

Beolink 5000

E-Paper display mod

Installation guide

v1.0

by Pila

1 Warning !

There is a serious risk of damaging your remote, even when following these instructions.

I especially advise AGAINST installing this mod on a remote with a mostly working LCD.

I am not responsible for any damage or malfunction! Perform at your own risk.

Note : Some steps requires proper (de)soldering skills and tools.

2 Opening your Beolink 5000.

Remove the batteries.

Hold the “CD” button for a few seconds, to ensure no charge is kept stored in the capacitors.

Fully unscrew the 3 screws at the back (one is behind the battery cover).

Remove the keypad by pulling gently.

Lift the 2 plastic sheets laying on top of the *upper PCB*.

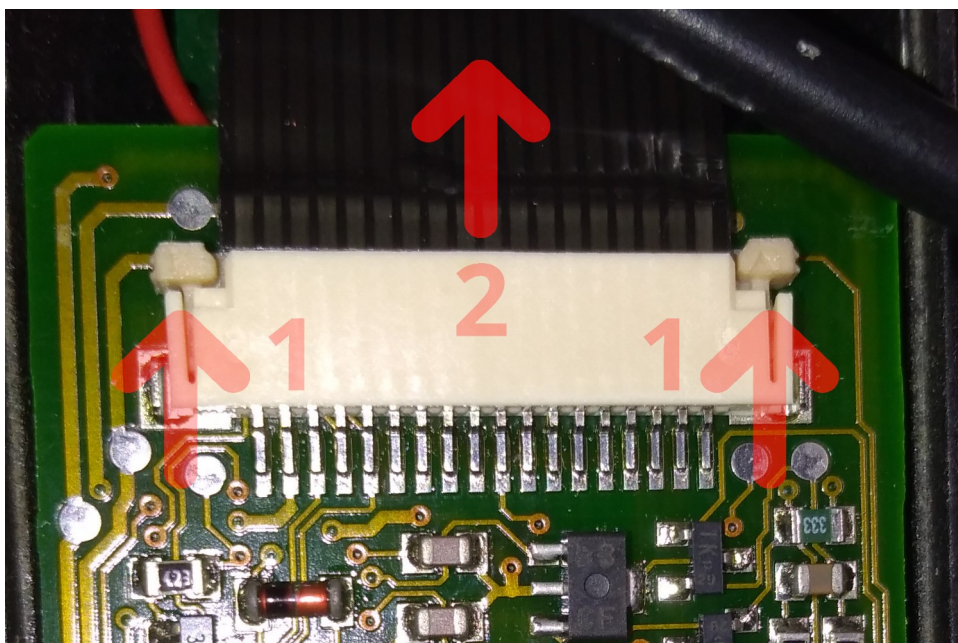
3 Removing the LCD and the upper PCB.

The *upper PCB* is connected to the *lower PCB* with a ribbon cable, located near the battery compartment.

Free the LCD from its frame, by pushing it from the back side (be careful, it will let go suddenly).

Flip the *upper PCB* (and the LCD, if still attached), to access the ribbon cable connector.

Disconnect the ribbon connector: pull gently both sides of the holder tray, then you can remove the ribbon from the connector (see picture).



4 Removing the original LCD logic

LAST WARNING: This step will permanently damage the original LCD, and potentially some LCD-related circuits on the *upper PCB*. Only proceed if you are fully committed to install this mod.

Note : this step requires proper (de)soldering skills and tools.

Cut the flat ribbon connecting the LCD to the *upper PCB*.

Remove the metallic shield protecting the LCD circuits on the *upper PCB*, by desoldering each of its mounting points (do not apply any force until the solder is molten, or you might rip out the pad).

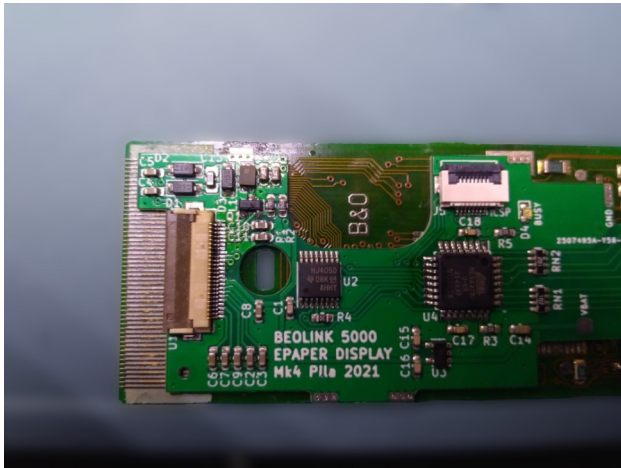
Desolder the LCD controller, its choke, and the 2 logic inverters (see picture, red markings where components were removed).

Use solder-wick to ensure that no solder remains on the pads, since the surface needs to be perfectly flat to install the *E-paper interface PCB*. When brushing the solder-wick on small pads, specially those of the LCD controller, brush in the direction on the pad, on pad at a time. Trying to brush all the pads in one pass can result in damaged pads.



5 Installing the E-Paper interface PCB

Precisely position the *E-paper interface PCB*, so that the 2 slots on the upper PCB are **perfectly centered** in the 2 holes of the *E-paper interface PCB*. Check that the *RST* pad also lines up with the proper pad on the *upper PCB* (see picture).

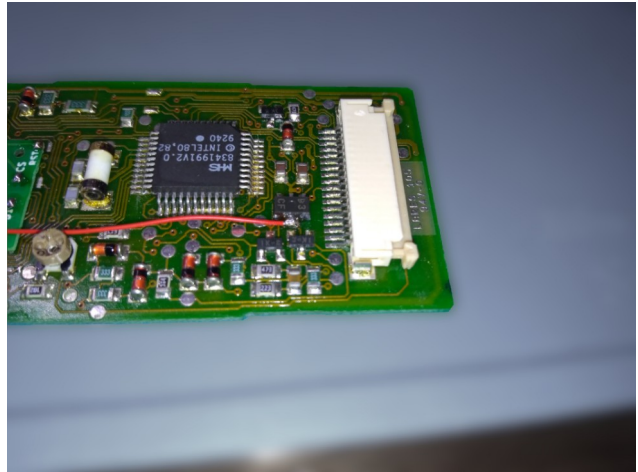
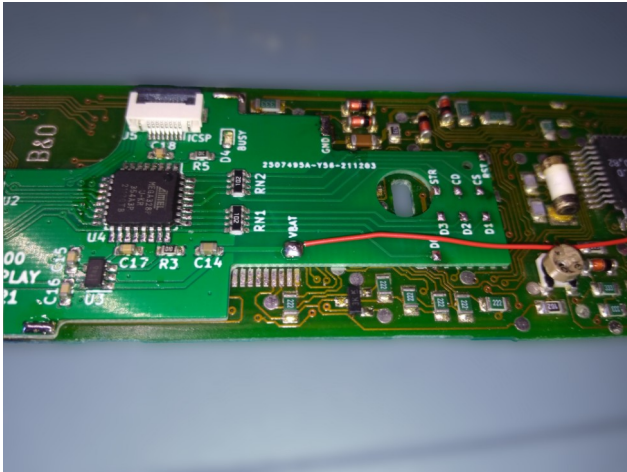


Heat the top of the *GND* pad of the *E-paper interface PCB*, then add some solder so it flows inside the pads. The *E-paper interface PCB* is now mechanically connected to the *upper PCB*, do not attempt to reposition it. If you need to reposition it, make sure to heat the *GND* pad long enough to melt all the solder connecting it to the *upper PCB*.

Repeat the process (heat and flow solder through pad) for all the signal pads on the *E-paper interface PCB*, and then for all the mounting pads.



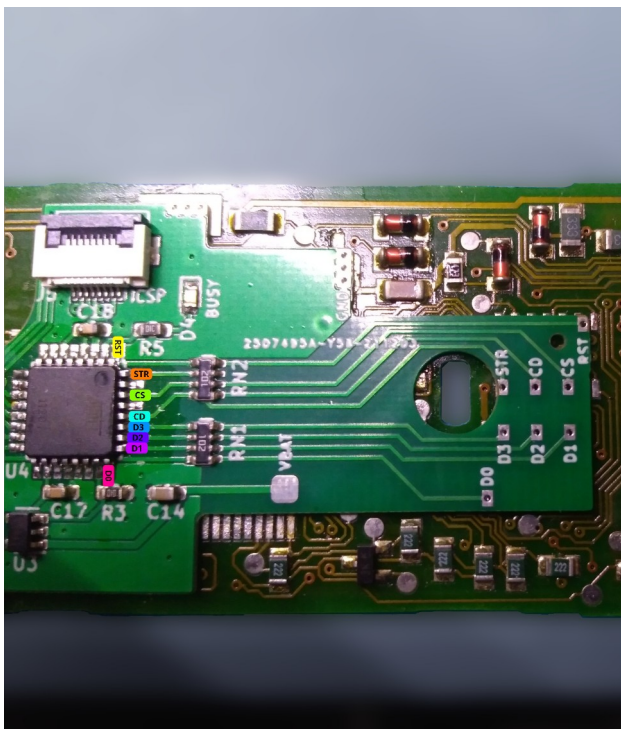
Last, install the VBAT wire according to the picture.



6 Confirming proper signals connection

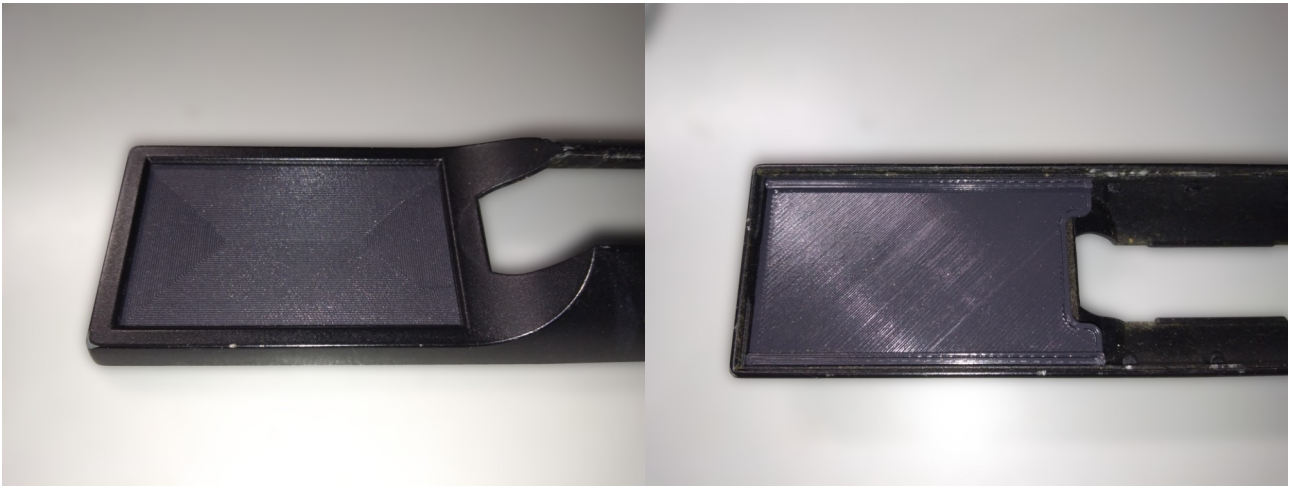
The following pictures shows the connection of each signal both on the CPU of the *upper PCB* (right picture, marked MHS) and on the ATMEGA chip (left picture) of the *E-paper interface PCB*.

Using an ohmmeter, please confirm that the resistance between the 2 ends of each signal measures 1,0k Ω . If one signal shows a higher resistance, please reflow the corresponding pad. In some case, if the *E-paper interface PCB* is not sitting perfectly flat on the *upper PCB*, reflowing might not be enough to get a proper connection. In that case, a wire can be soldered directly between the pad of the *E-paper interface PCB* and the corresponding pin of the CPU on the *upper PCB*.



7 Installing the cradle

Use thin double-sided adhesive tape bands to secure the *cradle* to the Beolink frame.



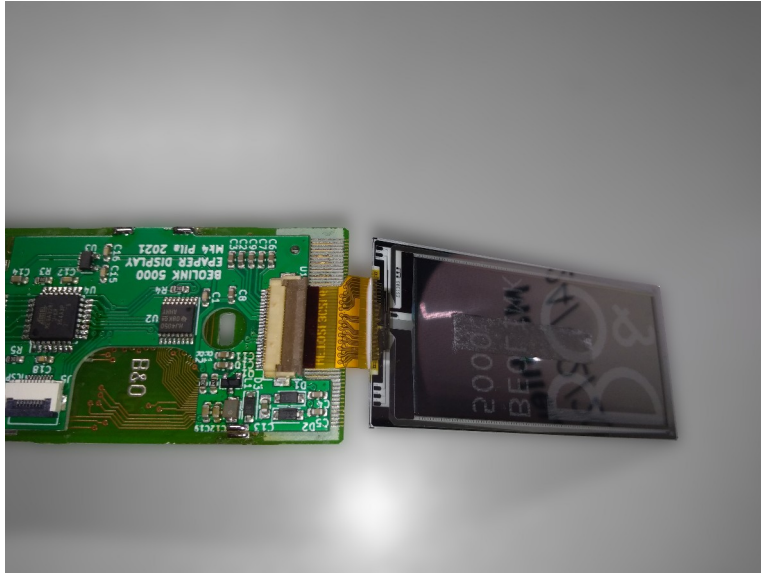
8 Reinstalling the upper PCB

Simply reconnect the ribbon cable from the lower PCB, insert the ribbon in the connector, then push the holder tray all the way in. Make sure the upper PCB keys side is facing up, as nothing will prevent you connecting the ribbon backward.



9 Connecting the E-Paper display.

On the *E-paper interface PCB*, flip open the ribbon connector , insert the ribbon from the *E-paper display*, then close the connector. Make sure the *E-paper display* is facing on the right direction, as its ribbon can be inserted both ways. The viewable side of the *E-paper display* must be on the same side as the *upper PCB* keys side.



10 Securing the upper PCB

The *E-paper display* can lay on the *cradle*, and the *upper PCB* can now return to its original position.

Reinstall both plastic sheets on the *upper PCB*.

11 First test

Insert the batteries in the battery compartment. Since the remote is not fully reassembled yet, make sure to hold the battery compartment in place, as nothing prevents it from moving upward.

As the last battery is inserted, the *E-paper display* should turn on, and show the startup screen, with the firmware version identifier. You can test the display by pressing the various buttons of the remote. Do not proceed to the next steps if you cannot confirm that the display is properly working !



12 Reassembling the Beolink 5000

Remove at least one battery.

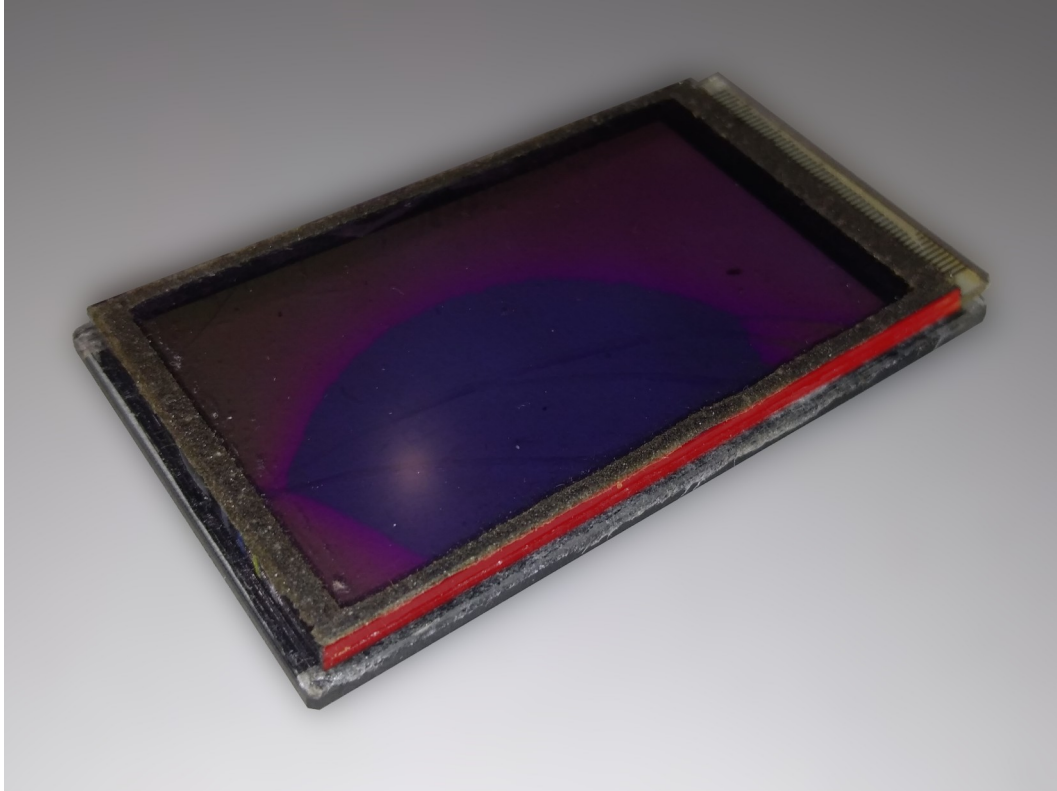
Secure the *E-paper display* in the *cradle* using a small piece of double-sided tape.

Reinstall the keypad, and secure it with the 3 screws from the back of the remote.

13 Separating the LCD from its front glass panel.

Heat the LCD / glass assembly to about 100°C.

While holding the glass secure (using wood is a good idea, as it stands heat, and will not damage the glass), push on the side of the LCD (red area on the picture), so that it “slides” out of the glass.



14 Installing the glass panel

Add a thin bands of double-sided adhesive tape to the back sides of the glass panel, on top on the original adhesive, then firmly press the glass in position to secure it to the cradle.

You can now take some time to enjoy your newly working Beolink 5000.

