PaPiRus Assembly Tips And Gotchas

In this tutorial we are going to look at some tips and gotchas about the PaPiRus HAT and the PaPiRus Zero ePaper diplays.

This is what's covered in this tutorial:

- Connect the screen to the PaPiRus board
- Damaged screen
- Connect the GPIO adapter
- Install the pogo pin connector
- Install the push buttons
- Barcode effect
- Software info
- Bi-adhesive pads
- Refresh rates and screen lifespan
- Full and partial updates

Connect the screen to the PaPiRus board

These instructions apply to both the PaPiRus HAT and the PaPiRus Zero

To open the connector at the back of the PaPiRus board you need to lift the dark brown clip on CN1 by gently allow it to rotate over its hinges until it is perpendicular to the board. The brown part clips on the beige one so it is normal for it to oppose slight resistance when opening the connector.
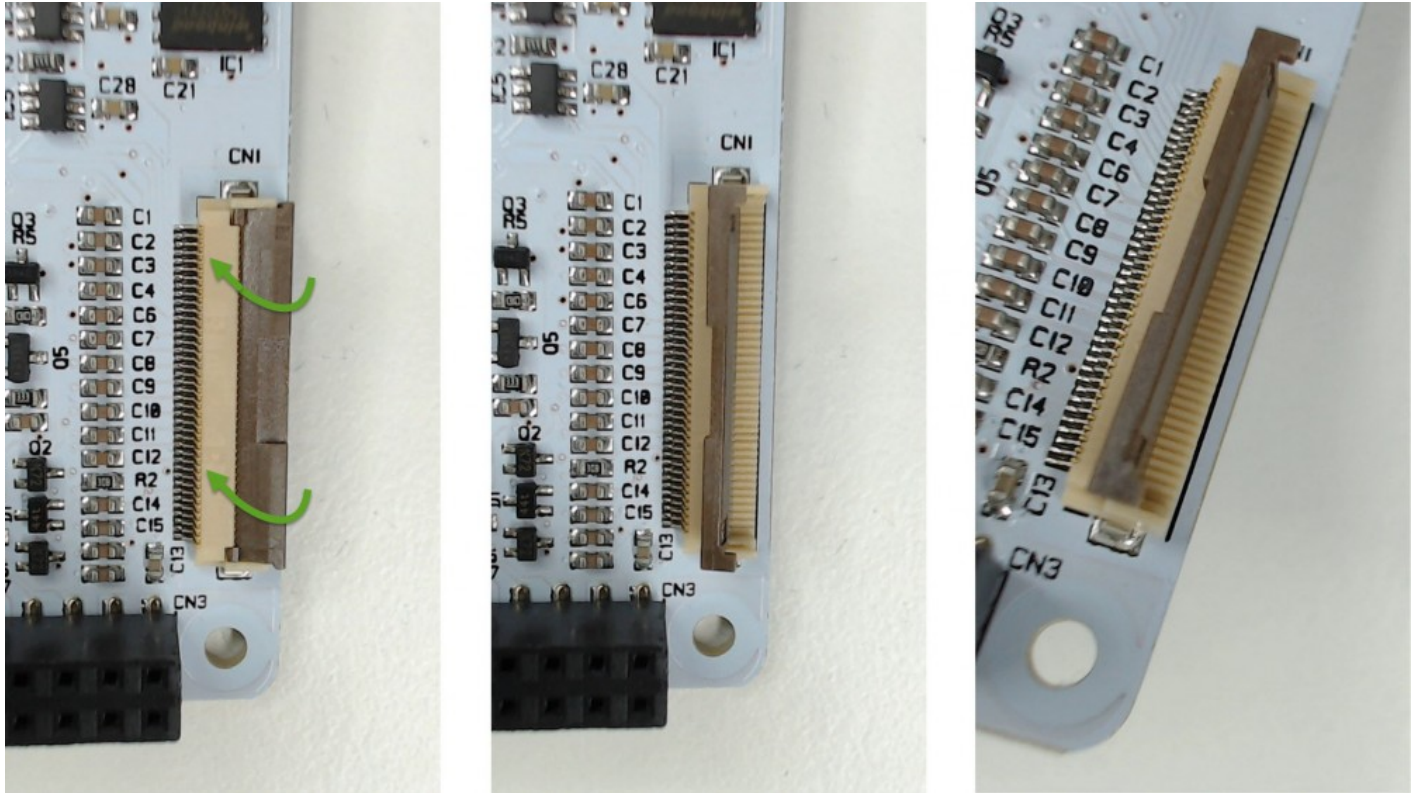
The cable terminal is the same for every screen. With the connector open, slide the cable on the beige part of the connector and gently push it so that it reaches underneath the brown clip. Make sure that the cable is inserted evenly so that when the clip is rotate back into the closed position the two dots shown in the picture are parallel with the connector.
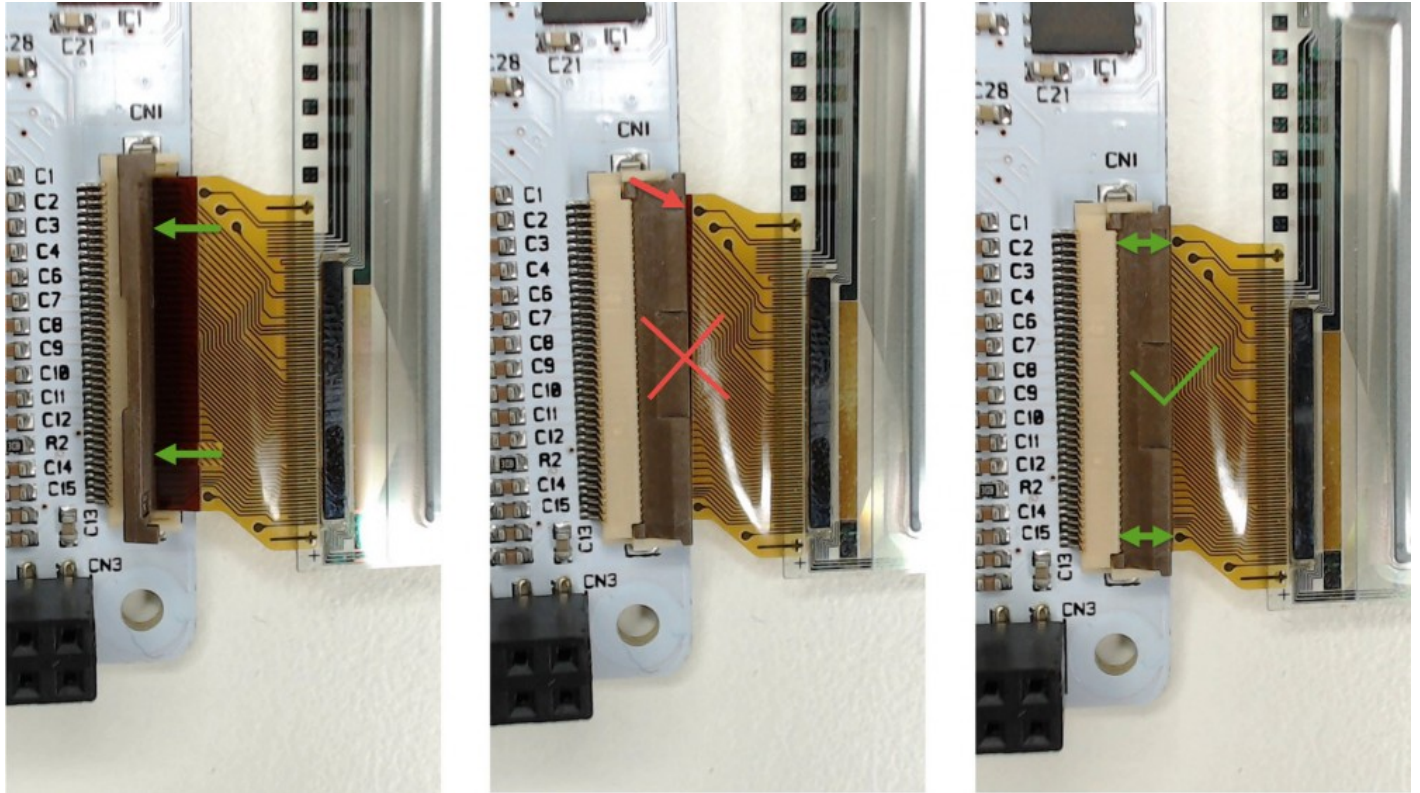
This is one of the main causes of the screen not operating correctly so make sure you pay particular care when plugging the screen in CN1.

Once the cable is in the correct position, rotate the brown clip into the closed position. You will notice that it will oppose some resistance but this is absolutely normal.

[Damaged screen](#)

The screens are extremely fragile so be very careful when handling them and fix them on the board only when your project is quite "defined". In alternatively to the bi-adhesive provided you can use a little bit of blue tack to keep the screen in place whilst you are still developing your idea so that you can easily lift the screen off before removing the PaPiRus from the Raspberry Pi. In this way you'll make sure that you will never exercise too much pressure on the screen itself.

If the damage is not obvious you can run

which will tell you if screen is functioning correctly or not.

We are now offering [replacement screens, follow this link](#) to get a replacement or simply a different size from the one you have.

[Connect the GPIO adapter](#)

Note that these instructions only apply to the PaPiRus HAT

If you need to place the PaPiRus HAT board elsewhere in your project than on the Raspberry Pi GPIO header then you can use the [GPIO adapter](#) which plugs in CN4. This connector replicates the GPIO on a practical flat cable to provide more flexibility in positioning the screen for your project.

To open the connector slide out the black clip. Push the flat cable in completely then push the black clip back in. The flat cable will have to be plugged in so that the blue part always faces upwards as in the picture.
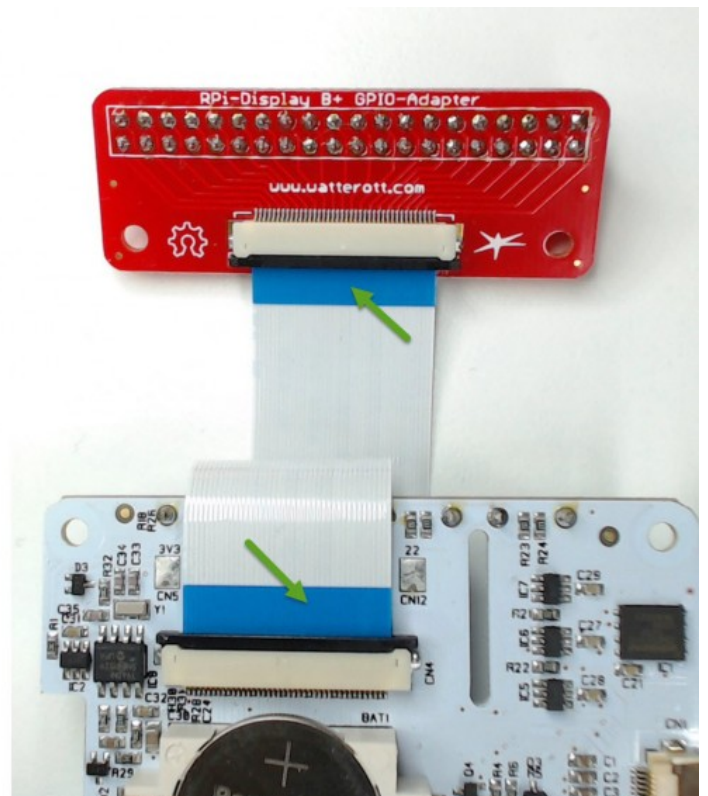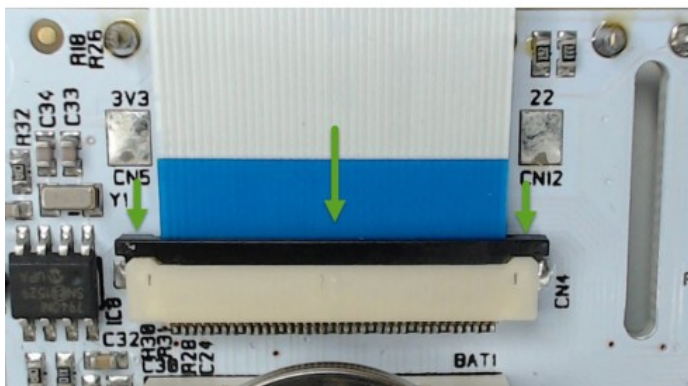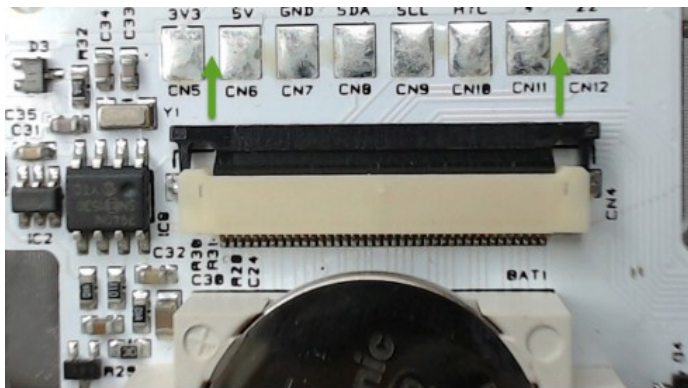

Install the pogo pin connector

Note that these instructions only apply to the PaPiRus HAT

The pogo pin will either be installed on CN13 or CN15 depending on whether you will be using your PaPiRus on a Raspberry Pi B+, 2B or a Raspberry Pi 3B.

Place the pogo pin in either of those pads from underneath as shown in the picture. By keeping the pogo pin in place perfectly perpendicular on the PCB proceed to solder it from the top side of the board. Use non lead free solder if possible as that's generally easier to work with. If you have a temperature adjustable controlled solder station you should be setting it to about 300° Celsius.
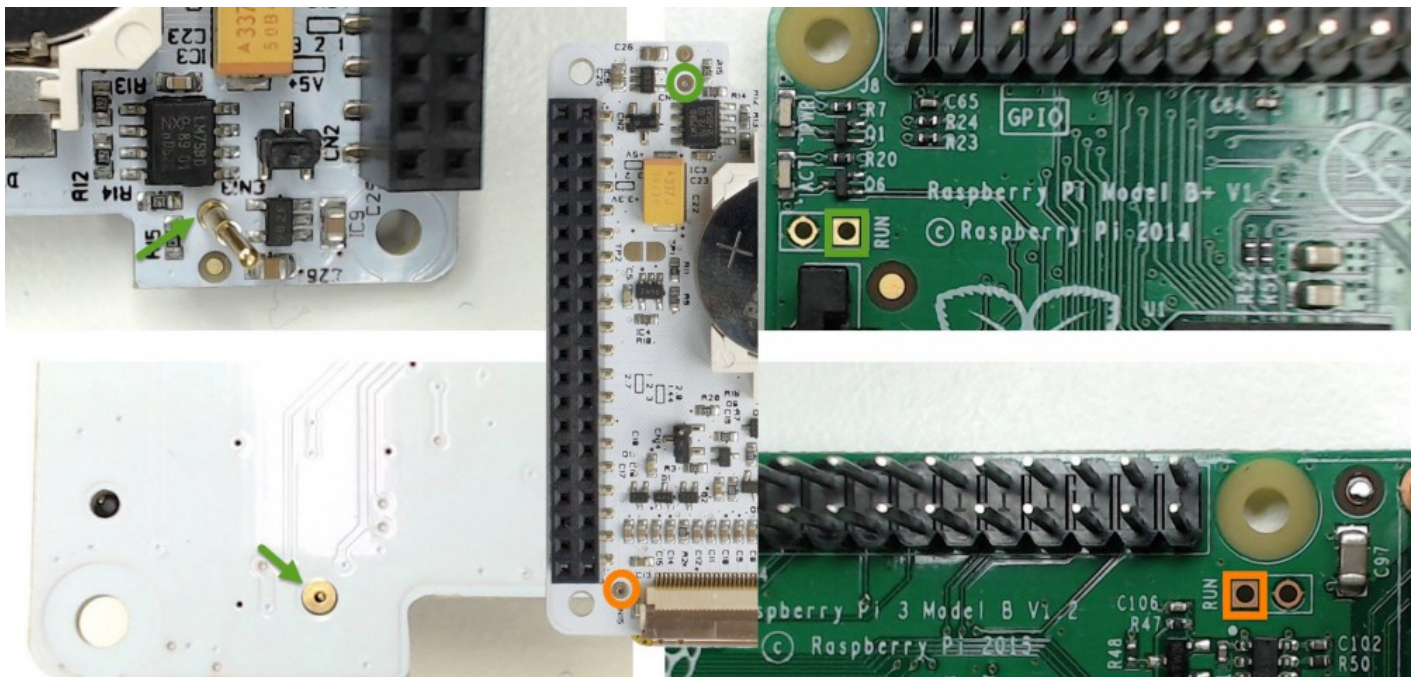

Install the push buttons

Note that these instructions only apply to the PaPiRus HAT

Place the buttons on the top side of the PCB so that the legs completely go through and the bottom of the switch is touching the PCB.

Turn the board around and solder the feet with sufficient lead. Use non lead free solder if possible as that's generally easier to work with. If you have a temperature adjustable controlled solder station you should be setting it to about 300° Celsius.
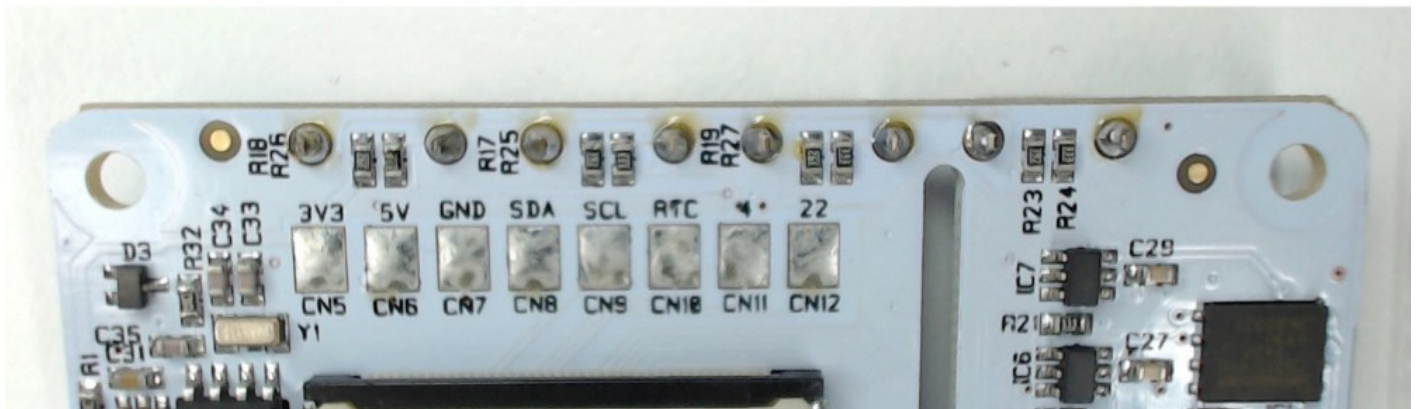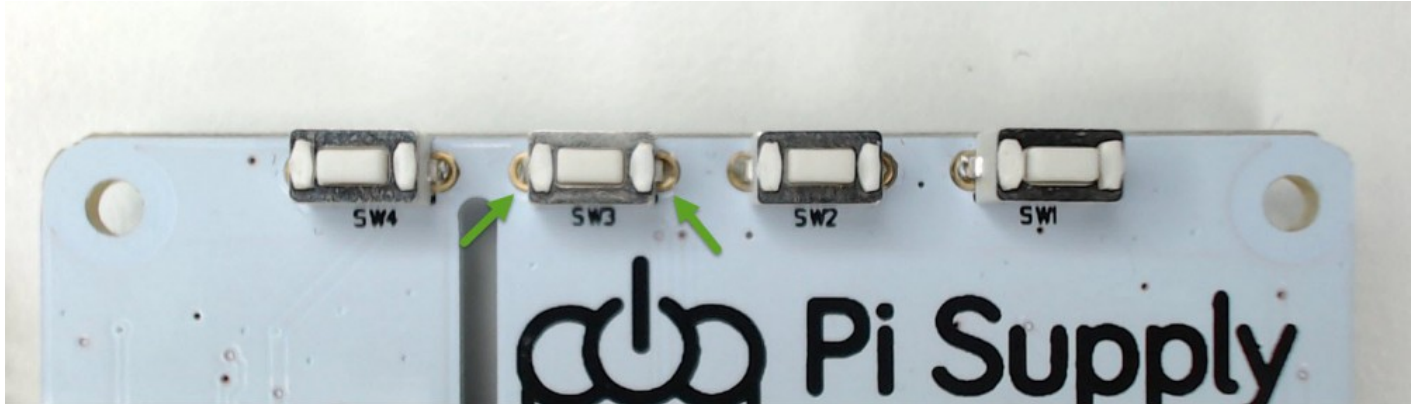
Barcode effect

If the screen size is not setup correctly writing on the screen will result in a barcode effect type of picture which might be wrongly mistaken as a defective screen.

To fix this simply type:

Remember that the screen sizes are:

- 2.7"

- 2.6"
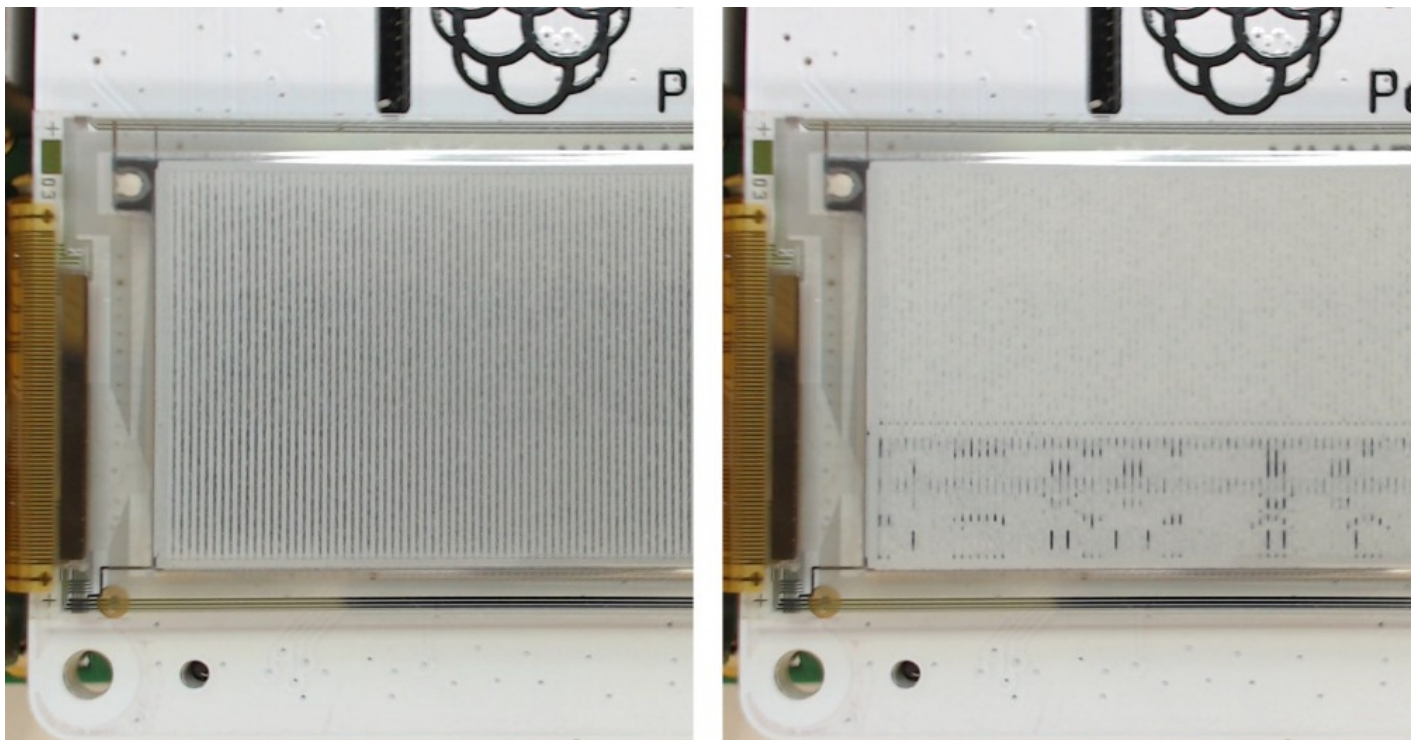- 2.0"
- 1.9"
- 1.44"

Although we only provide 2.7", 2.0" and 1.44" for the moment.

Check this link to verify [which screen did you purchase](#).

So for example to set a 2.0" screen you will need to type:

Which pins are used by PaPiRus?

Click to enlarge

[Where can I find information about the software?](#)

On [our GitHub repository](#) we keep a very detailed documentation of the PaPiRus software. There

you will also find in depth information about the hardware and much more.

I found small bi-adhesive pads in the box, what are they for?

The bi-adhesive pads are there so that you can fix the screen on the board.

Make sure that you use them once you are fairly sure that that's the configuration you want to keep the board in because removing those will be very tricky and will most certainly damage the screen.

We have had success removing those pads by cutting through them with a scalpel or a fairly similar type of blade. Obviously the adhesive part will not come off from the screen nor it will come off too easily from the board.

Is there an alternative to using the bi-adhesive pads provided? We have add success using blu-tack to keep the screen in place without preventing its removal. A small dot would be enough and should be fairly easy to detach.

Refresh rates and screen lifespan

A typical ePaper refresh rate for a full-screen update is around 1 to 2 Hz (1 to 2 updates per second). The refresh rate of the ePaper displays is dependent on a number of factors including temperature. At lower temperatures you have to drive the display more slowly otherwise you can get "ghosting" and also can damage the display. By fiddling with the temperature variables we have had customers who we know have got this level to ~15 Hz but this is not advised unless you know what you are doing as it will severely reduce the life of the display and may cause other bizarre side-effects.

Lastly, a good way to increase the refresh rate of information on the screen is to not use full screen updates but use partial updates as described below.

Full and Partial Updates

Also try using the method partial_update() instead of the update() one if you want to refresh the screen faster and maybe want to create some simple animations. Remember though that the partial method cannot be used indefinitely and you will have to refresh the screen every once in a while. You should ideally do a full refresh of the screen every few minutes and it is also