

Microcontrollers and Robotic

Week 4: Sensors



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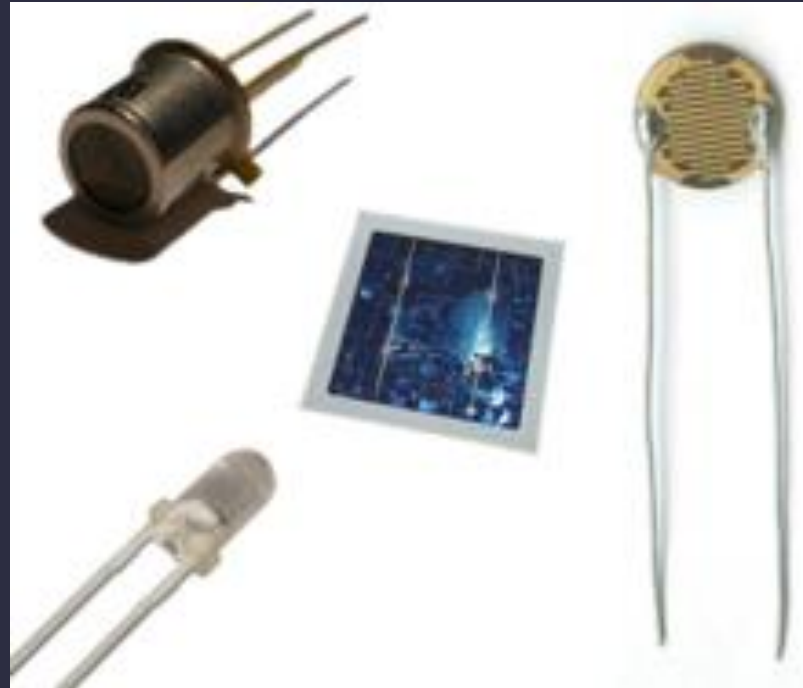
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Sensors

- A sensor is a device that produces an output signal for the purpose of sensing of a physical phenomenon.



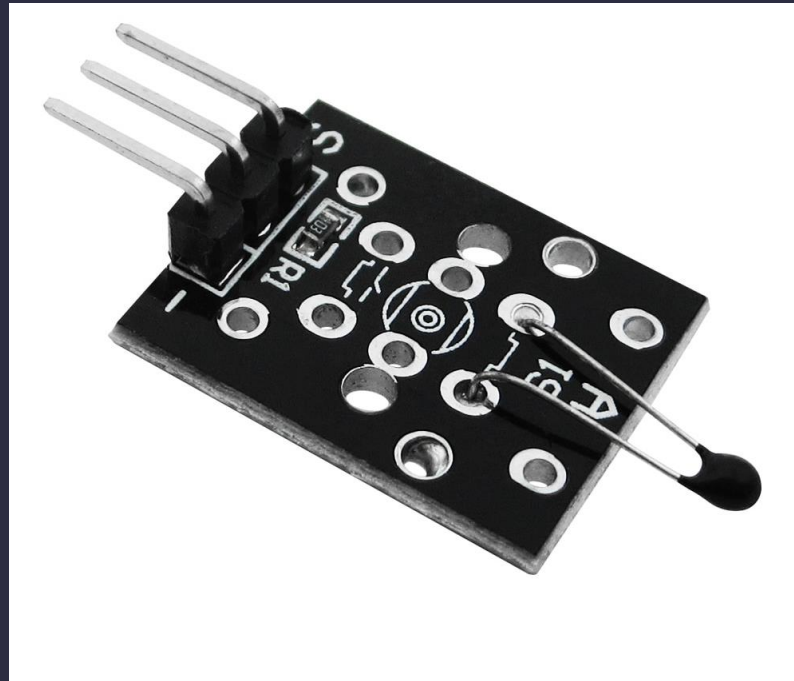
Sensors

- There are two types of electronic sensors:
 - Analog
 - Digital

Analog sensor captures environment data and outputs as analog signal

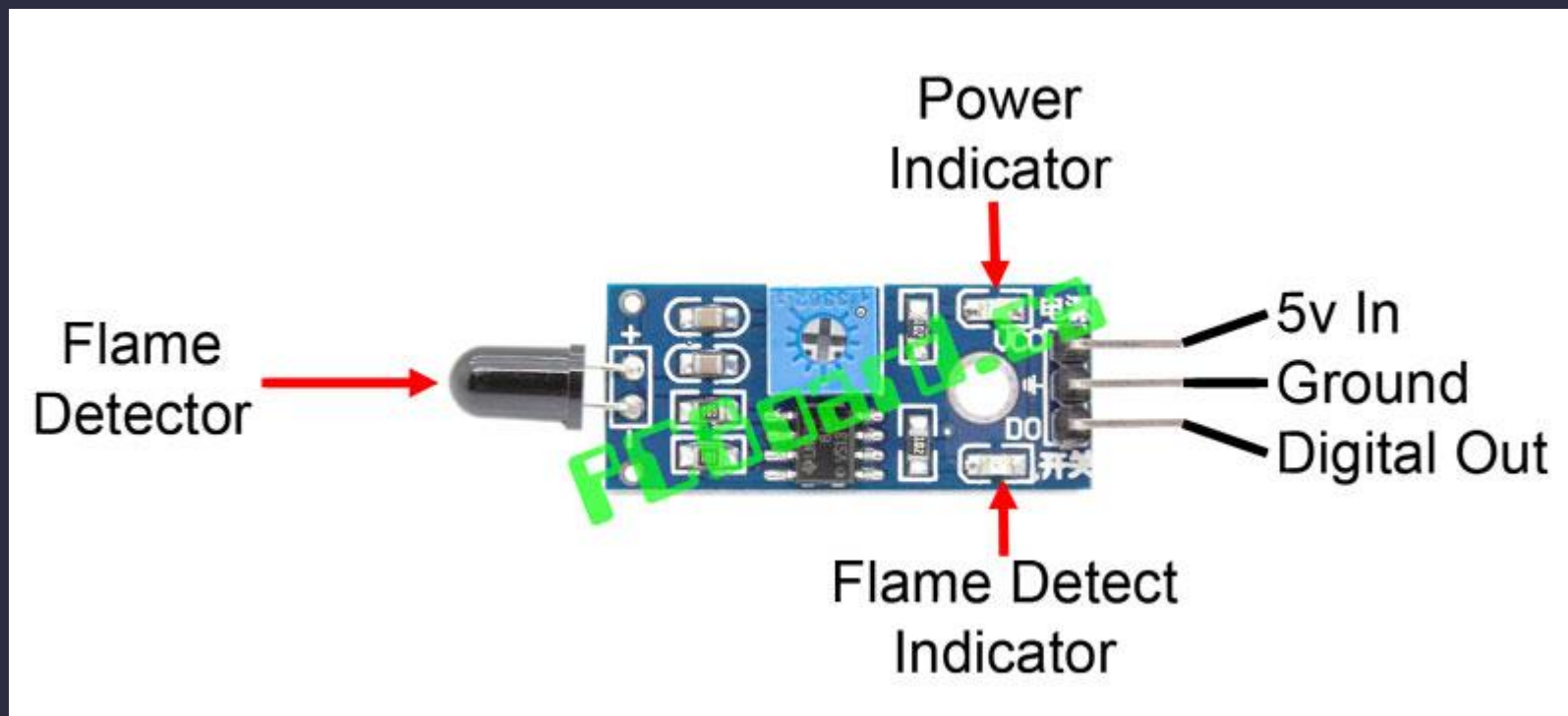
Digital sensor also captures environment data and output digital signal

Sensors



Temperature Sensor with Analog Output
Pinout
VDD, GNC and TempOut

Sensors



ON/OFF Sensor Output

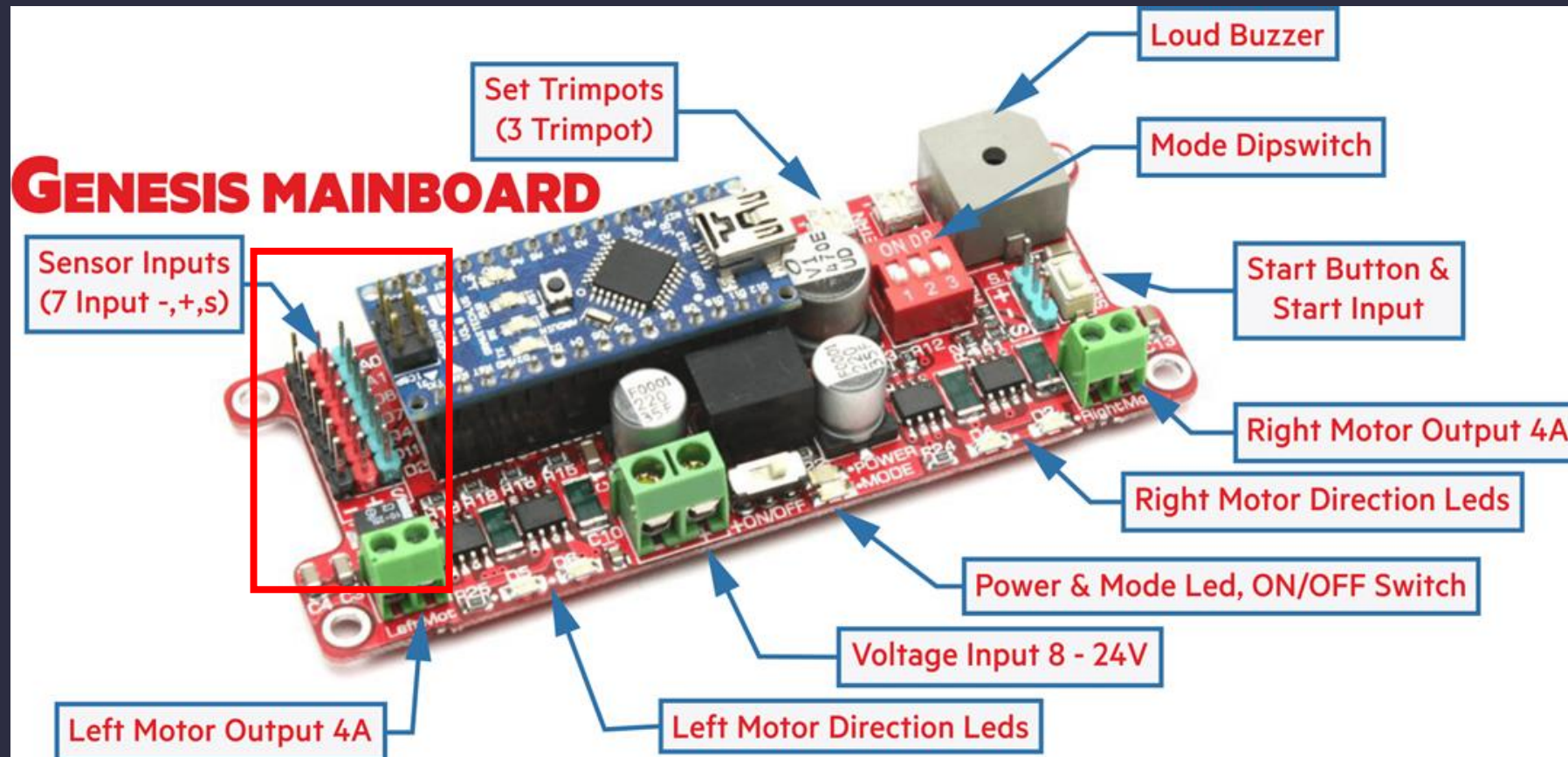
Sensors



Distance Sensor with UART Output

Sensors

- Arduino Mini Sumo Robot Kit



Sensors

- Arduino Mini Sumo Robot Kit

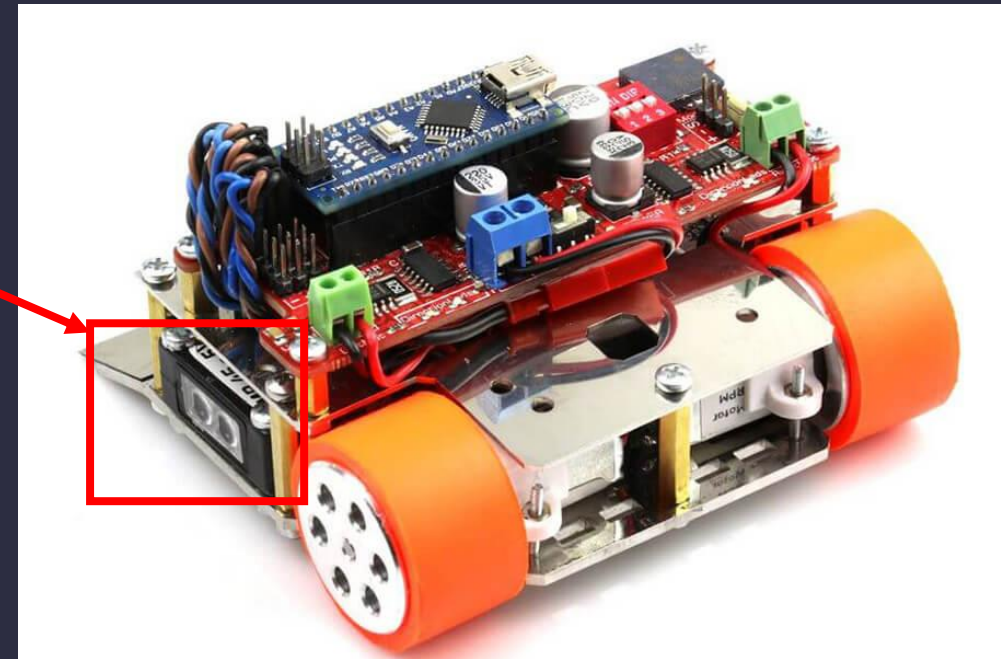
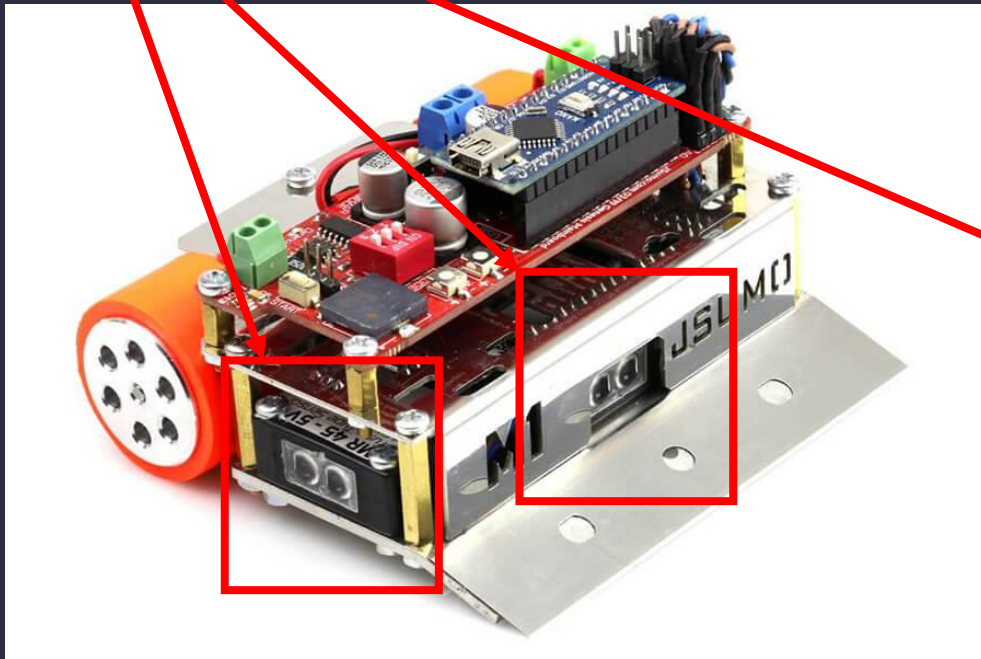
GENESIS ARDUINO NANO PIN TABLE

Arduino Pins	Purpose	Arduino Pins	Purpose
D0	Empty	D11	Right Motor PWM Channel (Speed Control)
D1	Empty	D12	Left Motor Dir Channel (Direction Control)
D2	Empty	D13	Right Motor Dir Channel (Direction Control), Arduino Nano Built-in Led
D3	Left Motor PWM Channel (Speed Control)	A0	Empty
D4	Empty	A1	Empty
D5	Dipswitch 1 Input	A2	Empty
D6	Dipswitch 2 Input	A3	Empty
D7	Dipswitch 3 Input	A4	Empty
D8	Mode Led (Can be used for any purpose)	A5	Empty
D9	Speaker (Can be used for any purpose)	A6	Turn A6 Set Trimpot
D10	Start Module & Button Input	A7	Speed A7 Set Trimpot

Sensors

Our development kit has:

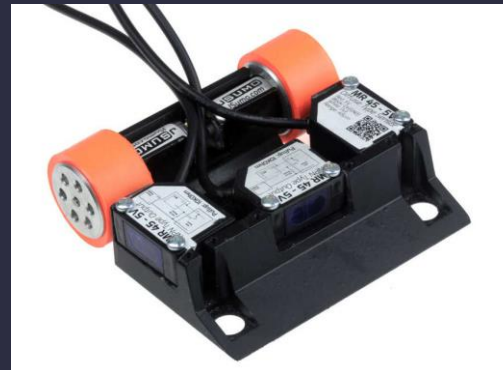
- 3X MR45



Sensors

Our development kit has:

- 3X MR45 : 0 – 5V Signal Range, detection from 45 centimeters



Sensors

Our development kit has:

- 3X MR45 :
- Left MR45: A4
- Middle MR45: A3
- Right MR45: A2

On Setup

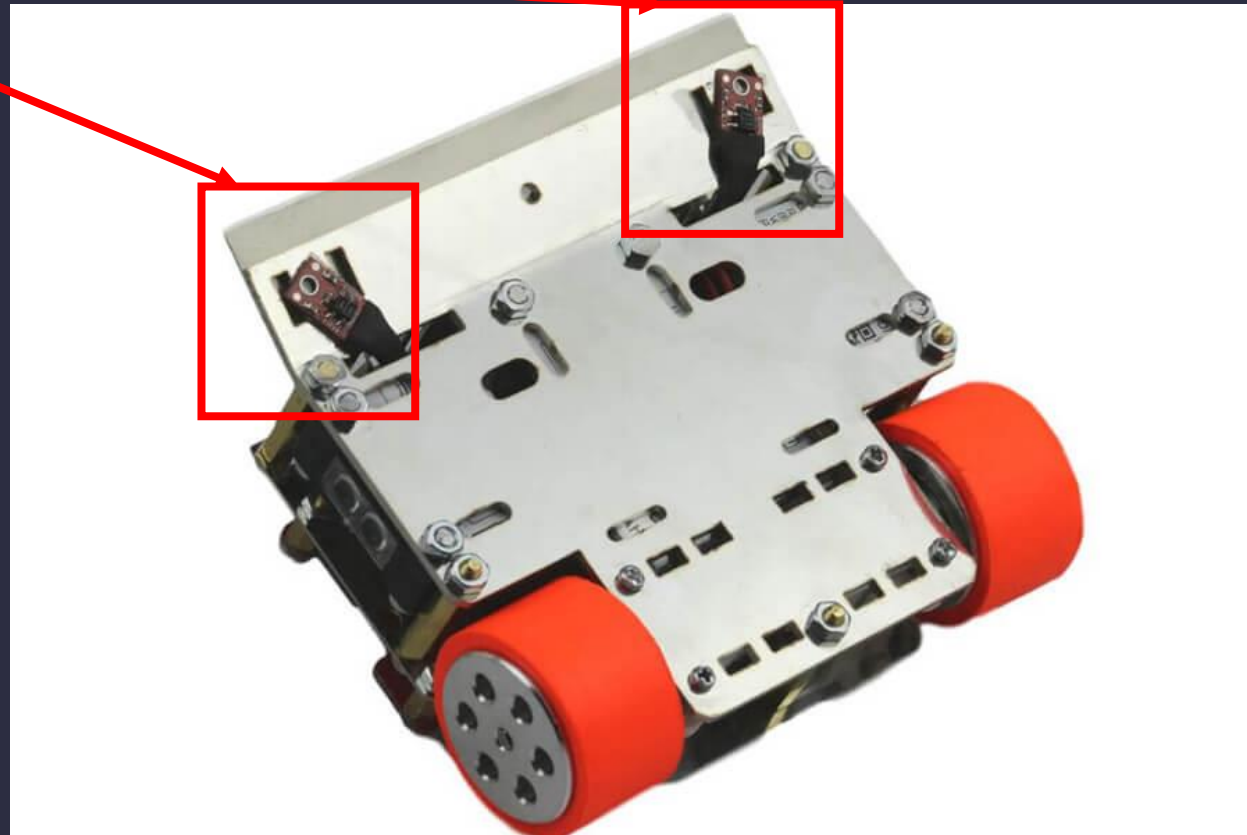
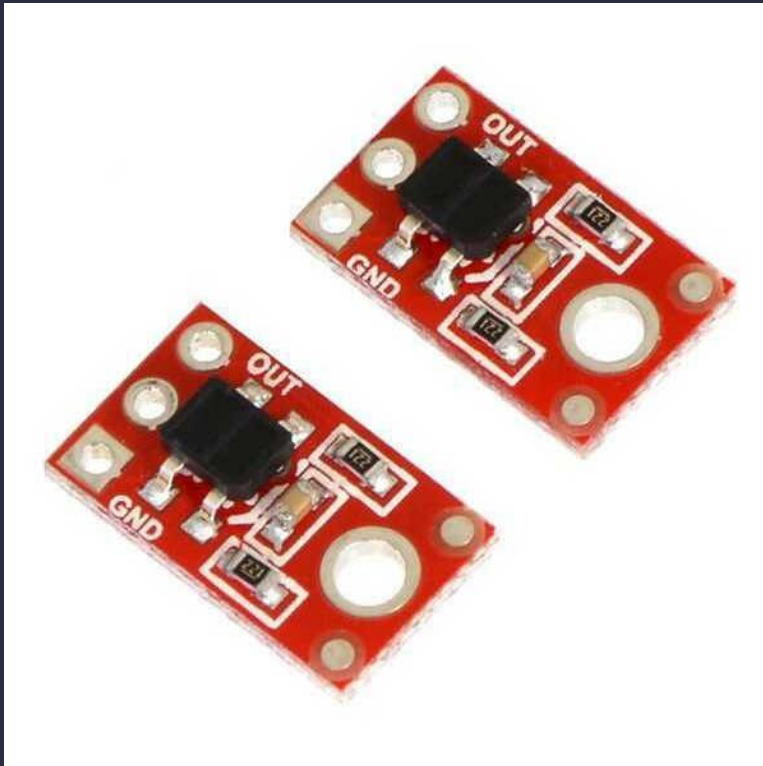
```
pinMode(MSens, INPUT);
```

```
digitalRead(MSens) or analogRead
```

Sensors

Our development kit has:

- 2x QTR1A Contrast Sensor



Sensors

Our development kit has:

- Right QTR1A: A1
- Left QTR1A: A0

On Setup

```
pinMode(MSens, INPUT);
```

```
analogRead(A0)
```



Sensors

Check QTR1A Datasheet