

Alarm System with NodeMCU

Today, home security and automation have gained significant importance. This work focuses on the design and implementation of an innovative alarm system that utilizes NodeMCU, an open-source development platform based on the ESP8266 WiFi SoC, integrated with the popular messaging service, Telegram. The combination of these technologies provides an efficient, accessible, and user-friendly security solution for the home or office.

We have developed a system that is activated and deactivated through messages sent via Telegram. This system features an LED device, which serves as a visual indicator of the alarm's status. Additionally, it is equipped with a buzzer that emits an audible signal when movement is detected, provided that the alarm is activated.

Elements used:

- Nodemcu ESP8266
- PIR motion sensor
- LCD Display
- Two Leds
- Two Resistors
- Buzzer
- Breadboard
- Wires

The procedure followed was as follows:

- Purchase and acquisition of the materials listed above.
- Wiring to connect the LEDs and the buzzer, with their respective pins.
- Connecting the motion sensor device and the LCD screen.
- Creation of the bot on Telegram.
- Development of the code.

The main idea of this project is as follows:

- Remote Control through Telegram: The system can be activated and deactivated by sending commands ("Activar", "Desactivar") via Telegram. When the system starts, it sends a message to a specific Telegram chat to indicate that it is operational.
- Motion Detection: Utilizes a PIR (motion) sensor to detect presence in the monitored area. Upon detecting motion, the system sends an alert through Telegram and activates visual and auditory indicators.
- Visual and Auditory Indicators: Two LEDs (one red and one green) and a buzzer are used to indicate the system's status. The red LED and the buzzer are activated upon motion detection (when the alarm is activated), while the green LED indicates a normal state with no motion detected.

- LCD Display: An LCD display shows relevant information such as the WiFi connection status, the current state of the alarm ("Alarma Activada, "Sin movimiento", "Alarma sin funcionar"), and alerts of detected motion.

This project successfully demonstrates the integration of modern technology and home automation to create a highly functional and user-friendly security system. By harnessing the power of the NodeMCU ESP8266, a versatile and accessible open-source platform, in conjunction with the widely-used Telegram messaging service, we have developed an alarm system that is not only efficient in monitoring security but also convenient in terms of remote control and communication.