terraPen
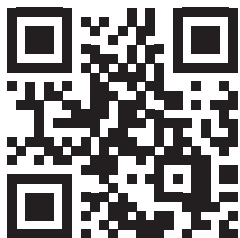
Quick Start Guide

Welcome and thank you for purchasing a terraPen plotter!

We cannot wait to see what you Create with your terraPen!

Whats in the box

- terraPen
- Pen height setting puck
- Power supply
- Corners for paper holding
- Large pen holder
- Hex keys adjusting the pen head
- Pen
- SD card (pre installed)

If you get stuck, have questions or need help, get in touch on discord.

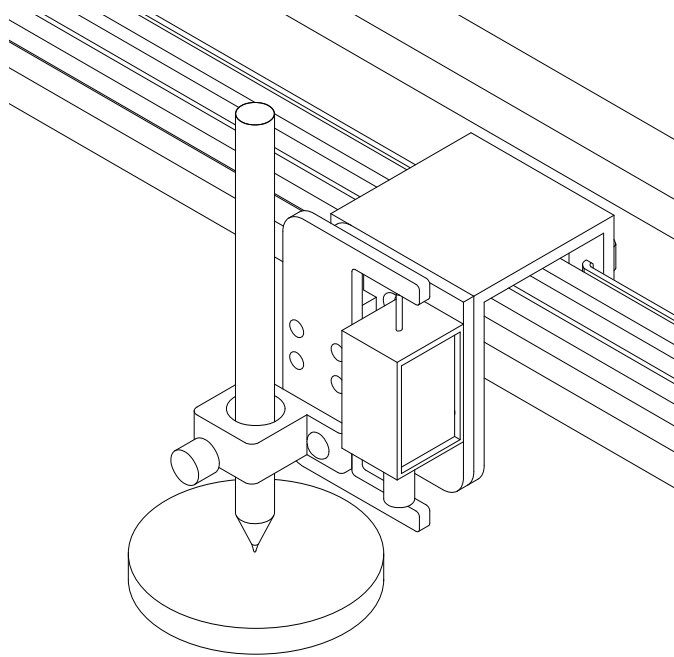Visit us at terrapen.xyz for more information.

1

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fig. 1 terraPen web UI

1st time connection

Connect the power adaptor to the terraPen controller (located under the base board) by lifting up the front of the machine. When power is applied, the machine automatically powers on.

On first use,you will be able to conect to it via WiFi and will appear in the list of available WiFi networks on your device as "terraPen". Connect using password 12345678. On Windows, a browser will open to the terraPen User Interface (UI) *(fig. 1, A)*, on macOS, a Captive Portal will open, however we reccomend connecting manually by opening a browser and going to http://terrapen.local or http://192.168.0.1

From the UI Dashboard you can move *(fig. 1, B)*, and zero the machine axis using the Controls panel.

Layout and orientation can change depending on device and screen size.

Calibration Plot

Remove the original calibration plot from the baseboard and flip the paper over and re-mount in the corner tabs. After removing the Velcro strap, carefully position the carriage to the front left corner of the paper stock.

Pen Height – Lift the pen holder up as far as it will go, it should click into place and hold once engaged. To install the included pen in the pen holder at the correct height, the provided height setting puck *(fig. 3)*. Let the pen nib fall onto the puck before tightening the pen holder so the pen is held securely.

Setting Zero - You need to choose a starting point for your work, typically the front left corner of your stock. Click the "Zero XY" button *(fig. 1, D)*. When you start plotting, the machine will start from this position.

Refresh the SD File viewer panel *(fig. 1, F)*, this will show what files are on the onboard storage. Ensure your paper is secure, the pen is tight in the holder, the pen is at the front left corner and the machine is set at X0, Y0, Z0 *(fig. 1, C)* – when ready, press the play symbol inline to the file you wish to plot *(fig. 1, Fa)* and your terraPen will plot the calibration file!

fig. 2 Ensure top row is set to zero (fig. 1, C)

As the artwork is stored on the terraPen, you can plot untethered with no PC connected!

2

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fig. 3 Pen height using setting puck

Uploading

The terraPen uses gcode files to control machine and pen movement. You can use various tools to convert your work into gcode, for example there are gcode plugins for Inkscape, online gcode generators such as Laserweb, or desktop applications like DrawingBotV3 that converts images for plotting and directly output gcode. Lightburn, which while designed for laser cutters, generates very well optimized gcode that works great with terraPen. There are also command line tools like vpype that can output gcode. You can even output code directly from your own generative art if you wish.

However you generate your gcode, you can upload it to your terraPen so you can plot it. Navigate back to the panel titled SD Files *(fig. 1, F)*. To upload new files, click on the "Upload" button and select the file(s) you want to upload and click "Open". Your files will now start uploading to terraPen and a progress indicator will be displayed.

Note: Uploading large files can take some time.

Existing files can be deleted by clicking on the "Trashcan" icon *(fig. 1, Fa)*. Files can be stored in folders and folders can be created by clicking the "Add folder" icon *(fig. 1, F)*. Total SD card storage space used is also shown at the bottom of the panel.

Plotting

You can plot anywhere on the bed that the Pen can reach, this is just over A2! Affix your paper to the bed parallel to the sides / X axis of the machine. Mount the stock with the included corner tabs or tape, ensuring it is as flat as possible. Use the steps below to check the bounds of your stock placement to the plotting extents.

Moving the pen head

You can move the pen head by hand or by using the "Controls" panel jog wheel *(fig. 1, B)*. Click on the segments of the job wheel to move the head in that direction. Outer segments move 100mm, while inner segments move 10mm, 1mm and 0.1mm respectively. To move the pen up and down, use the "Pen Up" and "Pen Down" buttons. Note: The Z axis controls may or may not move the pen up or down depending on the configuration and tool head.
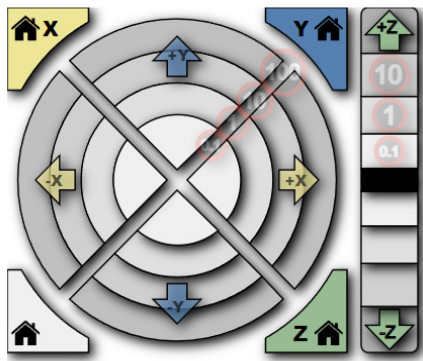

fig. 4 Jog wheel to move axis

Starting a Plot

Starting a Plot – To start a plot, locate the gcode file in the "SD Files" panel and click the "Play" button *(fig. 1, Fa)*. The plot should start immediately. You can pause and resume the plot from the "GRBL" panel *(fig. 1, E)* where a progress bar, "Pause" and "Cancel" buttons should appear.

Note: essential to have zeroed all axis before plotting *(fig. 3, C)*!

Note: After cancelling a plot, the UI will display an alarm. Click the "Alarm" button at the left of the message to clear the alarm. You will not be able to move the machine or start a new plot until it is cleared.
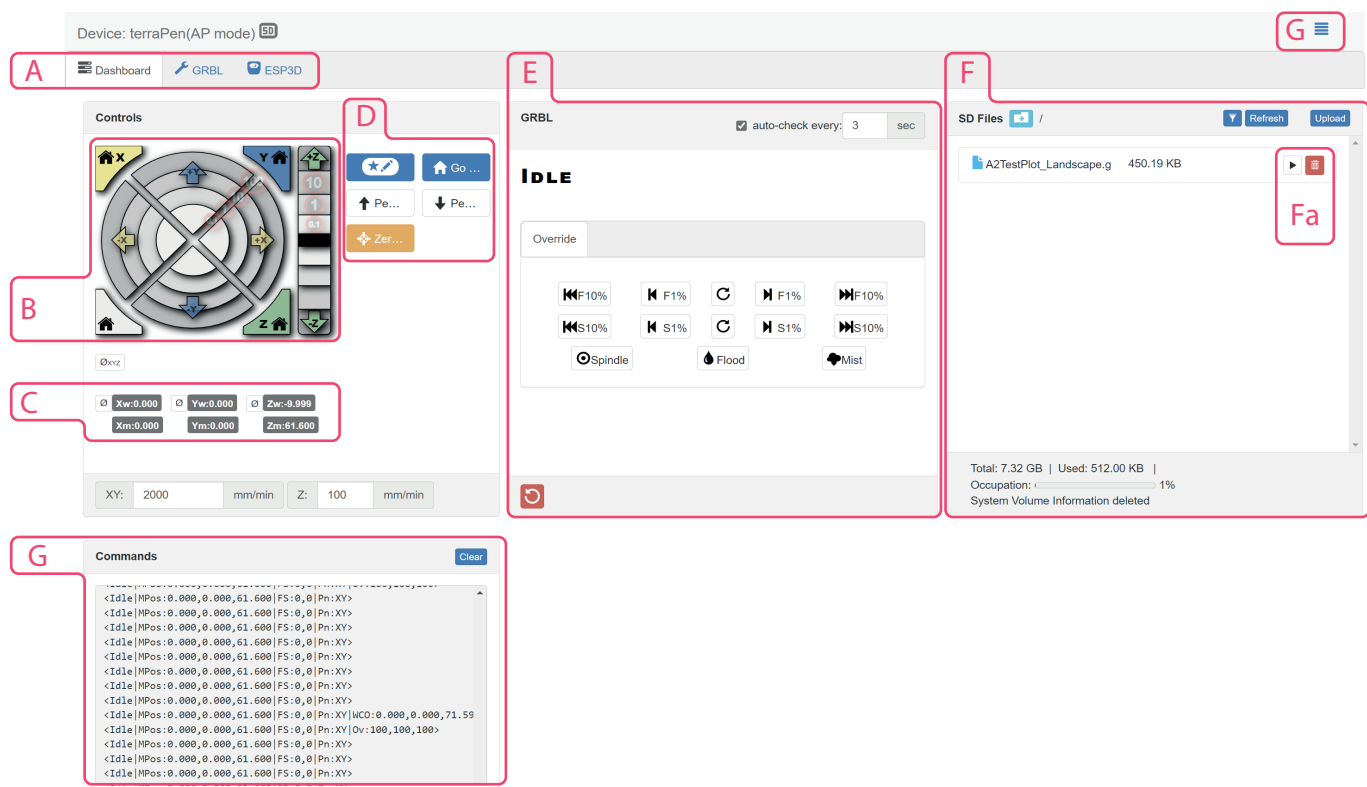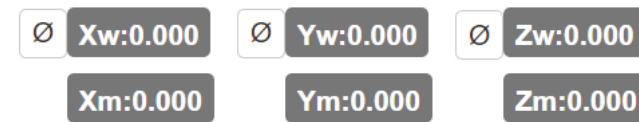
3

Connect to personal network

Use this feature to add the terraPen on your personal network, allowing you to browse the web whilst simultaneously controlling and monitoring the terraPen plotter.

After connecting to the "TerraPen" access point and loading the UI click on the menu button *(fig. 1, G)* and then "Setup". This will start the setup wizard.

Click on "Start setup"

Click "Continue"

You will see the current WiFi configuration. This is the default Access Point mode , network name "TerraPen" and password which you can change if required.
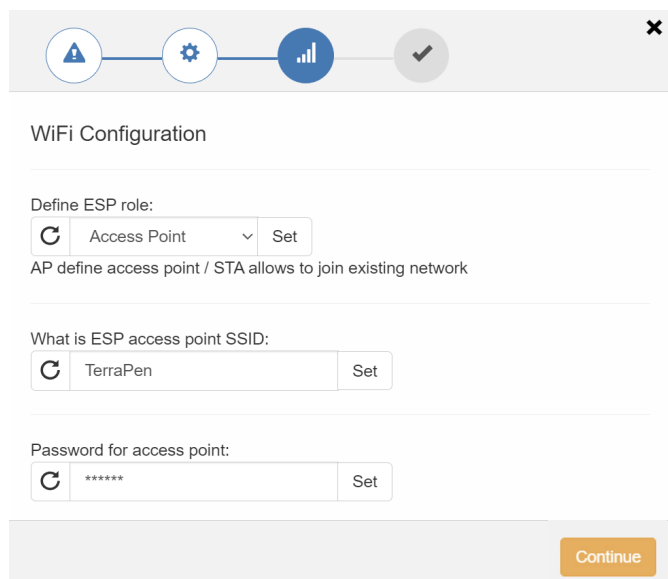

Fig 5. terraPen in AccessPoint mode

Role - To connect to your WiFi network, change the role from Access Point to WiFi Client and click the "Set" button, changing the colour should change to green.

SSID - Next enter the SSID or network name of your WiFi network and click "Set".

Password - Enter the password for your WiFi network and click "Set".
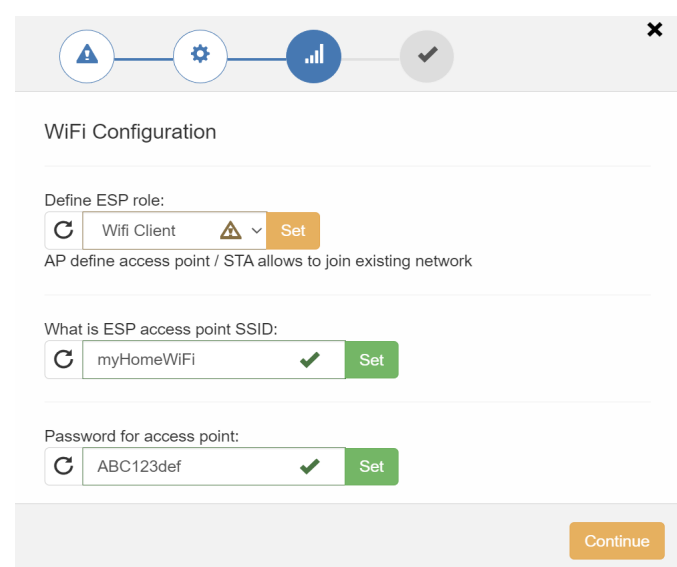
Click "Continue"

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fig. 6 terraPen in WiFi Client mode

Click "Close" to finish

Click "Yes" to restart the controller.

The controller will then attempt to connect to your WiFi network. In a browser go to http://terrapen. local to connect to the UI or connect using its IP address to connect. Check your router for the assigned address (e.g. http://192.168.1.145).

Note: If you make a mistake, the controller will fall back to AP mode after attempting to connect to your network after a minute so you can come back here after reconnecting and make any required changes.

Restart terraPen

Should you need to restart the terraPen, it is safe to switch off or unplug the machine. Alternatively you can do this via the web interface. Select the "ESP3D" tab *(A)*

ESP3D Settings

fig. 7 ESP3D Settings

Within which you will see the ESP3D settings. The red power icon can be pressed to reset the terraPen. It is likely you will be required to reconnect to the access point or refresh the broswer session once reset, which takes approximately 45 seconds.

4