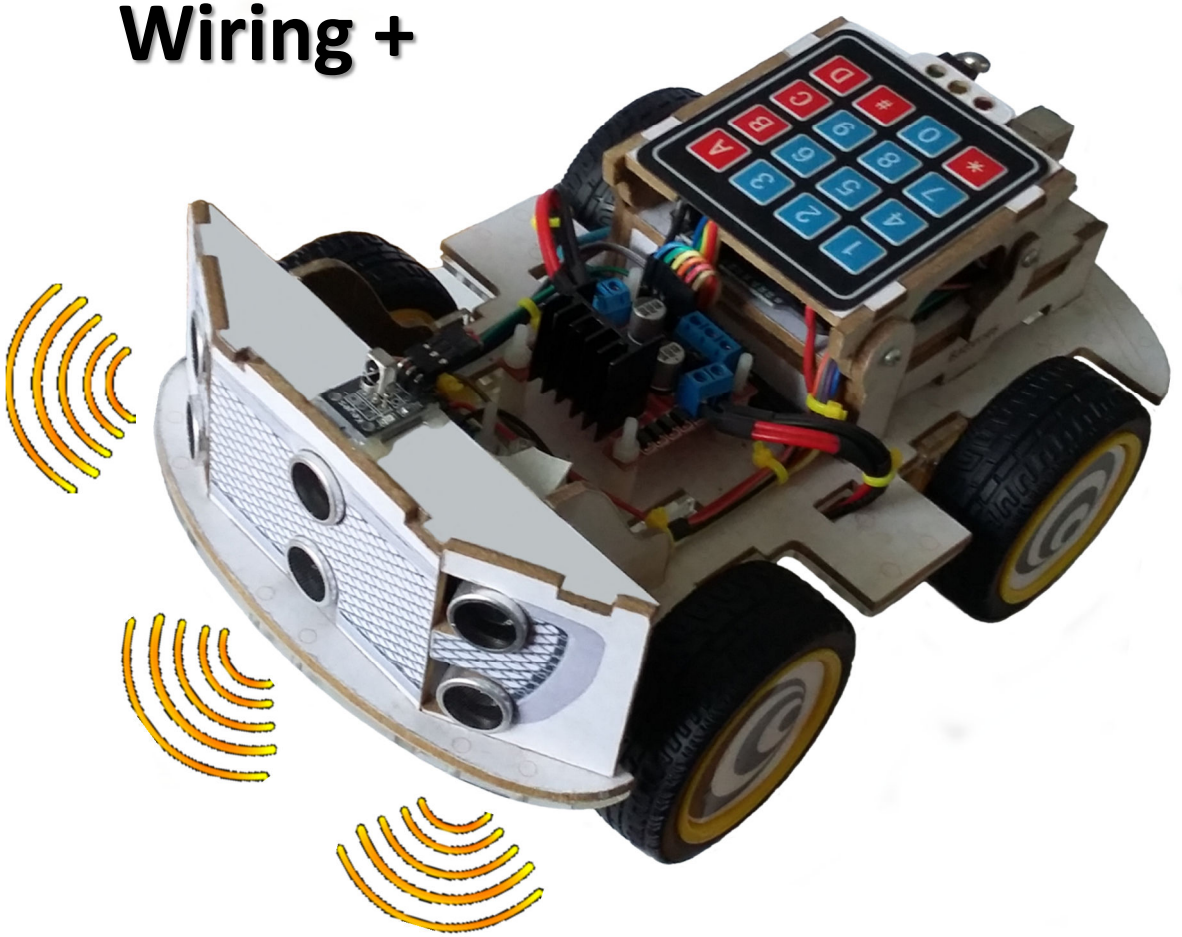
# 4x4 Autonomous Robot Car

## Wiring +

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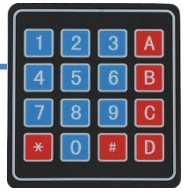
TechKnowTone

# Function Block Diagram:

IR Sensor

Arduino MEGA



Mode Switches

Sonar Sensor L-H

Sonar Sensor Centre

Sonar Sensor R-H

5v

PWM Ctrl

Rechargeable Battery Pack: 6 x AA (7.2v)

2 Channel Speed Controller L298N

Speed Sensor L-H

Speed Sensor R-H

PWM

PWM

Motor L-H Front

Motor L-H Rear

Motor R-H Front

Motor R-H Rear



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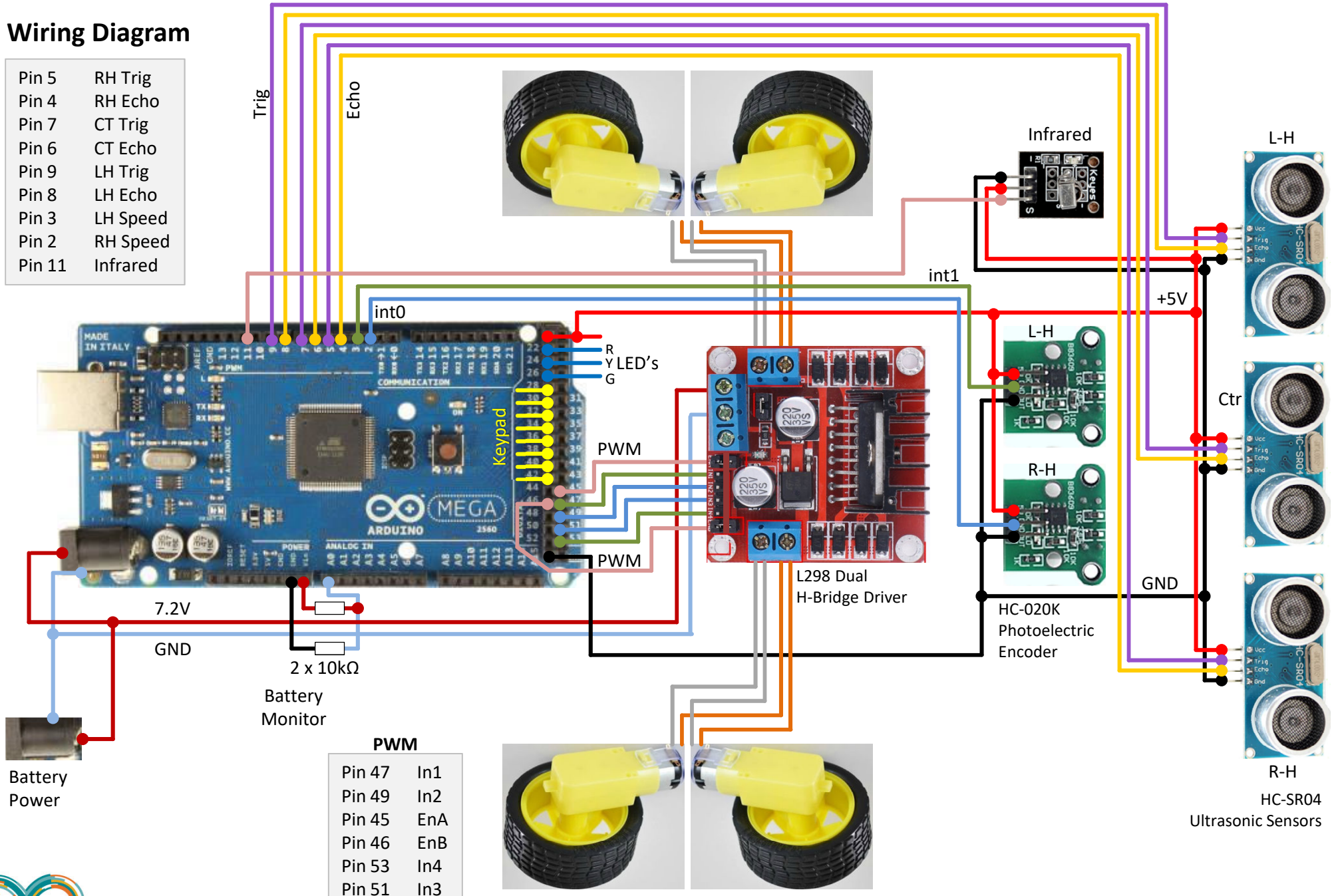
# Wiring Diagram

| | |
|---|---|
| Pin 5 | RH Trig |
| Pin 4 | RH Echo |
| Pin 7 | CT Trig |
| Pin 6 | CT Echo |
| Pin 9 | LH Trig |
| Pin 8 | LH Echo |
| Pin 3 | LH Speed |
| Pin 2 | RH Speed |
| Pin 11 | Infrared |




**PWM**

| | |
|---|---|
| Pin 47 | In1 |
| Pin 49 | In2 |
| Pin 45 | EnA |
| Pin 46 | EnB |
| Pin 53 | In4 |
| Pin 51 | In3 |



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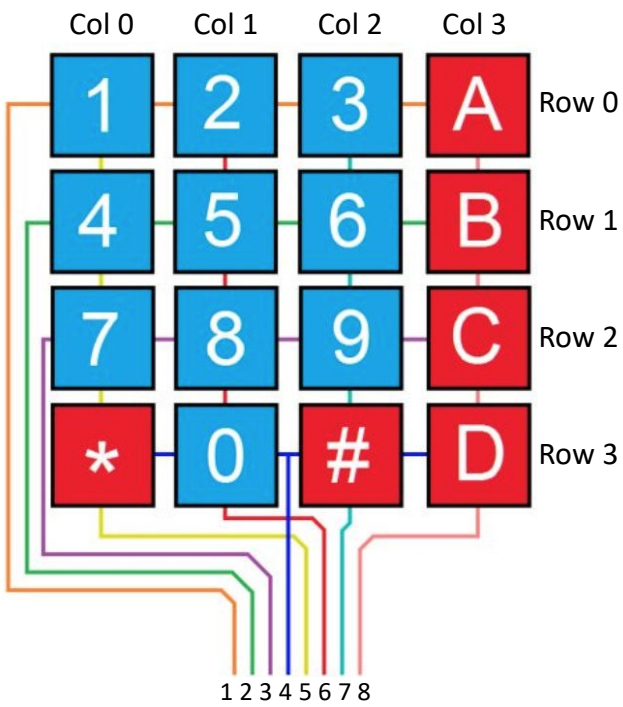
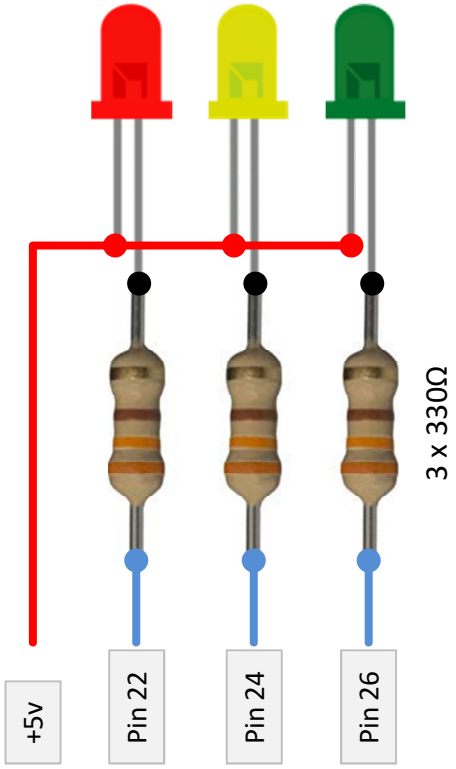
# Keypad & LED Wiring Diagram

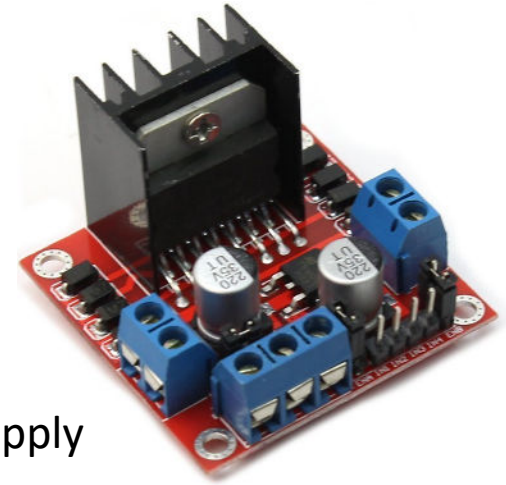




| | |
|---|---|
| Pin 28 | Row 0 |
| Pin 30 | Row 1 |
| Pin 32 | Row 2 |
| Pin 34 | Row 3 |
| Pin 36 | Col 0 |
| Pin 38 | Col 1 |
| Pin 40 | Col 2 |
| Pin 42 | Col 3 |

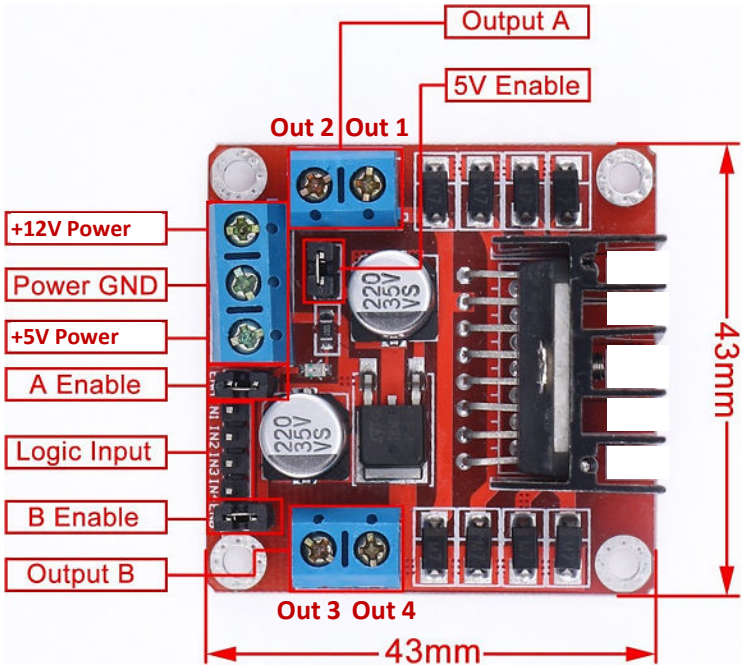


# L298N Motor Drive Controller:

## Features:

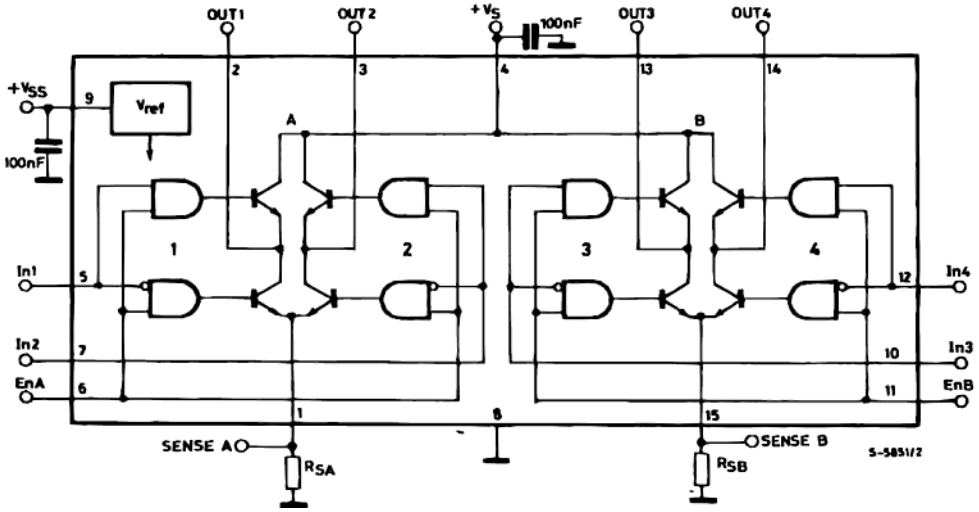


- L298N as main chip
- Large filter capacitance
- After flow protection diode
- Double H bridge drive
- Logic voltage 5V
- Can act as ‘limited’ Arduino 5V supply
- Motor Drive voltage 5V-35V
- Drive current 2A(MAX single bridge)
- Max power 25W
- Over-temperature protection
- Size:43 x 43 x 27mm / 1.69 x 1.69 x 1.06“

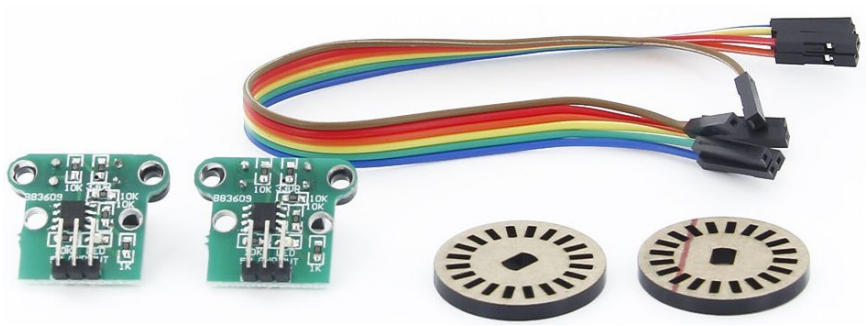



## Notes:

- Remove ‘Enable’ links to 5v
- Use ‘Logic’ inputs to set motor polarity
- Drive PWM into the ‘Enable’ inputs
- Pull all inputs ‘LOW’ (10kΩ) during ‘RESET’
- Drive LH and RH with opposite polarity

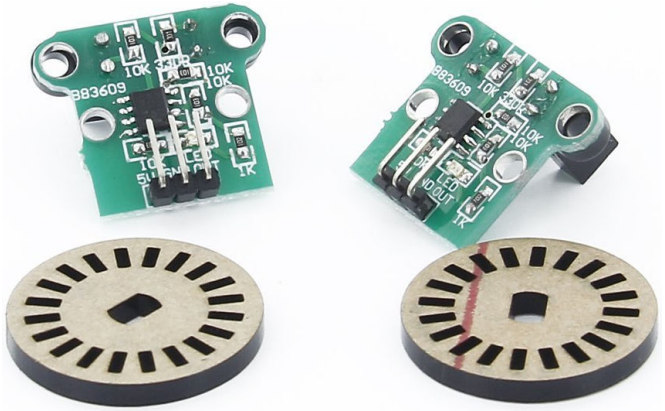


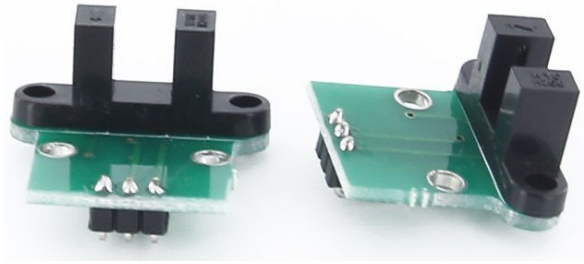
# HC-020K Photoelectric Encoders:



## Features:

- Measure rotational speed/distance
- Module Working Voltage: 4.5 - 5.5V
- Photodiode Forward Drop: $V_f$ = 1.6V
- Photodiode Current: $I_f$ < 20mA
- Signal output: A, B two lines; TT power level;
- Resolution: 0.01mm
- Measurement frequency: 100KHz
- Disc diameter: 24mm
- Inner Disc Diameter: 4mm
- Encoder resolution: 20 lines

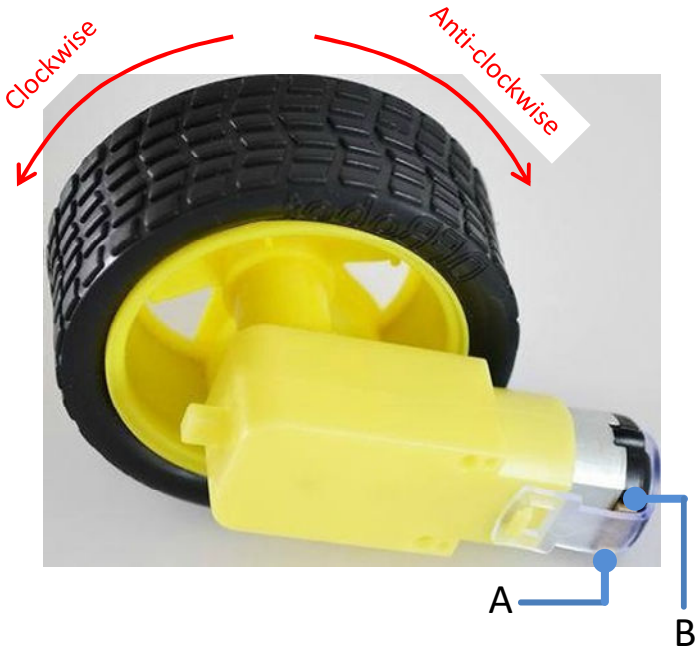




# Drive Motors:

## Features:

- Voltage: DC 6V
- Current: 120mA
- Armature: 3.7Ω + 1.2mH
- Stall current: 1.6A @6V
- Reduction ratio: 48:1
- RPM (With tire): 240
- Tire Diameter: 66mm
- Car Speed(M/minute): 48
- Motor Weight (g): 50
- Motor Size: 70mm x 22mm x 18mm
- Noise: <65dB.





| | |
|---|---|
| A+ B- | Clockwise |
| A- B+ | Anti-clockwise |



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## Batteries:

Back in 2015, as with other projects, I decided to power this car using 6 x AA nickel-metal hydride rechargeable batteries, which performed well in this application.


More recently I have switched my design approach to develop projects powered from 2 x 18650 Lithium-iron rechargeable batteries. The benefits being:

- Fewer batteries, easier to charge
- Cheaper
- Greater power density, lower volume & lighter
- Lower self-discharge

So if I was designing this car today I would modify the battery compartment to accommodate the 18650 style batteries.


If you choose to go down this route **DO NOT** buy batteries which have built in discharge and over-current protection, as they will not deliver the high currents you need to draw in this project, even though they claim to have a higher storage capacity.

I made this mistake on another project. They are however excellent for use on projects which do not require large currents, and they are self protecting. So you don't need to monitor them to ensure you avoid the lower discharge limit of 3 volts.