Infrared sensor

This tutorial demonstrates how to print the converted values of two infrared obstacle avoidance module ADMs via **serial port (USART1)** .

1、software-hardware

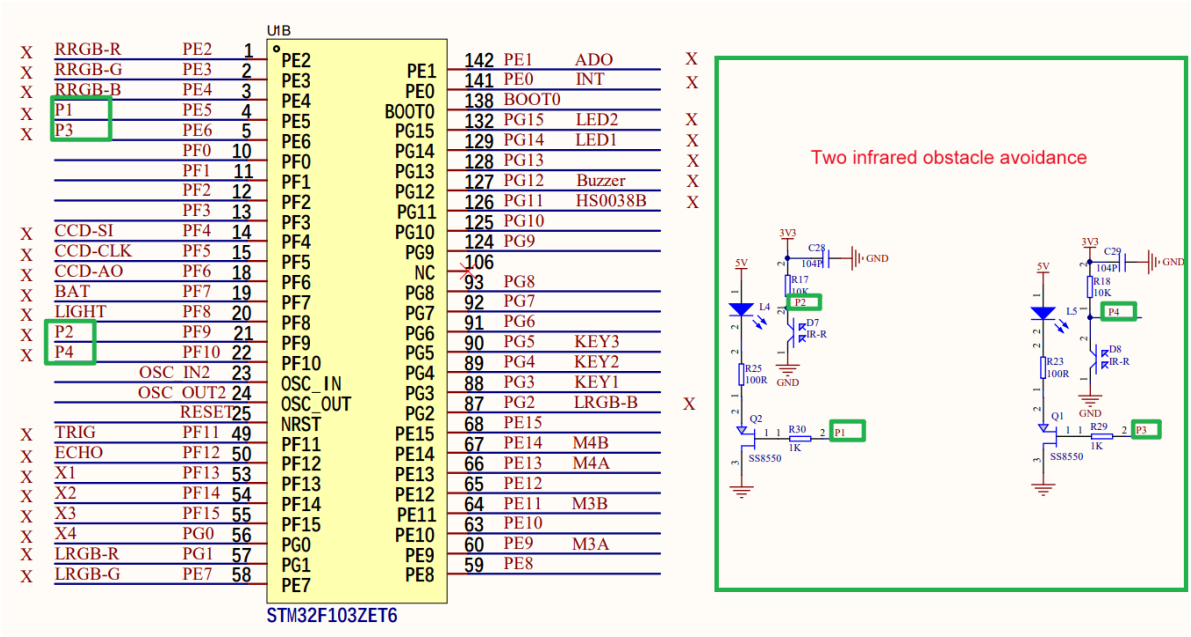
- **STM32F103CubeIDE**
- **STM32 robot expansion board**

  Two infrared obstacle avoidance modules are integrated on the development board
- **Type-C cable or ST-Link**

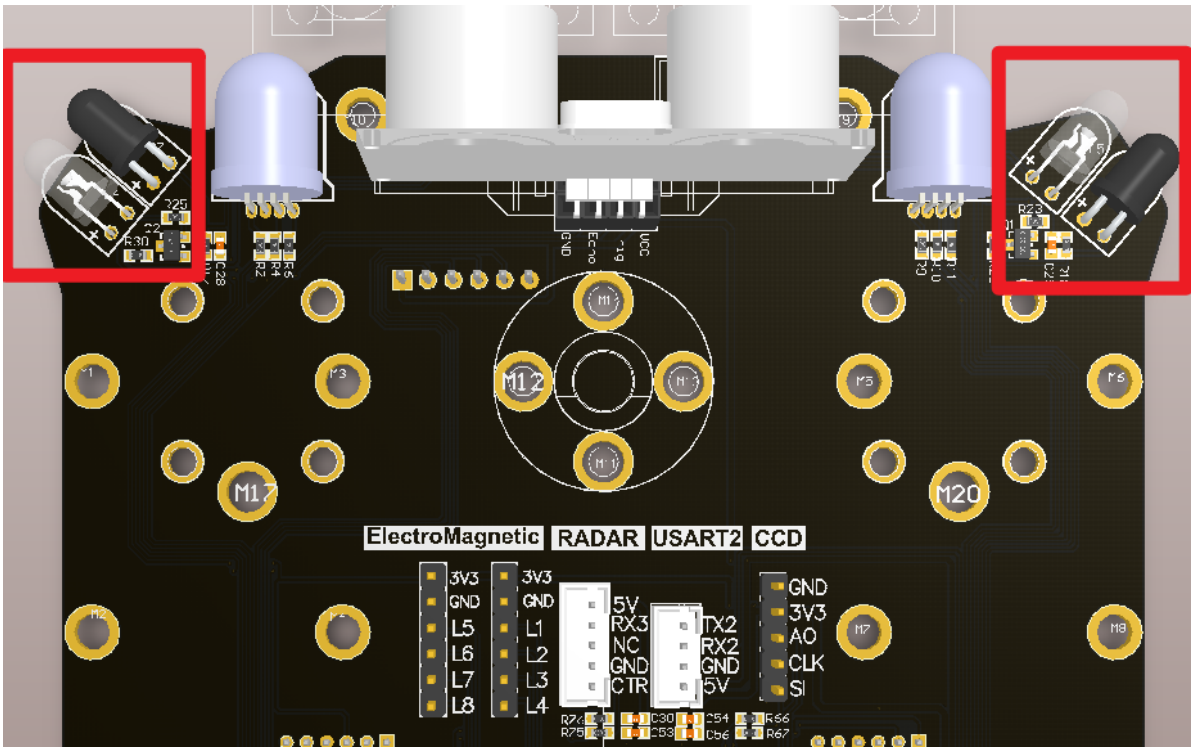
  Download or simulate the program of the development board

2、Brief principle

2.1、Hardware schematic diagram



2.2、Physical connection diagram



2.3、Principle of control

The analog voltage output of infrared obstacle avoidance module can be converted to digital value by two ADC conversion. The range is 0 to 2^12-1 (that is, 0 to 4095).

Infrared obstacle avoidance (development board integration)	**Corresponding pin**
P1	PE5（Control the left obstacle avoidance module switch）
P2	PF9（ADC3_IN7）
P3	PE6（Control the switch of the right obstacle avoidance module）
P4	PF10（ADC3_IN7）

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.

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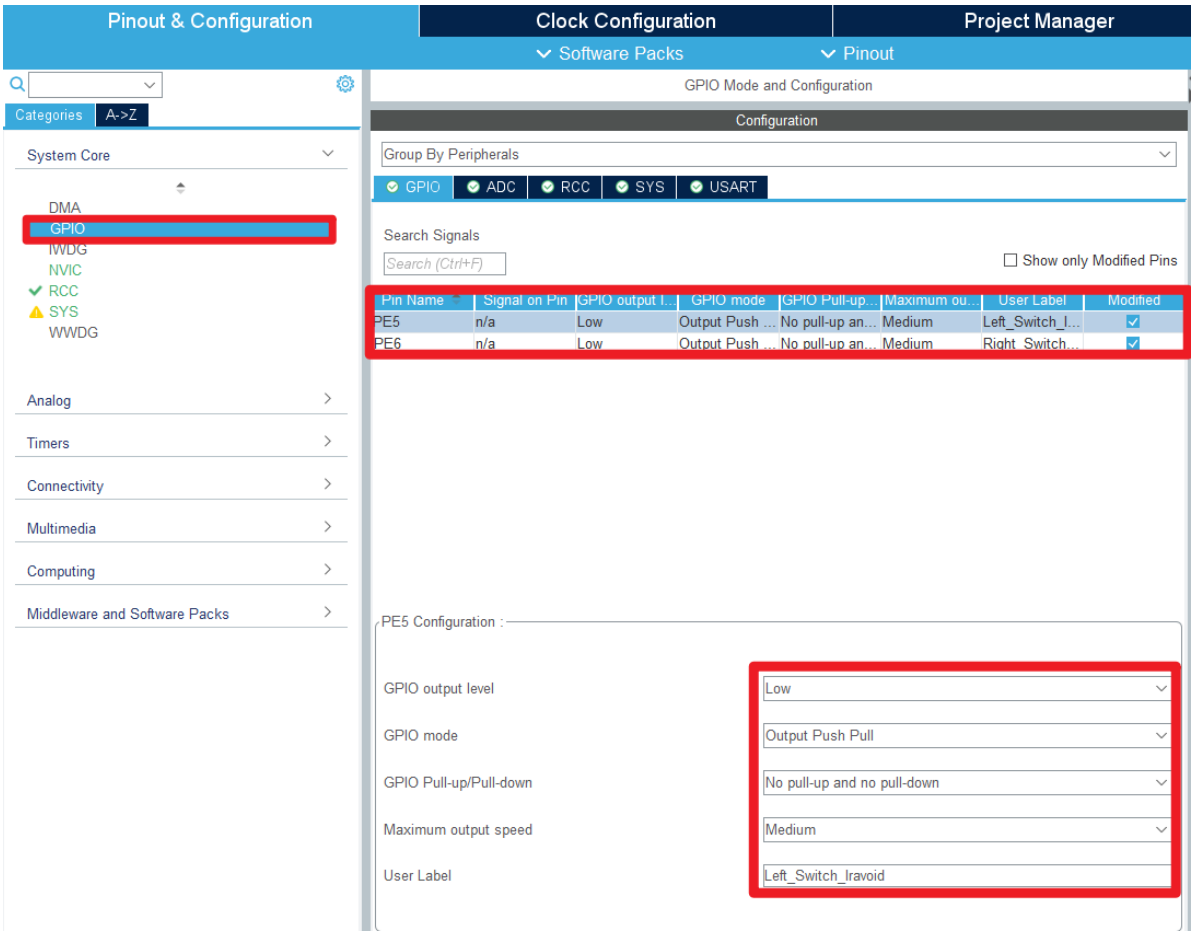
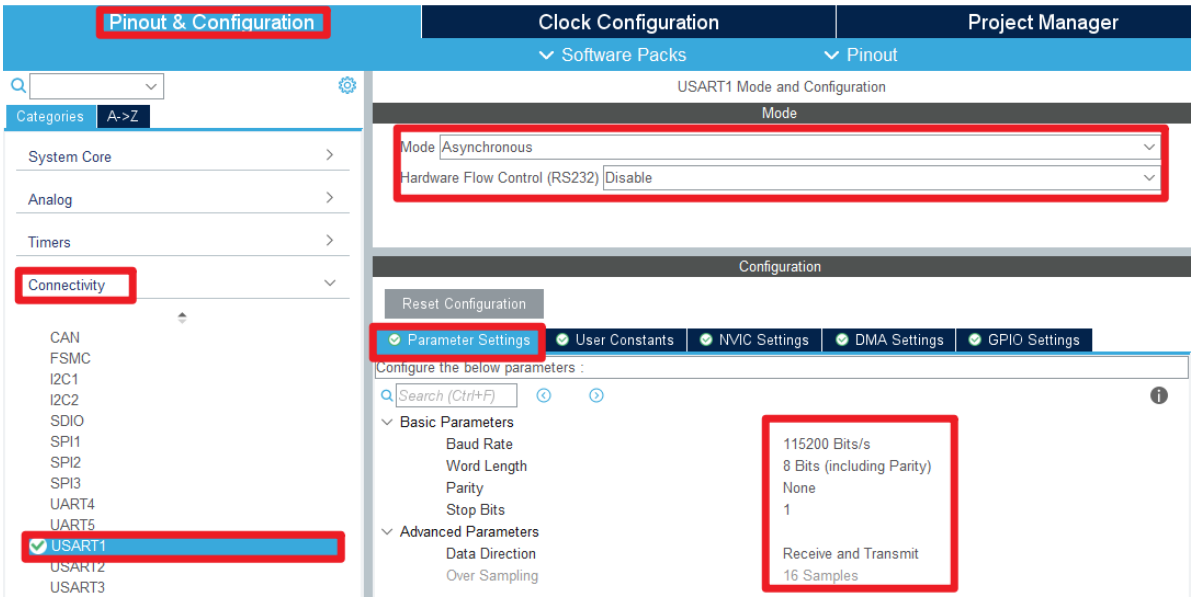
3.2、Pin configuration

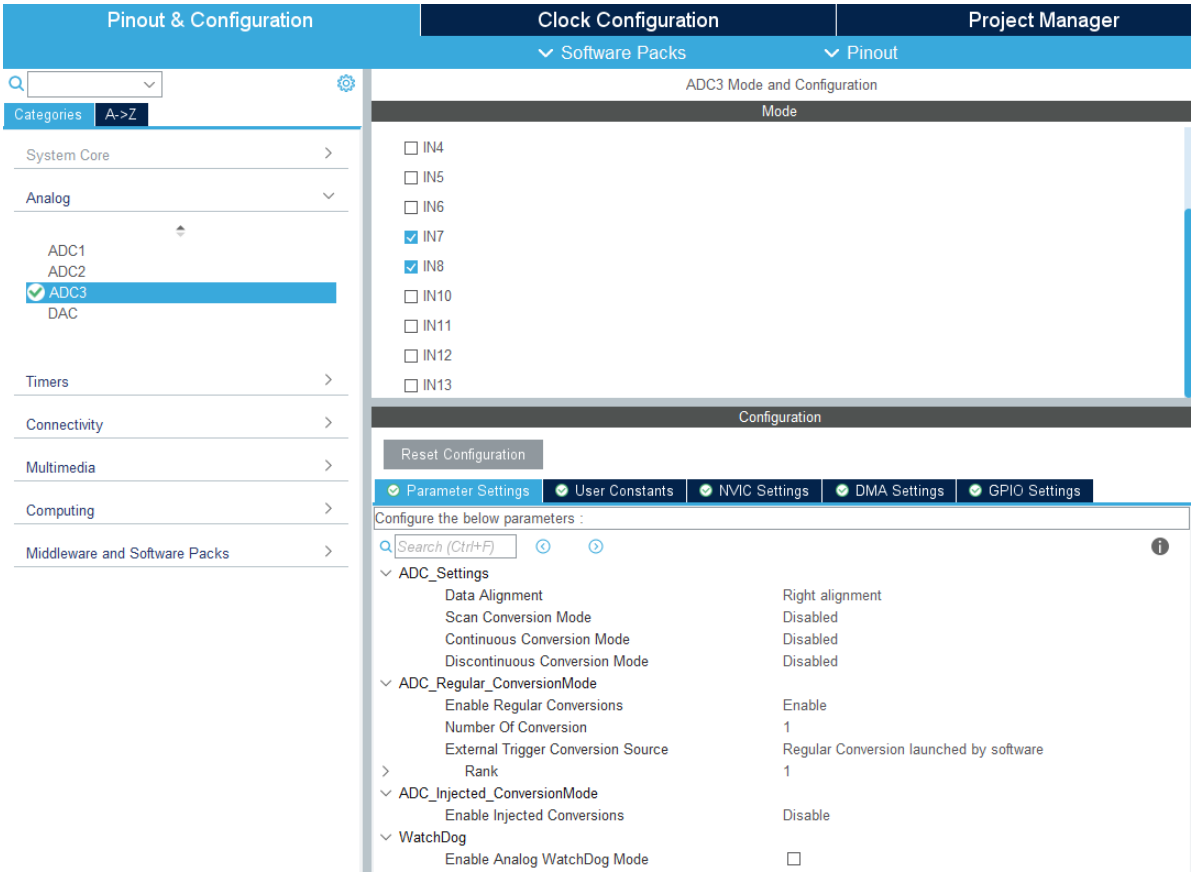
- **GPIO**

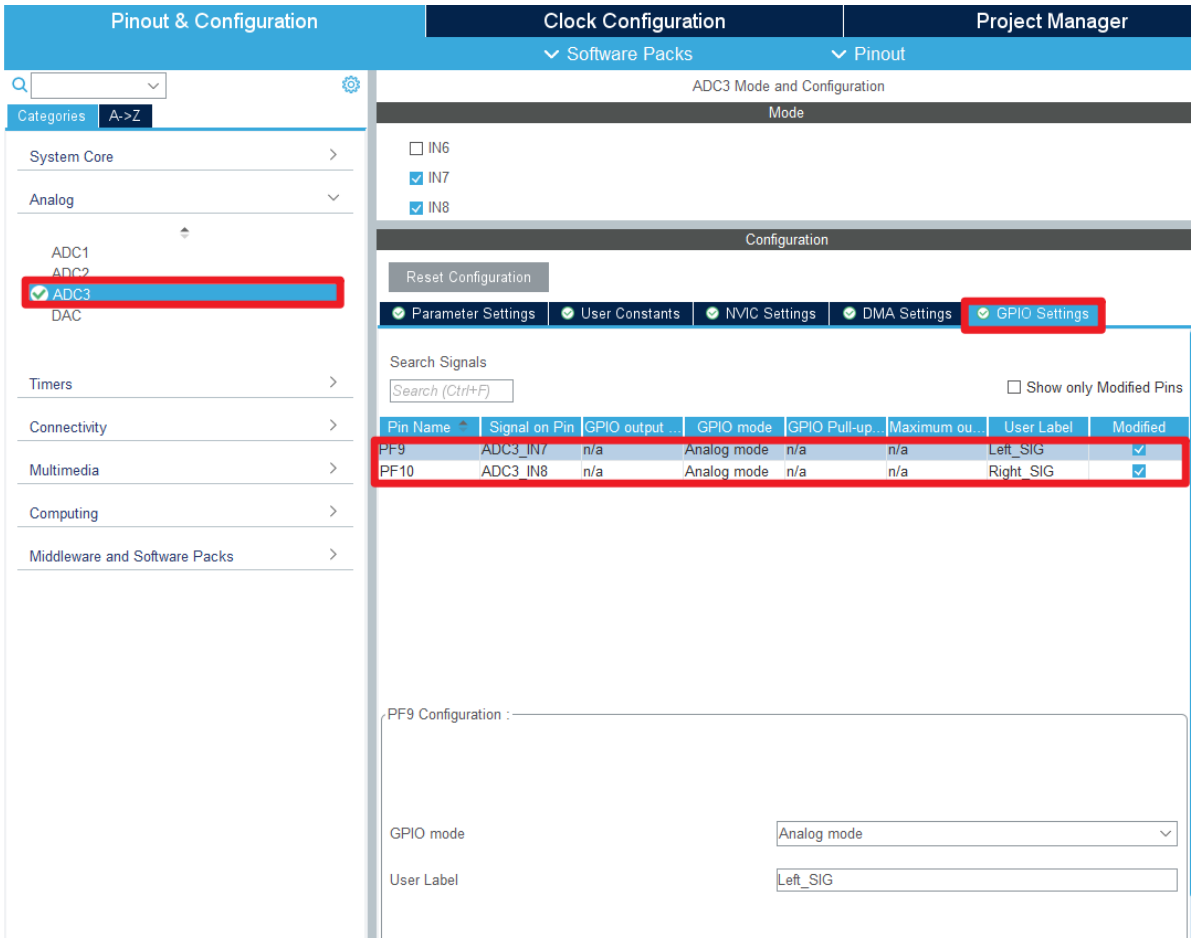


- **USART**

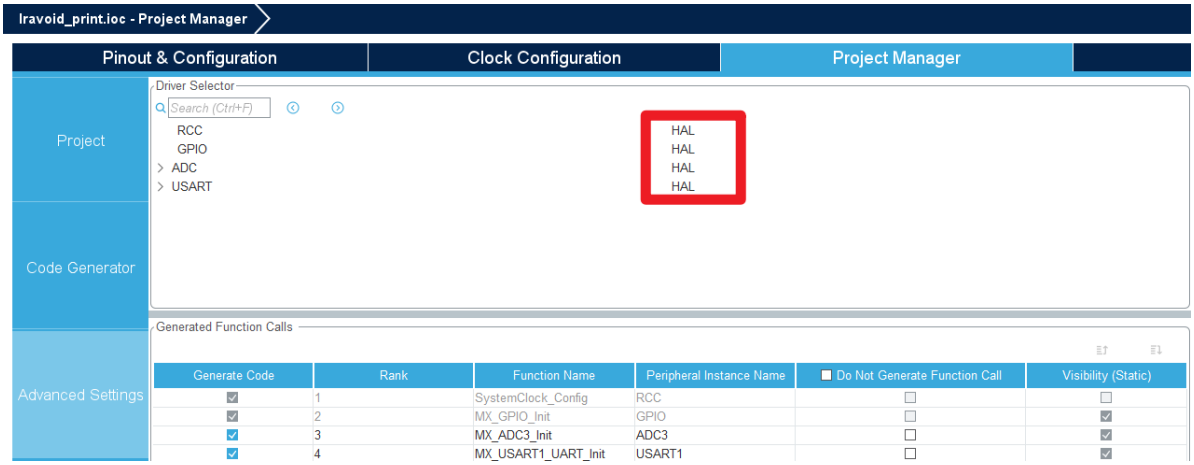


- **ADC**

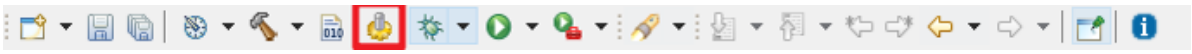




- **Advanced Settings**



- **Generating code**



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：Adc_Get_Iravoid**

Function prototypes	**uint16_t Adc_Get_Iravoid(uint32_t ch)**
Functional Description	The converted values of the infrared sensor ADC are collected
Input parameters	**ch**：channel
Return value	ADC converted value

> **函数：Get_Iravoid_Data**

Function prototypes	**void Get_Iravoid_Data(uint16_t *left_data,uint16_t *right_data)**
Functional Description	Print the converted values of the two infrared sensor ADCs
Input parameters1	**left_data**：Infrared sensor values on the left
Input parameters2	**right_data**：Infrared sensor values on the right
Return value	None

5、Experimental phenomenon

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

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

phenomenon:

The serial port continuously prints the converted values of the two infrared sensor ADCs with a time interval of 0.3 seconds.