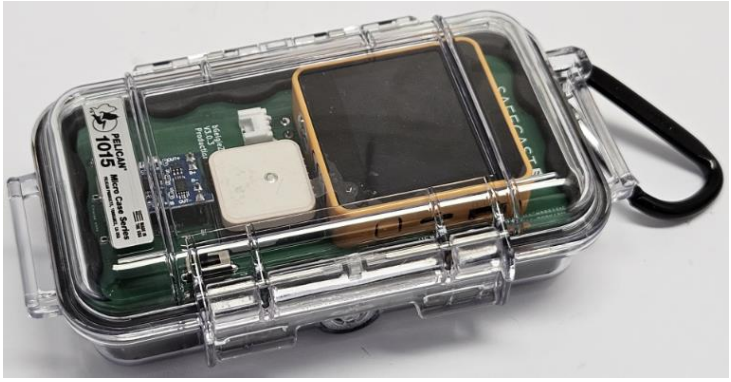
BGEIGIEZEN V.3.0.3 ASSEMBLING

ISSUES AND COMMENTS

Alberto Villa, 2024-07-03

INDEX



1. Introduction

While assembling my bGeigieZen V3.0.3 several problems emerged regarding both the manual, the hardware assembling and the firmware installation.

In the manual there are a few typos to be corrected, some steps could be removed and other ones could be described in more detail to make them as clear as possible.

The hardware assembling has required some modifications to accept a protected type of LiPo battery, to avoid damaging the battery body by the protruding pins of connector J6, and to be able to close the transparent case without overstressing the hinges and the M5 module (excessive overall height).

The firmware "burning" has not been possible with Acer Aspire 5 laptop, USB2 and USB3 interfaces, type "A" and type "C" physical ports (none worked). White screen of the M5 module, periodical rebooting issue and COM port not detected.

Tried with desktop running Windows 7: white screen, periodical rebooting issue, but now COM port was detected and burning started. At the end an error message appears, and screen remains white.

These issues, plus some comments/suggestions, are described here below.

2. Assembling Manual

2.1 – Schematic and User Guide

The electrical schematic of the assembly is missing, as well as a link to the User Manual.

2.2 – LiPo battery

a) It should be explained since the very beginning that the battery has to be purchased separately, and give some examples (unprotected and protected ones).

b) A note should be added telling that during the battery charging phase a red LED is lit on the charger board, and that when the charge is completed a blue LED is lit instead.

2.3 – M5 Core 2 module

It comes without its backplate, therefore the backplate removal procedure could be omitted (pages 3 to 5).

2.4 – Headers, pages 6-10

Page 6: another photo could be included to show the splitting of the extended pin headers for the battery charger module (improved version). The advantages of this version should be explained.

2.5 – Grove System connector

Page 16: "Place the grove (white) connector…etc." Note: "Grove" should have a capital G. The sentence could be modified for instance like the following:

"Place the Grove System white connector (J6) and… etc."

2.6 – Preparing the Geiger pancake sensor

Page 17: The sentence

"be always careful where you place the tube when the grid touches something the mira is very fragile and can easily be puncture"

should be somewhat adjusted. For instance (apart writing mica instead of mira):

"Be careful when you handle the Geiger pancake sensor, because the mica window is very fragile and can be easily be punctured"

2.7 – Software Install instructions (page 27)

a) The following figure with the "Download" button is missing. It should be shown before the step "Hit the Download Button":

b) The following paragraph needs to be adjusted:

- Connect the M5Stack with a USB-C cable (not the charging port of the blue PCB). The M5Stack should switch on and the Burning-Software should detect
  Note: *If there is a white screen and the bGeigieZen keeps rebooting, the issue could be the that the power from the USB-C is not sufficient to run the M5StackCore. Please change to another port with enough power.*
- the M5Stack and display a message (PICTURE?)
- Press the Burn-Button

Maybe it could be changed like this:

- Connect the M5Stack with a USB-C cable (not the charging port of the blue PCB). The M5Stack should switch on and the Burning-Software should detect the M5Stack and display the message (*show a screenshot…*)

  NOTE: *If there is a white screen and the bGeigieZen keeps rebooting, the issue could be the that the supply power from the USB-C is not sufficient to run the M5StackCore. Please change to another port with enough DC power.*

- *Press the Burn Button*

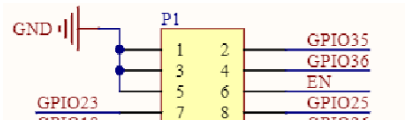
c) Screenshots of the M5 module should be included, showing the display before and after the update procedure.

d) At this point, a link to the User Guide should be included.

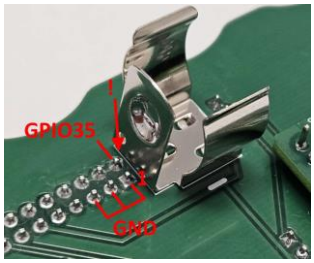
3. Hardware

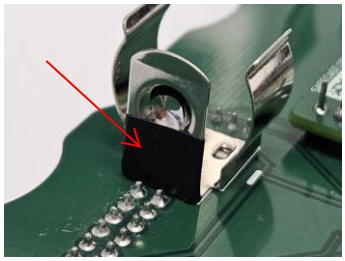
3.1 – Negative battery clip possible issue

The negative polarity battery clip (GND) is **extremely close** to pins 1 and 2 of the 2x15 header J1. Pin 1 of J1 is GND (and this is OK) but pin 2 is a GPIO35:



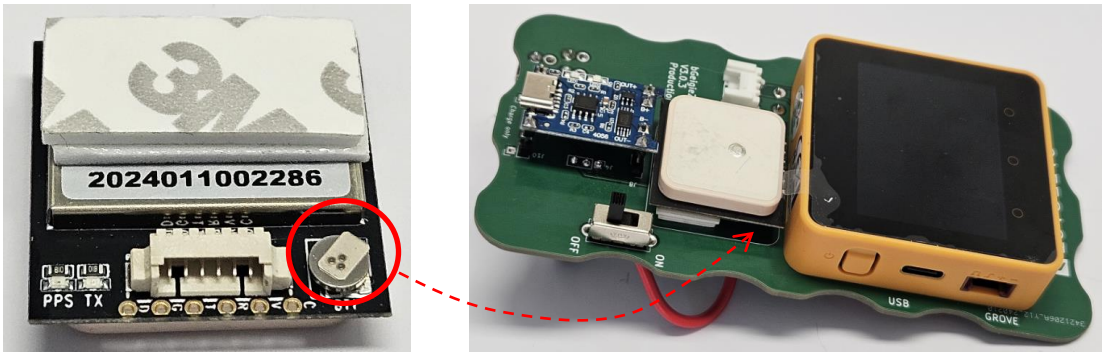
Therefore an adhesive tape has been wrapped around the base of this battery clip, to keep it well insulated from the pins of J1.





3.2 – GPS module battery issue

The GPS module has a small battery placed close to the holes for the header pins. This position is very near the M5 module, hence the substitution could be a difficult task without first removing the module from the board.



But the removal of the M5 module is impossible once the Geiger sensor is attached to the baseplate, because the two fixing screws are accessible only without the pancake in place.

Therefore the sensor should be detached from the baseplate, and I fear that this is not an easy operation (apart the risk of damaging the mica window).

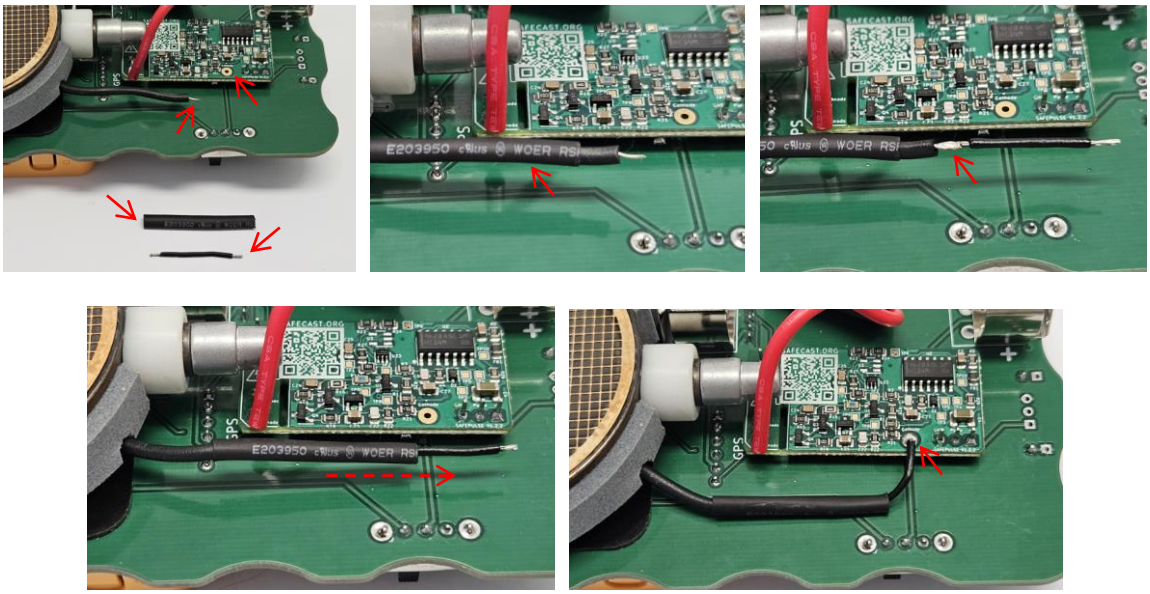
3.3 – Geiger sensor gray rubber belt

Before removing the backside of the gray rubber belt to be wrapped around the pancake sensor, it is best to cut a small notch corresponding to the cathode wire solder joint:

3.4 – Extending the cathode wire of the Geiger sensor

The cathode wire of the pancake is too short, and it is entirely covered by an insulating jacket.

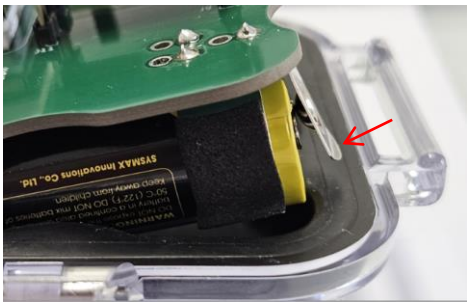
After removing a few mm of the jacket the wire has been prolonged with a short wire. A piece of heatshrinking tube covers the solder junction as shown here below:



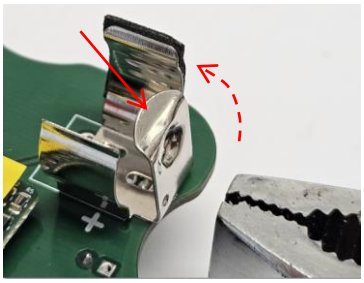
3.5 – Protected LiPo 3.7 V battery issue

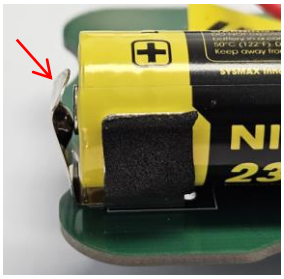
- Nitecore mod. NL1823
- Diameter: 18.4 mm
- Length: 69.5 mm (instead of 65 mm)

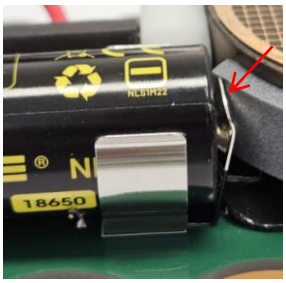
The positive polarity battery holder has been soldered in the most distant position, but this has not been sufficient, as shown in these photos:

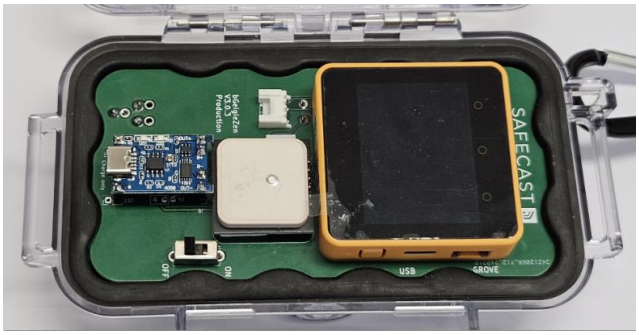


It has been necessary to bend inward the two battery clips to reduce the overall length of the assembly and let the board fit (with some effort) into the Pelican case:





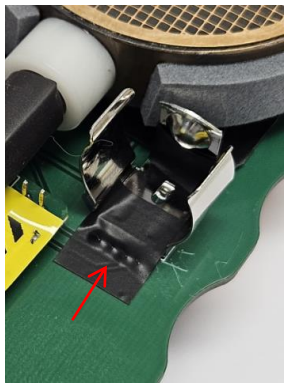


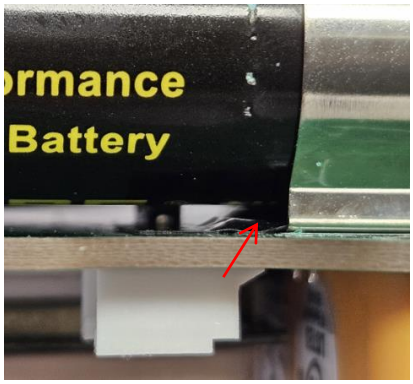


3.6 – Problem with pins of the Grover connector (J6)

The protruding pins of the Grover System connector (J6) can damage the body of the battery when the latter is pressed in:

These four pins have thus been shortened and covered with adhesive tape:

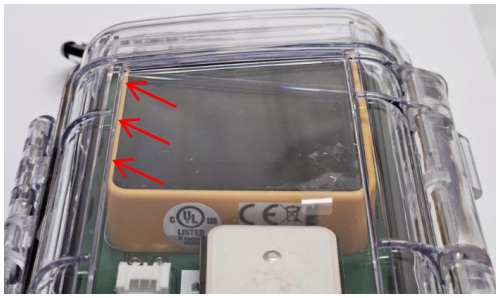




3.7 – Problem with the overall height

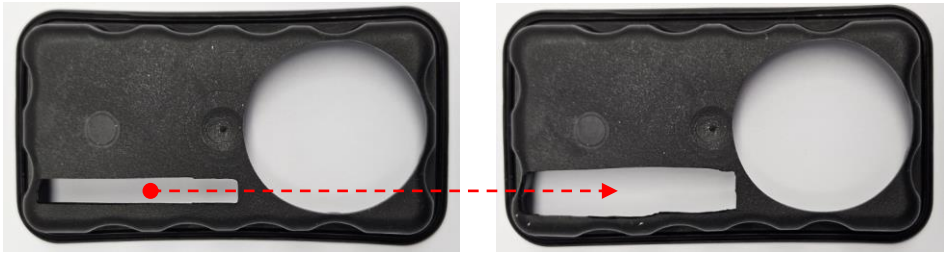
The overall height of the assembly is excessive, even if the board top plane is just 2 mm below the rubber liner of the Pelican case (as recommended by the assembling manual).

The cover touches the inner edge of the M5 module too early. Hence, to reach a complete closure the cover has to be forced down, generating a considerable stress on the plastic hinges and on the M5 module.

It turns out that the rectangular slot in the rubber liner below the battery is too narrow, giving rise to a bulge:

The slot has thus been widened with a sharp cutter, bringing the original 7x63 mm size to a wider (approx.) 14x68 mm opening:

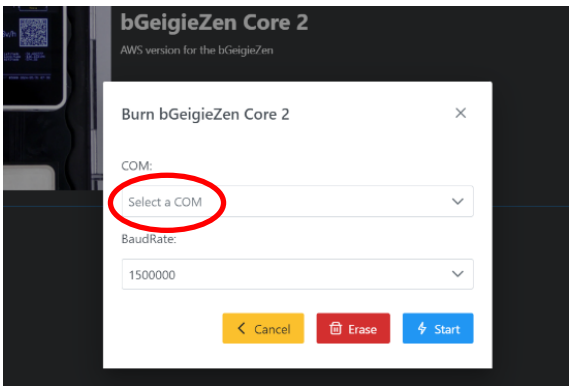


Now the case can be closed with a minor effort (but still forcing a bit on the M5 module):

4. Software Install – M5 burner

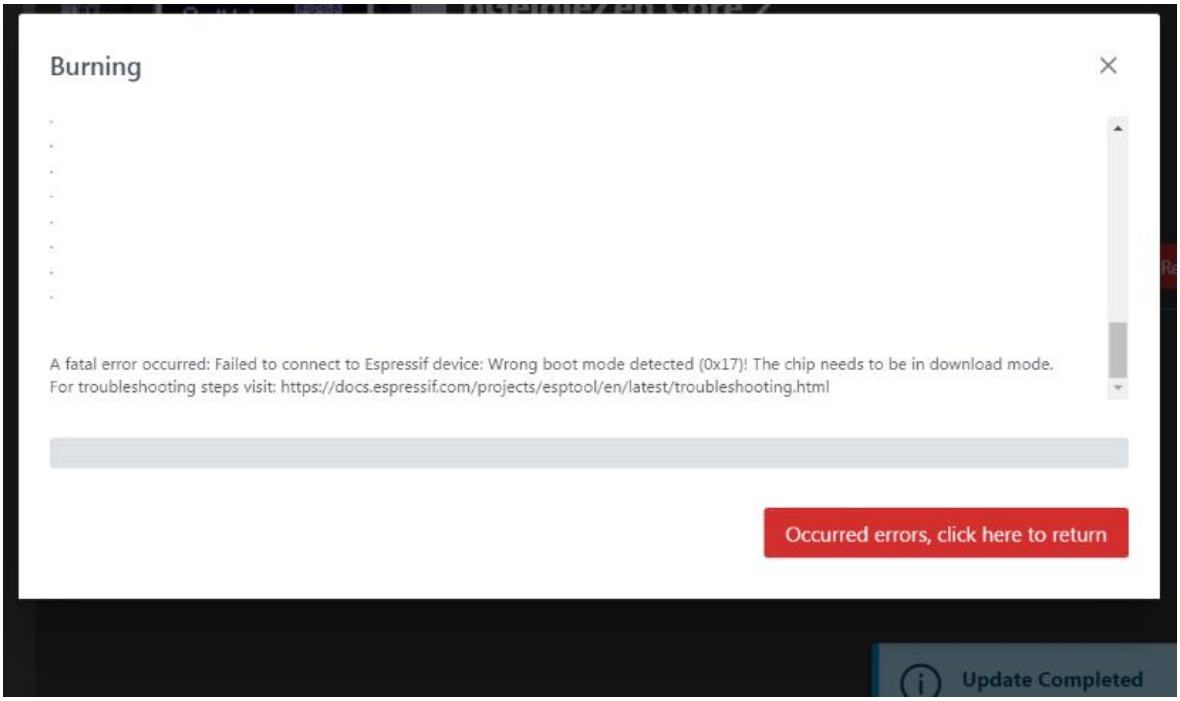
4.1 – Issue with Acer Aspire 5 laptop and Windows 11

The “burning” has not been possible with Acer Aspire 5 laptop, USB2 and USB3 interfaces, type “A” and type “C” physical ports (none of them worked). White screen of the M5 module, periodical rebooting and GPS blue led blinking. But COM port not detected, hence burning impossible.



4.2 – Issue with desktop pc and Windows 7

Tried also with a desktop pc running Windows 7 and several USB2 ports of type A. Again white screen of the M5 module, periodical rebooting and GPS blue led blinking. Now the COM port is detected and burning can be started. At the end it says “Update complete”, but the display of the M5 module remains white and the following fatal error message appears:



Tried also after lowering the communication speed down to 115200 Baud, but without success.