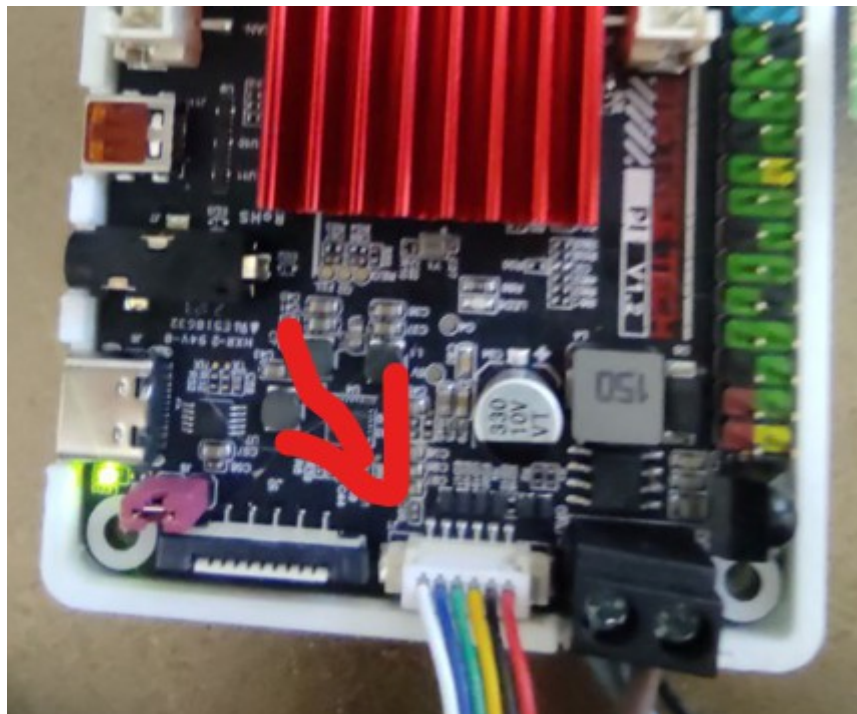
- Klipper installed on a Btt pi V1.2

- An Adxl345 sensor from Bigtreetech

We will start by connecting the adxl sensor to the tablecloth supplied with the Btt Pi

The other end will connect to the SPI adxl port of the Btt Pi right next to the power supply.
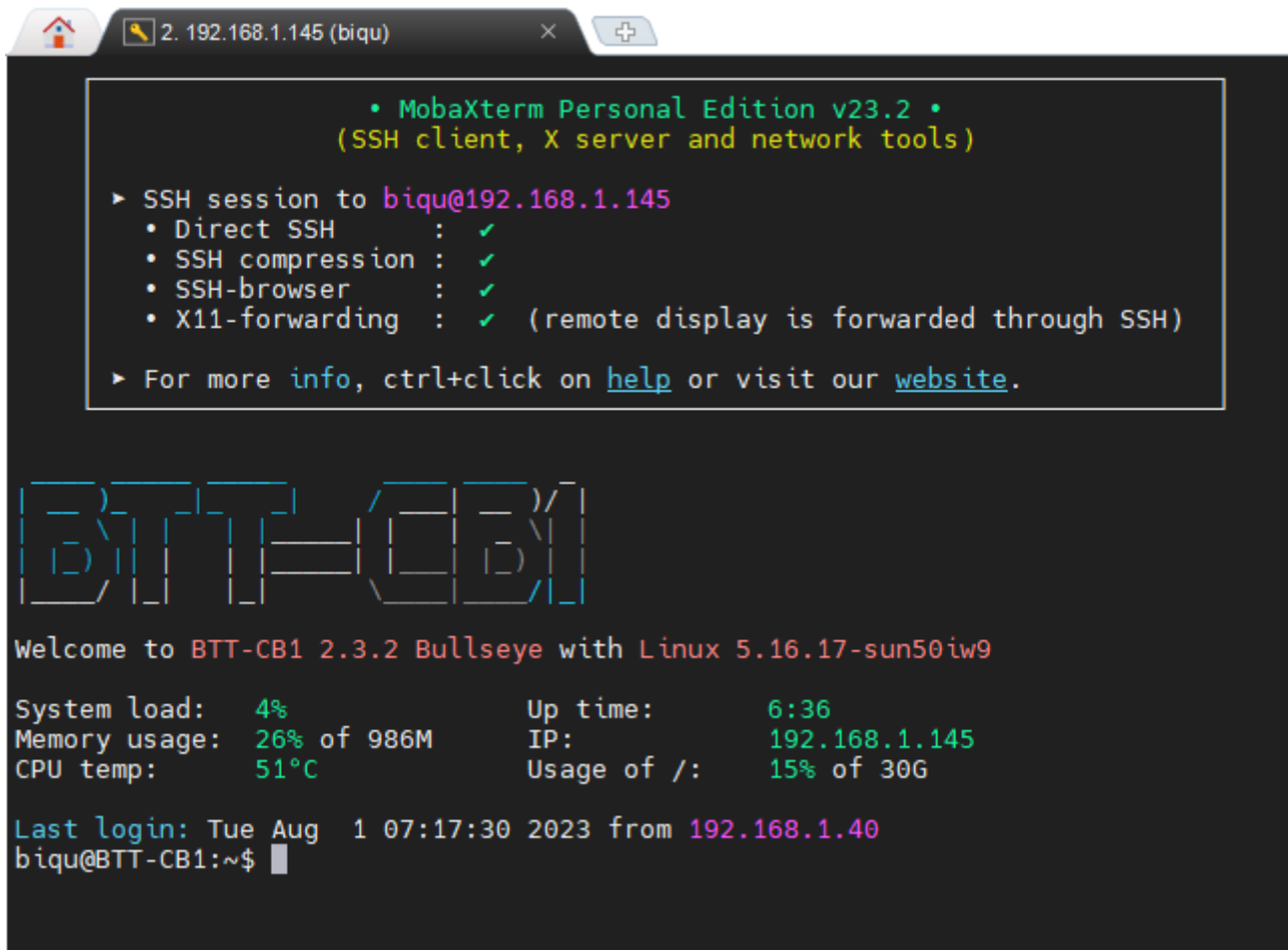

Pay attention to the polarities!!!!

Once the sensor is connected we will take care of the configuration of
Klipper
so that it can recognize the sensor.

open a SHH client (example: MobaXterm)

and connect to the Btt Pi

Once connected type the following command:

sudo -i

this allows you to obtain write rights (equivalent root)

Then type:

cd ..

cd boot

We are now going to edit the BoardEnv.txt file

Type :

nano BoardEnv.txt
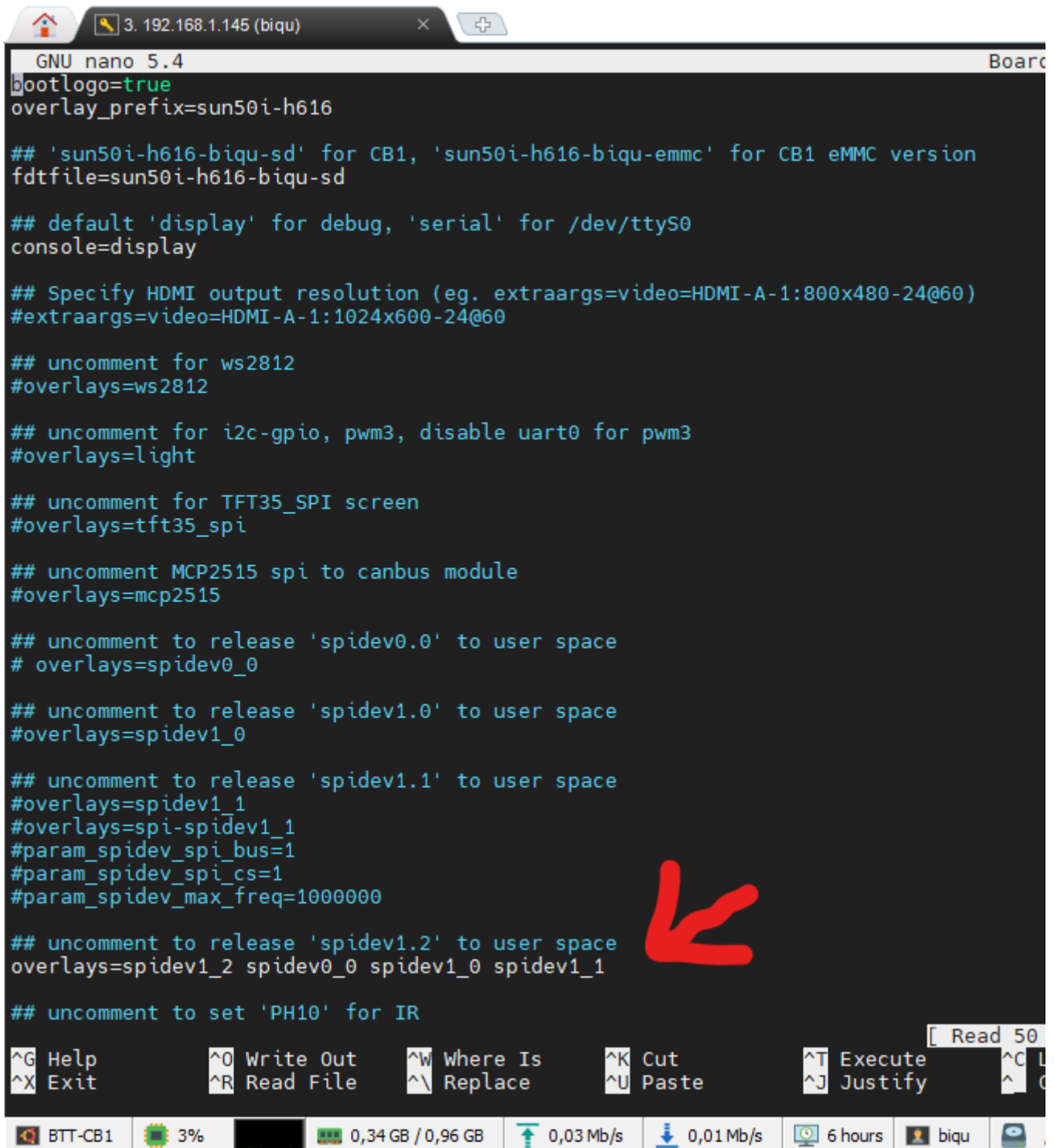
find the line:

uncomment to release 'spidev1.2' to user space

##overlays=spidev1_2

Remplacer **##overlays=spidev1_2** par :

overlays=spidev1_2 spidev0_0 spidev1_0 spidev1_1

```
bootlogo=true
overlay_prefix=sun50i-h616

## 'sun50i-h616-biqu-sd' for CB1, 'sun50i-h616-biqu-emmc' for CB1 eMMC version
fdtfile=sun50i-h616-biqu-sd

## default 'display' for debug, 'serial' for /dev/ttyS0
console=display

## Specify HDMI output resolution (eg. extraargs=video=HDMI-A-1:800x480-24@60)
#extraargs=video=HDMI-A-1:1024x600-24@60

## uncomment for ws2812
#overlays=ws2812

## uncomment for i2c-gpio, pwm3, disable uart0 for pwm3
#overlays=light

## uncomment for TFT35_SPI screen
#overlays=tft35_spi

## uncomment MCP2515 spi to canbus module
#overlays=mcp2515

## uncomment to release 'spidev0.0' to user space
# overlays=spidev0_0

## uncomment to release 'spidev1.0' to user space
#overlays=spidev1_0

## uncomment to release 'spidev1.1' to user space
#overlays=spidev1_1
#overlays=spi-spidev1_1
#param_spidev_spi_bus=1
#param_spidev_spi_cs=1
#param_spidev_max_freq=1000000

## uncomment to release 'spidev1.2' to user space
overlays=spidev1_2 spidev0_0 spidev1_0 spidev1_1

## uncomment to set 'PH10' for IR
```

[Read 50

```
^G Help        ^O Write Out    ^W Where Is    ^K Cut      ^T Execute    ^C
^X Exit        ^R Read File    ^\ Replace     ^U Paste    ^J Justify    ^
```

BTT-CB1   3%   0,34 GB / 0,96 GB   0,03 Mb/s   0,01 Mb/s   6 hours   biqu

to save type on 'Ctrl o' then 'ENTER'

and finally 'Ctrl x' to quit the editor.

Restart the Btt Pi by entering 'reboot'

You can now close MobaXterm.

Wait a few seconds for the Btt Pi to restart.

Go to Klipper --> Machine

open the printer.cfg file

find the following lines:

```
58   #######################################################################
59   # Définition et activation du capteur ADXL345 (Input Shaper)          #
60   #######################################################################
61
62   # décommenter la ligne suivante pour activer le capteur adxl345 (btt)
63   # la commenter quand innutilisé
64
65   #[include Btt_ADXL345.cfg]
66
```

and uncomment [include Btt_ADXL345.cfg]

```
58   #######################################################################
59   # Définition et activation du capteur ADXL345 (Input Shaper)          #
60   #######################################################################
61
62   # décommenter la ligne suivante pour activer le capteur adxl345 (btt)
63   # la commenter quand innutilisé
64
65   [include Btt_ADXL345.cfg]
66
```

to finish click on 'Save and Restart'

Klipper should restart without error.

Go to 'Console'

Type :

ACCELEROMETER_QUERY

if everything went well you should have an answer like this

```
17:48  accelerometer values (x, y, z): 5286.058936, -7550.100608, -74.020594

17:48  ACCELEROMETER_QUERY
```

if you have an error message repeat the previous steps, you forgot an operation...

fix the sensor firmly on the axis to be tested (x or y)

axis y (Bed) :
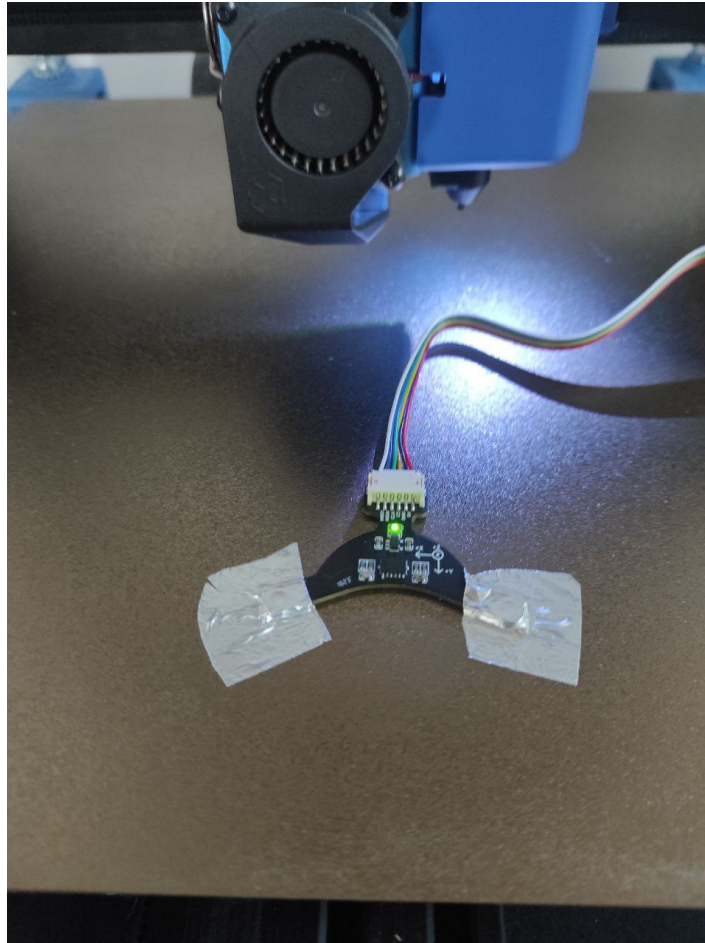
to run the test go to the Klipper console and enter:

shaper_calibrate axis=y

The Bed will start to vibrate at different frequencies, this is normal, do not touch the printer during the test to avoid distorting the data.

Wait for the end of the test, results will appear:

```
10:57  The SAVE_CONFIG command will update the printer config file
       with these parameters and restart the printer.

10:57  Shaper calibration data written to /tmp/calibration_data_y_20230805_085442.csv file

10:57  shaper_type_y:mzv shaper_freq_y:28.400 damping_ratio_y:0.100000

10:57  shaper_type_x:mzv shaper_freq_x:56.000 damping_ratio_x:0.100000

10:57  Recommended shaper_type_y = mzv, shaper_freq_y = 28.4 Hz        ←

10:57  To avoid too much smoothing with '3hump_ei', suggested max_accel <= 1500 mm/sec^2

10:57  Fitted shaper '3hump_ei' frequency = 48.0 Hz (vibrations = 0.0%, smoothing ~= 0.356)

10:57  To avoid too much smoothing with '2hump_ei', suggested max_accel <= 1500 mm/sec^2

10:57  Fitted shaper '2hump_ei' frequency = 39.0 Hz (vibrations = 0.0%, smoothing ~= 0.355)

10:57  To avoid too much smoothing with 'ei', suggested max_accel <= 2800 mm/sec^2

10:57  Fitted shaper 'ei' frequency = 38.6 Hz (vibrations = 3.3%, smoothing ~= 0.216)

10:57  To avoid too much smoothing with 'mzv', suggested max_accel <= 2400 mm/sec^2    ←

10:57  Fitted shaper 'mzv' frequency = 28.4 Hz (vibrations = 1.3%, smoothing ~= 0.253)

10:57  To avoid too much smoothing with 'zv', suggested max_accel <= 8200 mm/sec^2

10:57  Fitted shaper 'zv' frequency = 46.0 Hz (vibrations = 24.5%, smoothing ~= 0.078)

10:57  Calculating the best input shaper parameters for y axis
```
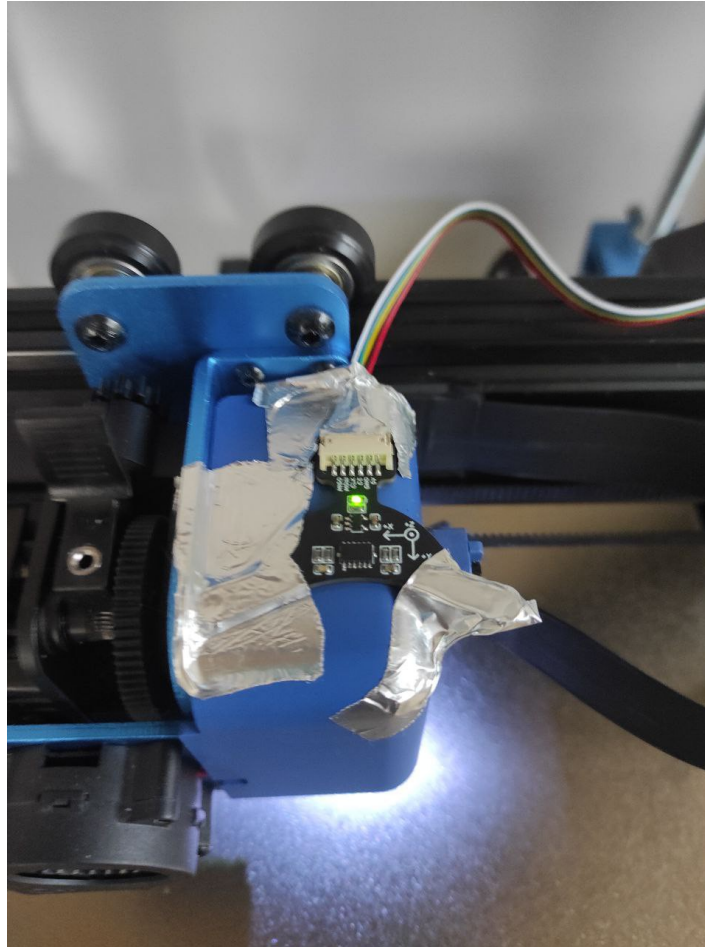
DO NOT CLICK ON SAVE CONFIG!!

Find the recommended value (28.4 Hz in this example) and the
two lines of data associated with it
then note the max_accel value (2400 in this example)

DO NOT CLICK ON SAVE CONFIG!!

Do the same for the x axis (on the print head)

type :

shaper_calibrate axis=x

```
11:05  The SAVE_CONFIG command will update the printer config file
       with these parameters and restart the printer.

11:05  Shaper calibration data written to /tmp/calibration_data_x_20230805_090229.csv file

11:05  shaper_type_y:mzv shaper_freq_y:28.400 damping_ratio_y:0.100000

11:05  shaper_type_x:mzv shaper_freq_x:54.600 damping_ratio_x:0.100000

11:05  Recommended shaper_type_x = mzv, shaper_freq_x = 54.6 Hz          ←

11:05  To avoid too much smoothing with '3hump_ei', suggested max_accel <= 6900 mm/sec^2

11:05  Fitted shaper '3hump_ei' frequency = 96.8 Hz (vibrations = 0.0%, smoothing ~= 0.087)

11:05  To avoid too much smoothing with '2hump_ei', suggested max_accel <= 7300 mm/sec^2

11:05  Fitted shaper '2hump_ei' frequency = 81.0 Hz (vibrations = 0.0%, smoothing ~= 0.082)

11:04  To avoid too much smoothing with 'ei', suggested max_accel <= 8600 mm/sec^2

11:04  Fitted shaper 'ei' frequency = 67.8 Hz (vibrations = 1.0%, smoothing ~= 0.070)

11:04  To avoid too much smoothing with 'mzv', suggested max_accel <= 8800 mm/sec^2

11:04  Fitted shaper 'mzv' frequency = 54.6 Hz (vibrations = 0.0%, smoothing ~= 0.068)    ←

11:04  To avoid too much smoothing with 'zv', suggested max_accel <= 11100 mm/sec^2

11:04  Fitted shaper 'zv' frequency = 53.4 Hz (vibrations = 9.1%, smoothing ~= 0.060)

11:04  Calculating the best input shaper parameters for x axis

11:04  Wait for calculations..
```

do the same reading as before

recommended frequency 54.6

max_accel 8800

once the TWO tests have been carried out, type the console

SAVE_CONFIG

Klipper will restart

open the printer.cfg file

comment out the sensor line

```
58  ###############################################################
59  # Définition et activation du capteur ADXL345 (Input Shaper)        #
60  ###############################################################
61
62  # décommenter la ligne suivante pour activer le capteur adxl345 (btt)
63  # la commenter quand innutilisé
64
65  #[include Btt_ADXL345.cfg]
66
```

you can verify that the data was saved at the end of the file

```
341  #*#
342  #*# [input_shaper]
343  #*# shaper_type_x = mzv
344  #*# shaper_freq_x = 54.6
345  #*# shaper_type_y = mzv
346  #*# shaper_freq_y = 28.4
347  #*#
```

find the Printer section:

```
68  ################################################################
69  # Définition de l'IMPRIMANTE                                  #
70  ################################################################
71
72  [printer]
73  kinematics: cartesian
74
75  max_velocity: 500
76  # max_accel calculé par le capteur adxl (prendre la valeur la plus faible recommandée entre le résultat de x et y)
77  max_accel: 2400
78  # Par défaut le max_accel_to_decel est la moitié de max_accel
79  max_accel_to_decel: 1200
80
81  max_z_velocity: 10
82  max_z_accel: 100
83
84  # square_corner_velocity par defaut 5.0
85  square_corner_velocity: 5.0
```

in max_accel enter the lowest value found previously:

had :

max_accel x = 8800

max_accel y = 2400
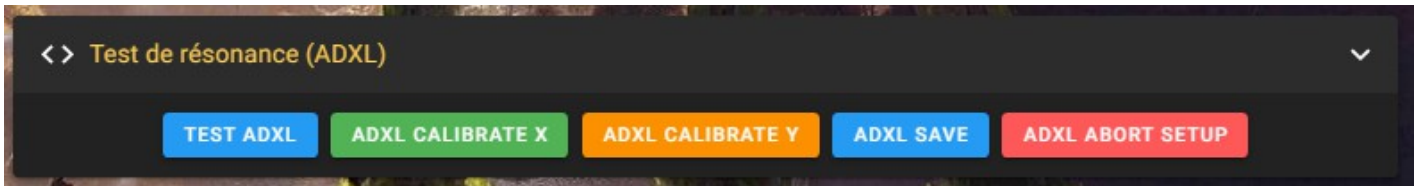
so we will keep **max_accel: 2400**

Set max_accel_to_decel to half of max_accel

max_accel_to_decel: 1200

Click on Backup and Restart

The Input Shaper configuration is now complete.

I added a Macro input_shaper in the config files, which allows to do the calculation procedure without having to type the commands in the console.

Remember, BOTH resonance tests must be done before saving the configuration.

Hope this tutorial has helped you.

Site internet : https://papy-3d-factory.xyz

Tiktok : https://www.tiktok.com/@papy_3d_factory

Github : https://github.com/Papy-3D-Factory?tab=repositories/