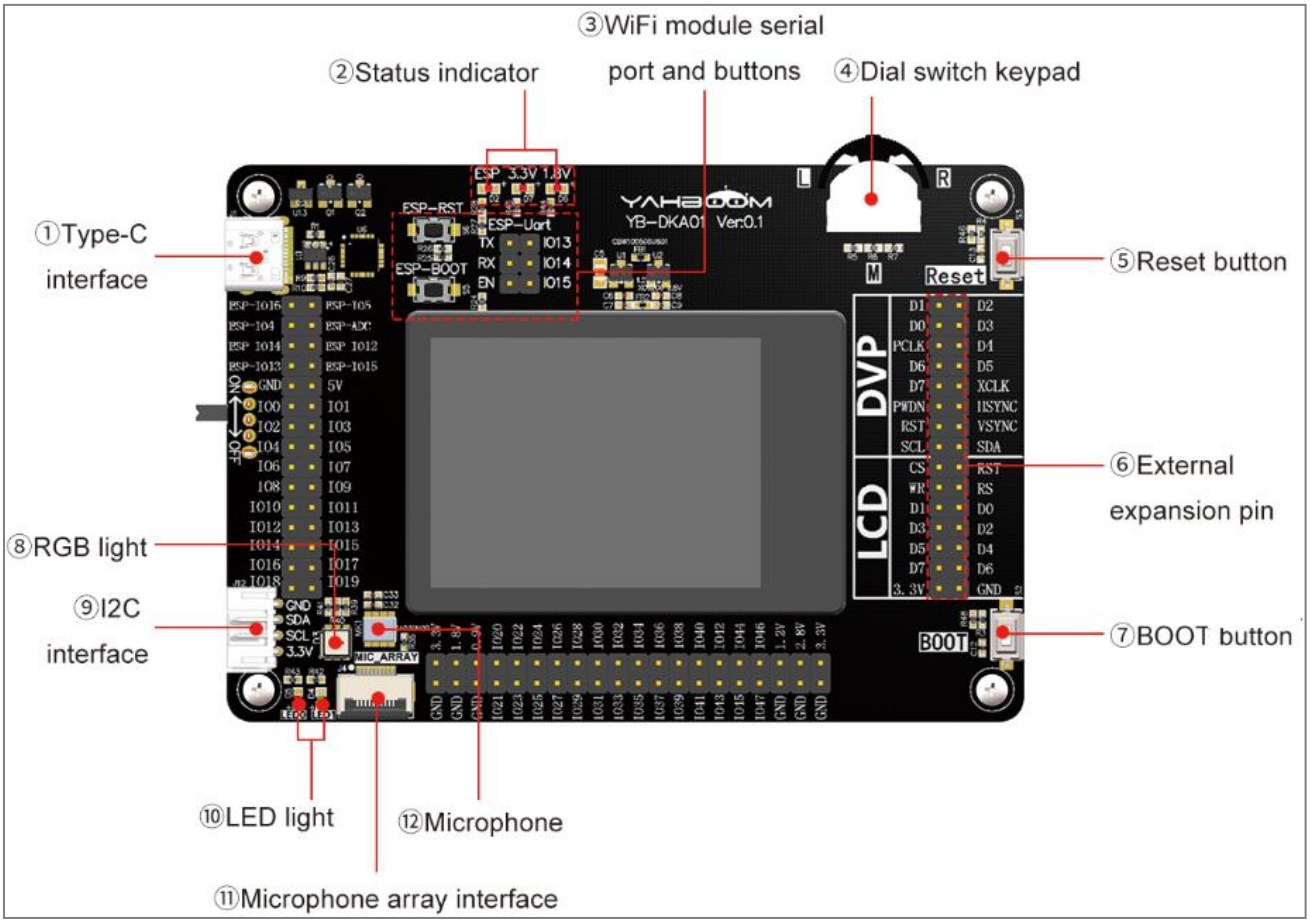
First Trial and test

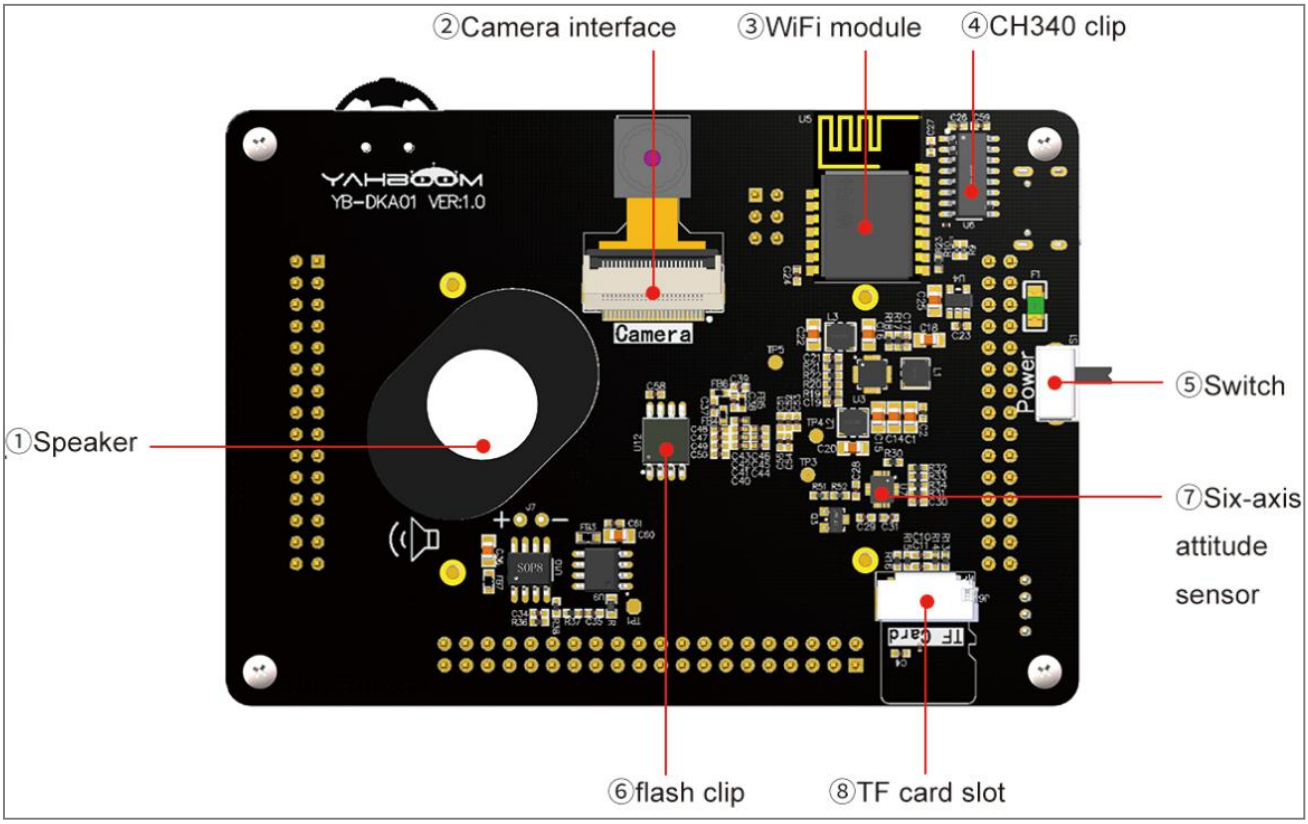
1. Introduction to the location of components

Front



①**Type-C interface:** power supply, download firmware and serial port debugging, etc.
②**Status indicator:** Indicate whether the 3.3V, 1 8V voltage of the development board is normal, and the light is on when it is normal. And the WiFi module BOOT level indicator.
③**WiFi module serial port and buttons:** can be used to burn the firmware of the WiFi module or communicate with the K210 serial port.
④**Dial switch keypad:** Three-channel dial switch.
⑤**Reset button:** the reset button of K210 chip.
⑥**External expansion pin header:** The development board has led out all the I0 ports of K210 for connecting with external devices.
⑦**BOOT button:** can be used as a custom function button.
⑧**RGB light:** set three I0 port levels to light up different colors.
⑨**I2C interface:** external I2C slave device can be connected for communication
⑩**LED light:** LEDO and LED1.
⑪**Microphone array interface:** used to connect a microphone array.
⑫**Microphone:** record sound.

Back



①Speaker: play sound.
②Camera interface: connect the camera.
③WiFi module: ESP8285-WiFi module, which can realize IOT function on the Internet.
④CH340 chip: download firmware and serial port debugging function.
⑤Power switch: the main power switch of the development board, turn ON to open, turn OFF to turn off.
⑥flash chip: used to save program firmware and data.
⑦Six-axis attitude sensor: The inside is composed of a three-axis gyroscope and a three-axis accelerometer.
⑧TF card slot: You need to insert the TF card yourself, with the golden finger facing the development board.
(Please prepare TF card by yourself)

2. Factory testing

The K210 development board with Factory testing program is burned by default.
Users can test the various components of the K210 according to the following steps. Then write other firmware for using.

Main interface

1-checking the camera.
2-checking the buttons and lights.
3-checking the WiFi module.
4-checking the gyroscope.
5-checking the microphone and speaker.

2.1 Checking the camera

Click the "camera"button on LCD. you can see camera capture screen will display on the LCD screen.

Note: The interface jumps when it is opened at the first time.

Click “BOOT”button on board to back to main interface.

2.2 Checking button and RGB light o board

Click “Back”button on LCD to back to main interface.

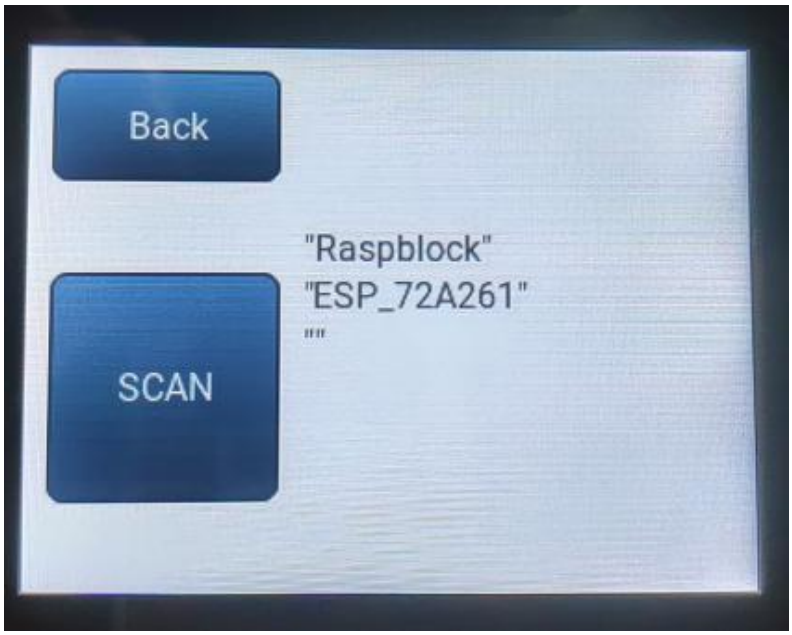
Array: Test the microphone array interface, output low level to the corresponding IO port in turn. Users can ignore this feature.

LED_OFF: Turn off all lights.

L: When we toggle the keypad to the left, L button will become red.

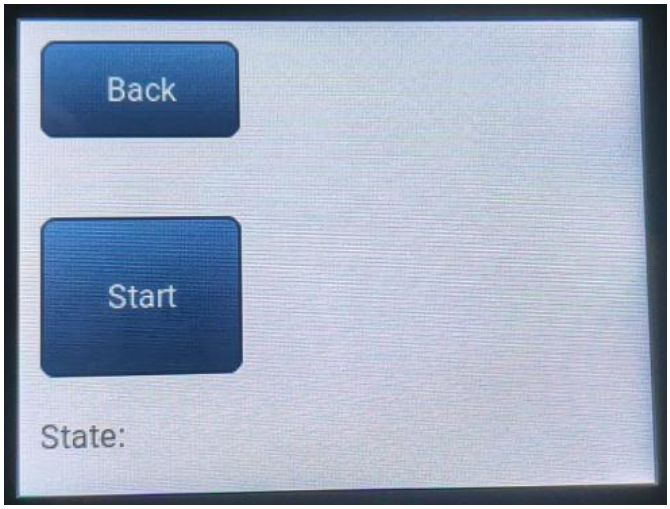
M: When we press the keypad, M button will become red.
R: When we toggle the keypad to the right, R button will become red.
BOOT: When we press this BOOT key on board, BOOT button on LCD will become red.
Red: Make RGB light become red.
Green: Make RGB light become green.
Blue: Make RGB light become blue.
L1: Make LED0 light up.
L2: Make LED1 light up.

2.3 Checking WIFI module



Back: Return to main interface.
SCAN: Scan WIFI signal. Then, print out WIFI name, which will take about three seconds.

2.4 Checking gyroscope



Back: Return to main interface.
Start: start up gyroscope.
We need to put K210 board on horizontal desktop. Click “Start”, we will see a robot icon be displayed. After about 1 second of instability, it is stably displayed in the middle of LCD.

When K210 development board is tilted to the left, the robot moves to the left;
when K210 development board is tilted to the right, the robot moves to the right;
when K210 development board is tilted up, the robot moves up;
when K210 development board is tilted down, the robot moves down;
Finally, the K210 development board is placed on the horizontal desktop, the robot will automatically return to the middle position.

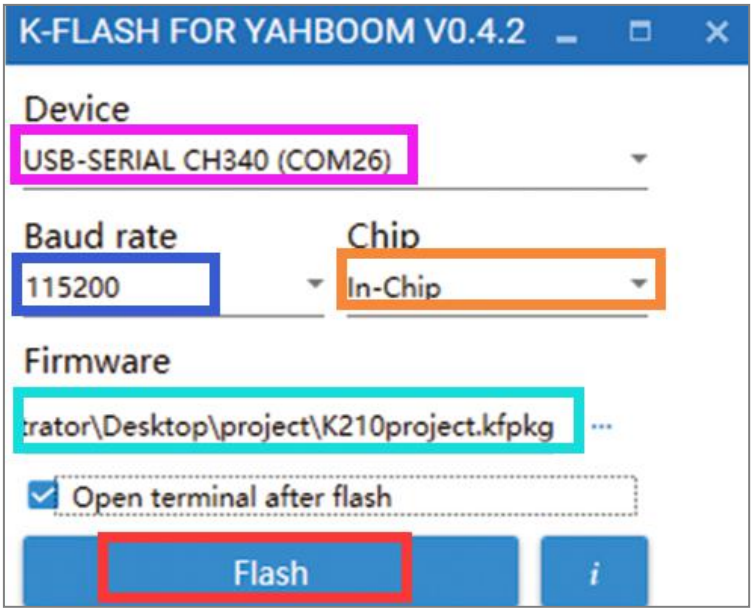
2.5 Checking Mic and speaker

Back: Return to main interface.
SD: Initialize the TF card.
Before pressing this operation, we need to insert the TF card in the correctly. Then, click to initialize the TF card. If the initialization is completed, it will display “SD: OK”.

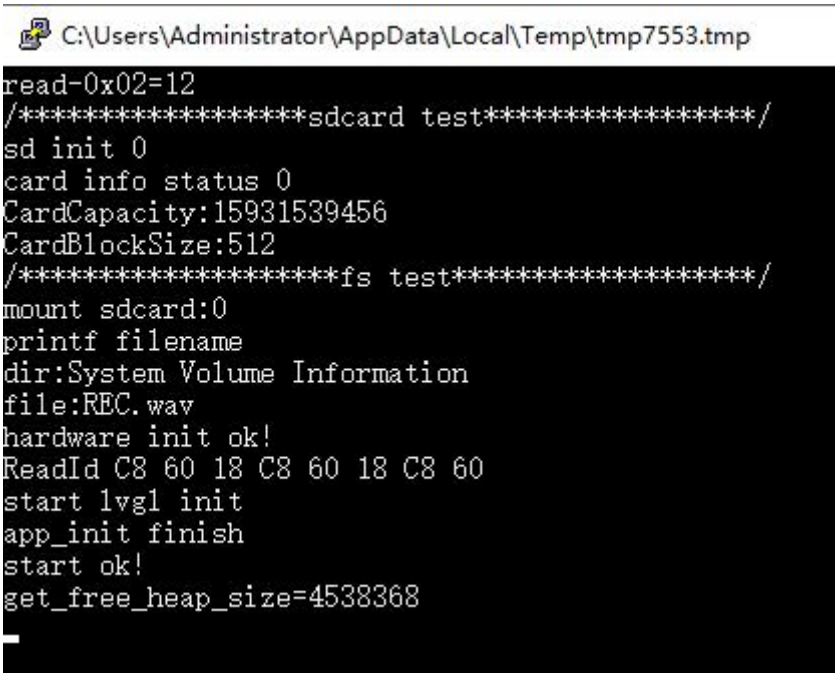
Record: Start recording, the red light will flash. You need to click to initialize the TF card before recording.
Stop: Stop recording and the red light goes out.
Play: Play the recording , the blue light is on.

3. How write program into K210 board

3.1 Double-click to open **K-Flash.exe**, and connect the computer to the K210 development board through the Type-C data cable.
Device: selects the serial port number of your K210 development board.
Baud rate: selects the baud rate(115200).
Chip: selects In-chip or In-SRAM.
If you choose in-Chip, it will write to the chip, it will start automatically when power is on, and will be saved after power off.
If you choose in-Memory, it will be write to SRAM and will not be saved after power off.
Firmware: selects the program firmware (.bin file), we select **K210project.kfpkg**.
Checking Open terminal after flash means that the terminal will be opened automatically after the programming is completed.
Click Flash to start burning the firmware.



3.2 After the writing is completed, the terminal will be opened automatically and the following information will be printed.



4. First Trial

After burning the【K210project.kfpkg】firmware, there are four picture buttons on the main interface, including face detection, object detection, RGB control, recording and playing.

A. Face detection

Click "Face Detection" and the LCD screen will display the camera screen. When the camera detects a human face, a small frame will appear on the face.

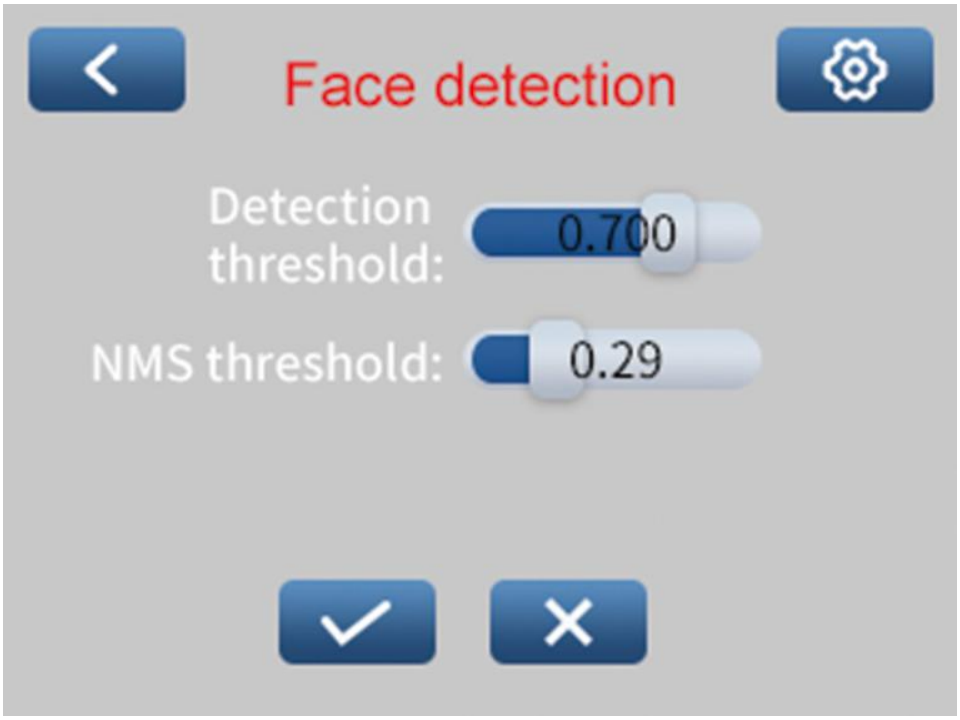
Click the screen again to pop up the following menu. At the same time, the camera stops collecting data.

After modifying the data by dragging the slide bar, click the "√" below to save the data, and click"X" to exit without saving.

Detection threshold: The threshold of face detection.

NMS threshold: Non-maximum threshold, mainly combining recognition frames for face detection.

Return method: Click the "<" button in the upper left corner, or scroll the keypad to the left to L to exit.



B. Object detection

Object detection can detect the following objects:

Airplane, bicycle, bird, boat, bottle, bus, trolley, cat, chair, milk, table, dog, motorcycle, person, potted plant, sheep, sofa, train, TV.

Click "Object Detection" button to enter the object detection function interface.

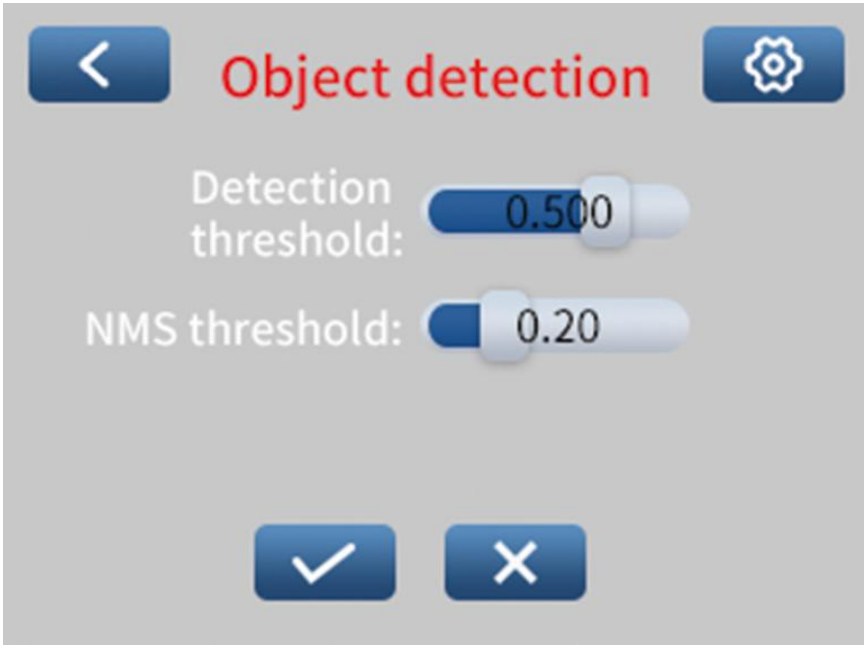
When check the object described above, the LCD will circle the detected object and mark the type of this object.

Click the screen again to pop up the following menu. At the same time, the camera stops collecting data.

After modifying the data by dragging the slide bar, touch the "√" below to save the data, and touch "X" to exit without saving.

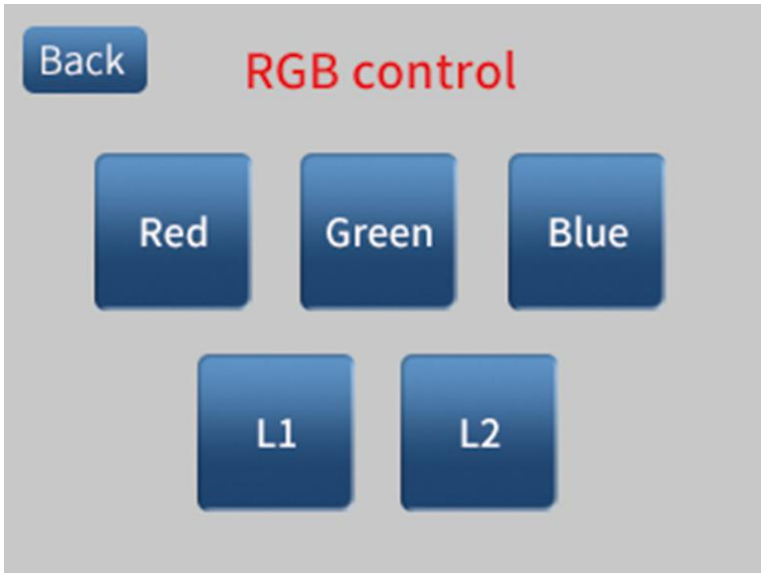
Detection threshold: The threshold of object detection.

NMS threshold: Non-maximum threshold, which is mainly combined with the recognition frame of object detection



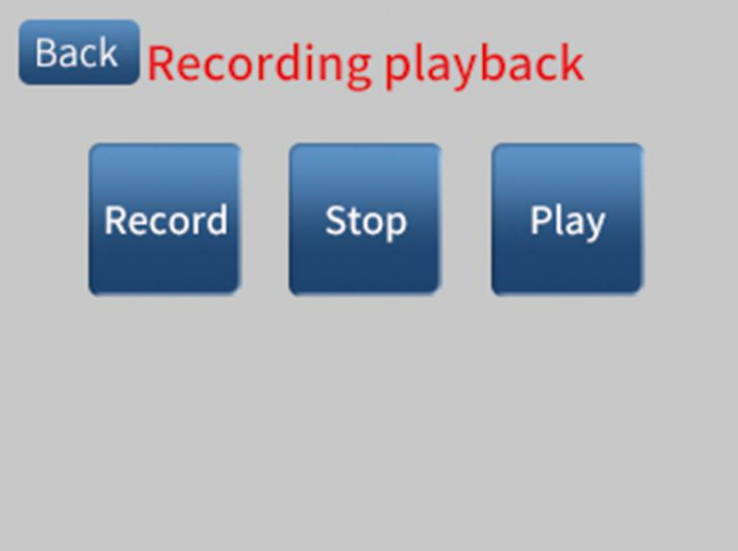
Return method: Click the "<" button in the upper left corner, or scroll the keypad to the left to L to exit.

C. RGB control



Click "RGB Control" to enter the RGB control interface, as shown above. Click the Red, Green, and Blue buttons, the RGB lights will correspond to three different colors.
Click “L1”, LED0 will light up red, click “L2”, LED1 will light up green .
Click “Back” to exit to the main interface.

D.Recording and playing



Tip: you need to close the K210 development board and then insert the TF card(fat32).

Click "Recording/Playing" button to enter the recording playback interface.
When we press “Record” to start recording (RGB red starts to flash);
press “Stop” to stop recording and save it to the TF card (RGB red is off);
press “Play” to play the sound just recorded (RGB blue lights up).