

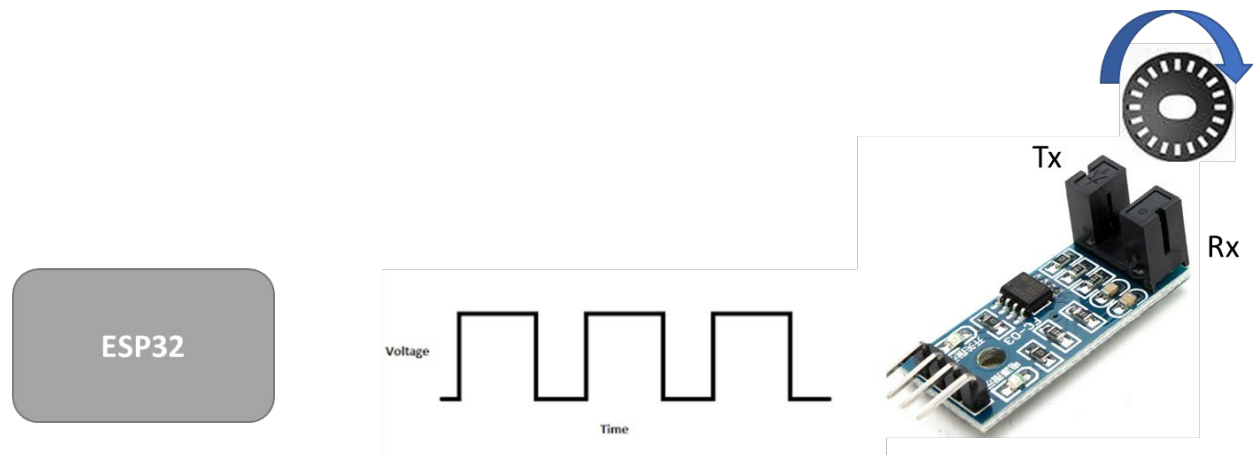
Module 11 – Tachometers

For this module you will need:

- Your car constructed from Module 10
- 6 Female to male jumper wires
- 2x tachometers

In this module we will interface the ESP32 with speed sensors (i.e., tachometers). The disks installed during the chassis construction will be used to measure the rotations per minute of the wheels.

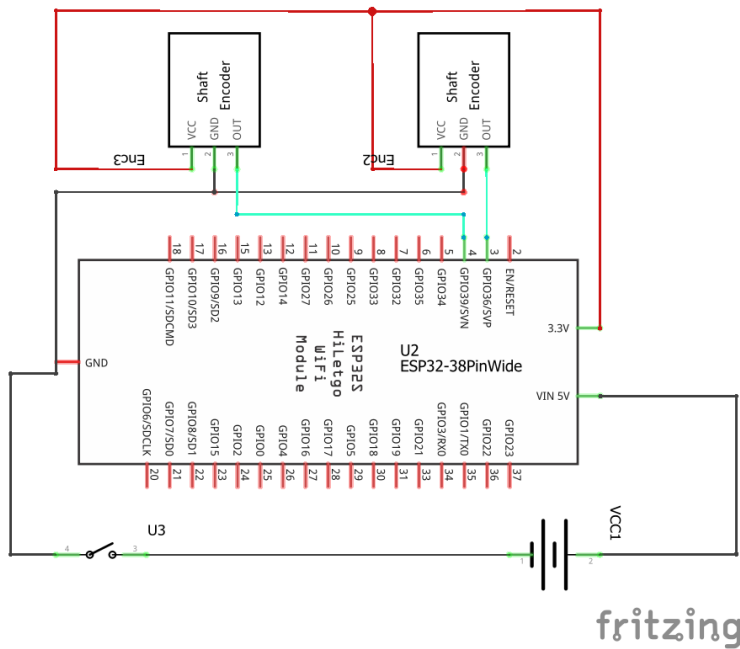
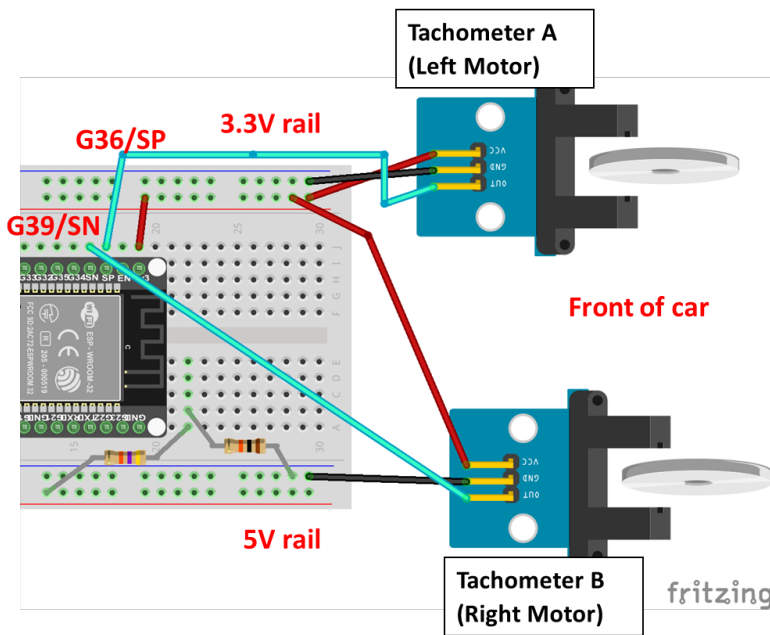
A tachometer is a useful tool for counting the RPM (rotations per minute) of a wheel or basically anything that spins. As the disk spins between the sensor, the link between the transmitter and receiver is broken. When the link between them is broken, the voltage read by the ESP32 changes from high to low. Detecting these transitions in software is how we can detect wheel movement and can execute some code that calculates the current RPM of whatever is spinning to break the transmitter/receiver link.



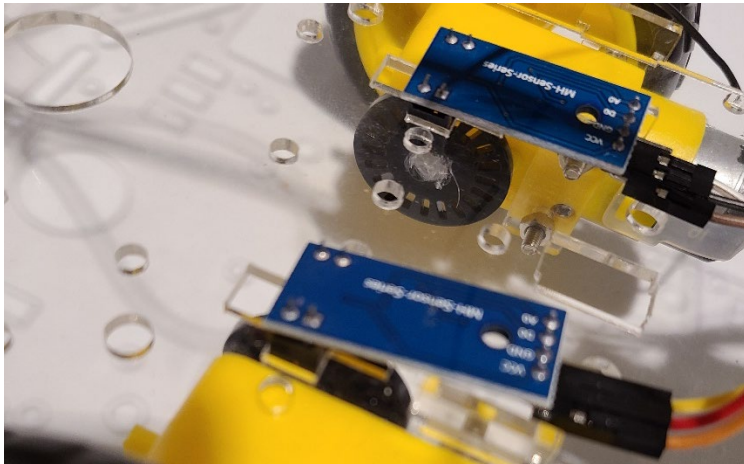
The tachometers Vdd connect to 3.3V. D0 is the data pin. Gnd connects to Ground. A0 is not used.

Connect a jumper from 3.3V pin on ESP32 to the **3.3V red rail (on the side with RST)**.

For clarity, only the tachometer circuit is shown in the diagram. Add this sub-system to your current breadboard layout.



Place the sensor face down in the slots where the disks are.



Open the Arduino IDE, upload the sketch: **stemcamp_tachometer_demo.ino**

Open the serial monitor.

Be sure the **battery switch is OFF**.

Keep the microcontroller plugged in by USB.

Pick up the car and turn on the power switch.

The Sensors will read the amount of rotation per wheel, indicating speed as rotations per minute.