

DistoXBLE assembly Instructions and tips

2023-06-09

This document is based on the DistoX2 assembly doc by B. Heeb and is written by S. Tian and Marco Corvi.

Parts:

Disto X310 by Leica

DistoXBLE board by S. Tian (included in the kit of S. Tian)

USB socket, either micro-USB or micro-UBS-C, (USB-C included in the kit of S. Tian)

Non-magnetic screws (included in the kit of S. Tian)

Non-magnetic LiPo battery, there are 2 models suitable:

Model A: Original PGEB-NM503040 (Not PGEB-NM503040).

Model B: New NM503040 that replace the electrode to wires, made by S. Tian.

Other parts:

Epoxy glue

Pads or padding foam

Adhesive paper-tape and bi-adhesive tape

Tools:

Torx T6 screwdriver

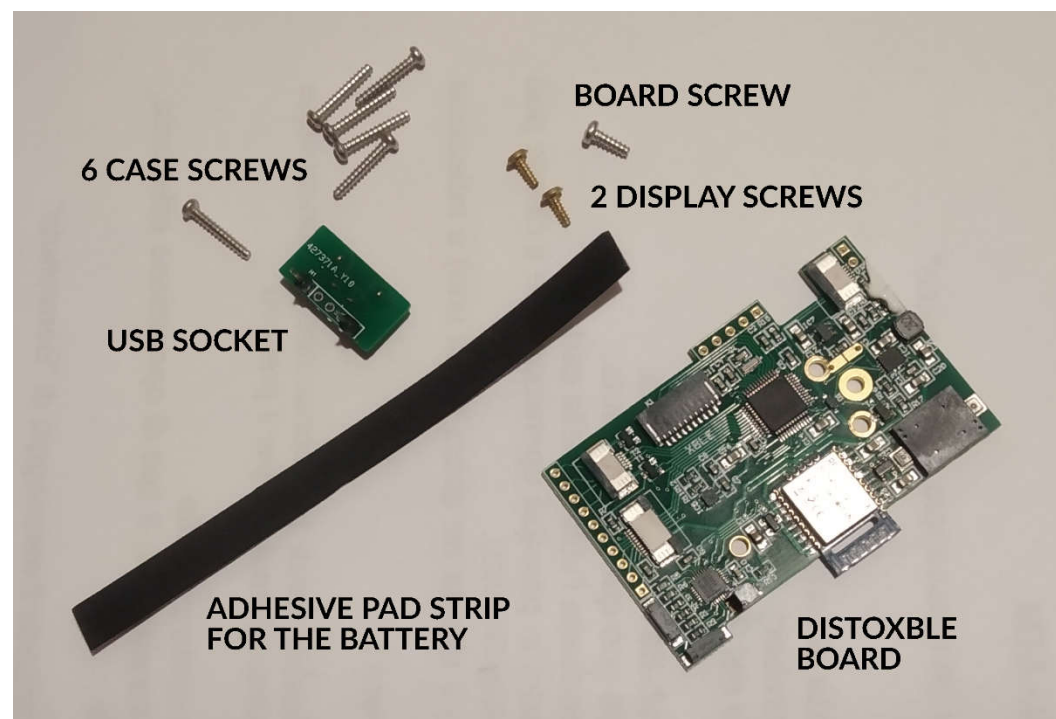
2 mm blade screwdriver

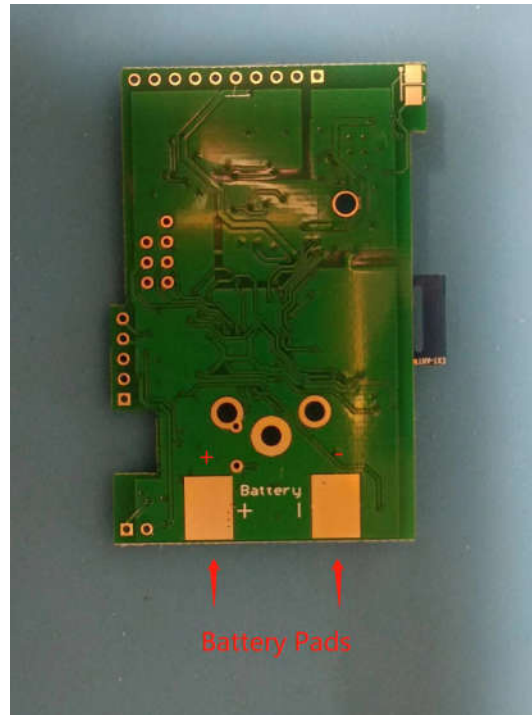
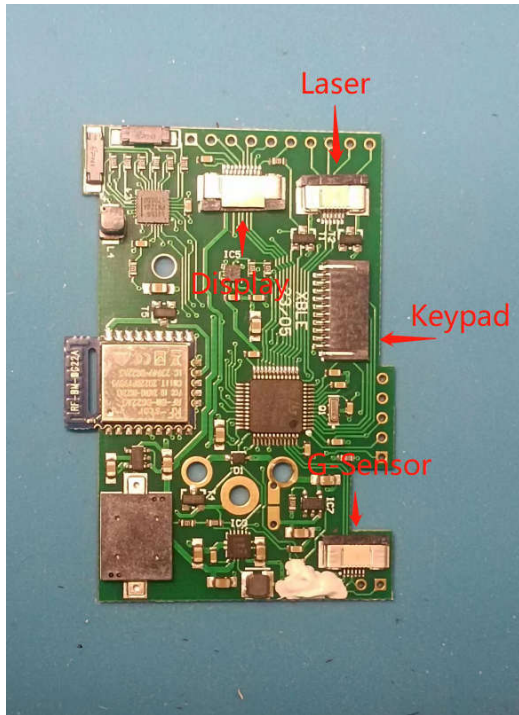
Soldering iron with solder

Multimeter

Plastic pry tool

Iron file, pliers (optional)



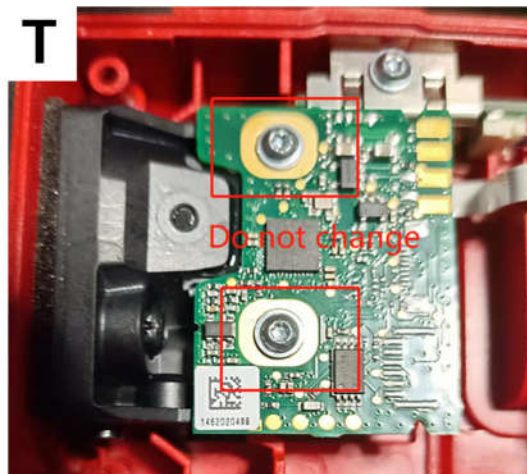


(1) Open the Disto X310 case and unmount cable ribbons.

Using the Torx T6 screwdriver remove the six screws from the back of the case. Gently lift the top of the case (with display and keypad) and disconnect the display and keypad ribbons. Pull the connectors, there is no slider. Just pull the display ribbon towards the back and the keypad ribbon to the right. Next, remove the laser and G-sensor ribbon from the board. No sliders, just pull towards the front. (Unmount 4 ribbons in total.)

WARNING

Do not manipulate the laser module (smaller board in the device near the front), in any way. **In particular, do not touch the two screws:** the laser will become disaligned to the optics and it is very difficult to re-align it.



(2) Desolder the Leica board.

Remove the screw in the middle of the Leica board. Desolder the board from the two battery connectors. To do this you can use a use solder wick or another desoldering tool. If you do not have a desolder you can melt the solder at a connector with the soldering iron and gently lift the board on the side of the connector with a plastic pry tool. After melting and lifting a few times alternating at the connectors, the board gets disconnected.

This is a good time the make sure the charge connectors do not have sharp points that might damage the battery. In case make them round with a small iron file.

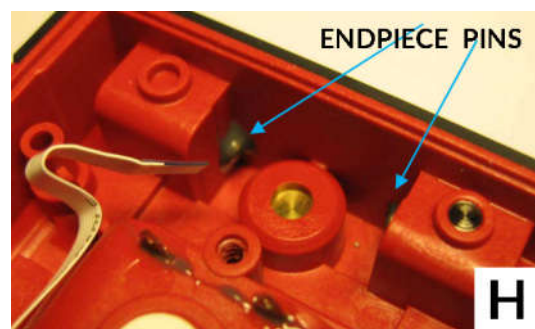


(3) Endpiece magnet

You either have to remove the magnet in the endpiece or the whole endpiece.

To remove just the magnet it is easiest to drill a small hole up to and slightly under the magnet using a Dremel like tool and a small drill (I am using a 0.8mm ball-drill). It can then be levered out using an ale.

To remove the whole endpiece scrap away the glue on the endpiece pins inside the case and push the pins from inside out. When they protrude a couple of millimeters pull them completely out with pliers. Fill the holes with some epoxy glue to make the case waterproof.



(4) Spacer padding and battery soldering

There are 2 types of batteries: Type A and Type B, each has different assembly way.

Model A: The original PGEB-NM503040

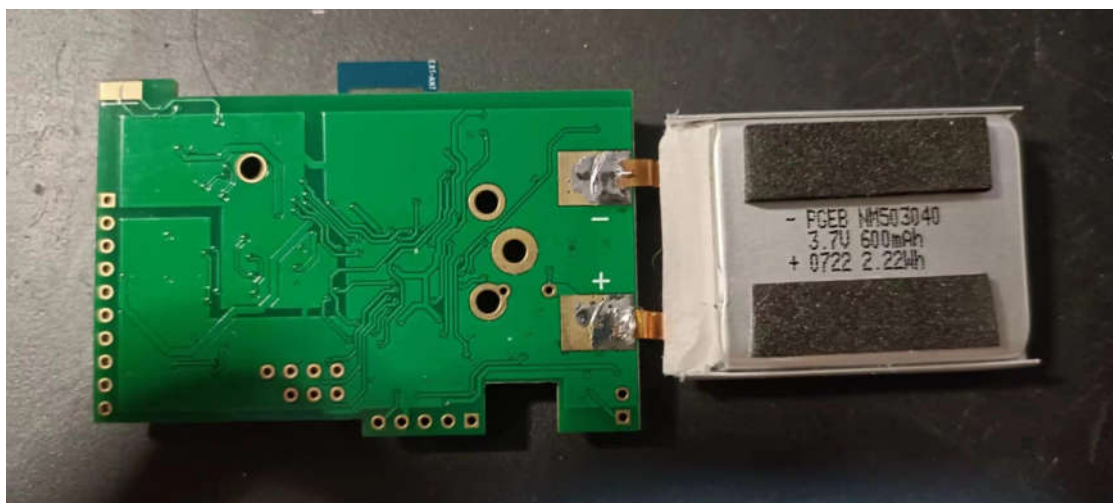
The battery connectors are fragile. Before you solder the battery to the DistoXBLE board put some paper-tape around the battery on the side of the connectors (figure on the next page)



The battery must not move once the DistoXBLE has been assembled otherwise the battery connectors may break. Furthermore, if the battery comes close to the board (in particular to the charger connectors) it can get cut and damaged. To prevent this and to hold the battery tight, spacers are applied to the battery, as in figure. The spacers between the battery and the board are placed as the 2 pictures showed below.

Solder the battery electrodes to the board pads. **Place the electrodes just over the board pads so that they extend from the board edge long enough to fold the battery over the board.**

Be careful not to invert the polarity. (See the +/- printed on battery and board).

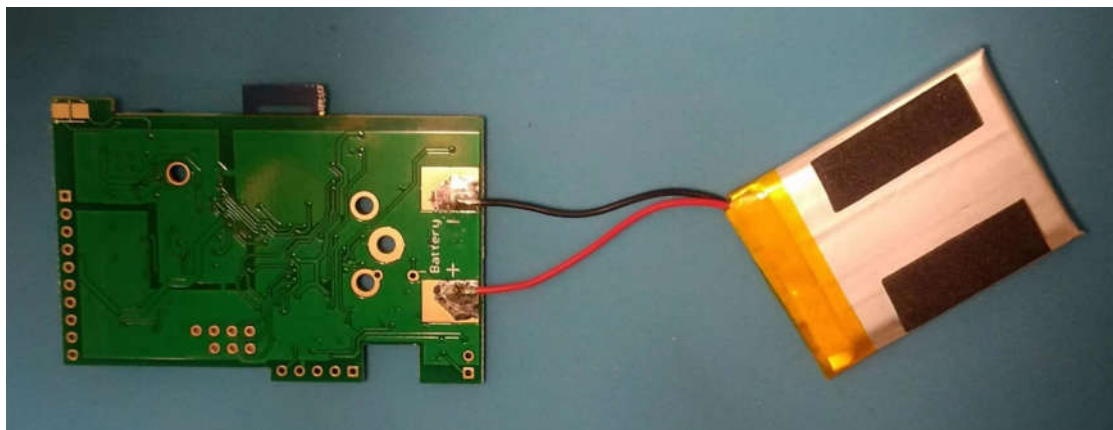
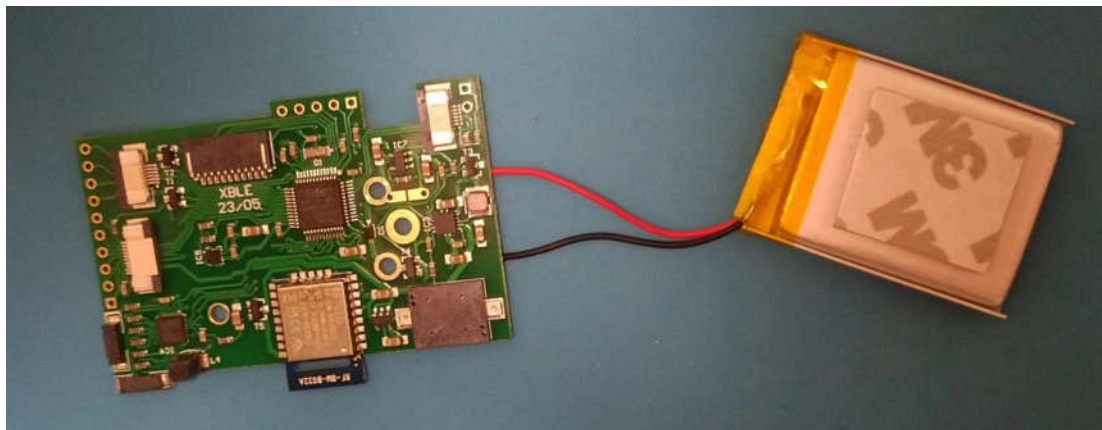
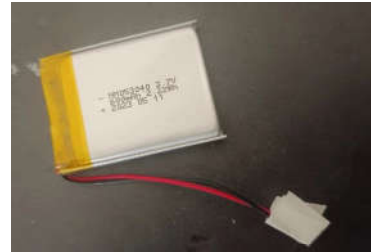


Model B: The new non-magnetic battery NM503040

Model B non-magnetic batteries replace the 2 fragile electrodes to 2 wires, which are much more stable.

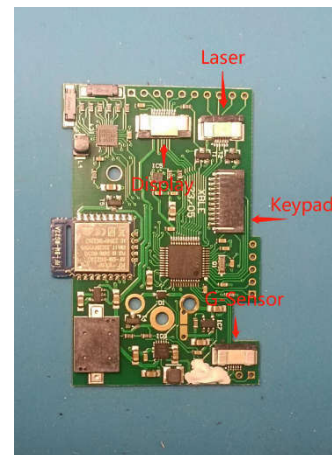
The red wire is the positive while black wire is the negative. Before soldering, cut the 2 wires to 4 - 5 cm length. When soldering, put the 2 wires on the center side of the 2 pads, because the case on the center side has bigger room to place the 2 wire headers.

3 Spacers are needed to adhere to the battery. Place the bigger bi-adhesive spacer on the side with printings. Place the 2 smaller adhesive spacers on the other side of the battery. The model B battery is adhered on the front panel of the case (The part with LCD and keypad). Place the 2 smaller adhesive spacers in the proper position to allow there is enough room for the 2 wires after closing the case.



(5) Connect laser and G-Sensor ribbons

Put the laser and G-sensor connectors in the DistoXBLE board. Pull the small black sliders forward using a plastic pry tool and slide each connector underneath the corresponding slider until it is firmly inserted. Push the sliders close with the plastic pry tool.



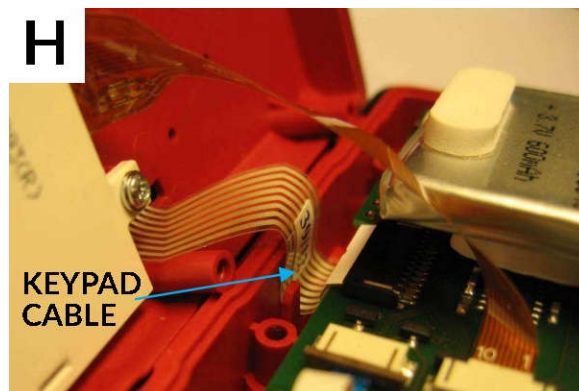
(6) Mount the DistoXBLE board

Put the DistoXBLE board in place. Fix it with the provided non-magnetic screw. Solder it to the charge connectors (be generous with the solder). Check the connection with a multimeter: each connector in the battery compartment must be electrically connected to the respective contact on the board.



(7) Display and keypad

Replace the display screws with the two provided small screws. At a minimum you must replace the screw on the side of the magnetic sensor (left side seen from above), or just remove it and leave only one screw to hold the display. Connect the keypad ribbon. There is no slider. Just insert it firmly. **Bent the ribbon down inside the case as in figure and put a piece of paper tape or double-side adhesive tape to hold it this way.**



This guarantees the cable has a good contact with the connector. If not, you may encounter some keys that do not function well. This especially occurs in some pre-owned Leica X310.

Connect the display ribbon. Pull the slider towards the back and slide the connector over it. Insert it firmly and close the slider using a plastic pry tool to push it in.

(8) Checks

At this point you should make sure that the DistoXBLE works. Press the DIST button on the keypad: the laser should turn on and the display should show the blinking icon and the values of azimuth and clino. Try to take a shot.

Press DIST again and CLR (CLEAR) to turn the laser off. Check the other buttons:

- FUNC displays device infos.
- UNITS shows the data in memory
- REF changes the device reference
- CLR+SMART toggles the calibration mode on/off

Finally press and hold for five seconds the CLR button to switch off the DistoXBLE. If something is not working you must go back and fix it. The most likely problem is a connector not well inserted.

(9) Close the case

Model A: The original PGEB-NM503040

Fold the battery over the board. Be careful to put a padding foam between battery and board, or place adhesive pads on the battery to keep it from the board. Some padding between battery and keypad may be necessary to prevent the battery to move inside the case. (shown as the picture below)

Make sure the keypad cable is placed sideways below the board. Take care of the correct placement of the rubber seal. Use the six provided a-magnetic screws to close the case. Keep the original washers in place.



Model B: The new non-magnetic battery NM503040

Adhere the battery to the back of the front panel with the double sided adhesive spacer, shown as the picture below. **When closing the case, make sure the case edge does not cut the 2 power wires and they are well placed.** (Shown as the picture below).

Make sure the keypad cable is placed sideways below the board. Take care of the correct placement of the rubber seal. Use the six provided a-magnetic screws to close the case. Keep the original washers in place.

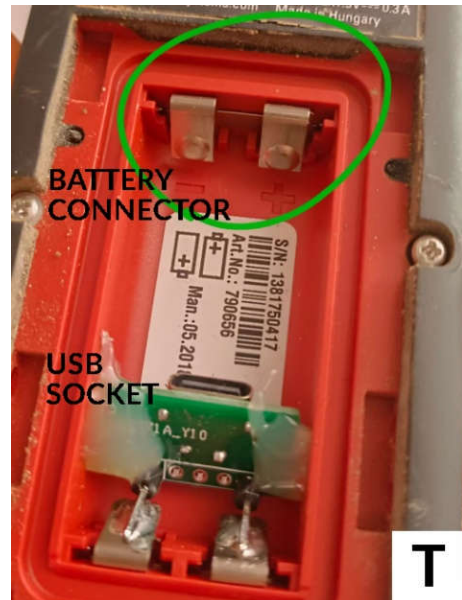


(10) Remove the useless battery connector.

The front battery connector affects the magnetic sensor. Use a blade screwdriver to remove it. There is a tiny tick holding it. Bend it a little towards the inside of the battery compartment and force it to come out.

(11) USB socket

Solder the USB socket to the charging connectors in the battery compartment, as shown in the figure. Directly solder the 5V pad to the + (left) contact and GND to – (right) contact, as in figure. Do not connect D+, D–, and ID. Use some epoxy glue to fix the USB socket to the case inside the battery compartment.



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Troubleshootings

This section applies when there are some problems after assembly. The problem solutions also work for disto X2 (Beat Heeb and Oliver Landolt's version).

Problem 1: Some keys fail to work or become insensitive

Solution :

Check the Keypad ribbon. As mentioned above, the cable should be bent and inserted into the gap between the case and the PCB board. Put a piece of paper tape or double-side adhesive tape to hold it this way.

This operation makes the ribbon and the connector contact better.

Problem 2: Disto X turned on with no laser and quickly turned off automatically after 3 seconds with a long beep.

Solution :

This is due to the G-sensor cable ribbon not well mounted. There is a short-circuit inside the connector. Re-mount the G-sensor cable and check if it works. If not, simply unmount the G-Sensor cable. Disto XBLE can work well without the external G-sensor. The other G-sensor on board has better performance and lacking the external G-sensor does not impact the accuracy.

Problem 3: The azimuth angle shows 177° and does not change while rotating the device.

Solution:

The Z-sensor is not soldered well. It might be damaged during the transportation. Re-soldering this component works. If there is any damage on the component, changing a new one is needed.

