

Servo motor with IR remote and Arduino

Components Used:

- Arduino UNO R3
- Servo Motor
- IR Sensor
- Remote

IR Sensor

An **Infrared (IR) sensor** is an electronic device that detects infrared radiation. It consists of an IR **emitter (LED)** that emits infrared light and an **IR receiver (photodiode)** that detects reflected or transmitted IR signals. IR sensors are commonly used in object detection, proximity sensing, and remote control systems.

Working Principle:

- The IR emitter sends out infrared light.
- If an object is in range, the IR receiver detects the reflected light.
- The sensor processes the signal and sends an output to a microcontroller or circuit.

Applications:

- Motion detection (security systems)
- Obstacle detection in robots
- Automatic hand sanitizers and soap dispensers
- Industrial automation



Fig15.1: IR Sensor

IR Remote

An **IR remote** is a handheld device used to wirelessly control electronic appliances such as TVs, air conditioners, and robotic systems. It transmits infrared signals encoded in a specific protocol (e.g., NEC, Sony, RC5) to an IR receiver, which deciphers the command and executes an action.

Working Principle:

- When a button is pressed, the IR LED in the remote emits a modulated IR signal.
- The IR receiver in the target device detects the signal and decodes it.
- The device responds based on the received command.

Applications:

- Remote controls for TVs, ACs, and audio systems
- Controlling robots and drones
- Smart home automation



Fig15.2: IR Remote

Project:

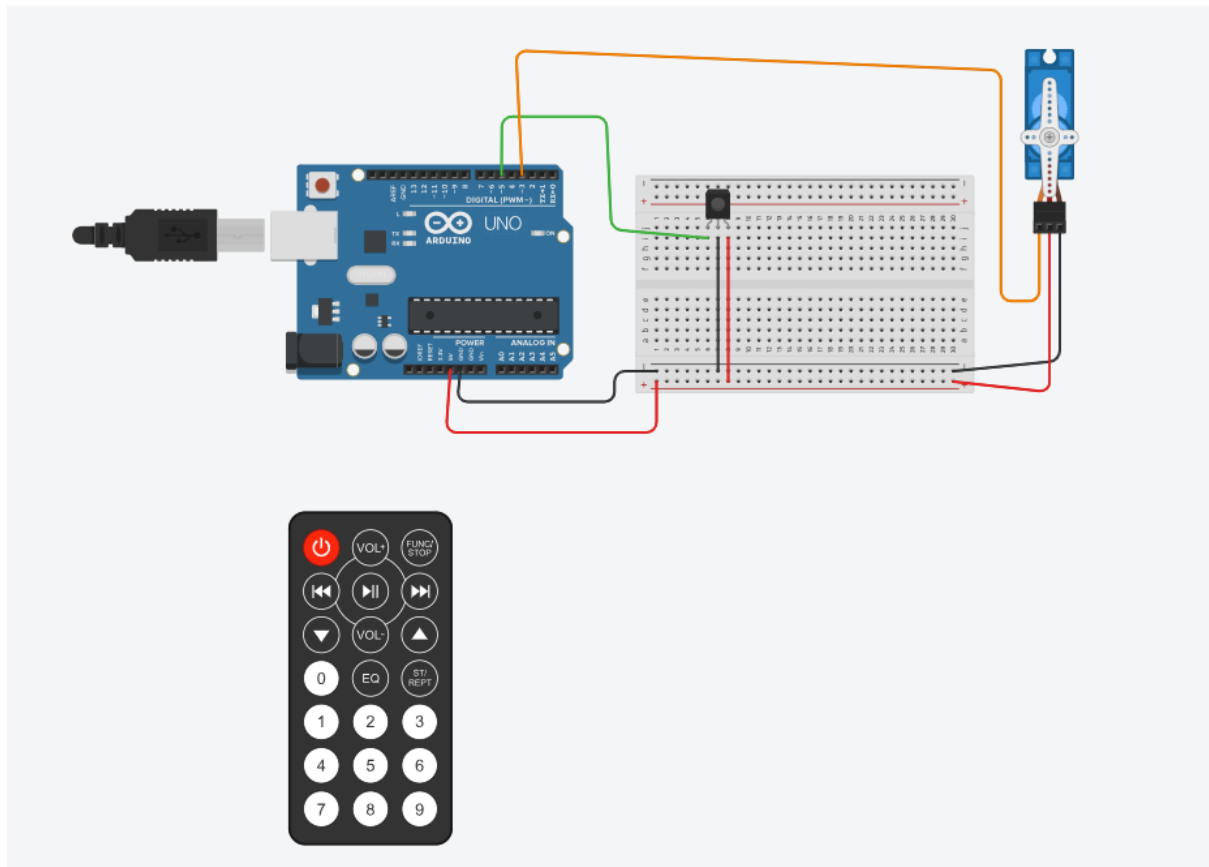


Fig 15.3: Remote Control Servo Motor using IR sensor and Arduino

Explanation:

A remote-controlled servo controller using Arduino, an IR sensor, and an IR remote enables wireless control of a servo motor based on infrared signals. In this system, an IR remote transmits signals that are received by an IR sensor, which is connected to the Arduino. The Arduino processes these signals, decodes the corresponding command, and controls the movement of a servo motor accordingly.

The IR receiver is connected to pin 5 of the Arduino, allowing it to detect infrared signals from the remote. When a button is pressed on the remote, the receiver captures the signal and sends it to the Arduino for decoding. The Arduino then compares the received value with predefined values and adjusts the servo motor's position accordingly. The servo motor is connected to pin 3 of the Arduino and is controlled using the Servo library. Based on the received signal, the servo moves to specific angles such as 45°, 90°, or 180°. After executing the command, the servo returns to its default position, ready to process the next input.

This system provides a simple yet effective method for controlling servo motors remotely. It can be used in various applications such as robotic arms, home automation, and automated mechanisms. By modifying the code, additional functionalities can be integrated, such as controlling multiple servos or implementing different movement sequences based on custom commands.

