

Component Specifications and Uses

NEO-6M GPS Module

Specifications:

- Positioning accuracy: ~2.5 meters
- Operating voltage: 3.3V to 5V
- Baud rate: Default 9600 bps
- Communication: UART (TX/RX)
- Cold start time: ~27s, Warm start: ~1s
- Antenna: External (typically ceramic patch or active antenna)

Uses:

- Provides real-time GPS location (latitude, longitude, altitude)
- Used in tracking systems (cars, drones, personal trackers)
- Helps in speed and time synchronization

IR Sensor (Infrared Obstacle Sensor)

Specifications:

- Operating voltage: 3.3V to 5V
- Range: ~2cm to 30cm (adjustable with potentiometer)
- Output: Digital (HIGH/LOW)
- Wavelength: ~760 nm

Uses:

- Detects obstacles or motion
- Used in robot navigation, line followers

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- Used for automatic door or object counters

Buzzer

Specifications:

- Voltage: 3V to 12V (commonly 5V)
- Types: Active (produces tone with DC), Passive (requires signal)
- Sound level: ~85 dB

Uses:

- Sound alert for warnings or notifications
- Alarm systems or status indicators

LED (Light Emitting Diode)

Specifications:

- Forward voltage: ~2V (red), ~3V (white/blue)
- Current: ~10-20 mA
- Polarity: Anode (+), Cathode (-)

Uses:

- Visual indicators (power, signal)
- Status display or alert
- Simple user interface element

SIM800L GSM/GPRS Module

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Specifications:

- Voltage: 3.7V to 4.4V (typically 4V)
- Communication: UART (AT Commands)
- Supports: SMS, Call, GPRS (2G)
- SIM card: Micro SIM
- Baud rate: 9600 (default)

Uses:

- Send/receive SMS
- Make/receive phone calls
- Send data over the internet (GPRS)
- Used in IoT, security, and remote monitoring

ESP8266 Wi-Fi Module

Specifications:

- Voltage: 3.3V (do not connect to 5V directly)
- Communication: UART or via AT commands
- Supports: 802.11 b/g/n Wi-Fi
- GPIO: 9-11 pins (ESP-01 has fewer)
- Flash memory: 512KB to 4MB

Uses:

- Adds Wi-Fi to projects
- Send data to server/cloud

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- Remote control via mobile/web
- IoT applications (home automation, sensor data logging)

Push Button

Specifications:

- Type: Normally Open (NO)
- Rated voltage/current: Up to 5V, low current
- Debouncing may be required in code

Uses:

- Manual user input (e.g., start/stop/reset)
- Trigger events (e.g., turn on a device, send signal)
- Simple control interface