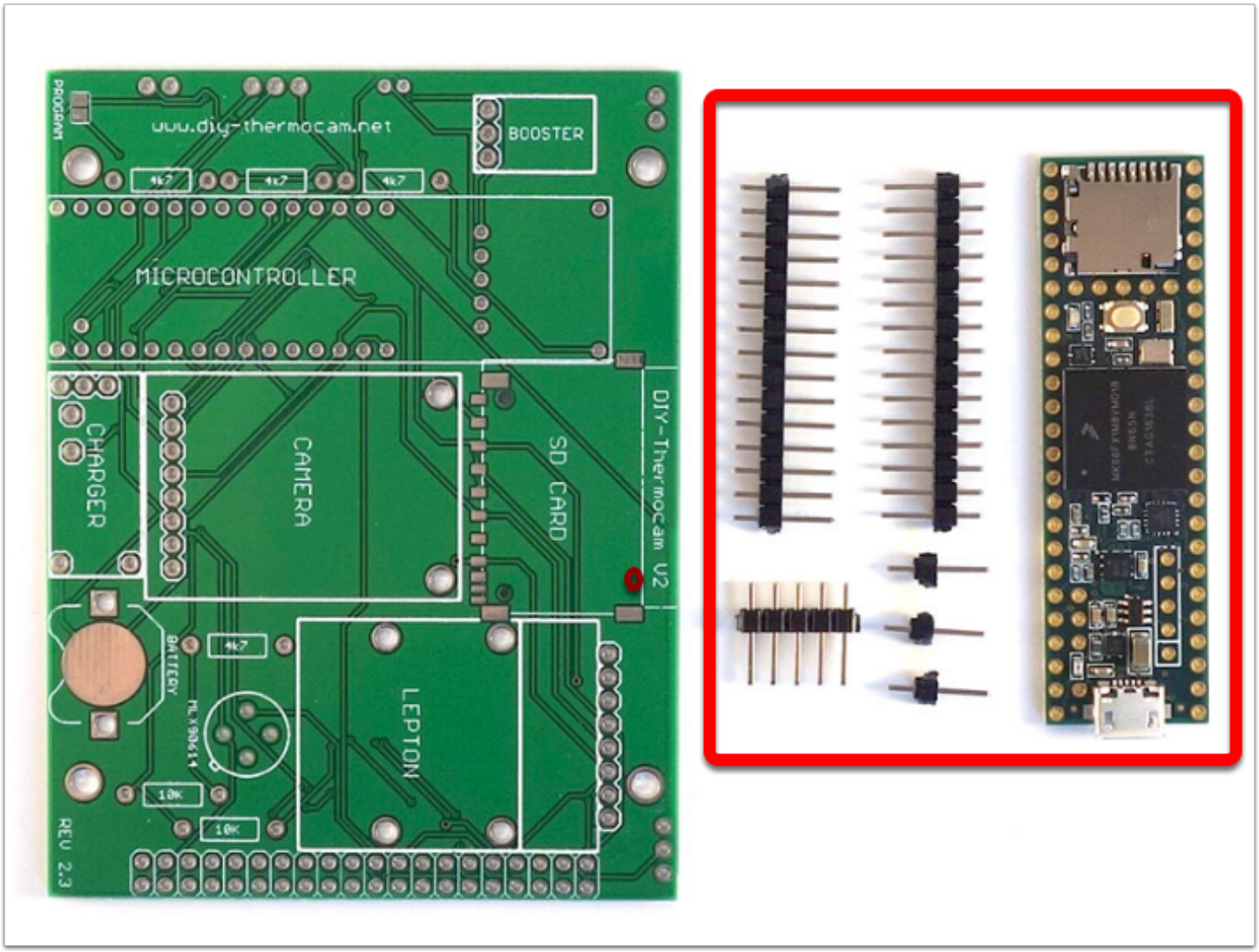
Revision 1 from 06.02.2017

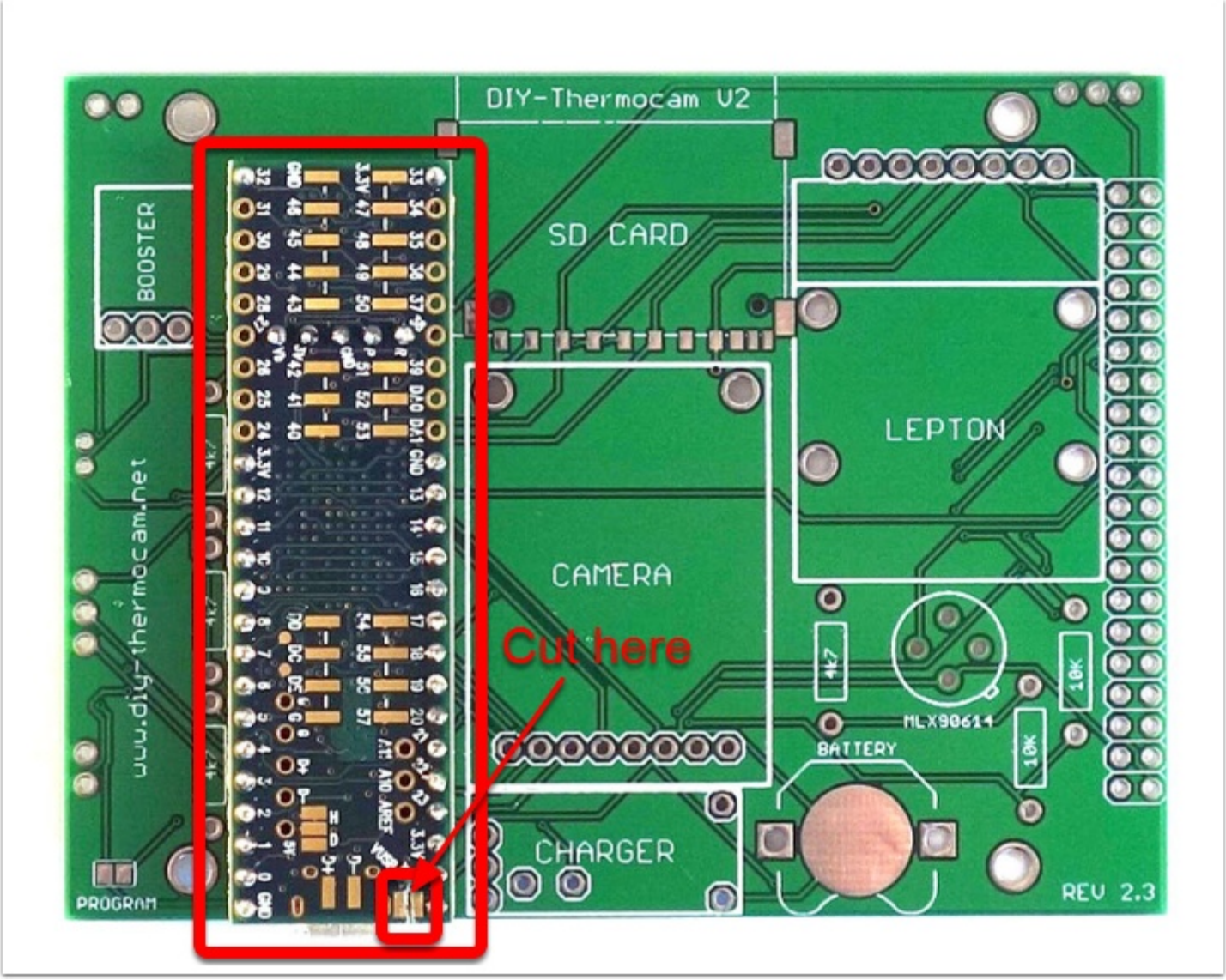
1.

- To assemble the device, you need the following tools: A soldering iron, some solder, a gripper, a nippers, a screwdriver and a multimeter
- If you have the choice between multiple soldering tips, use the smallest one
- In case you have a soldering station with adjustable temperature, use around 400 - 450 degree celcius
- Catch the PCB, the microcontroller and one of the two pin header strips
- Cut the header strip with a gripper into the following pieces: 2 x 15, 1 x 5 and 3 x 1



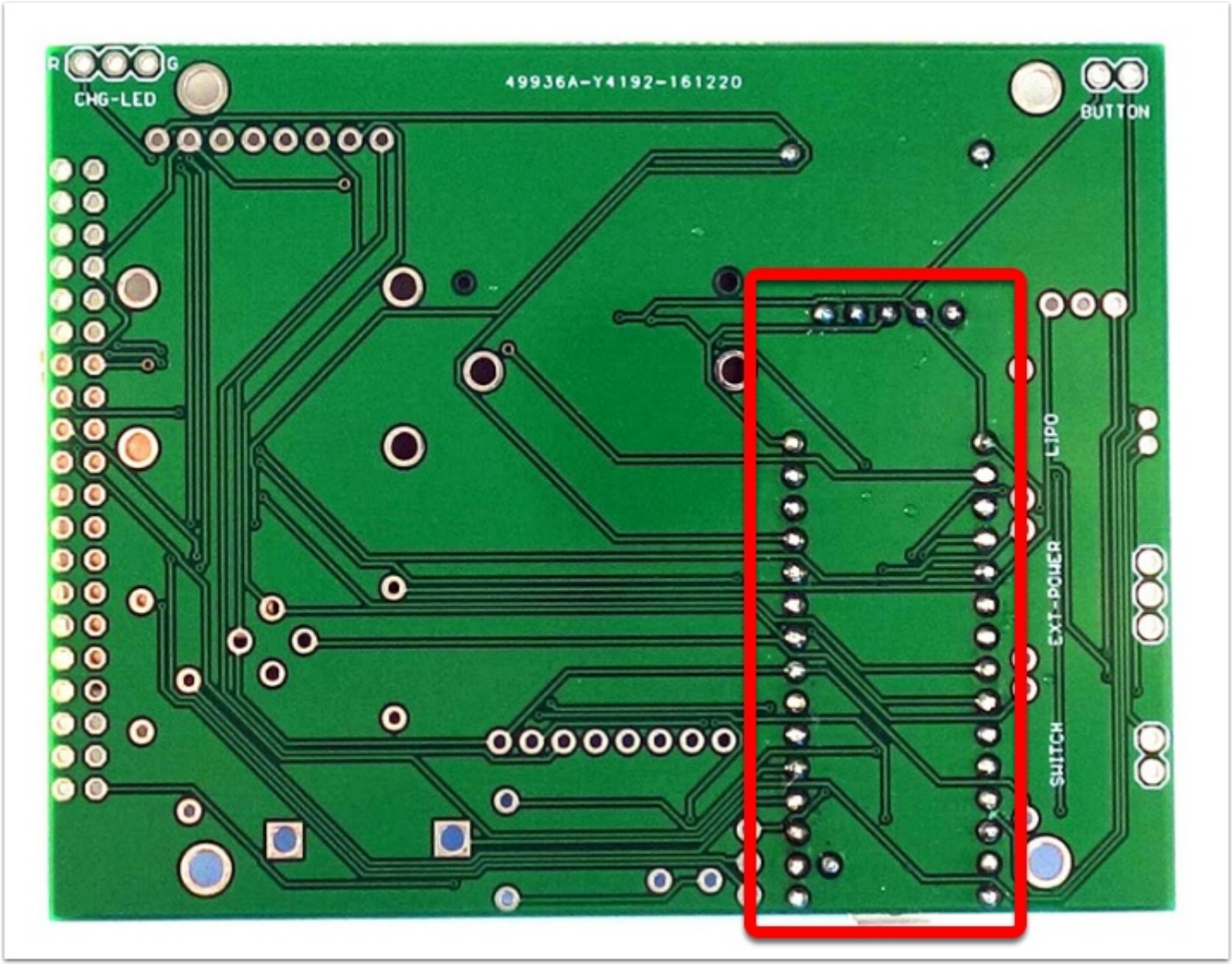
2.

- Plug the microcontroller into the header pieces
- One of the three single header should be placed in the hole labeled VUSB, do not forget it
- Put the microcontroller with the headers into the PCB and make sure they sit tight
- Solder the pins on top of the microcontroller
- Cut the trace between VUSB and VIN on the microcontroller with a sharp knife



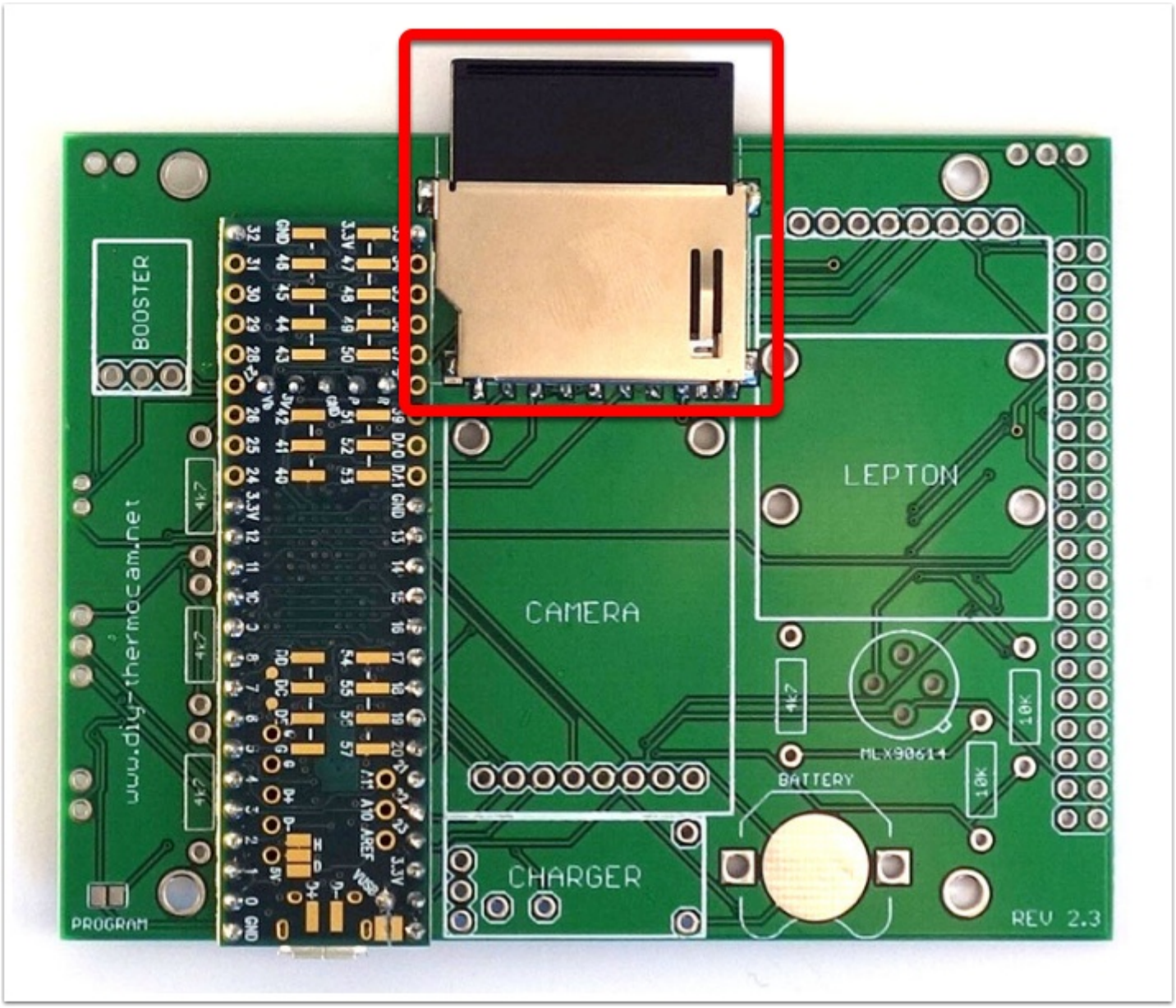
3.

- Turn the PCB around, make sure the microcontroller still sits tight
- Solder the pins on the bottom
- Remove the overlapping pieces with a gripper
- Re-solder the pins to make sure they are really connected well to the PCB



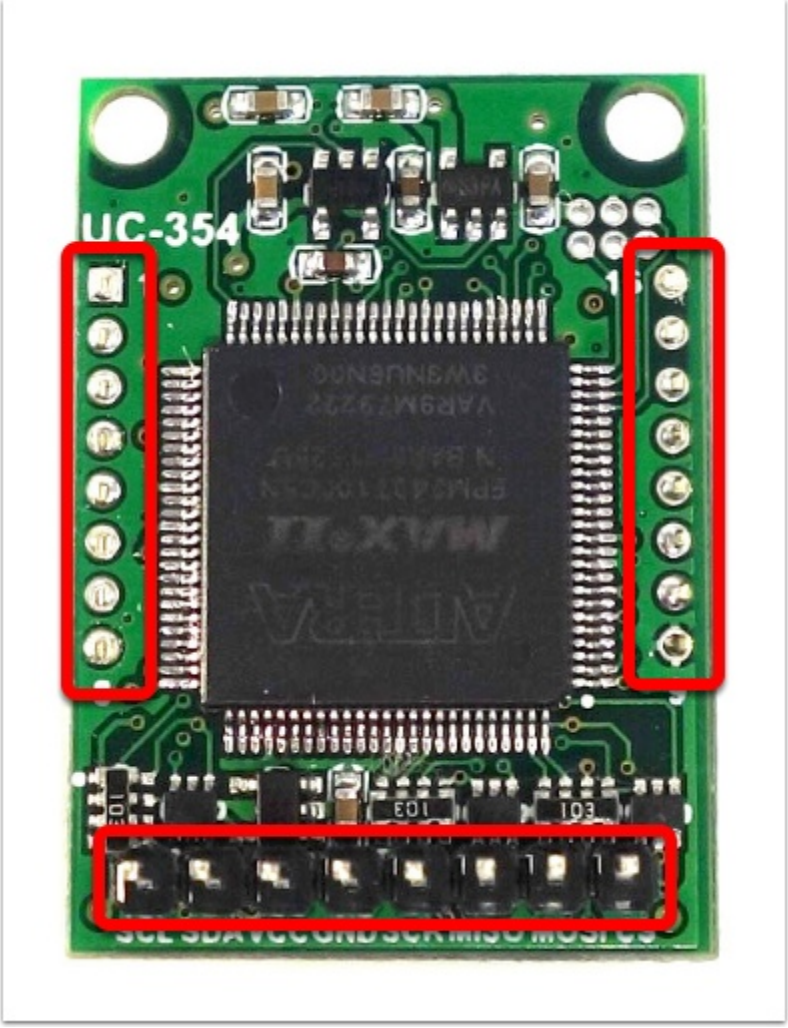
4.

- Attach the SD card slot to the PCB by soldering the four points on the edges first, then the data pins on the bottom side
- Put the 8GB micro SD card into the SD adapter
- Put the adapter into the SD card slot



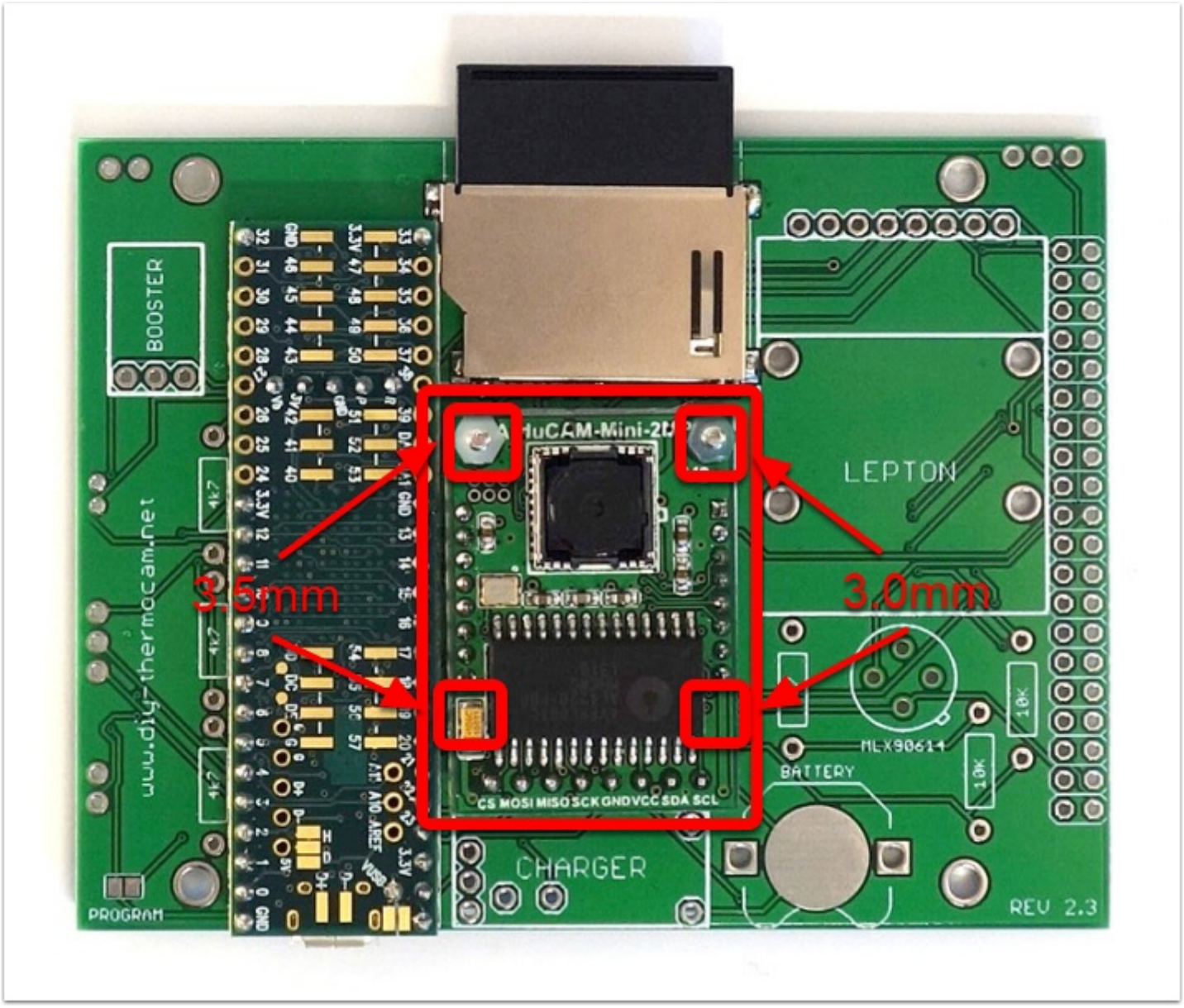
5.

- Remove the wifi shield from the backside of the visual camera module
- Push the two female sockets on the two sides alternating to the left and right, until they drop off
- Use the 8-pin female header socket to bend the 8-pin male header on the bottom of the module into a straight position



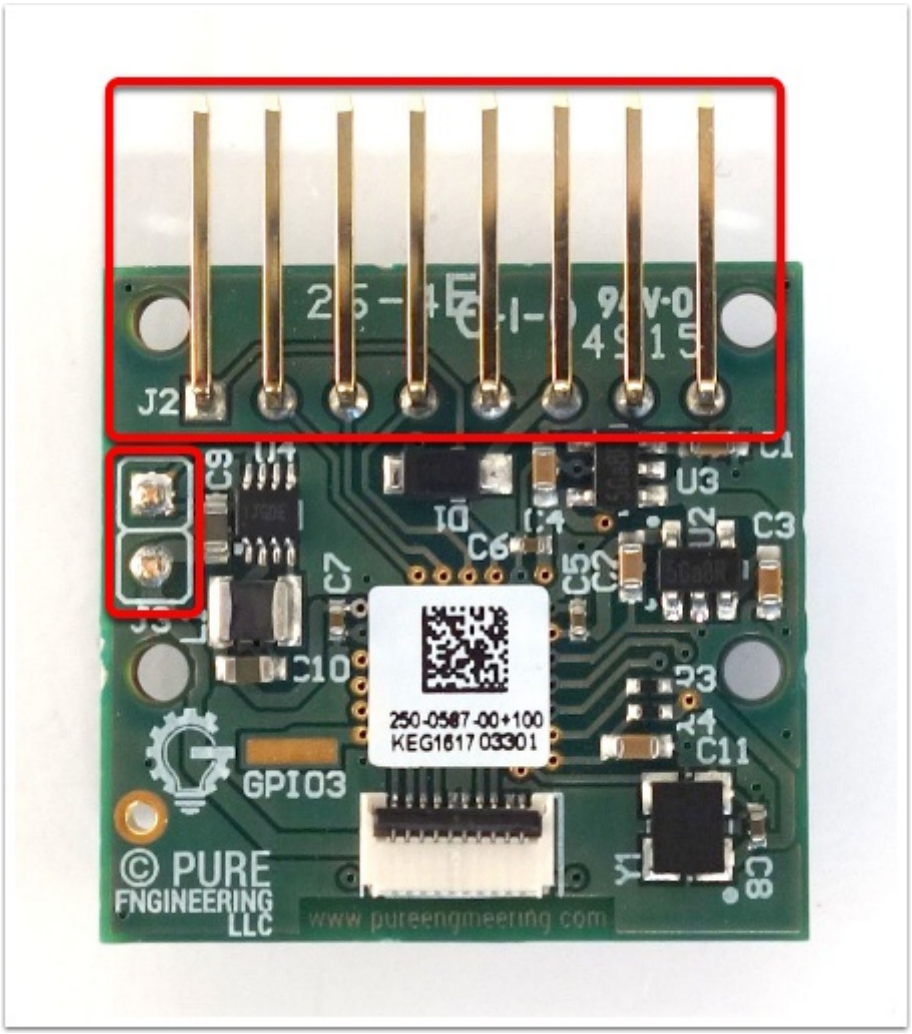
6.

- Use two of the M2 x 10 bolts and put them though the holes in the PCB
- On the left bolt, put one of the two larger M2 x 3.5mm distance spacers, on the right bolt one of the six M2 x 3.0mm spacer
- Put the visual camera module on top of the bolts, push the header into the PCB and save it with two M2 plastic nuts
- Use the remaining M2 x 3.5mm spacer and put between the module and the PCB on the left position marked, then use a M2 x 3.0mm spacer and put it on the right side
- Push the module against the PCB, then solder the 8-pin header on the backside and remove the overlapping pieces



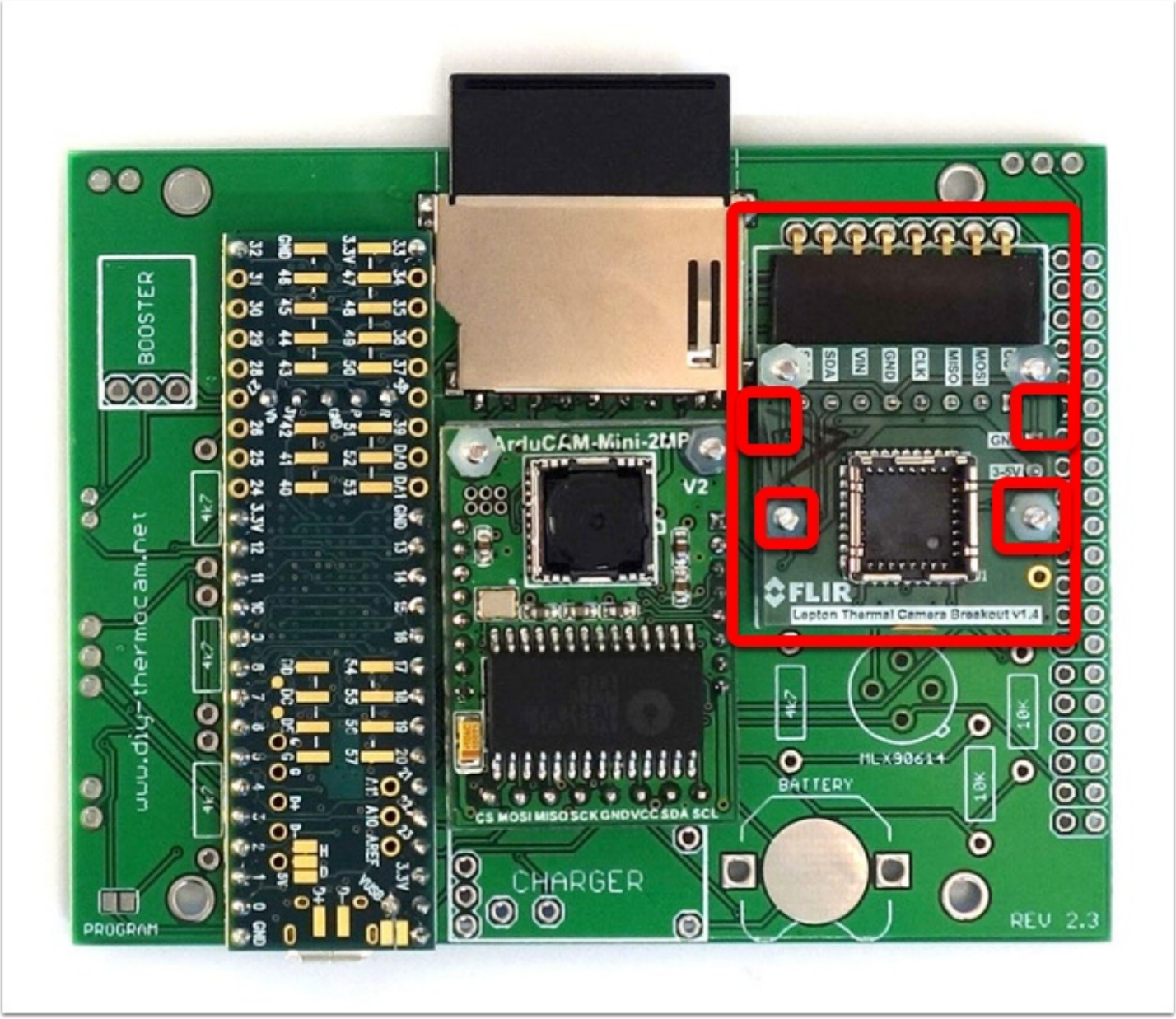
7.

- Remove the plastic part on top of the Lepton module
- Bend the 2-pin header alternating to the left and the right, until it drops off



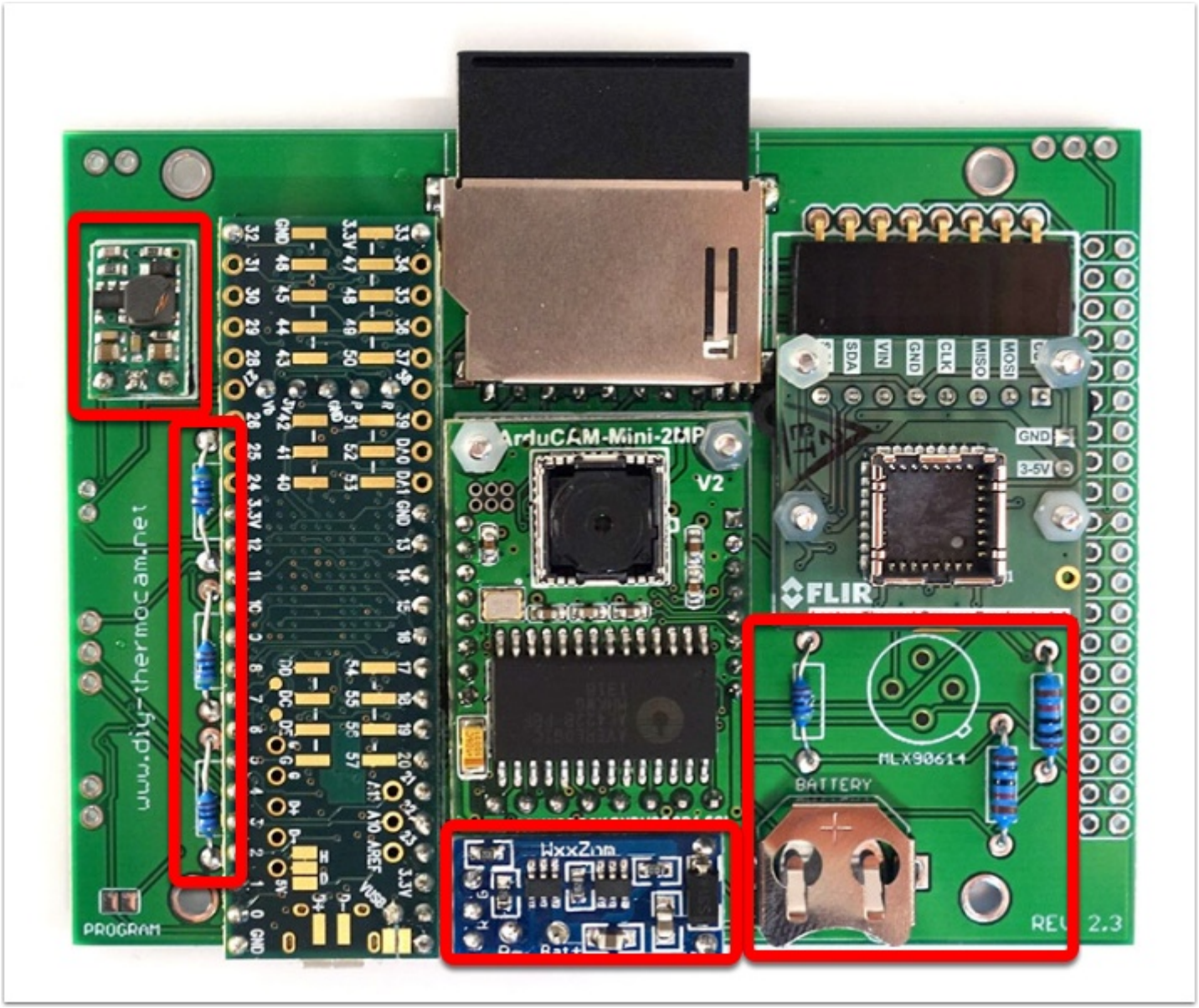
8.

- Grab the 8-pin right-angle female header and solder it into the PCB
- Use two M2x10 bolts and put one of the 3.0mm black spacers on top of each
- Plug the Lepton board into the socket and through the two bolts, then save it with two plastic nuts
- Pick up two more M2x10 bolts and put them into the empty holes on the top, then save them with plastic nuts
- Use two more smaller black spacers and put them between the PCB and the Lepton module on the marked position



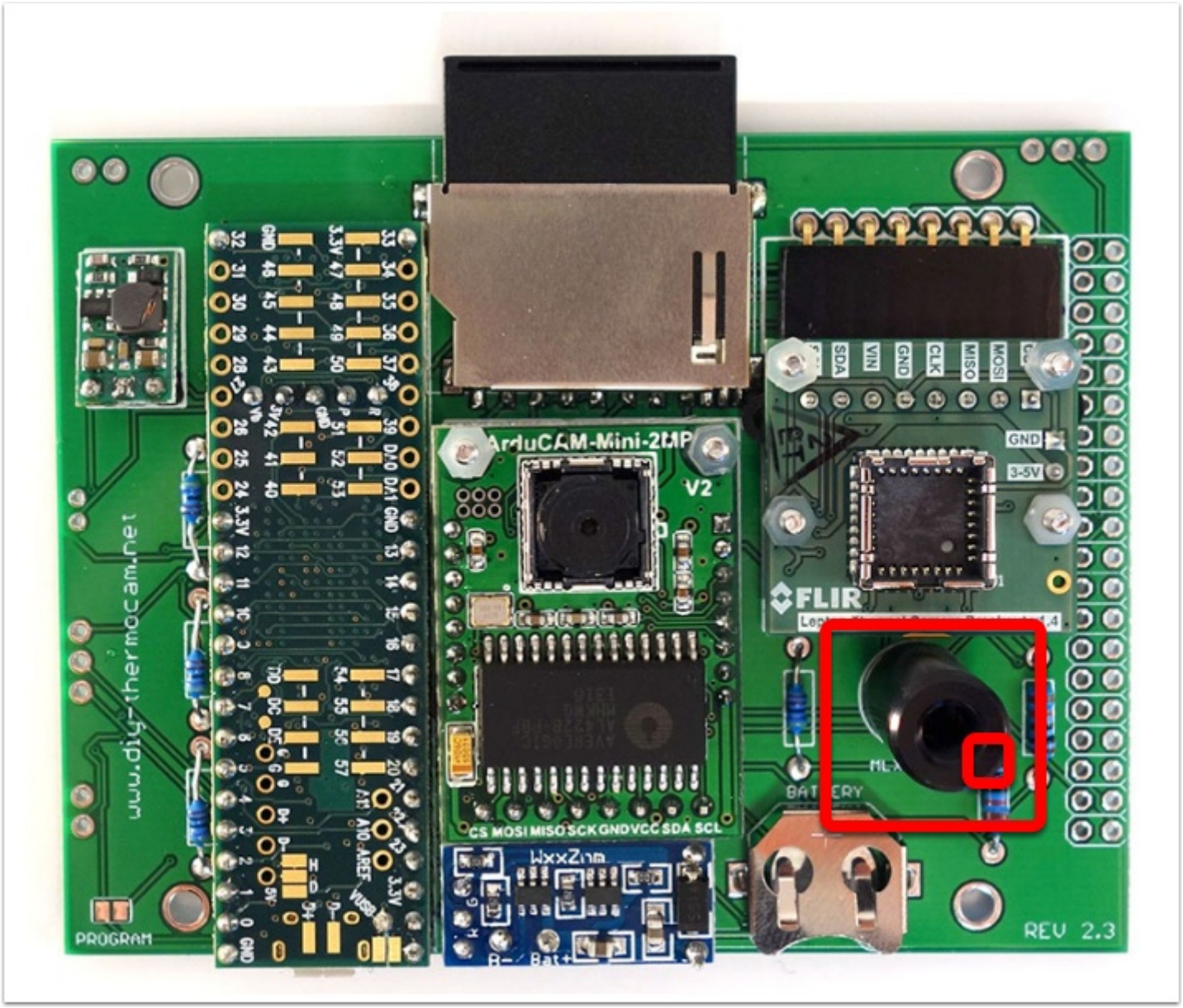
9.

- Solder the step-up converter to the PCB by using a 3 pin strip
- Solder the four 4.7k resistors (the smaller ones) to their position on the PCB
- Solder the two 10k resistors (bigger ones) to their position right to the spot sensor
- Solder the charging module to the PCB by using a pin strip together with four single ones
- Remove the overlapping pieces on the backside with a gripper
- Solder the coin cell battery holder to the PCB



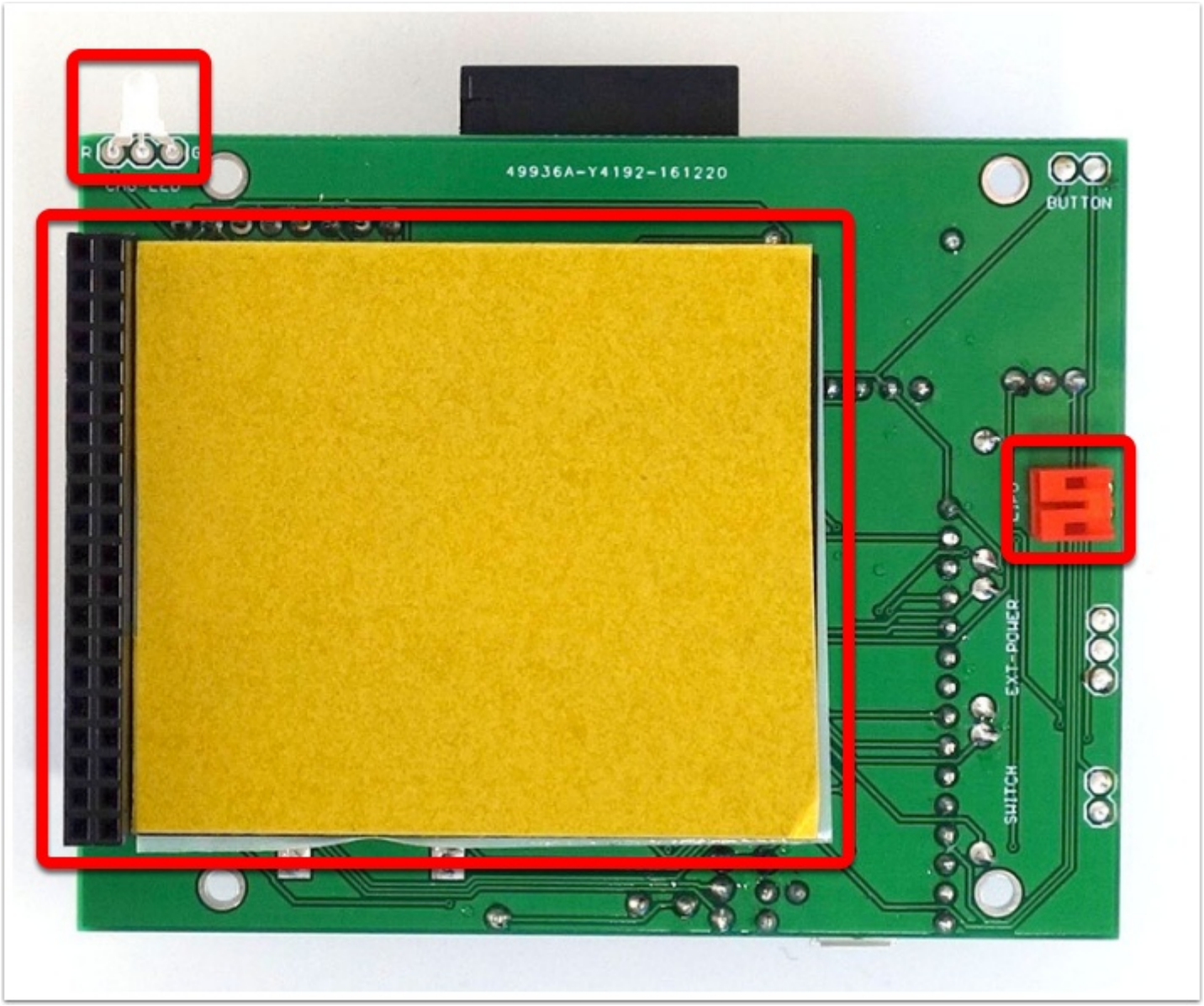
10.

- Catch the MLX90614 single-point infrared sensor
- Plug it into the board, make sure the little indicator matches the mark on the PCB
- Solder one pin first on the backside
- Then push the sensor against the board while heating the solder on the same pin to make sure that the sensor is really soldered flat to the board
- Solder the remaining three pins on the backside
- Remove the overlapping header pieces with a gripper



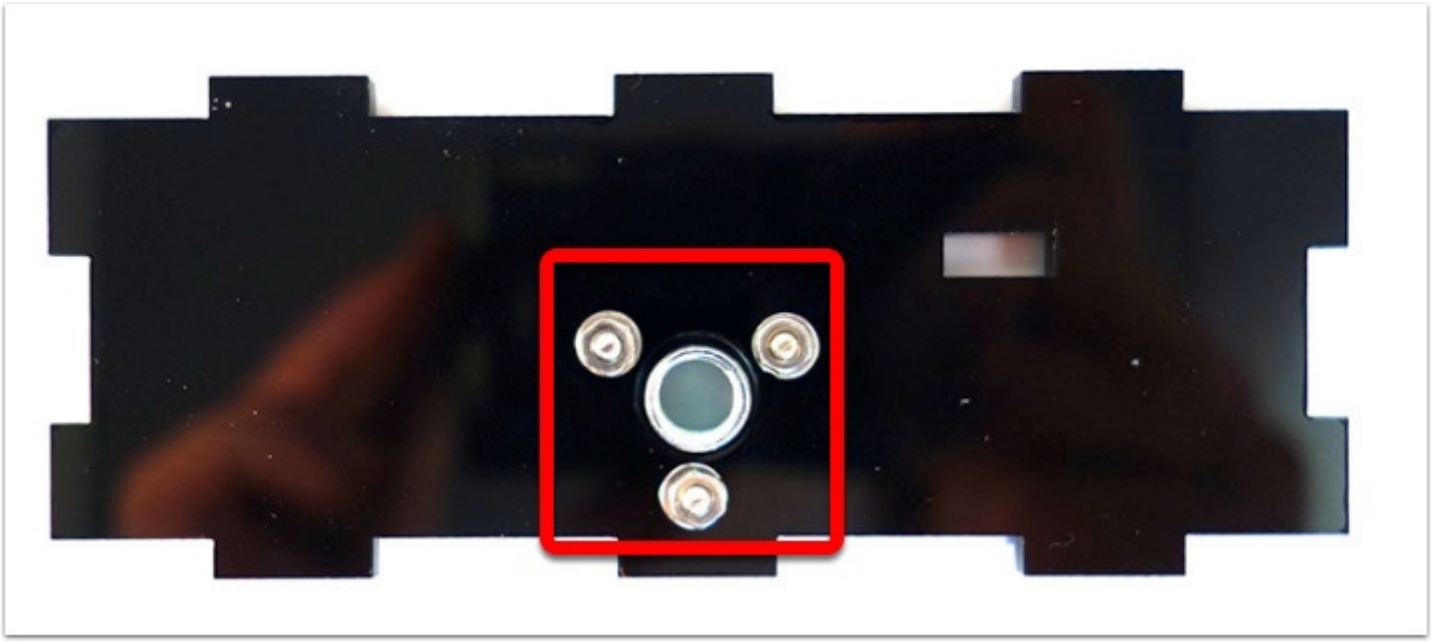
11.

- Solder the charging LED to the place labeled CHG-LED with the short leg in the hole G
- You can put it all the way in, and then bend the LED to the top as shown on the image
- Solder the battery connector to the place labeled LIPO on the right side
- On the left side, solder the display connector in the 40 holes, make sure it really sits tight
- Attach the adhesive tape for the lithium battery



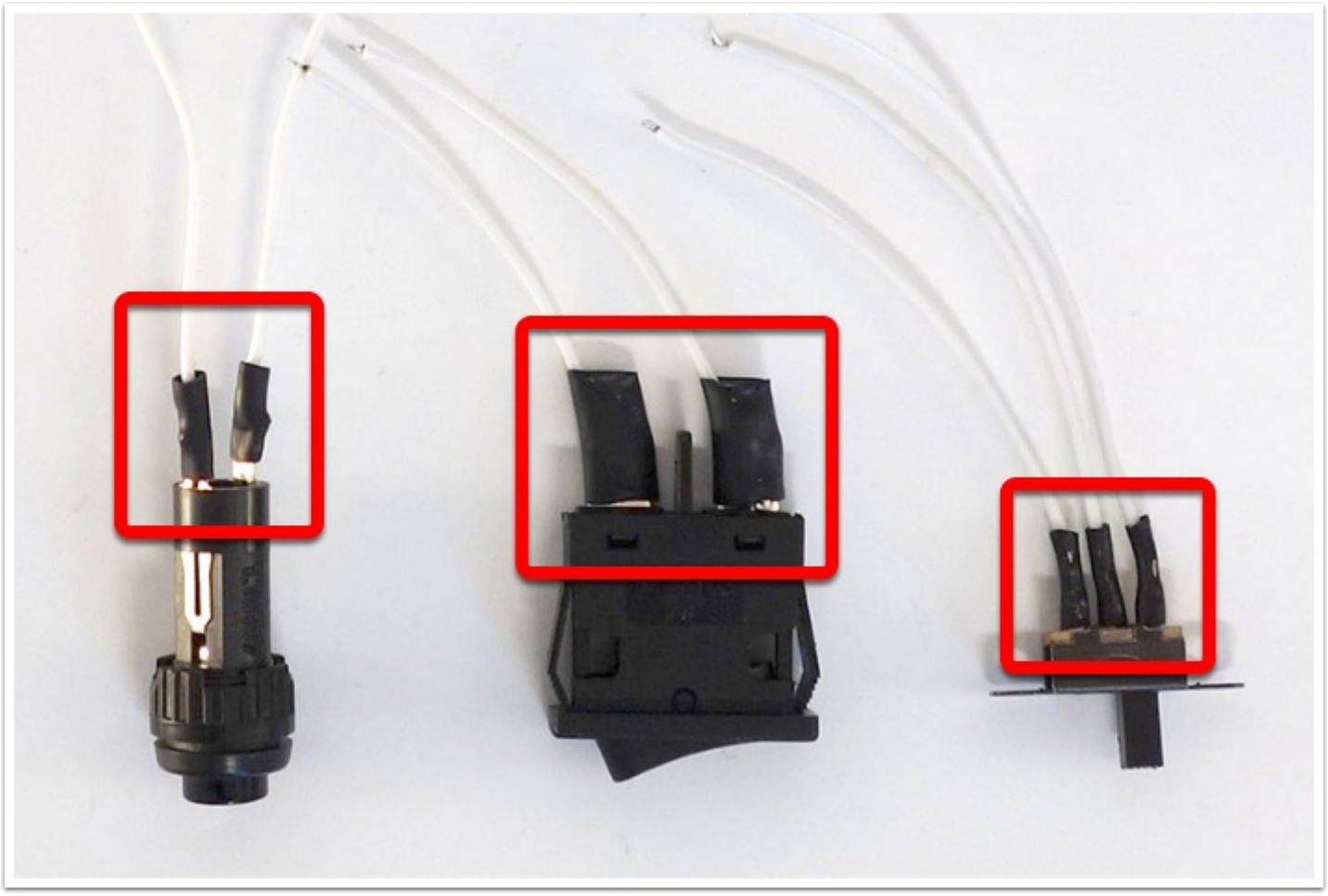
12.

- Grab the the six side panels from the enclosure and remove the protection foil from both sides
- For all enclosure parts, the shiny side goes inside, whereas the matted side goes to the outside
- On the bottom panel, fix the tripod socket on the outside with three M2 x 8 bolts, three washers and nuts and screw them very tight



13.

- Take the push button, the power switch and the external USB switch together with the shrink tubes and the cable pieces
- Solder the cable pieces to the components
- It is good to put some solder on the components pins first, then on the cables, and afterwards put those two together
- Put shrink tubes on top of the connection places on the cables and heat them with a soldering iron

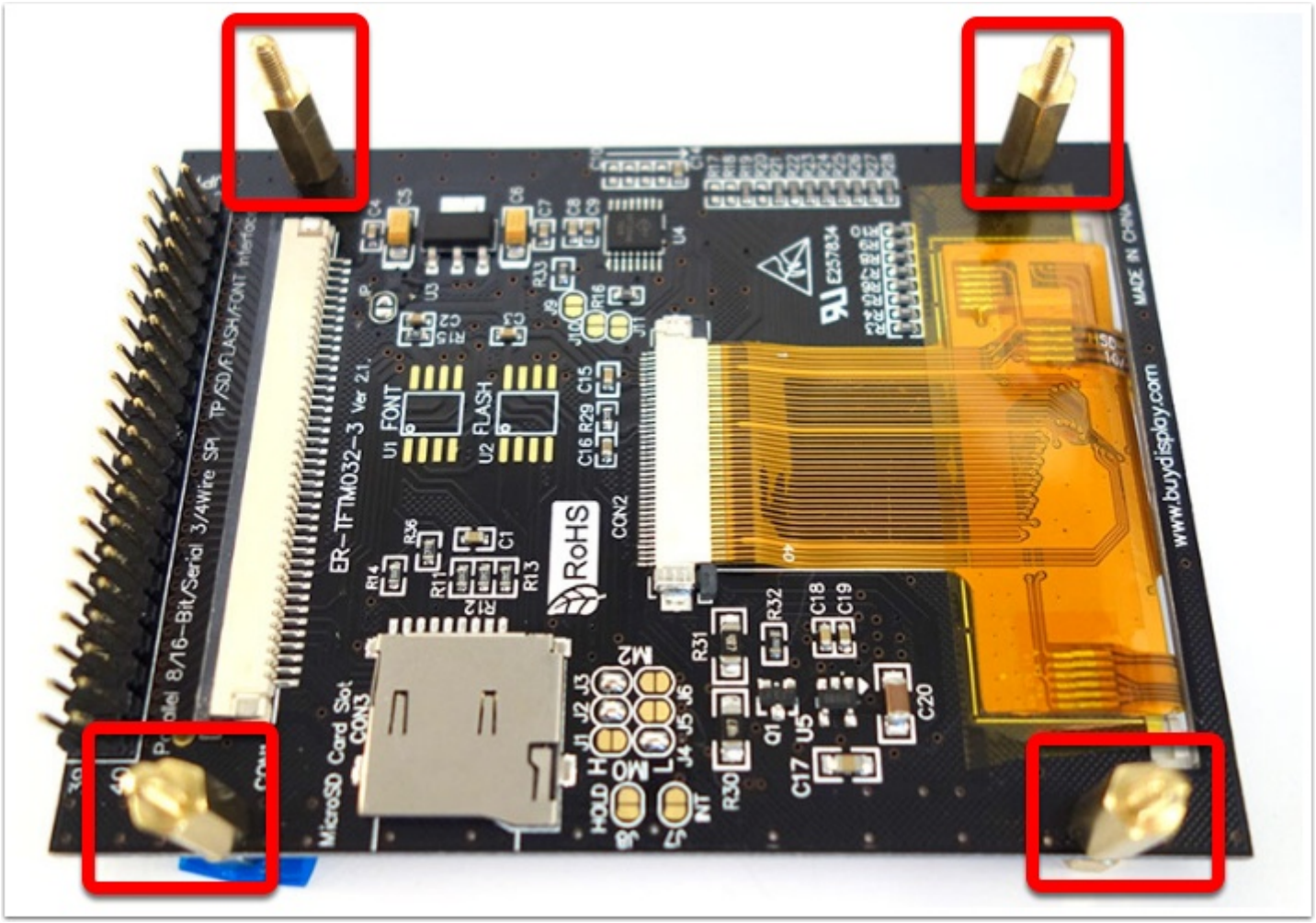


14.

- Put the position of the power switch to OFF (O) and push it through the hole in the panel
- Secure the USB power switch with two M2 x 8 bolts and two nuts, then switch it to the upper position as shown on the image
- On the other panel, put the button into the other side of the sidepanel and safe it with the screw ring

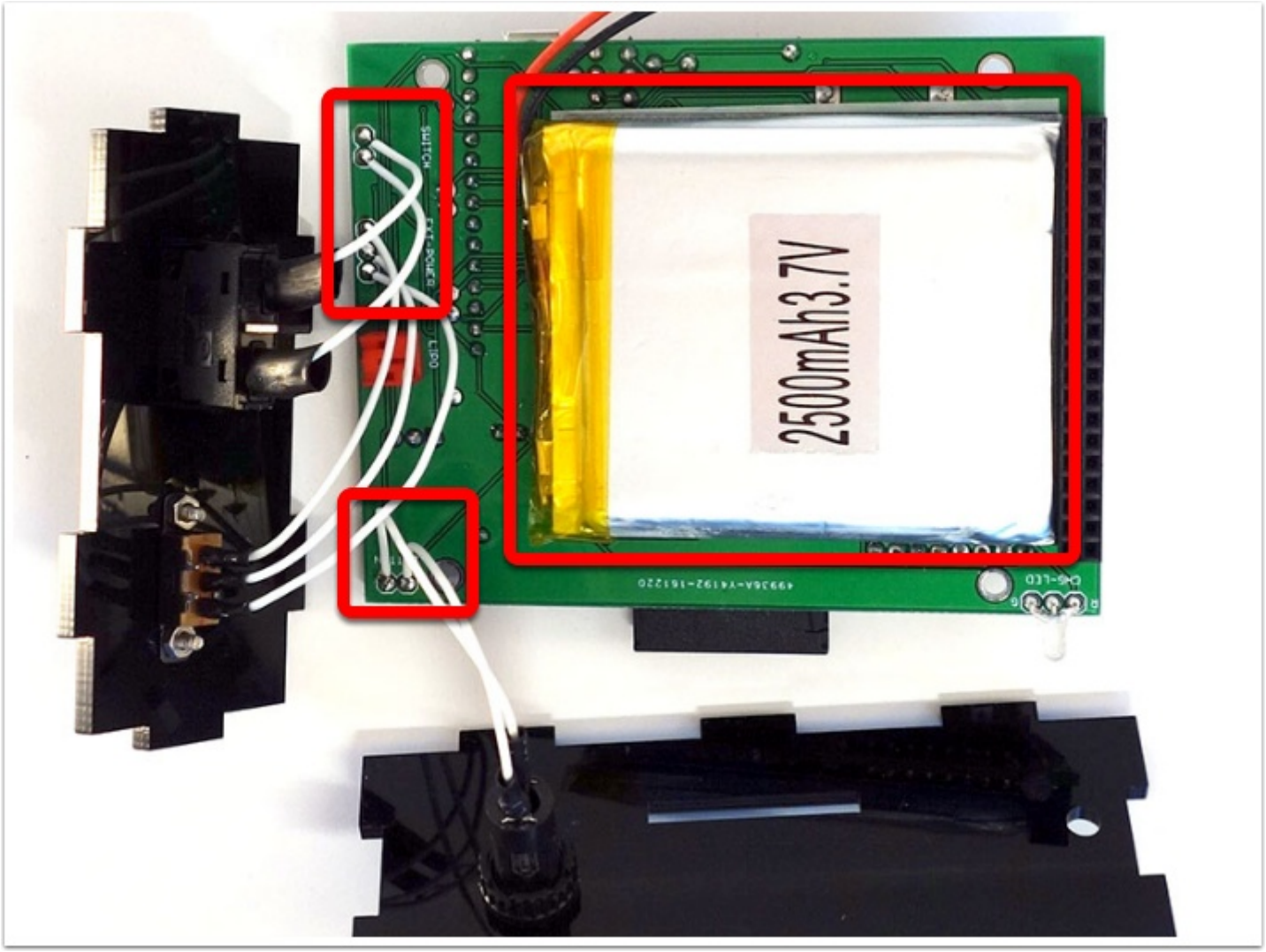
15.

- Pick the display module and screw the four smaller distance bolts into the four bigger ones



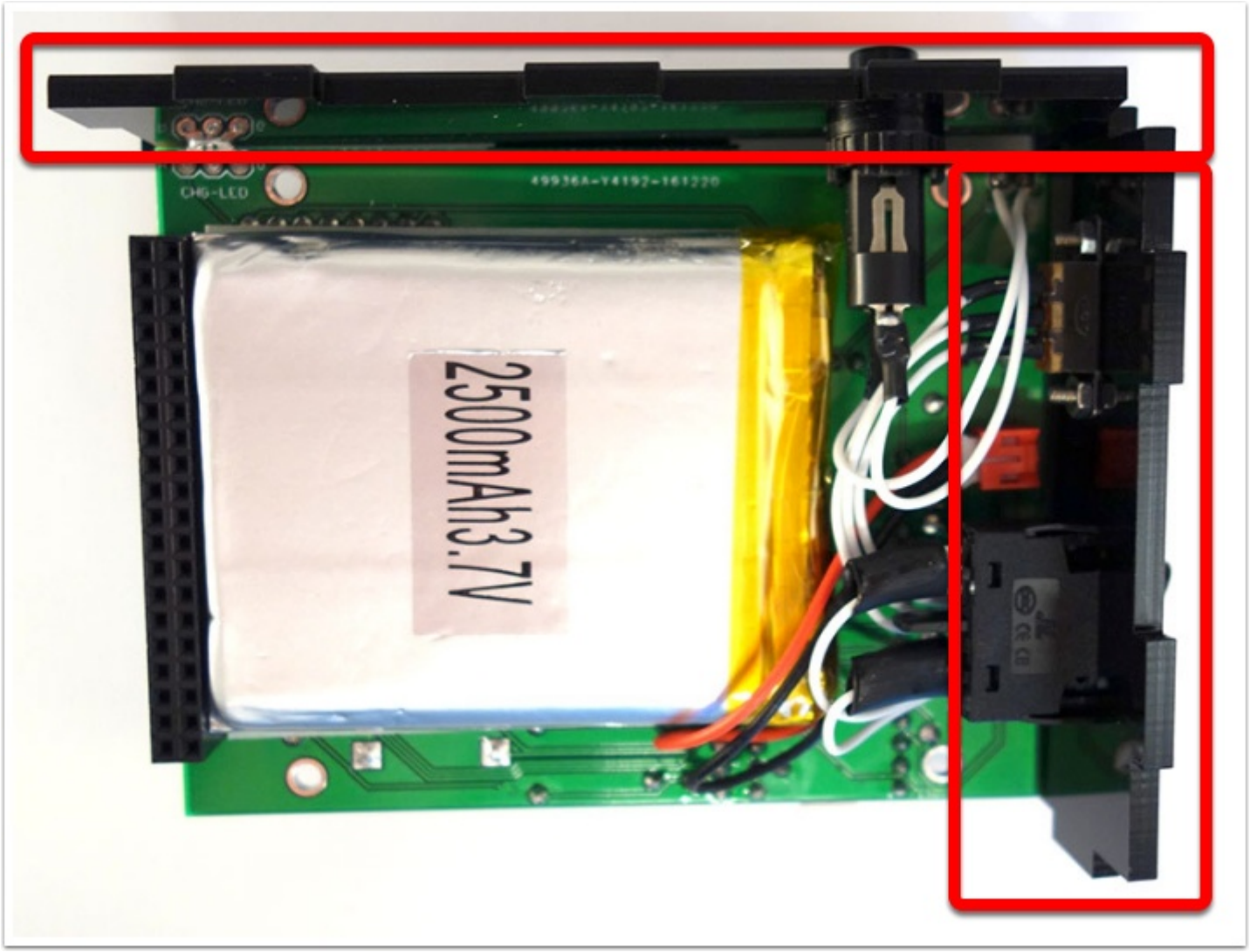
16.

- Solder the wires of the push button to the two pins labeled BUTTON, the direction does not matter. It is good to put some solder on the pins first, then on the cables, and afterwards put those two together
- Next, solder the wires of the power switch to the two pins labeled SWITCH, the direction does not matter
- Lastly, solder the three wires of the external USB switch to the connection labeled EXT-POWER
- Take care to keep the chronology order, so top to top, middle to middle, bottom to botttom



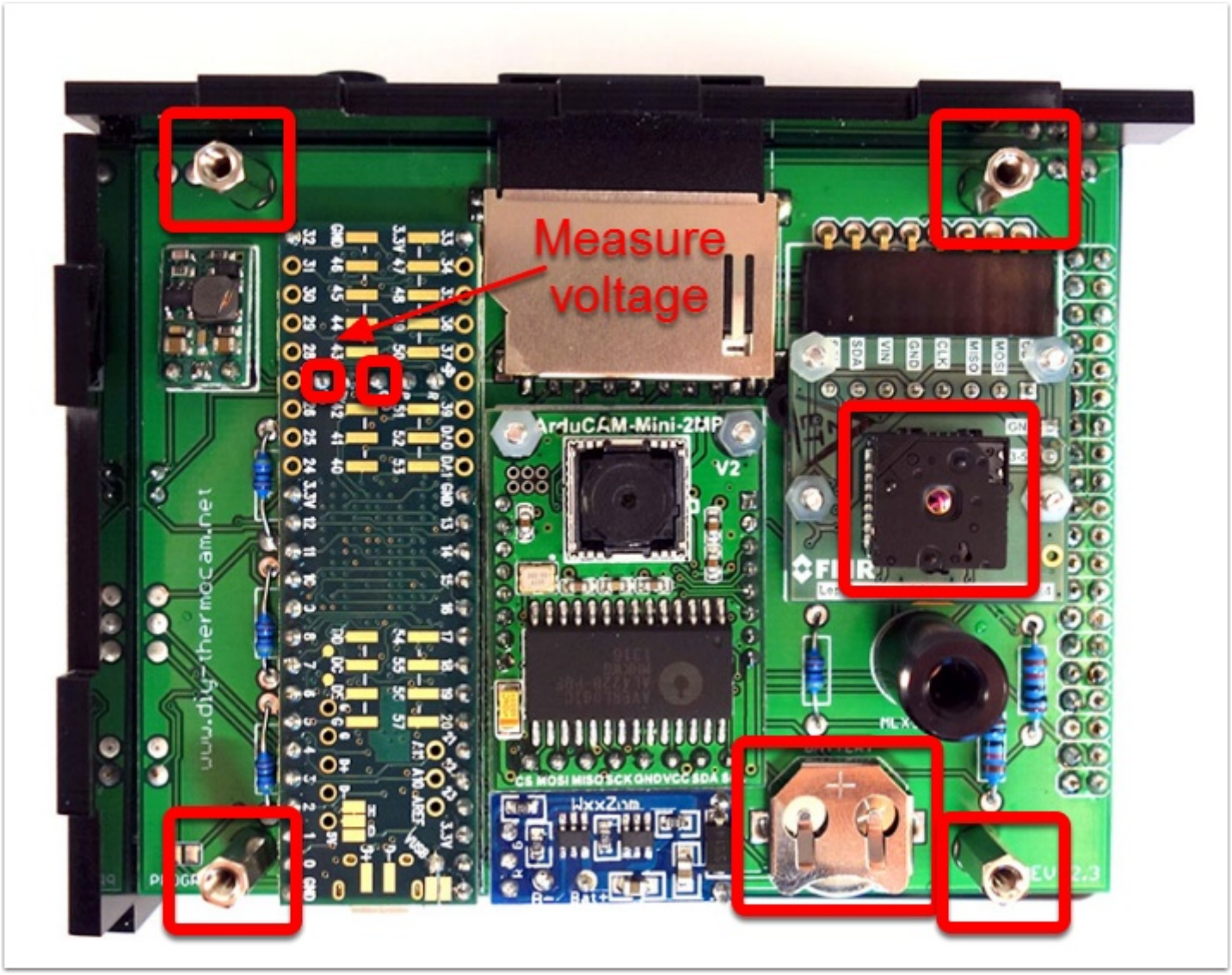
17.

- Make sure the power switch is still in the off-position, then connect the battery to the connector
- Put the two sideplates to their position and bend the wires, so that they do not put the display under pressure later



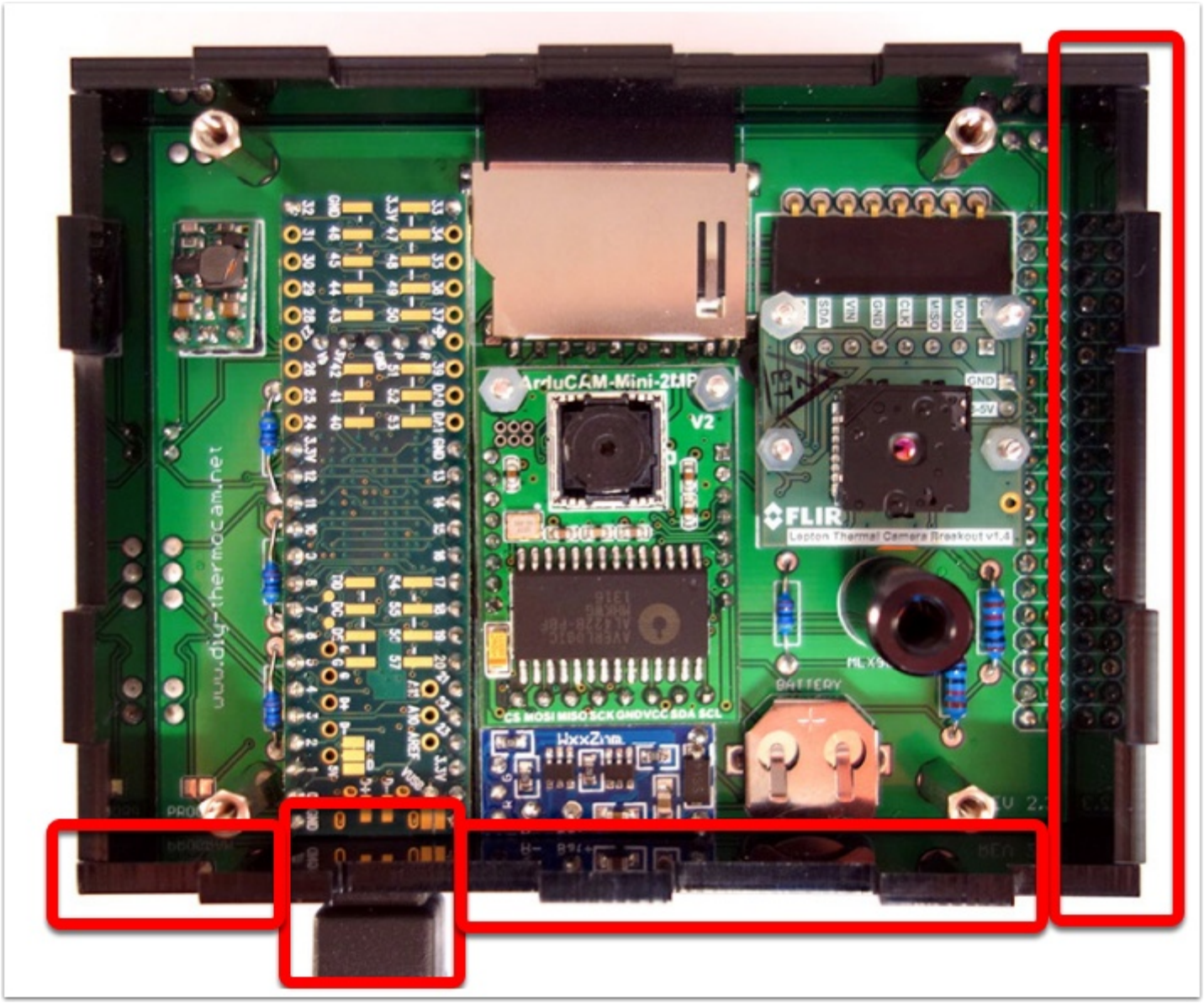
18.

- Put the display module on top of the PCB and safe it with the four remaining distance bolts
- Screw them into the PCB as shown on the image and tighten them
- Insert the Lepton into the module, make sure you hear a click when it snaps in
- Insert the coin cell battery into the holder, so that the side with the +-marker is on the top
- Check with a multimeter, if the voltage between the pin labeled "VBAT" (battery) and "GND" (ground) is above or equal to 3V
- If this is not the case, move the battery inside the holder a little bit, until you can measure the voltage on the two pins



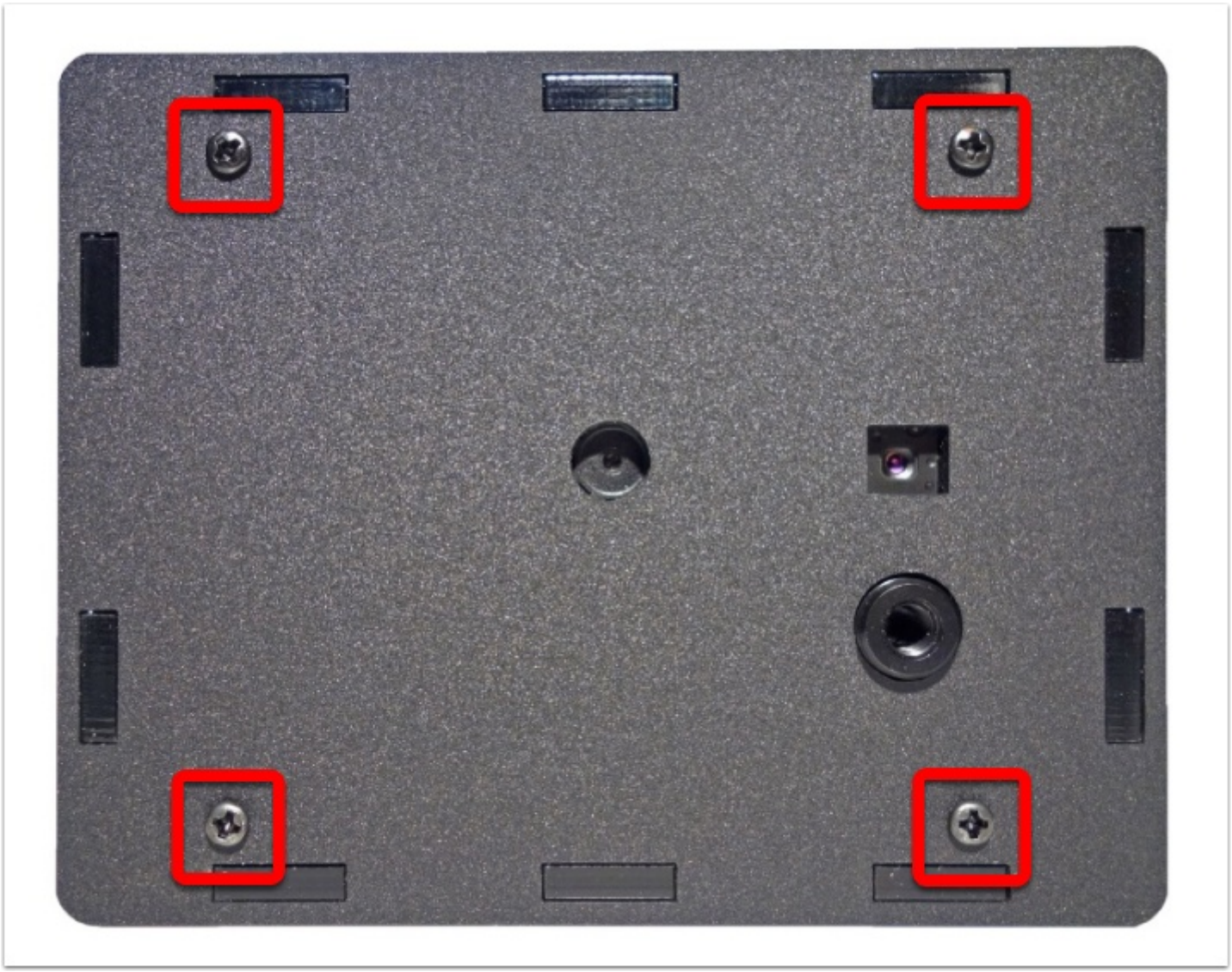
19.

- Install the display panel (top side) and afterwards the right and bottom sidepanel
- Make sure that the microUSB connector of the microcontroller snaps into the hole of the bottom sidepanel
- Connect the device with the microUSB cable to a computer and turn it on
- Flash the newest version of the firmware to the microcontroller by following the firmware flashing guide in the document section
- After you press "Connect", the updater will show that it was not able to connect to the device, press "Yes" to continue, then flash the file



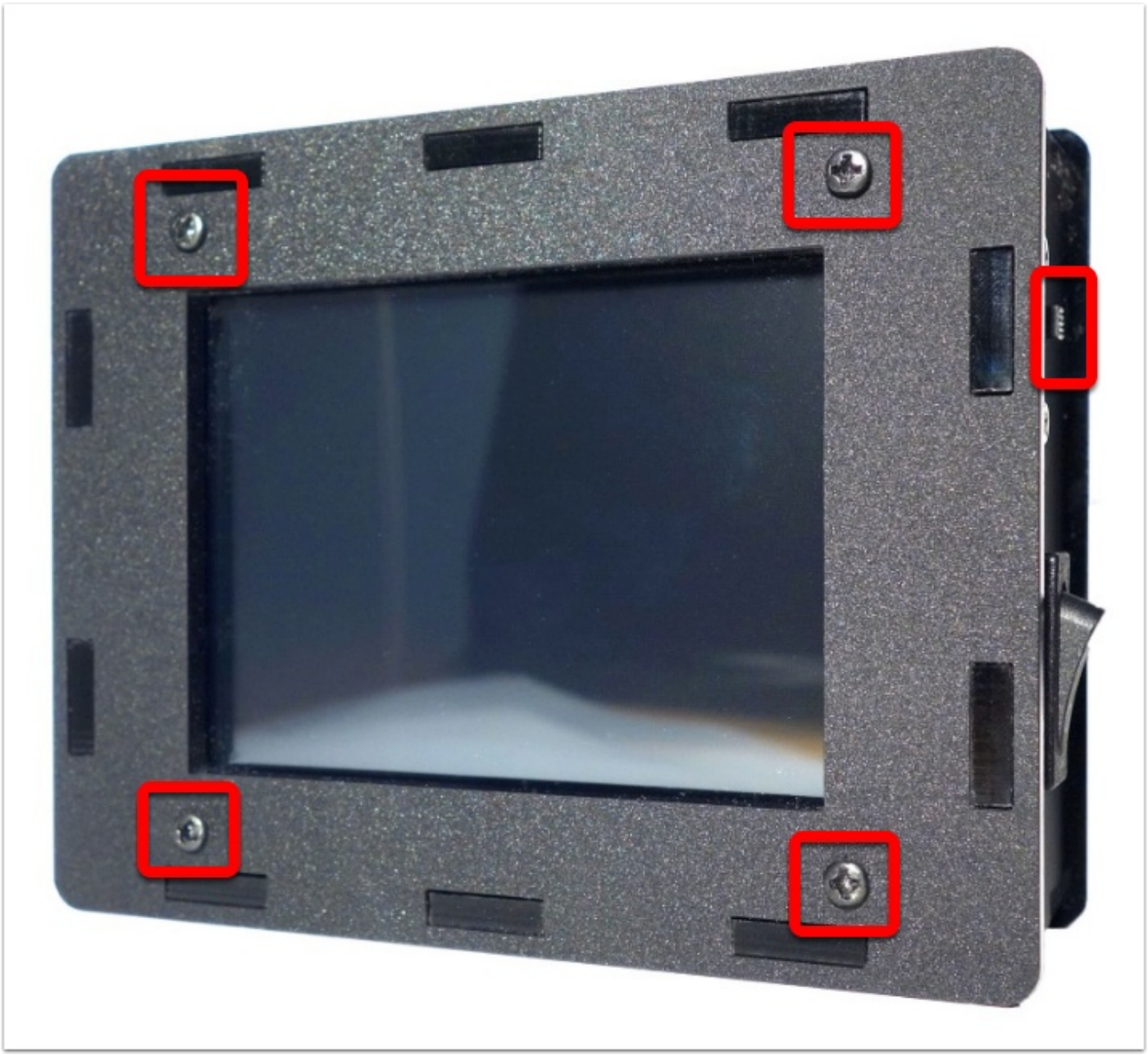
20.

- Put the backpanel on top of the four sidepanels and secure it with four of the black screws
- It may be a little bit tricky to make it fit the first time, do not use more pressure than required



21.

- Use the remaining four black screws and put them into the holes on the front plate, then tighten them
- Connect the device to a wall charger or your computer, make sure the external USB switch above the power switch is on the top position



22.

- Fully charge the device, so that the charging LED turns green
- Turn the device on and complete the first start procedure
- Afterwards, go into the main menu and run the battery calibration under Settings -> Other -> Battery Gauge -> Yes
- Change the comport of your USB serial device to COM10 to use the various software solutions, check out the firmware update guide for more information
- Congratulation, you just made your own open-source thermal imager! Check out the manual for information about the device usage