keyestudio

# Project 3: Line Tracking Sensor

## 1.Description




The tracking sensor is actually an infrared sensor. The component used here is the TCRT5000 infrared tube. Its working principle is to use different reflectivity of infrared light to colors, then convert the strength of the reflected signal into a current signal.

During the process of detection, black is active at HIGH level while white is active at LOW level. The detection height is 0-3 cm.

Keyestudio 3-channel line tracking module has integrated 3 sets of TCRT5000 infrared tubes on a board, which is more convenient for wiring and control.

By rotating the adjustable potentiometer on the sensor, it can adjust the detection sensitivity of the sensor.

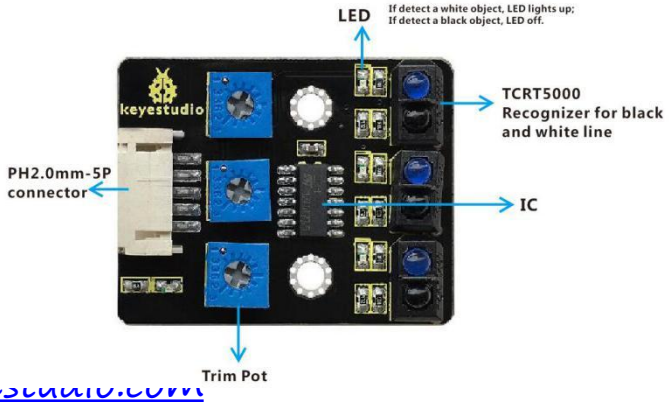
## 2.Specification

Operating Voltage: 3.3-5V (DC)

Interface: 5PIN

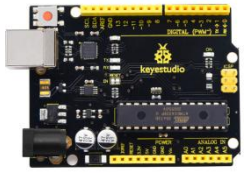
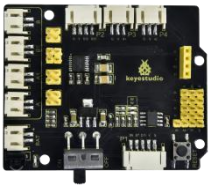
Output Signal: Digital signal

Detection Height: 0-3 cm

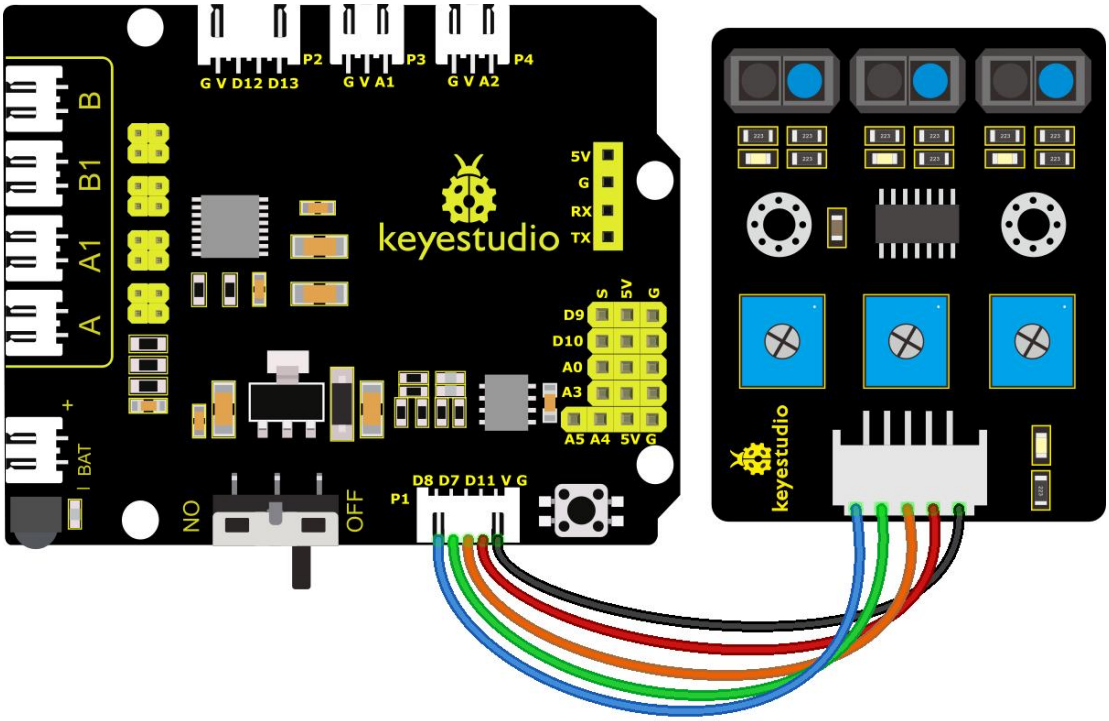


Note: Before testing, rotate the potentiometer on the sensor to adjust the detection sensitivity. The sensitivity is best when adjusting the LED to a threshold between ON and OFF.

## 3.Components

| | | | |
|---|---|---|---|
| Keyestudio 4.0 Development Board *1 | Keyestudio 8833 Motor Driver Expansion Board *1 | | Red LED Module*1 |
|  |  | |  |
| 5P Dupont Wire*1 | USB Cable*1 | 3P Dupont Wire*1 | Keyestudio Line Tracking Sensor*1 |
|  |  |  |  |

## 4.Wiring Diagram




G, V, S1, S2 and S3 of the line tracking sensor are connected to G（GND), V（VCC), D11, D7 and D8 of the sensor expansion board.

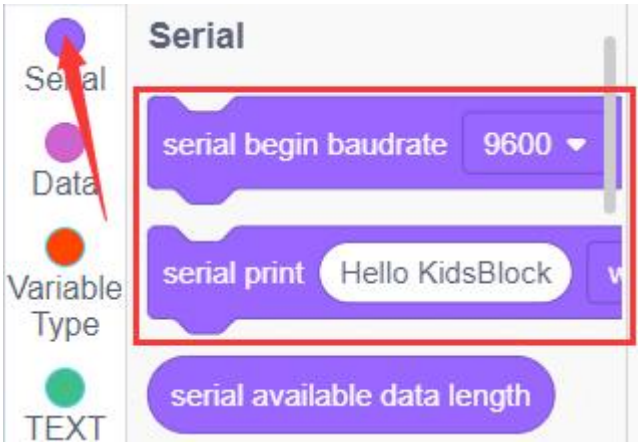
## 5.Test Code

You can drag blocks to edit. Blocks listed below are for your reference

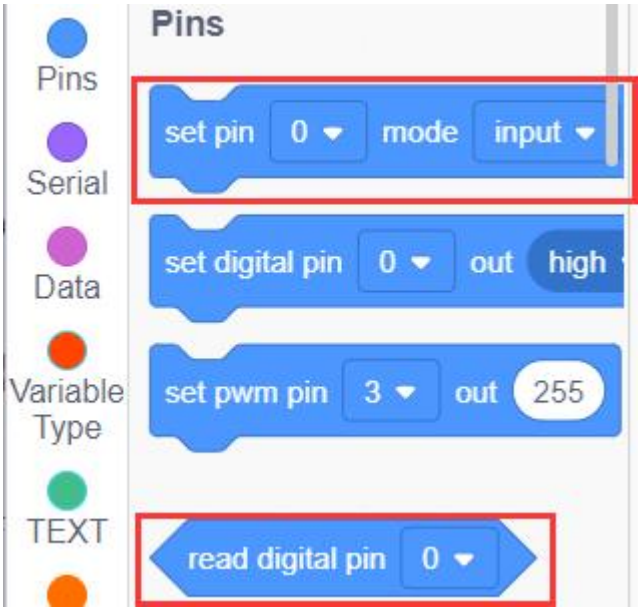
（1）



（2）


Serial
Data
Variable
Type
TEXT
serial begin baudrate 9600
serial print Hello KidsBlock
serial available data length

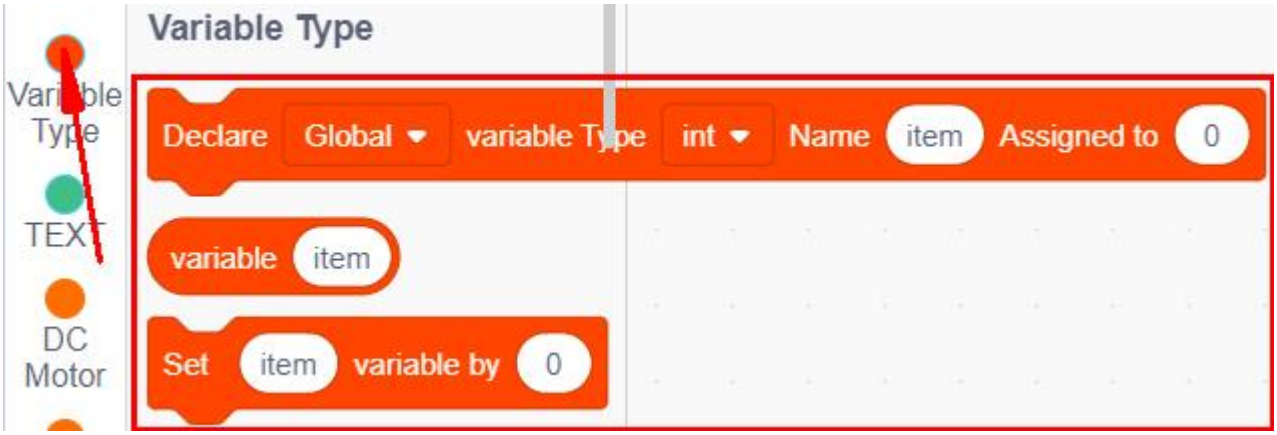
（3）


Pins
Serial
Data
Variable
Type
TEXT
set pin 0 mode input
set digital pin 0 out high
set pwm pin 3 out 255
read digital pin 0

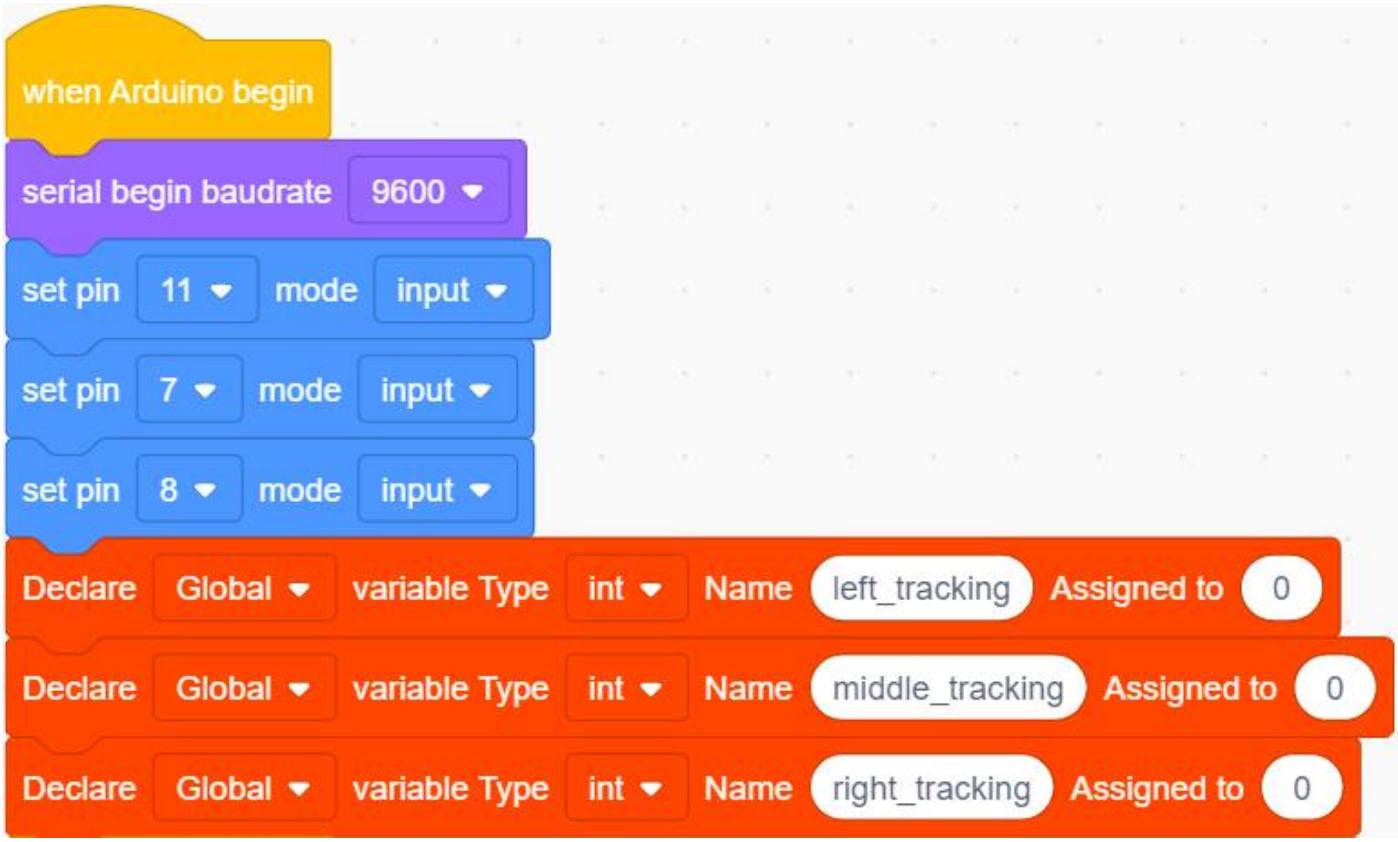
（4）


Control
Events
Variables
My
Blocks
Pins
wait 1 seconds
repeat 10
forever

(5)




## Complete Test Code



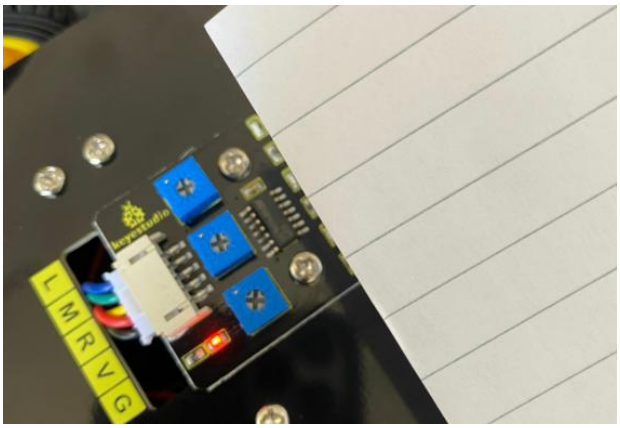



## 6.Test Result

After successfully uploading the code to the V4.0 board, connect the wirings according to the wiring diagram, and use a USB cable to connect the computer to power the board.

After powering on, click to set the baud rate to 9600 and you will view status of three line tracking sensors. When no signals are received, the

value is 1. If we cover the sensor with a white paper, the value will be 0.

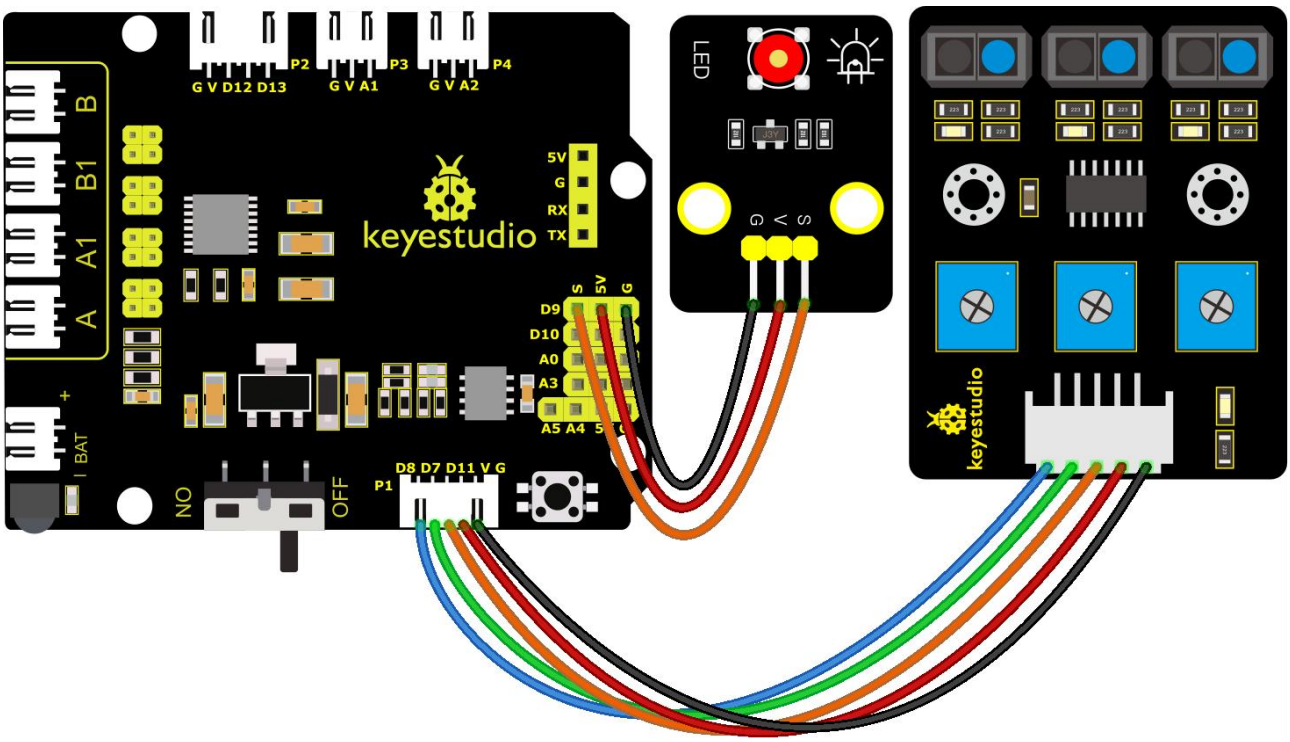






## 7.Extension Practice

After knowing its working principle, you can connect an LED to D9 so as to control LED by it.

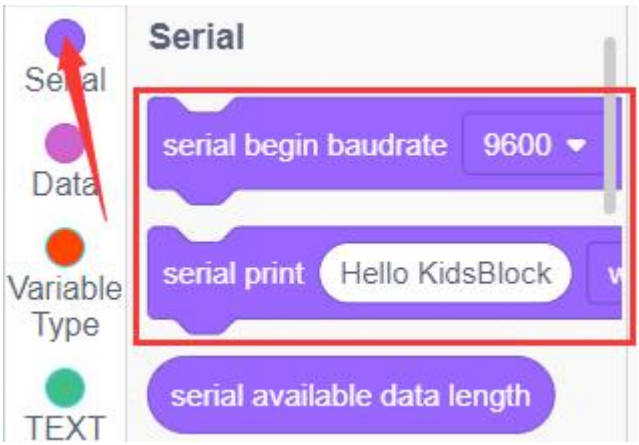



You can drag blocks to edit. Blocks listed below are for your reference

（1）



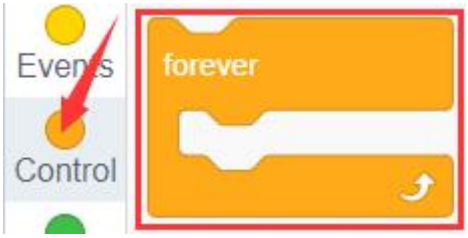

（2）



(3)


My Blocks
Pins
Serial
Data
Variable Type
Pins
set pin 0 mode input
set digital pin 0 out high
set pwm pin 3 out 255
read digital pin 0

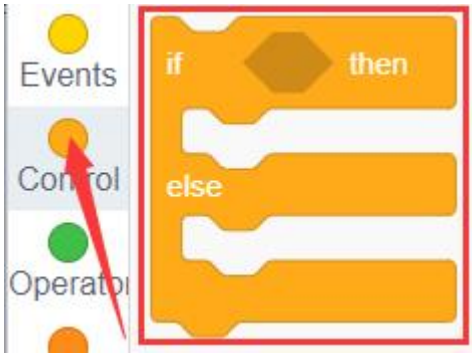
(4)


Events
Control
forever

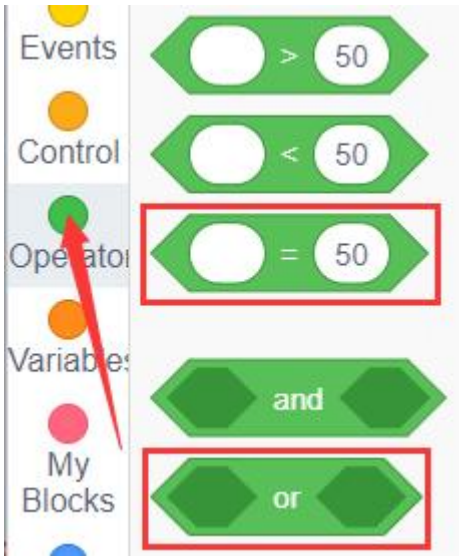
(5)


Variable Type
TEXT
DC Motor
Variable Type
Declare Global variable Type int Name item Assigned to 0
variable item
Set item variable by 0

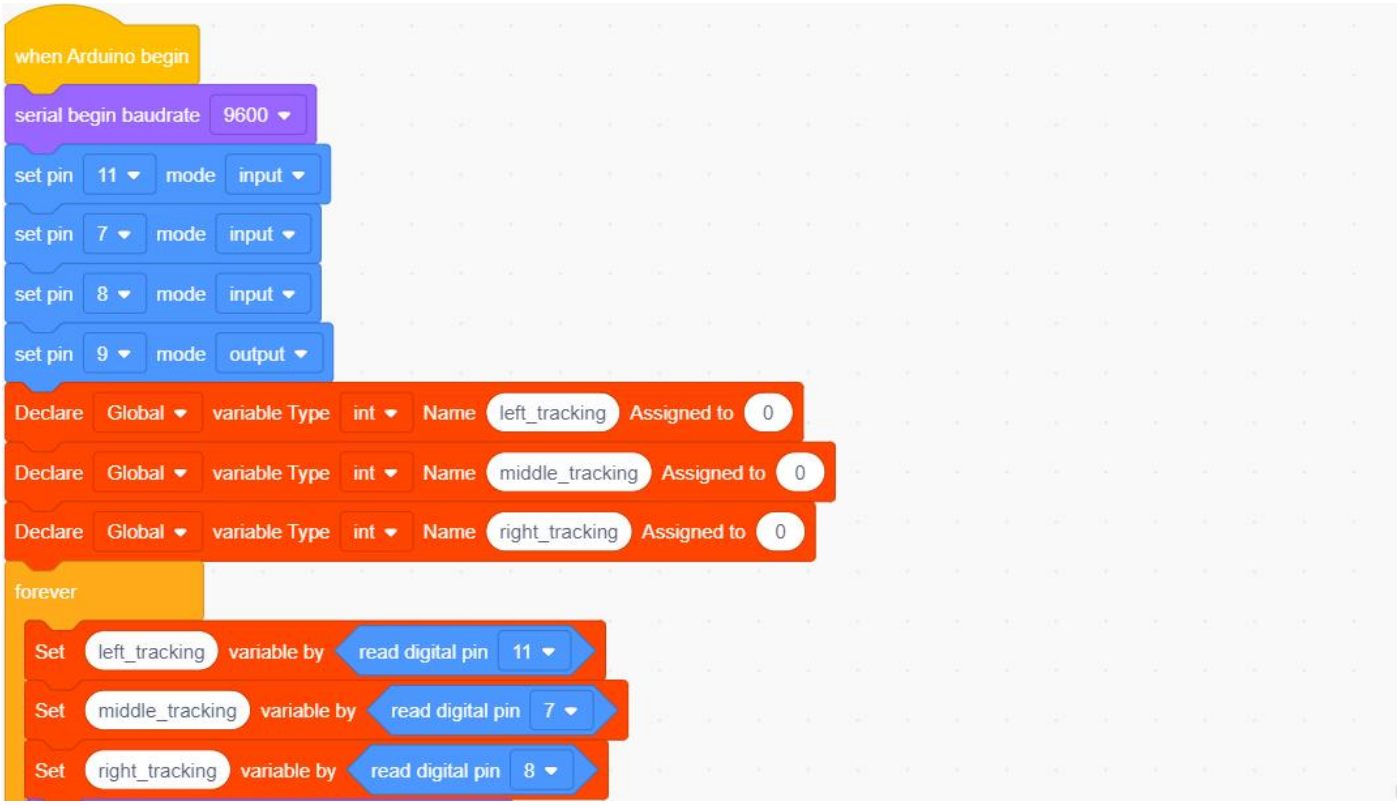
(6)

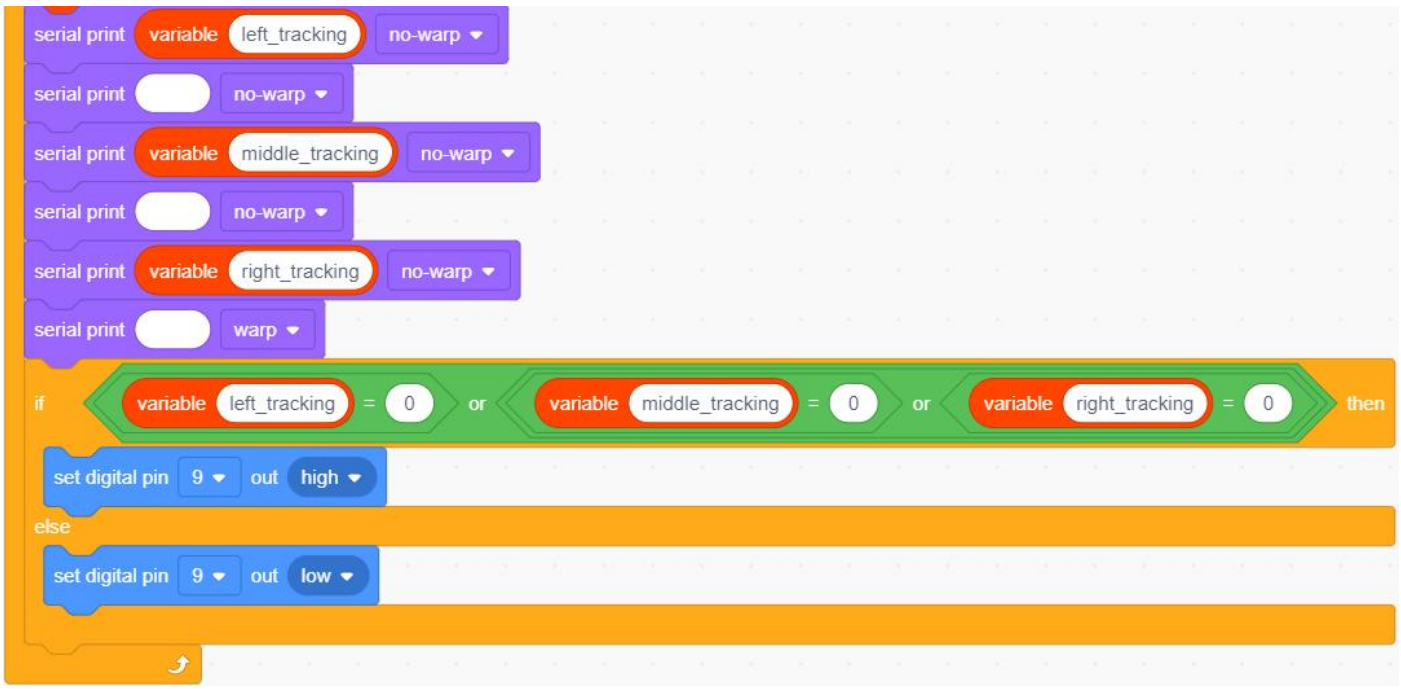

Events
Control
Operator
if then
else

(7)




## Complete Test Code






After successfully uploading the code to the V4.0 board, connect the wirings according to the wiring diagram, and use a USB cable to connect the computer to power the board.

After powering on, make a paper close to the sensor, then we can find the LED light up when covering the line tracking sensor.