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EIOT
LAB ASSIGNMENT 3

FAQs

1. Why do we need driver circuit in between motor & Rasberry board.

Ans A driver circuit is needed in between a motor & Rasberry Pi board to ensure proper control & protection of the motor. Motor requires higher voltage & current that what the Rassberry Pi can supply & they also produce electrical noise that can interface with the Rasberry Pi's sensitive electronics. A driver circuit provides isolation between the motor & provide appropriate control signals to the motor based on the input signal from the Rasberry Pi.

2. How to specify stepper motor while you purchase it?

Ans When purchasing a stepper motor you need to specify several parameters, including the step angle [the angle moved per step], the holding torque [the maximum torque the motor can produce when stationary] the rated voltage [the voltage at which the motor operates optimally] & current per phase

(the current needed to produce the rotated torque). You may also need to specify the physical dimensions of the motor, the type of shaft (eg. round or D-shape) & the number of leads (which determine the wiring configuration).

3 What are the various driver module you may use to control motors?

ans There are several driver modules that can be used to control motors including the L293D, L298N, TB6500 & A4988.

These driver modules can handle different type of motors, such as DC motors, stepper motors & provide various feature such as current limiting, thermal protections & step resolution

4 List and state other actuators.

ans The other types of actuators are as follows:-

solenoids, linear actuators, hydraulic actuators & piezoelectric actuators.

Solenoids are electromagnetic devices that convert electrical magnetic

devices that convert electrical energy into mechanical energy, while linear actuators provide linear motion using a motion or a hydraulic / pneumatic system. Pneumatic & hydr-aulic actuators use compressed air or fluid to provide motion, while piezoelectric actuators are a crystal that expands or contracts in respon-se to an electric field.

5 What is the alternate API used to control GPIOs on Raspberry Pi 3.

Ans In addition to default Raspberry Pi 3, GPIO library for controller on the Raspberry Pi there are several other APIs that can be used including:

- Wiring Pi :- This is a C library that provide a simplified interface for accessing GPIO pins on Raspberry Pi.
- Pi4J :- This is a Java Library that provides a similar interface for accessing GPIO pins.
- Pigpio :- This is a C library that provides a low-level interface for accessing GPIO pins with support for hardware & interruptions.

6 What is use of Relays?

Ans Relays are ~~used~~ devices that can be used to switch high-voltage or high-current loads using a low-voltage signal. They are often used to control lights, motors & other electrical devices that requires more power that can be provided directly by a micro-controller like the Raspberry Pi. Relays are useful for isolation & protection as they can provide galvanic isolation between the control signal & load & can help protect the control circuit from voltage spikes & other electrical noise.