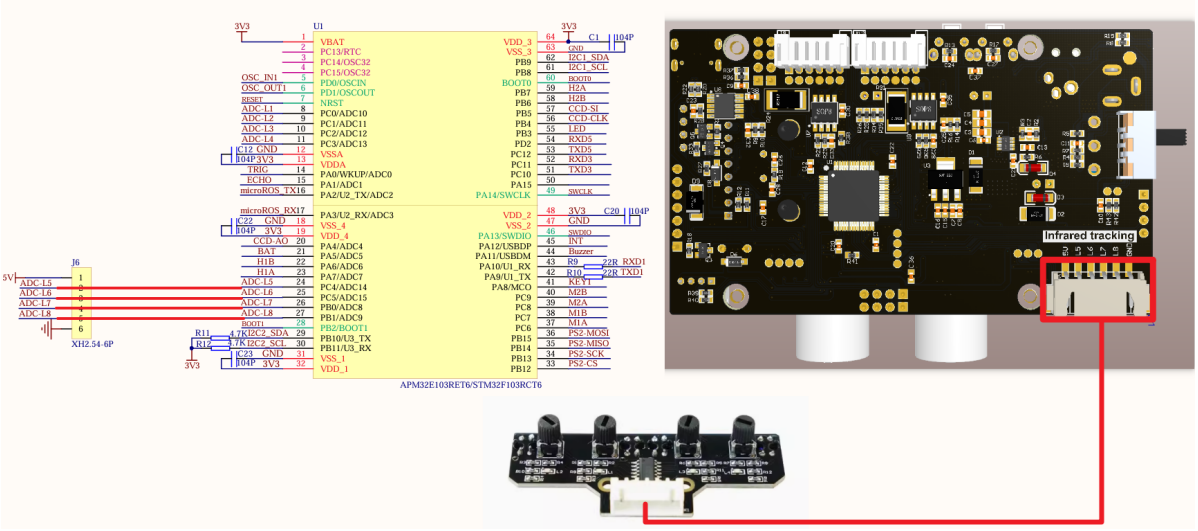
Four-way tracking module：Read status (GPIO)

The tutorial demonstrates the serial port and OLED display of the status of each indicator light of the four-way line patrol module.

```
The tutorial only introduces the standard library project code
```

Hardware connection

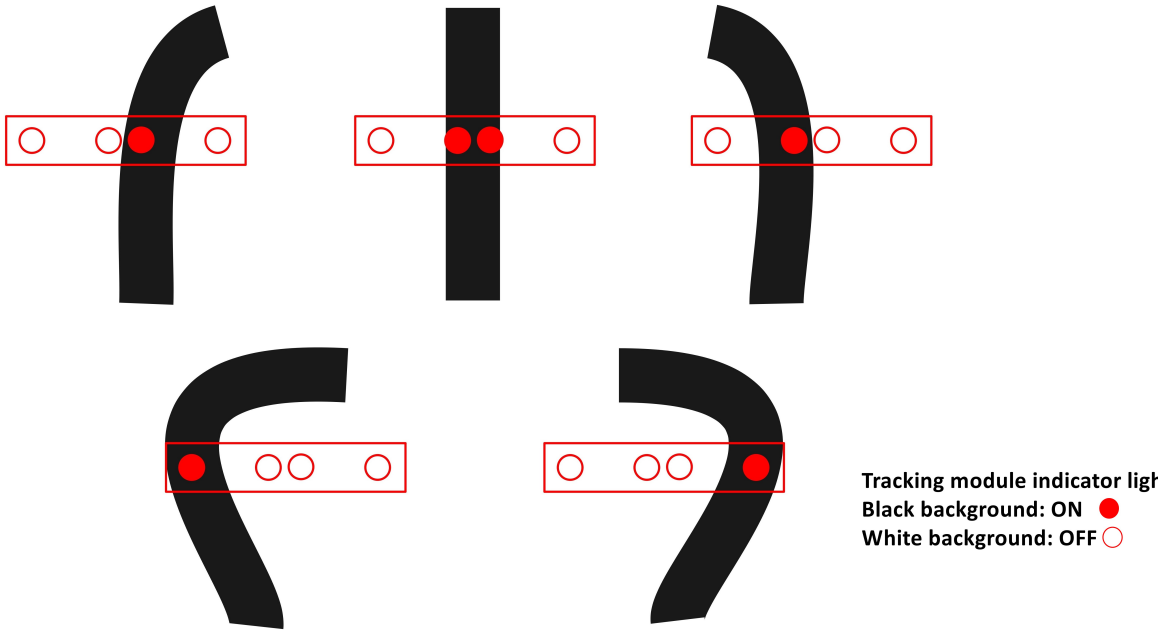


Since we have configured a special connection line, we only need to install it to the corresponding interface:

Four-way line patrol module corresponding LED	Four-way line patrol module	Development board
	VCC	5V/3.3V
L1	X1	PC4
L2	X2	PC5
L3	X3	PB0
L4	X4	PB1
	GND	GND

Control principle

By reading the X1, X2, X3, and X4 interface levels of the four-way tracking module, it is determined whether the black line is detected and where the black line is located.



> **Black line detected**

Light on → The corresponding interface of the four-way patrol module outputs a low level;

> **White line detected**

Light off → The corresponding interface of the four-way patrol module outputs a high level.

```
Note: The correspondence between the interface, LED, and adjustment knob shall be based on the silk-screen numbers, for example: X1 corresponds to L1, SW1
```

Software Configuration

Pin Definition

Main Control Chip	Pin	Main Function (After Reset)	Default Multiplexing Function	Redefine Function
STM32F103RCT6	PC4	PC4	ADC12_IN14	
STM32F103RCT6	PC5	PC5	ADC12_IN15	
STM32F103RCT6	PB0	PB0	ADC12_IN8/TIM3_CH3/TIM8_CH2N	TIM1_CH2N
STM32F103RCT6	PB1	PB1	ADC12_IN9/TIM3_CH4/TIM8_CH3N	TIM1_CH3N

Software code

Since the default function of the pin is the normal IO pin function, we need to use the default multiplexing function.

```
Product supporting materials source code path: Attachment → Source code summary → 2.Extended_Course → 8.IRtracking
```

Control function

The tutorial only briefly introduces the code, you can open the project source code to read it in detail.

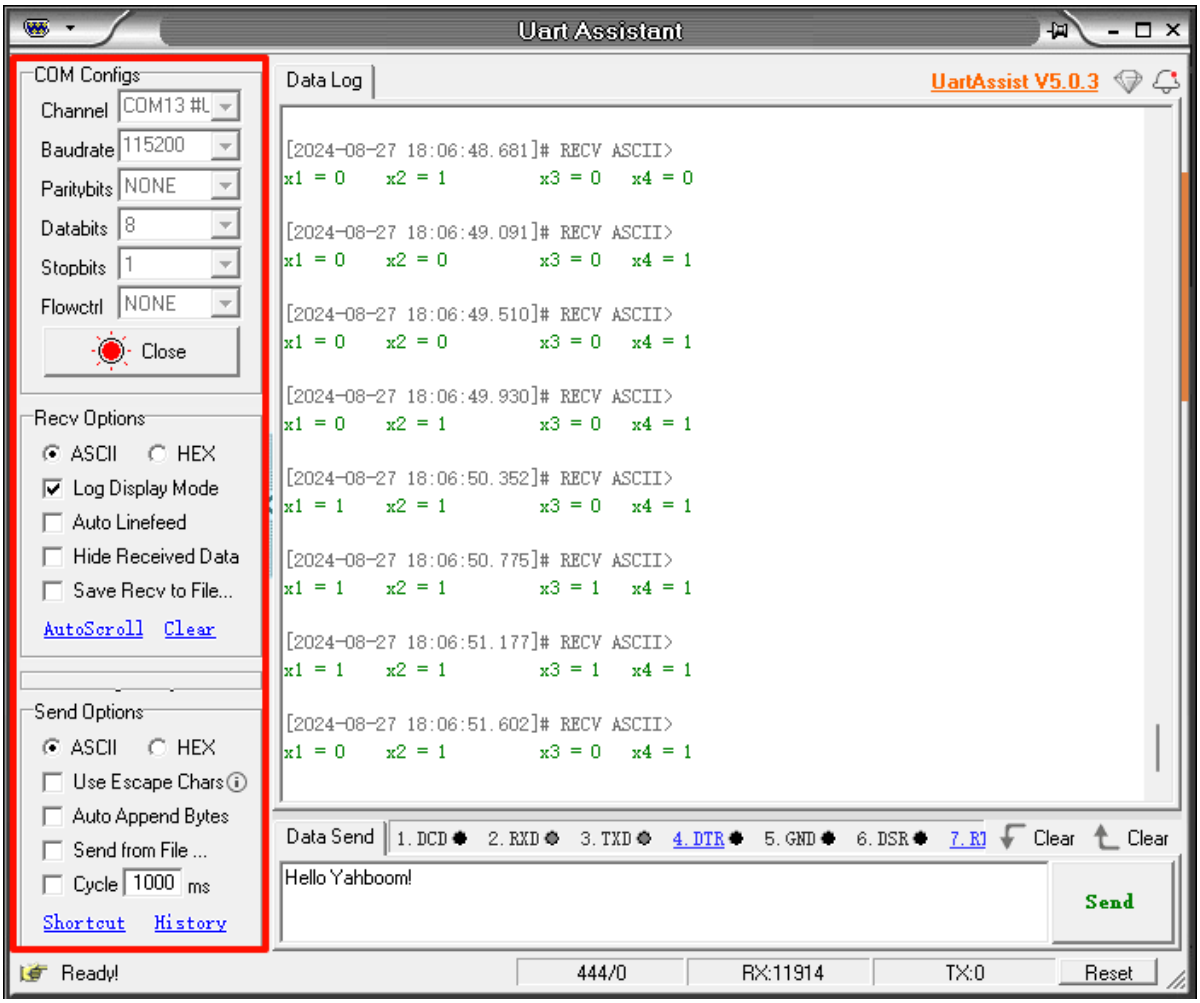
> **irtracking_init**

```
void irtracking_init(void)
{
    GPIO_InitTypeDef GPIO_InitStructure;
    RCC_APB2PeriphClockCmd(IR_X1_Clk|IR_X2_Clk|IR_X3_Clk|IR_X4_Clk, ENABLE);

    GPIO_InitStructure.GPIO_Mode=GPIO_Mode_IN_FLOATING;
    GPIO_InitStructure.GPIO_Pin=IR_X1_Pin;
    GPIO_Init(IR_X1_Port,&GPIO_InitStructure);

    GPIO_InitStructure.GPIO_Mode=GPIO_Mode_IN_FLOATING;
    GPIO_InitStructure.GPIO_Pin=IR_X2_Pin;
    GPIO_Init(IR_X2_Port,&GPIO_InitStructure);

    GPIO_InitStructure.GPIO_Mode=GPIO_Mode_IN_FLOATING;
    GPIO_InitStructure.GPIO_Pin=IR_X3_Pin;
    GPIO_Init(IR_X3_Port,&GPIO_InitStructure);

    GPIO_InitStructure.GPIO_Mode=GPIO_Mode_IN_FLOATING;
    GPIO_InitStructure.GPIO_Pin=IR_X4_Pin;
    GPIO_Init(IR_X4_Port,&GPIO_InitStructure);
}
```

Experimental phenomenon

The IRtracking.hex file generated by the project compilation is located in the OBJ folder of the IRtracking project. Find the IRtracking.hex file corresponding to the project and use the FlyMcu software to download the program to the development board.

After the program is successfully downloaded: the serial port prints and the OLED displays the X1, X2, X3, and X4 interface levels of the four-way tracking module.


Uart Assistant
COM Configs
Channel COM13 #L
Baudrate 115200
Paritybits NONE
Databits 8
Stopbits 1
Flowctrl NONE
Close
Recv Options
ASCII HEX
Log Display Mode
Auto Linefeed
Hide Received Data
Save Recv to File...
AutoScroll Clear
Send Options
ASCII HEX
Use Escape Chars
Auto Append Bytes
Send from File ...
Cycle 1000 ms
Shortcut History
Data Log
UartAssist V5.0.3
[2024-08-27 18:06:48.681]# RECV ASCII>
x1 = 0 x2 = 1 x3 = 0 x4 = 0
[2024-08-27 18:06:49.091]# RECV ASCII>
x1 = 0 x2 = 0 x3 = 0 x4 = 1
[2024-08-27 18:06:49.510]# RECV ASCII>
x1 = 0 x2 = 0 x3 = 0 x4 = 1
[2024-08-27 18:06:49.930]# RECV ASCII>
x1 = 0 x2 = 1 x3 = 0 x4 = 1
[2024-08-27 18:06:50.352]# RECV ASCII>
x1 = 1 x2 = 1 x3 = 0 x4 = 1
[2024-08-27 18:06:50.775]# RECV ASCII>
x1 = 1 x2 = 1 x3 = 1 x4 = 1
[2024-08-27 18:06:51.177]# RECV ASCII>
x1 = 1 x2 = 1 x3 = 1 x4 = 1
[2024-08-27 18:06:51.602]# RECV ASCII>
x1 = 0 x2 = 1 x3 = 0 x4 = 1
Data Send
1. DCD 2. RXD 3. TXD 4. DTR 5. GND 6. DSR 7. RI
Clear Clear
Hello Yahboom!
Send
Ready!
444/0
RX:11914
TX:0
Reset