Kiisu Development Board v4b

User Manual

Rainwalker OU, 2025

Document version 1.0 from 1.10.2025

Find the latest version here: https://github.com/kiisu-io/kiisu4

Cautions and warnings

1. This is a development board **intended for experienced users**; it is not a consumer product.
2. The development board can contain small and/or dangerous parts and **must be kept away from children**.
3. Use **only LIR2032 batteries**, never use CR2032 or another types on coin cell batteries.
4. Development **board can emit radio frequency signals**. Users are responsible for complying with local EMI regulations.

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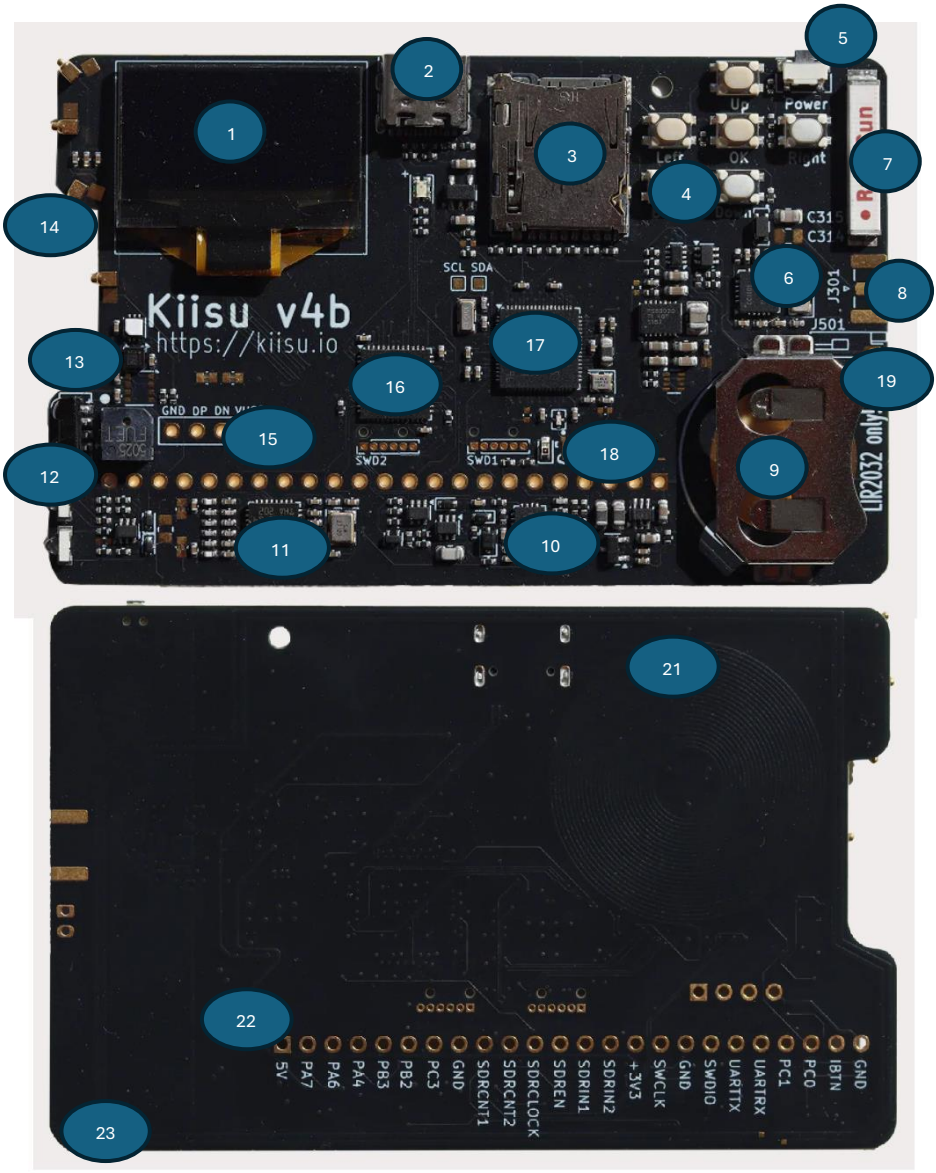
1. Board overview



1. OLED 128x64 screen, SSD1306 compatible in SPI mode.
2. USB Type C connected to Main MCU (17), supports charging of LIR2032 battery (9).
3. microSD Card slot.
4. Control buttons.
5. Power On button.
6. SubGhz transceiver CC1101.
7. Internal 433 MHz antenna for CC1101.
8. Place for SMA connector for external antenna.
9. LIR2032 battery connector. **Do not use another type of coin cell batteries!**
10. RFID reader and emulator with built-in antenna (21).
11. NFC reader and emulator ST25R3916 with built-in antenna (23).
12. Infrared receiver and transmitter.
13. Temperature and humidity sensor GXHTC3C is installed.
    Digital accelerometer and compass LSM303AGR may be installed or not depending on board's revision. It can be soldered by user.
    Gas sensor measuring relative humidity, barometric pressure, ambient temperature and gas (VOC) BME680 can be soldered by user.
14. iButton memory reader and emulator pins
15. USB header connected to Aux MCU (16).
16. Aux MCU STM32G431CBU6 up to 170 MHz
17. Main MCU STM32WB55RGV6 up to 80 MHz
18. Ambient light sensor
19. Place for li-ion battery connector
22. GPIO pins.

2. Schematics and resources

Board schematics, latest version of this manual can be found here: https://github.com/kiisu-io/kiisu4

Aux MCU demonstration firmware can be found here: https://github.com/kiisu-io/kiisu4-companion-fw

This firmware allows to run and develop any Flipper Zero firmware with some limitations. (**Note**: Rainwalker OU and Kiisu board are NOT affiliated with Flipper Zero Devices Inc or team)

Fork of official Flipper Zero Firmware can be found here: https://github.com/kiisu-io/kiisu-firmware

3. Limitations of compatibility

Despite this development, the board can run almost any firmware for the Flipper Zero device, there are some limitations:

1. The board doesn't contain Flipper Zero secret keys, so official firmware may not support some SubGhz protocols and U2F.
2. The performance of board antennas can differ.
3. Some parts of the schematic are different, so features like battery status depend on Aux MCU firmware.
4. Once again, this is development board, not final end user device.

4. Powering on

Board can be powered from USB (2), from Li-Ion battery LIR2032 (9) and external Li-Ion battery.

In the case of USB, the board will turn on automatically and will remain powered until there is USB voltage. In case of LIR2032, users should press Power On button (5). Board power than controlled by Aux MCU.

5. Updating or installing Kiisu or Flipper compatible firmware

1. Go to the firmware's GitHub and follow the instructions:

Kiisu: https://github.com/kiisu-io/kiisu-firmware

Kiisu Momentum: https://github.com/twoelw/Kiisu-Momentum-Firmware

Unleashed: https://github.com/DarkFlippers/unleashed-firmware

6. Entering DFU Mode on Main MCU

If your board doesn't boot properly, you can enter DFU mode.

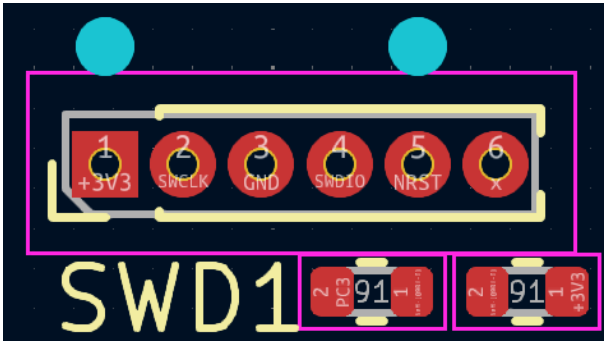
1. Disconnect USB and remove battery.
2. Press and hold OK Button (5).
3. Connect USB Type C (2).
4. Main MCU will enter in DFU mode.
5. Screen will remain blank.
6. Firmware can be updated via Flipper Lab (you can find the links above), by STM32CubeProgrammer, qFlipper and other software.

7. Updating firmware for Aux MCU over USB

1. Disconnect all USB and remove battery.
2. Press and hold Back Button (5).
3. Connect USB Type C (2).
4. Connect USB cable to Aux USB pins (15). You need to prepare this cable by yourself.
5. Aux MCU will enter in DFU mode and can be updated by STM32CubeProgrammer and other software.

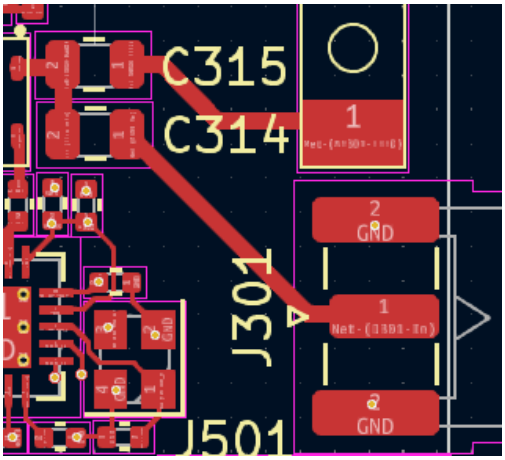
8. Updating and debugging Main and Aux MCU with ST-Link or other debugging tools

You can use ST-Link or other debugging tools, connecting them to SWD1 header (for main MCU) or SWD2 header (for aux MCU). Header is 1x6 row with 1 mm step. Here is the pinout:



1 – Voltage reference for debugging tool
2 – SWD Clock
3 – Ground
4 – SWD IO
5 – Reset
6 – Not used

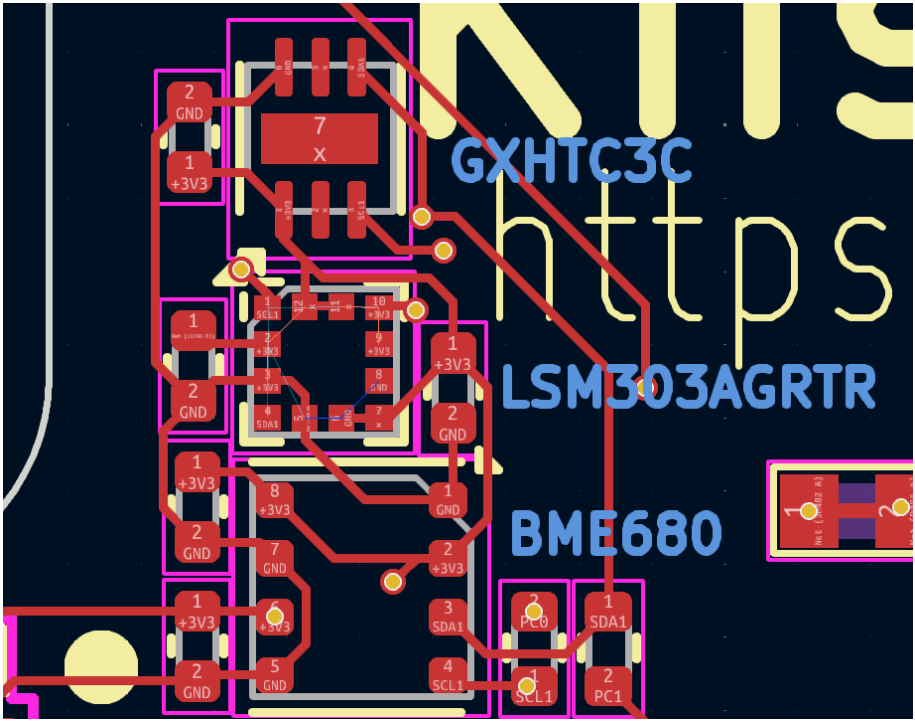
9. Connecting external antenna to CC1101 transceiver



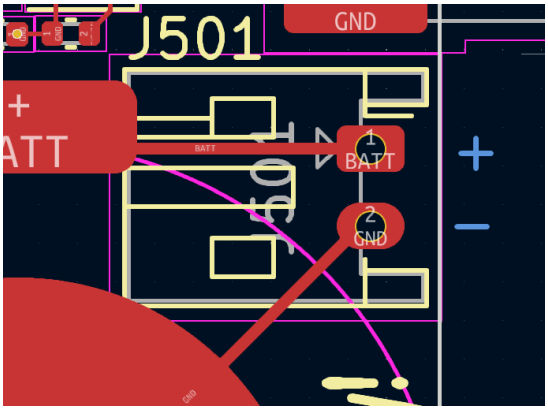
1. Move capacitor from C315 to C314.
2. Solder SMA edge connector to J301.
3. Connect antenna for desired frequency to J301.

10. Soldering BME680 or LSM303AGR

Gas sensor measuring relative humidity, barometric pressure, ambient temperature and gas (VOC) BME680 can be installed by user. Here is the place and chip orientation.



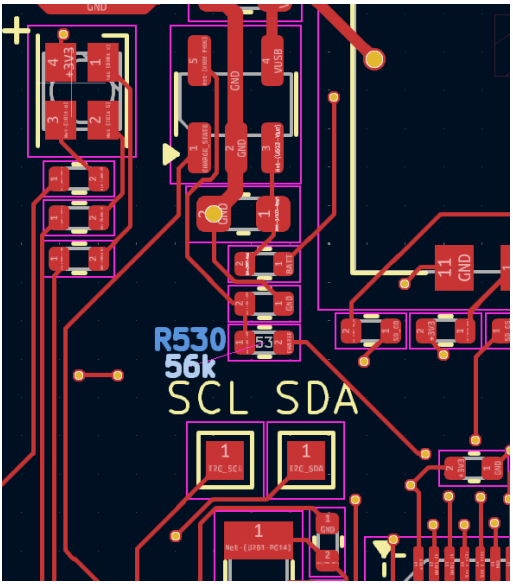
11. Connecting external li-ion battery



It is possible to power Kiisu board from external battery.

Using external battery in wrong way can damage you, your board, or battery. Be careful and do this only if you know what you do.

1. Remove LIR2032 battery from holder, disconnect USB.
2. Desolder LIR2032 holder.
3. Solder JST_PH_S2B-PH-K to J501 (or solder battery directly).
4. DOUBLE CHECK polarity of your battery (marked blue on picture above) and battery type (only li-ion with charging voltage 4.42).



Charger is MCP73831T-2ACI/OT. You can adjust charging current by changing the R530 resistor. Do not do this for LIR2032. Default value is 56k (for about 20 mA).