

# Kiisu Development Board v4a

## User Manual

Rainwalker OU, 2025

Document version 1.0 from 1.04.2025

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

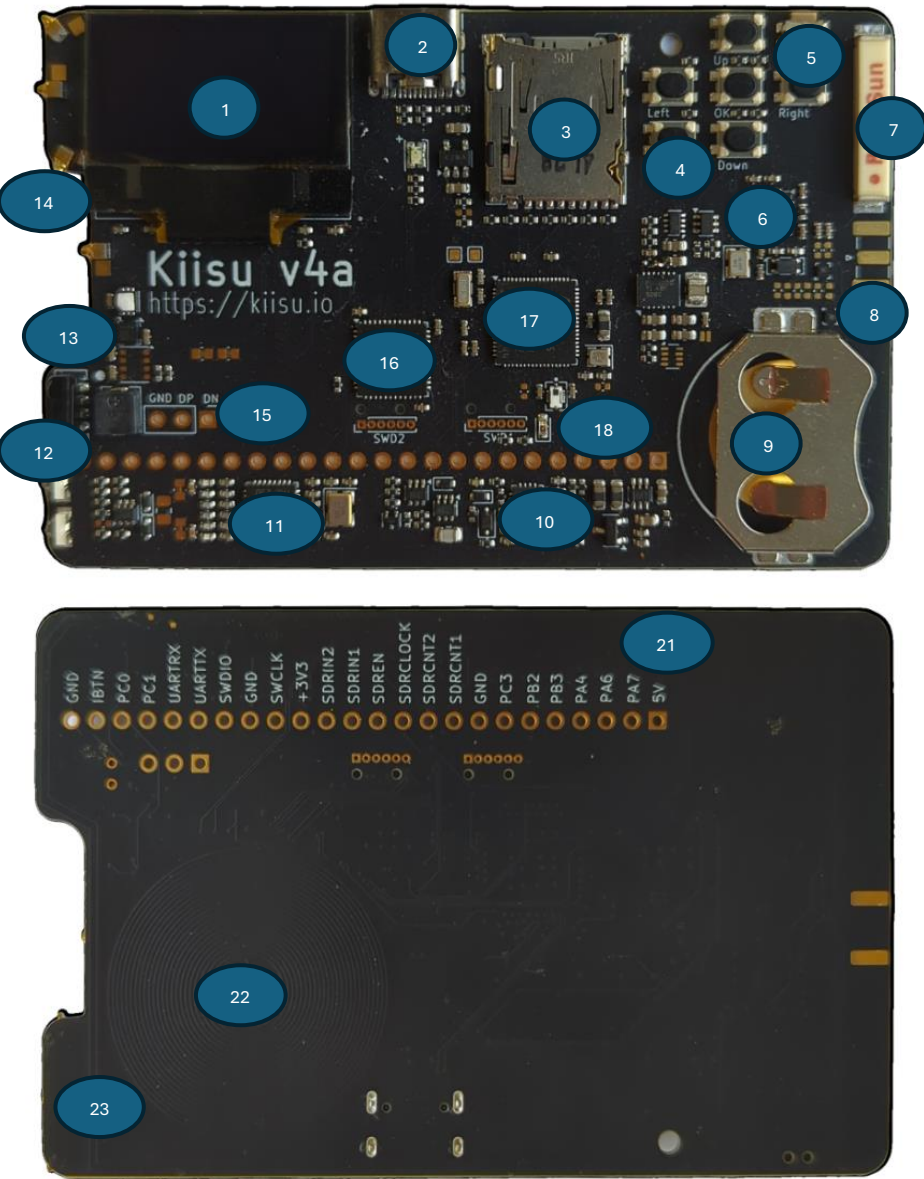
# Cautions and warnings

- 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 (23).
11. NFC reader and emulator ST25R3916 with built-in antenna (23).
12. Infrared receiver and transmitter.
13. Digital accelerometer and compass LSM303AGR.  
Temperature and humidity sensor GXHTC3C.  
Gas sensor measuring relative humidity, barometric pressure, ambient temperature and gas (VOC) BME680 can be installed by user.  
Digital ranger VL53xxx can be installed 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
21. 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>

This fork can also be run on Flipper Zero.

## 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 firmware for Main MCU over USB

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 and can be updated by STM32CubeProgrammer, qFlipper and other software.

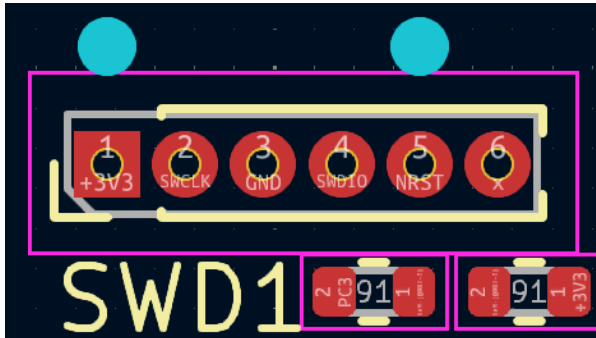
## 6. Updating firmware for Aux MCU over USB

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.

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

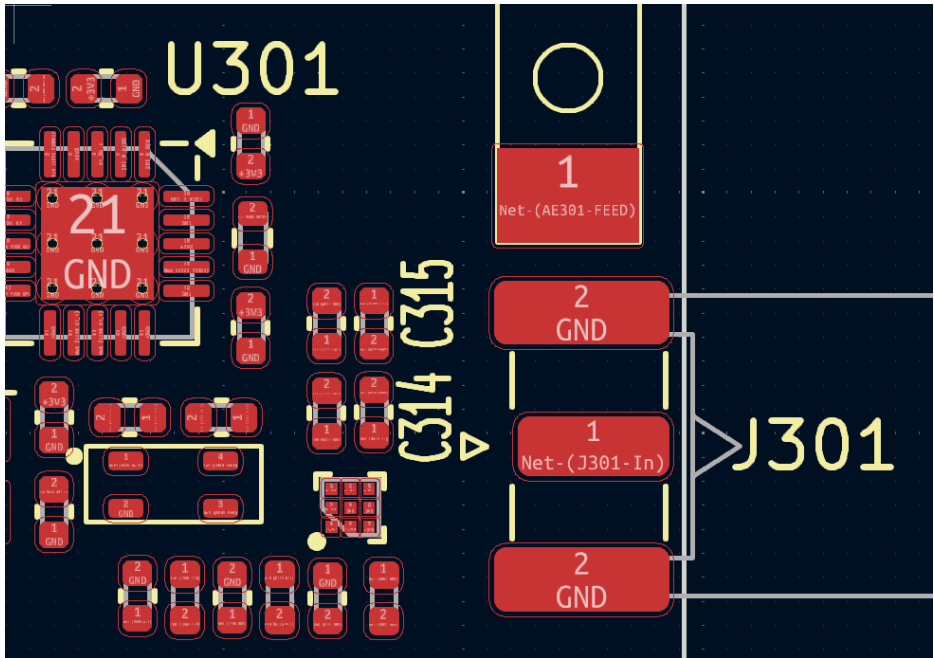
You can use ST-Link or other debugging tools, connecting them to SWD1 header (for main MCU) or SWD2 header (for aux MCU).

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

## 8. Connecting external antenna to CC1101 transceiver



1. Remove C315.
2. Solder jumper to C314.
3. Solder SMA edge connector to J301.