

Four-way tracking module

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This tutorial demonstrates how to read the level of an external 4-way tracking module on your development board using the **GPIO input** function.

1、software-hardware

- **STM32F103CubeIDE**
- **STM32 robot expansion board**

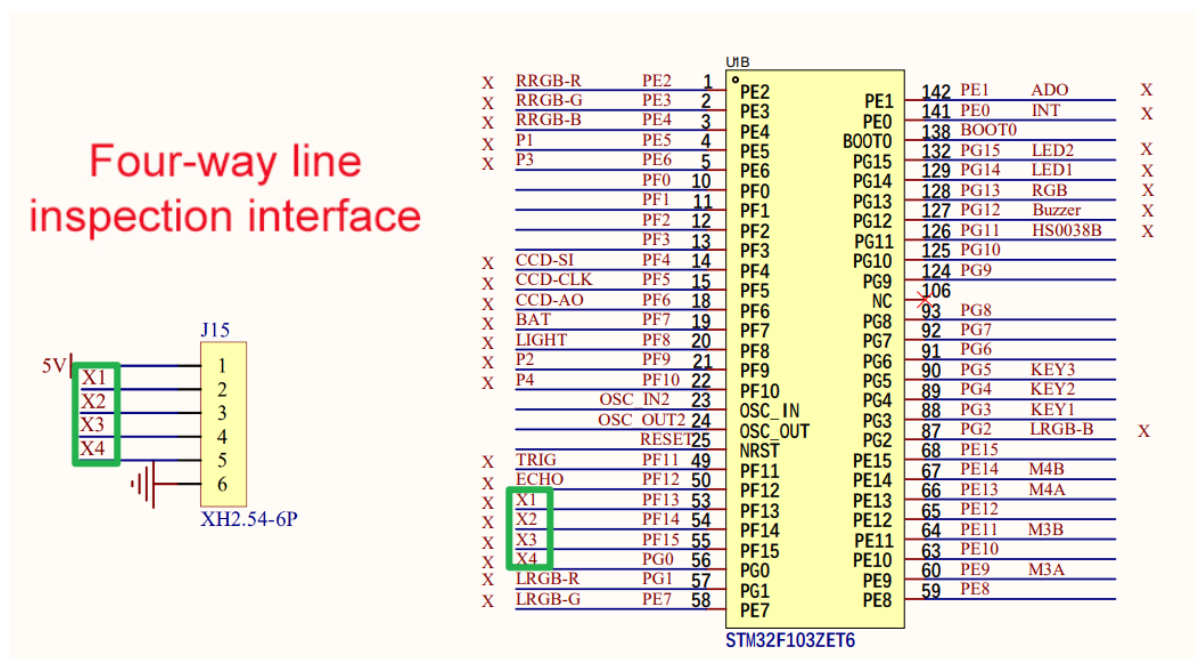
A four-way tracking module is externally connected to the development board

- **Type-C cable or ST-Link**

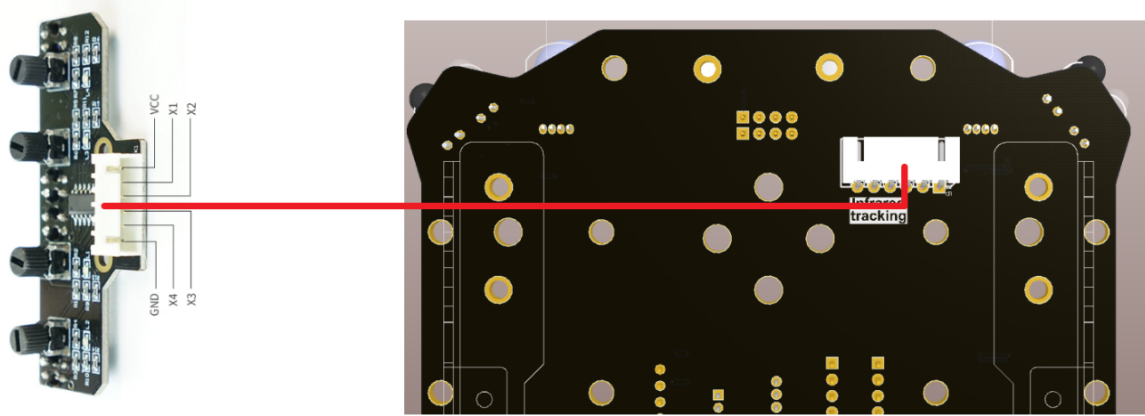
Download or simulate the program of the development board

2、Brief principle

2.1、Hardware schematic diagram



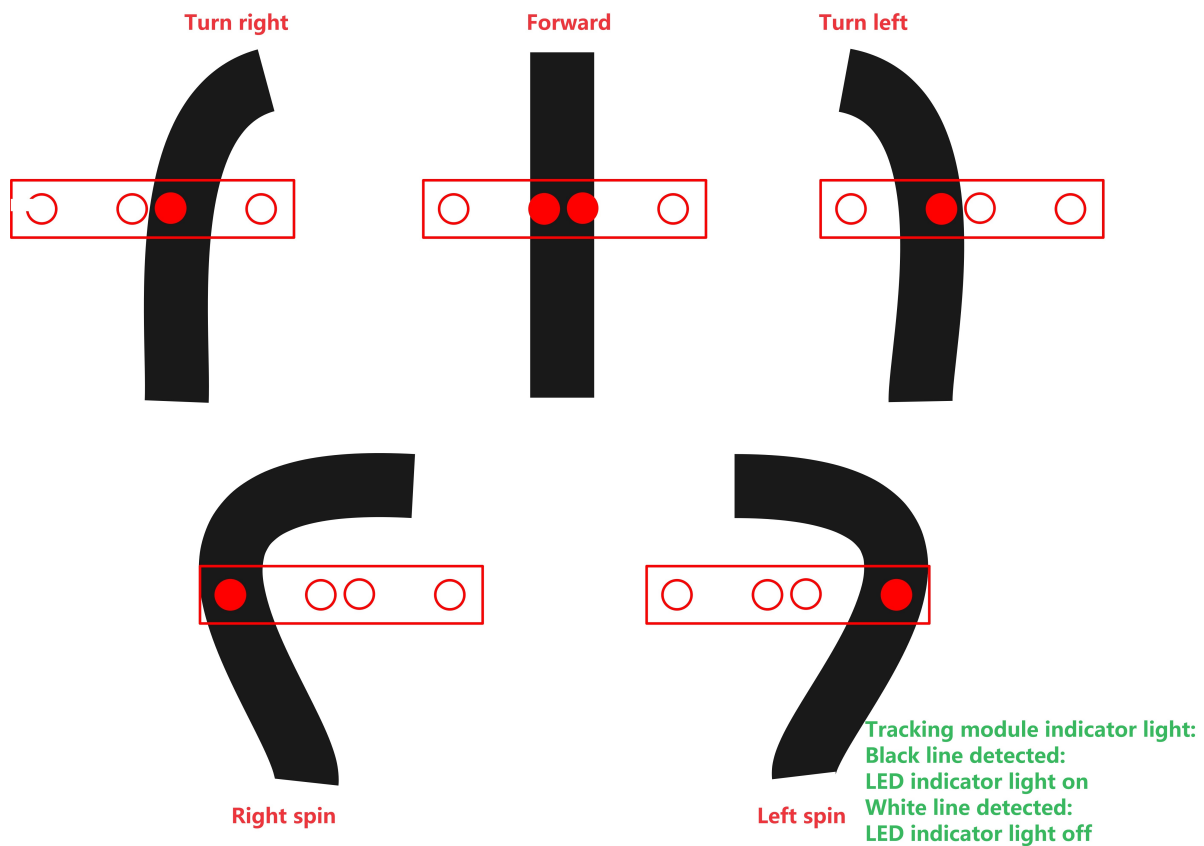
2.2、Physical Connection Graph



Use the 6Pin cable of XH2.54 and connect it to the corresponding interface

2.3、Principle of control

The interface levels of X1, X2, X3, X4 of the four-way tracking module are read to determine whether the black line is detected.



The following only lists some situations. Users can write their own logic code according to the actual situation.

- **Black line detected:** The light is on, and the output level of the corresponding interface of the four-way inspection module is low
- **White line detected:** The light is off and the corresponding interface of the four-way inspection module outputs a high level

RGB (Schematic name)	Control pin	feature
X1	PF13	Read the level of the X1 interface

RGB (Schematic name)	Control pin	feature
X2	PF14	Read the level of the X2 interface
X3	PF15	Read the level of the X3 interface
X4	PG0	Read the level of the X4interface

Note: The corresponding relationship between interface, LED and adjustment knob is subject to the screen print number, for example: X1 corresponds to L1 and SW1

3、Engineering configuration

Project Configuration: Prompts for configuration options in the STM32CubeIDE project configuration process

3.1、Notes

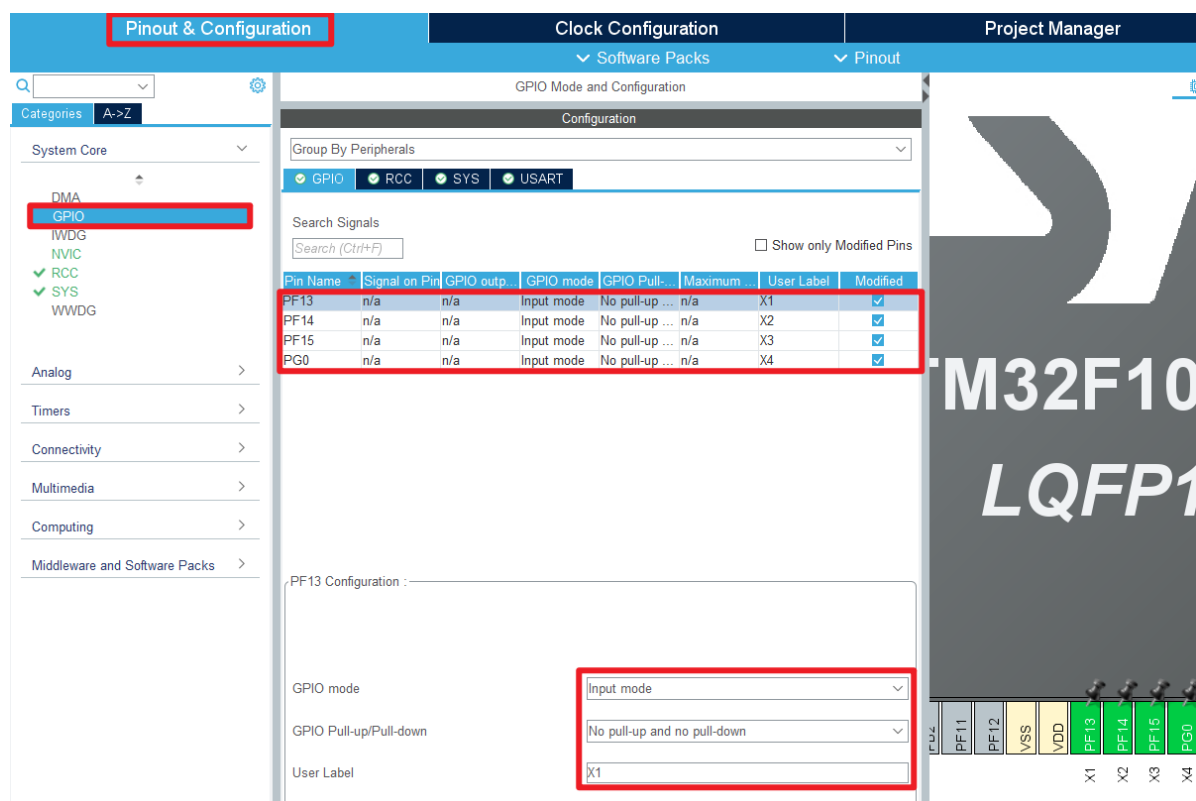
Omitted project configuration: **New project, chip selection, project configuration, SYS for pin configuration, RCC configuration, clock configuration, and project configuration** content

The project configuration part, which is not omitted, is the key point to configure in this tutorial.

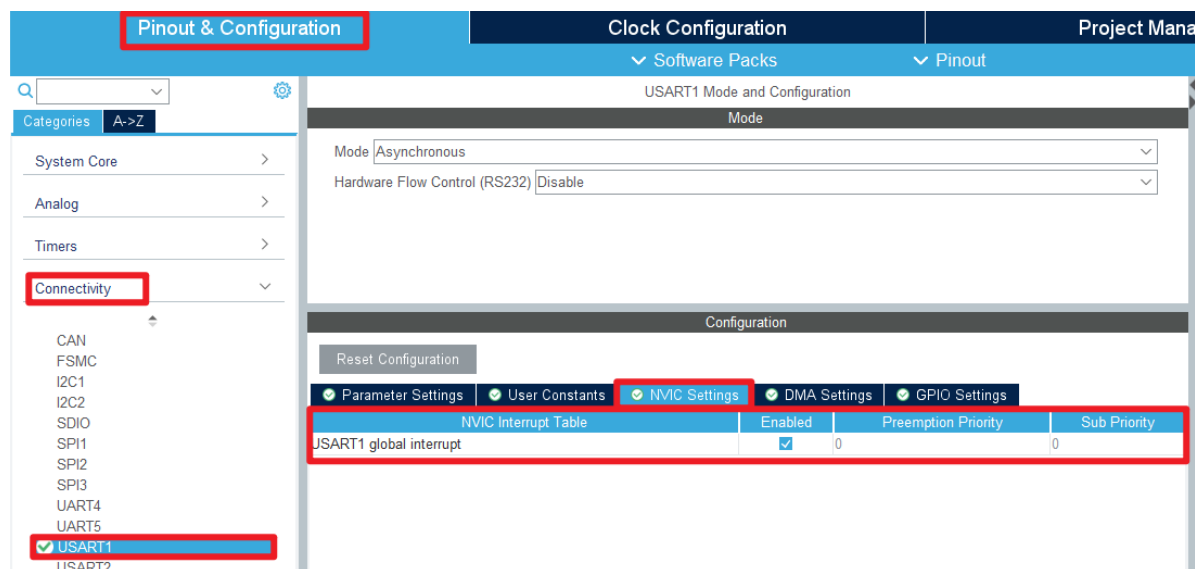
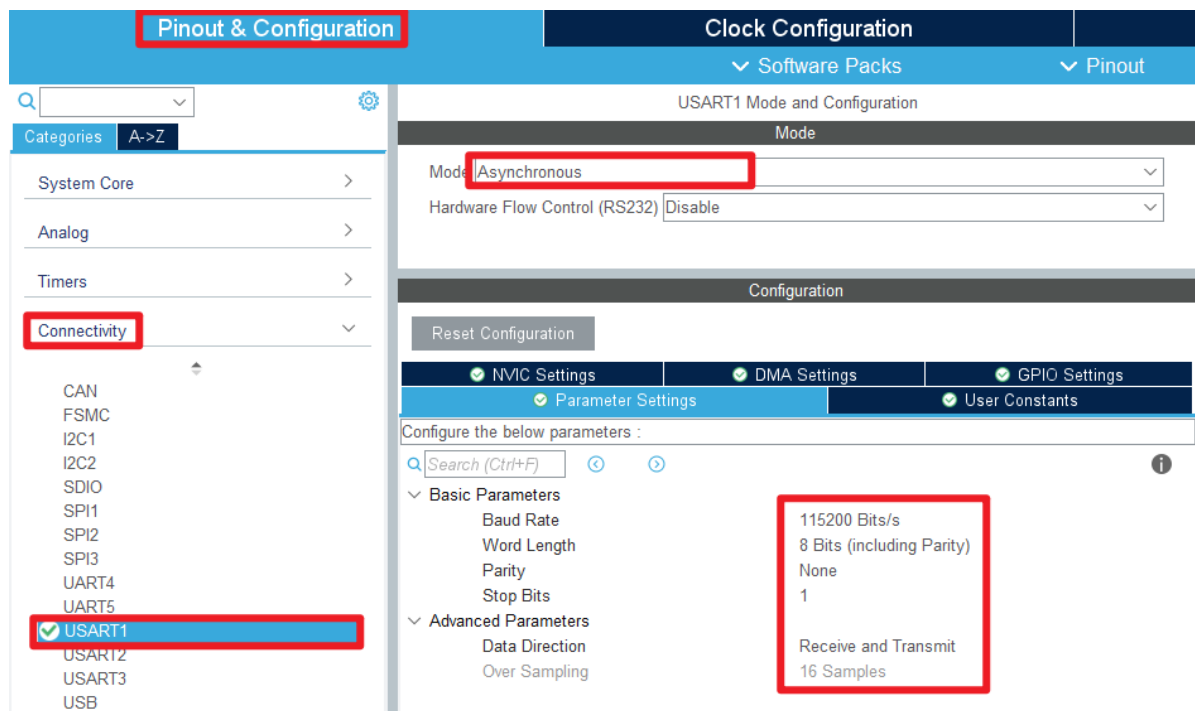
Please refer to [2, development environment construction and use: STM32CubeIDE installation - Use] to understand how to configure the omitted part of the project

3.2、Pin configuration

• GPIO



• USART1



- 生成代码



4、Main Function

This paper mainly introduces the functional code written by users. **Detailed code can be opened by yourself in the project file we provide, and enter the Bsp folder to view the source code.**

User function

Many of the common HAL library functions were covered in Chapter 3, but they will not be covered here.

函数: Read_irtracking

Function prototypes	uint8_t Read_irtracking(Irtracking_Pin irtracking)
Functional Description	Read the interface level of the four-way tracking module

Function prototypes	uint8_t Read_irtracking(Irtracking_Pin irtracking)
Input parameters	irtracking : Four-way tracking module pin, X1, X2, X3, X4
Return value	0或1 : 0 is low, 1 is high

5、Experimental phenomenon

After downloading the program successfully, press the RESET button of the development board to open the serial debugging assistant to observe the phenomenon

Program download can refer to [2, development environment construction and use: program download and simulation]

phenomenon:

The serial port prints the corresponding detection value of each tracking probe of the four-channel tracking module (0 represents low level, 1 represents high level).

