## Relay

A relay is an electronic component used to control the switching ON or OFF of electrical circuits using a small electrical signal from a microcontroller such as the Raspberry Pi

The relay acts as an interface between low-voltage control circuits and high-voltage electrical loads

It operates on the principle of electromagnetism, containing a copper coil (Coil) that creates a magnetic field when current passes through it. This magnetic field pulls a metal armature, changing the connection state between its internal terminals:

- COM (Common): The common contact

- NO (Normally Open): Open by default and closes when the relay is activated

- NC (Normally Closed): Closed by default and opens when the relay is activated

When a signal is sent from the microcontroller to the relay, current flows through the coil, generating a magnetic field that moves the metal armature. This action switches the connected circuit ON or OFF

Relays are used to control devices that require higher current or voltage than the microcontroller can supply, such as:

- Running motors and fans.

- Turning lights or pumps on and off.

-Cutting power in safety or smart control systems

Thus, the relay allows microcontrollers to safely and efficiently control high-power electrical systems without damaging sensitive electronic components