

4-Channel Line Tracking Module

2.1 Module Introduction

Basic Parameters

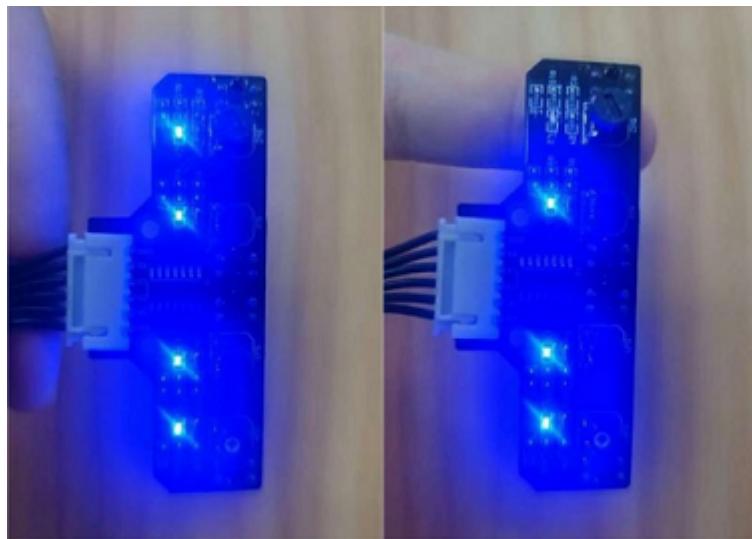
Parameters	
Working voltage	3.3V~5V
Working temperature	-10°~+50°
Installation aperture	M3 copper post/screw
Working current	10mA~50mA
Detection distance	1mm~50mm adjustable (recommended around 8mm)
Size	70*29mm
Output Interface	6pin interface 1234 is 4-channel signal output terminal, + is positive power supply, - is negative power supply
Output signal	TTL level (can be directly connected to MCU I/O port)

Testing Module

Connect the module's VCC and GND to the main board, other pins of the module do not need to be connected. Turn on the phone camera and aim it at the four-channel infrared sensor, you can see the four sensors emitting faint purple light.



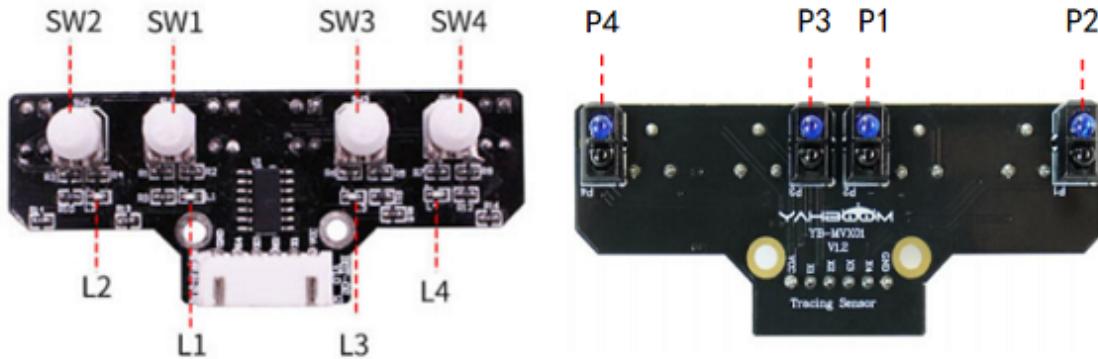
Hold the module away from the desktop, as shown in the figure you can see 4 LED lights are on. Place your finger under one of the sensors, as shown in the figure you can see the corresponding LED light turn off. If this phenomenon occurs, it means the four-channel line tracking module can work normally.



Note: If one of the LED lights does not change, just adjust the corresponding sensor knob to achieve this phenomenon

Actual Usage

Environment requirements: In indoor places with weak infrared light, the black track on the white surface must be greater than 16mm



Four-channel line tracking module (front)
tracking module (back)

Four-channel line

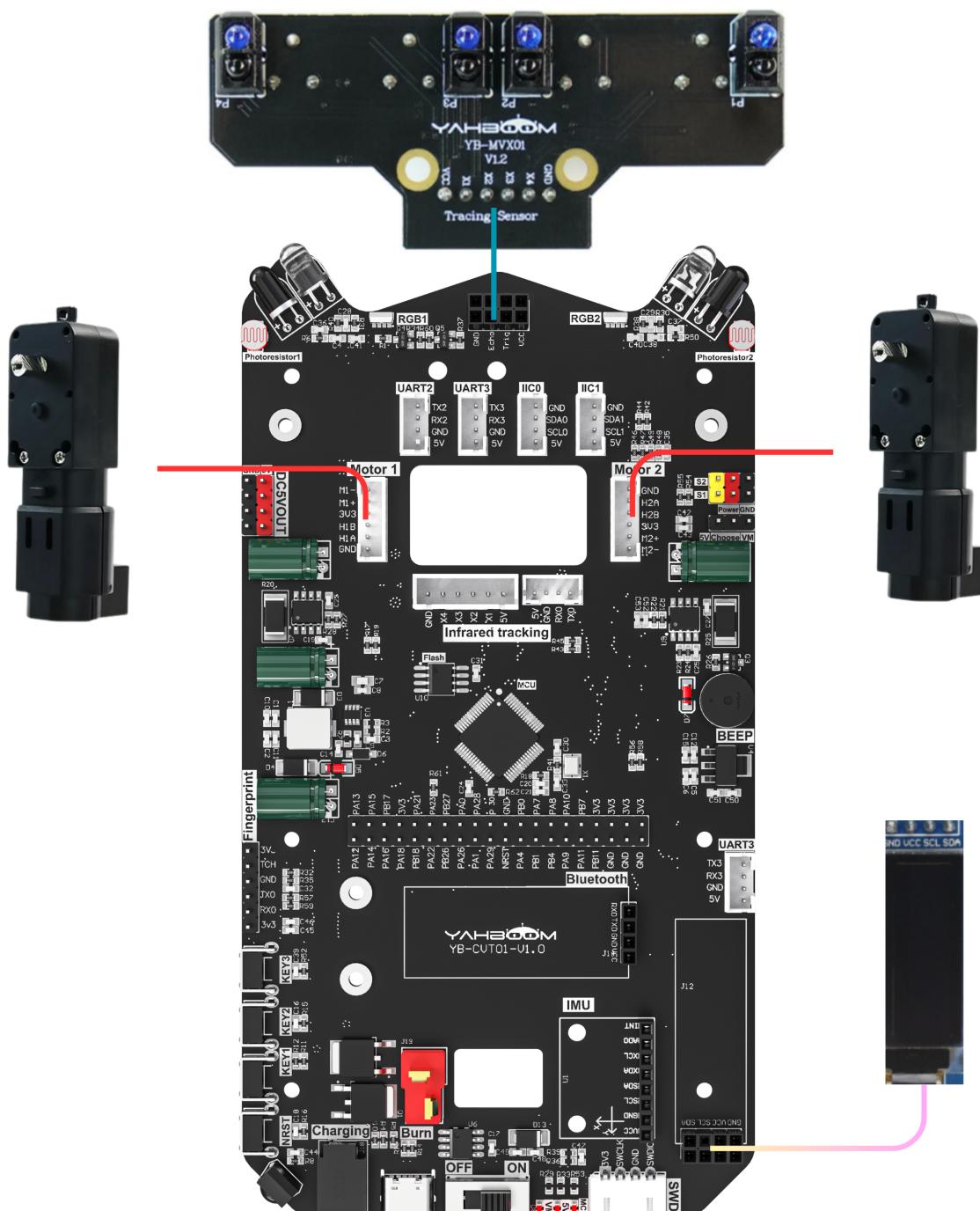
Debugging (only connect VCC and GND pins of the module):

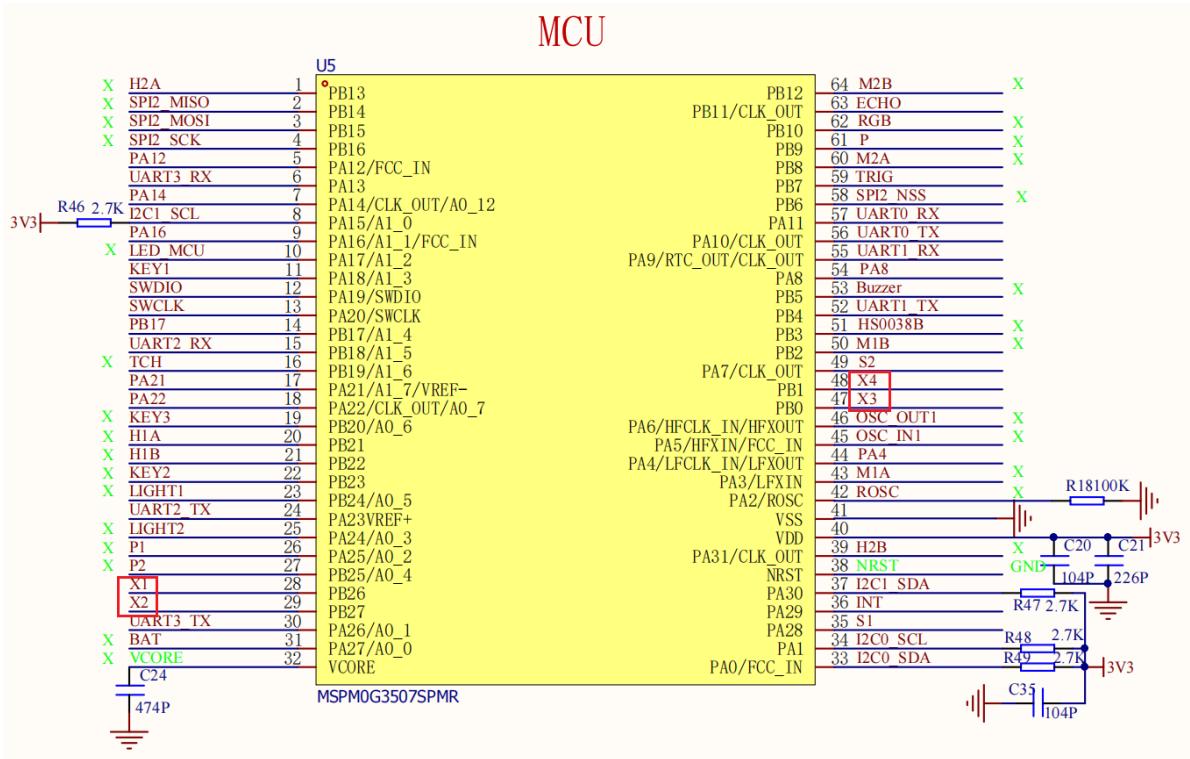
- Adjust potentiometer [SW1] so that when photoelectric sensor [P1] faces the white surface, LED light [L1] is off, and when facing the black line, LED light [L1] is on
- Adjust potentiometer [SW2] so that when photoelectric sensor [P2] faces the white surface, LED light [L2] is off, and when facing the black line, LED light [L2] is on
- Adjust potentiometer [SW3] so that when photoelectric sensor [P3] faces the white surface, LED light [L3] is off, and when facing the black line, LED light [L3] is on
- Adjust potentiometer [SW4] so that when photoelectric sensor [P4] faces the white surface, LED light [L4] is off, and when facing the black line, LED light [L4] is on

Note: During debugging, try to maintain the same height from the surface. When adjusting the potentiometer, the rotation range should not be too large, with a rotation range of less than 30 degrees. Slowly slide the module horizontally across the black line, you can see the LED lights turn on and off in sequence. At this time, it means the module has been debugged. If errors occur during subsequent use, simply readjust the potentiometer.

2.2 Hardware Wiring

Four-Channel Line Tracking Module	MSPM0G3507
5V	5V
GND	GND
X1	X1
X2	X2
X3	X3
X4	X4





PROJECT CONFIGURATION

- Project Config... 1/1
- MSPM0 DRIVER LIBRARY ...**
- SYSTEM (9)**
 - Board 1/1
 - Configuration NVM
 - DMA
 - GPIO 7**
 - MATHACL
 - RTC
 - SYSCTL 1/1
 - SYSTICK 1/1
 - WWDT
- ANALOG (6)**
 - ADC12
 - COMP
 - DAC12
 - GPAMP
 - OPA
 - VREF
- COMMUNICATIONS (6)**
 - I2C
 - I2C - SMBUS
 - MCAN
 - SPI
 - UART 1/4

GPIO_ENCODER_R

SR04

FOR_SENSOR

Name	FOR_SENSOR
Port	Any
Port Segment	Any

Group Pins

4 added

X1

X2

X3

X4

Name	X1
Direction	Input
IO Structure	Any

Digital IOMUX Features

Assigned Port DODTR

ADD **REMOVE ALL**

Name FOR_SENSOR
Port Any
Port Segment Any

Group Pins

4 added

 ADD

 REMOVE ALL

 X1



 X2



 X3



 X4



Name X1

Direction Input

IO Structure Any

Digital IOMUX Features

Assigned Port PORTB

Assigned Port Segment Any

Assigned Pin 26

Interrupts/Events

Group Pins

4 added

ADD

REMOVE ALL

X1



X2



X3



X4



Name

X2

Direction

Input

IO Structure

Any

Digital IOMUX Features

Assigned Port

PORTB

Assigned Port Segment

Any

Assigned Pin

27

Interrupts/Events

Port Segment

Any

Group Pins

4 added

ADD

REMOVE ALL

X1



X2



X3



X4



Name

X3

Direction

Input

IO Structure

Any

Digital IOMUX Features

Assigned Port

PORTB

Assigned Port Segment

Any

Assigned Pin

0

Interrupts/Events

LaunchPad-Specific Pin

No Shortcut Used

Port Segment	Any
Group Pins 4 added ADD REMOVE ALL <ul style="list-style-type: none"> <input checked="" type="checkbox"/> X1 <input checked="" type="checkbox"/> X2 <input checked="" type="checkbox"/> X3 <input checked="" type="checkbox"/> X4 	
Name	X4
Direction	Input
IO Structure	Any
Digital IOMUX Features	
Assigned Port	PORTB
Assigned Port Segment	Any
Assigned Pin	1
Interrupts/Events	
LaunchPad-Specific Pin	No Shortcut Used

2.4 Main Functions

Four_GetLineWalking

Function Prototype	<code>void Four_GetLineWalking(int *LineL1, int *LineL2, int *LineR1, int *LineR2)</code>
Function Description	Get the pin level status of four line tracking sensors (LineL1, LineL2, LineR1, LineR2) and return through pointers
Input Parameters	LineL1: pointer to variable storing the status of the first left sensor; LineL2: pointer to variable storing the status of the second left sensor; LineR1: pointer to variable storing the status of the first right sensor; LineR2: pointer to variable storing the status of the second right sensor
Return Value	None

2.5 Experimental Phenomenon

Connect the car wires, connect the OLED module, after burning the program to MSPM0, place the car on a map with white background and black lines, sensor data is displayed on the OLED

Where L2, L1, R1, R2 represent the four sensor data from left to right

