8 PTZ tracking color

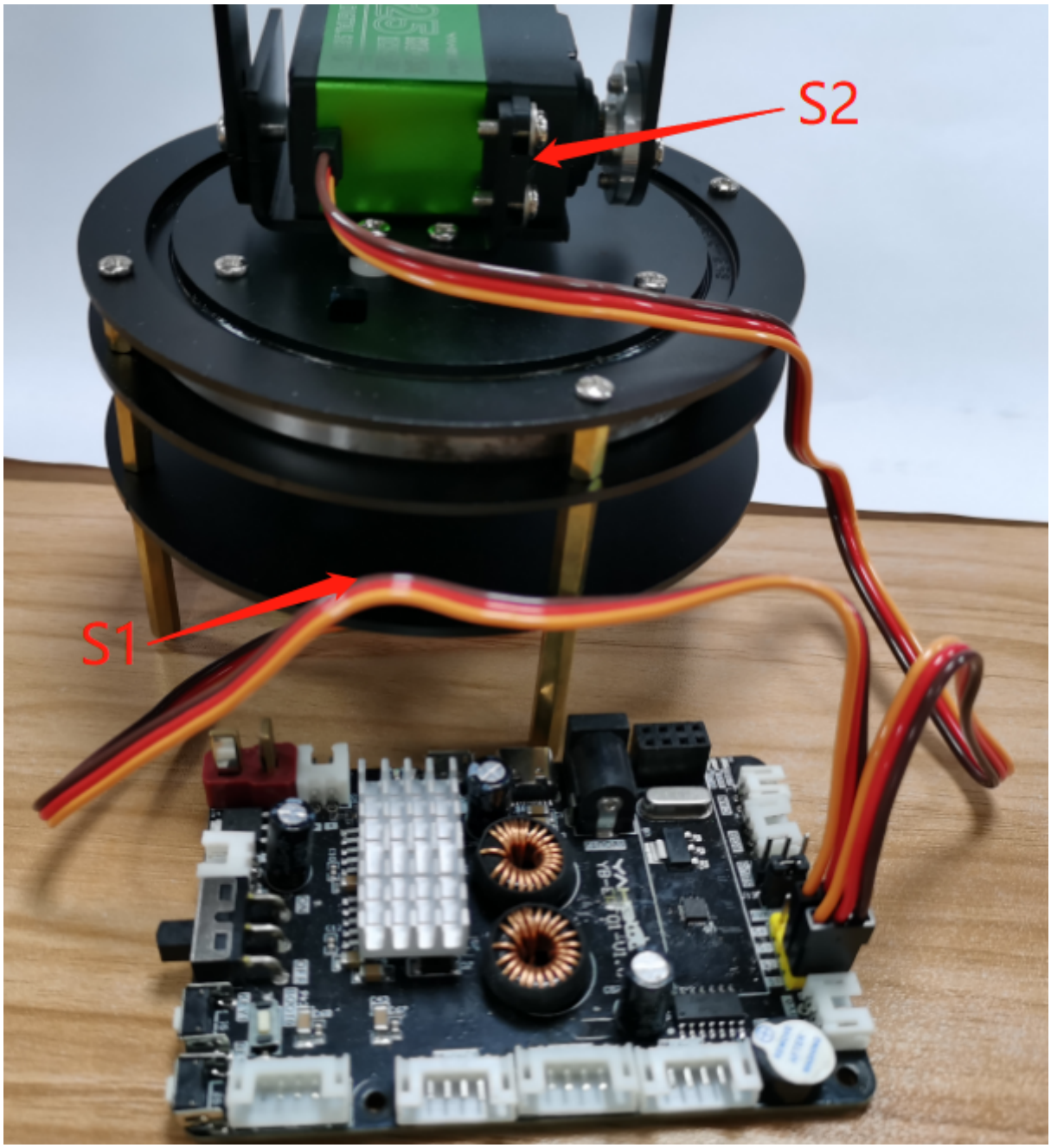
8.1 the experimental description

The present experiment was to belong to expand the class of experiments, the need to match other external devices to use, here to the car chassis and the ROS expansion Board is not part of K210 module kit contents, so the present experimental results are for reference only, if there is no corresponding device is not directly use the routine code.

ROS expansion Board needs advance programming firmware: ROS-CAR. hex

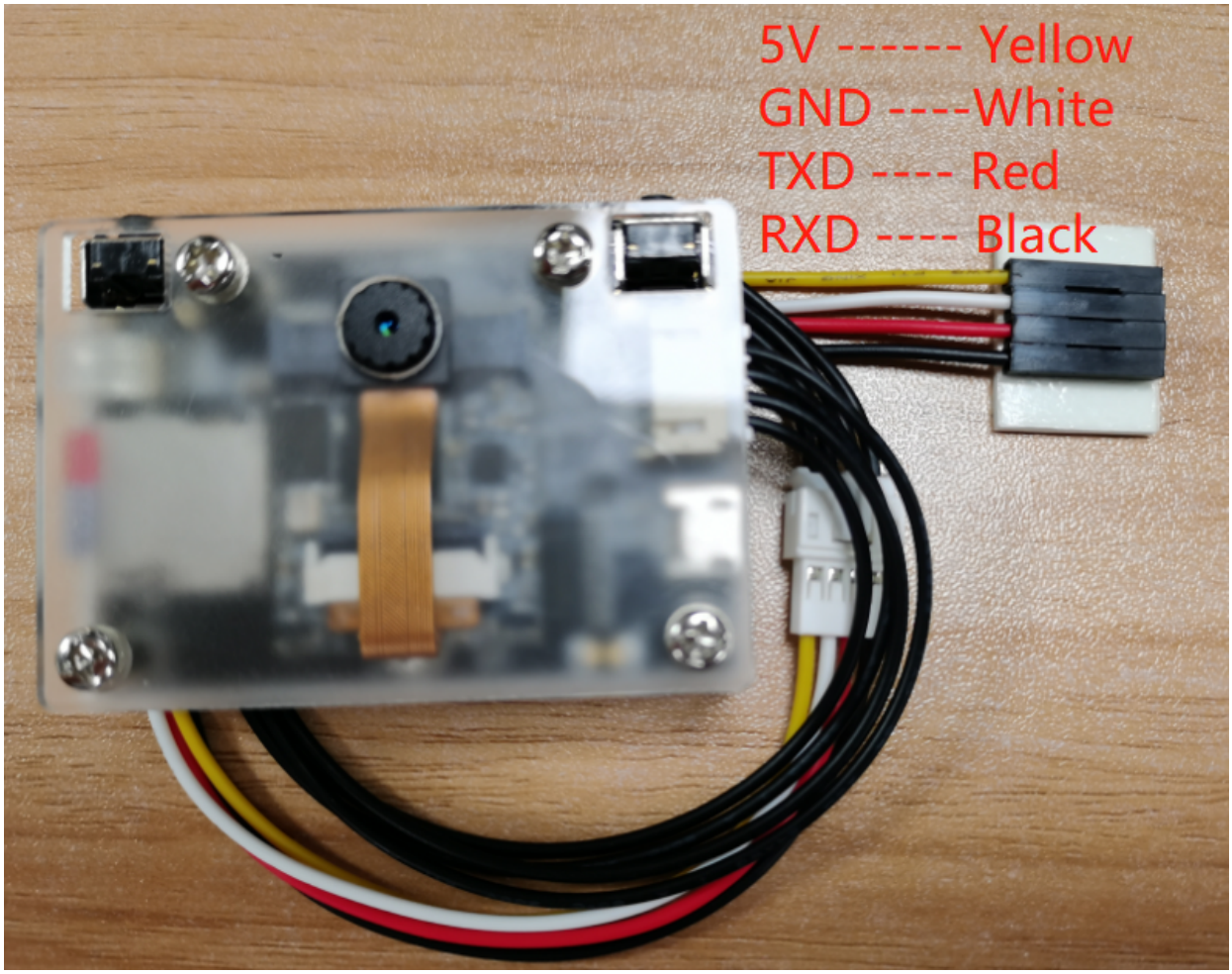
The gimbal servos connected to the ROS expansion Board on the corresponding interface:

S1 connected to the X-axis servos, S2 is connected to the Y-axis servos. Yellow for signal, red for VCC, black for GND.

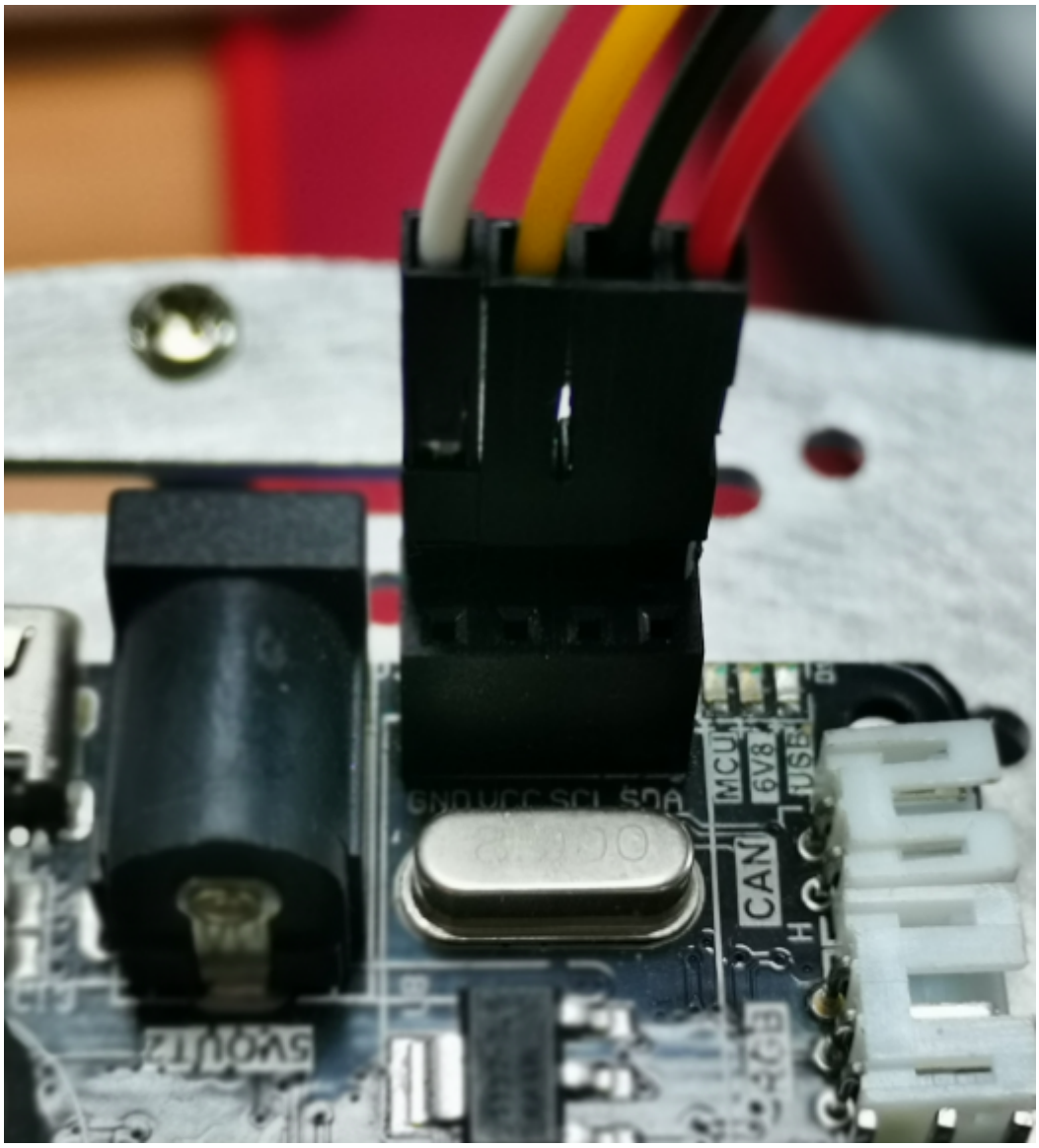


K210 module with the ROS expansion Board connected to the line sequence as shown below:

White(GND) connected to GND, yellow(5V) is connected to VCC, the black(RXD) connect the SCL, the red(TXD) connected to SDA.



Here you note that the illustration of the logo for the I2C line sequence identity, but K210 using serial communication, due to the burning of the ROS-CAR. the hex file has been put on this interface modification for the serial signal, so in fact the ROS expansion Board on the interface corresponding relationship is: the SCL is actually TX, SDA is actually RX.



8.2 the experimental goals

This lesson is mainly learning K210 module with the car chassis to do a visual inspection of the line features.

The present experiments the reference code path is: CanMV\06-export\tracking_color.py

8.3 the experimental operation

1. ROS expansion Board to burn the firmware: ROS-CAR. hex
2. Insert the RGB light strip into the RGB light interface of the ROS expansion board.
3. Please CanMV\06-export\library directory under the trolley driver library and PID control Library in advance to download to the memory card root directory.
4. Open CanMV IDE open tracking_color. py code and downloaded to the K210 module.
5. The K210 module via the 4PIN cable is connected to the ROS expansion Board.

6. The gimbal is placed on a white or black background, and then open the ROS expansion Board to the power supply.
7. The middle of the screen displays a white box, will have to keep track of the color put into the box, waiting for the box becomes green, then start to learn colors, wait for the green box disappears, then the learning is completed, the PTZ will follow just learning the color of the action.

8.4 experimental results

Wait for the system initialization is complete, the K210 module finish learning colors, you immediately follow the color action may be Colors of the block Up, Down, Left or right movement of the PTZ will track the color block exercise, make Color Block try to keep the screen in the middle.

If the tracking of the reaction is too fast or too slow, it may be appropriate to modify the program of PID parameters.

```
PIDx = (50, 0, 3)
PIDy = (50, 0, 2)
SCALE = 1000.0

PID_x = PID(
    160,
    PIDx[0] / 1.0 / (SCALE),
    PIDx[1] / 1.0 / (SCALE),
    PIDx[2] / 1.0 / (SCALE))

PID_y = PID(
    120,
    PIDy[0] / 1.0 / (SCALE),
    PIDy[1] / 1.0 / (SCALE),
    PIDy[2] / 1.0 / (SCALE))
```

8.5 the experiments are summarized

PTZ tracking color play is based on color recognition, will be identified to the color of the position coordinates, through the PID algorithm to calculate the PTZ need the position of the movement, so that the PTZ can track the movement of the color block. Since the picture frame rate and to identify the limit, the color block activities can not be too fast, otherwise the gimbal may not keep up with the reaction.