

VISITOR AUDIT SYSTEM

PROJECT DESCRIPTION :

VISITOR AUDIT SYSTEM is used to count the number of people entering your industry/stores. So we can find the traffic in real-time and optimize staff operation and visitor's needs within your store during working hours. Here we use an ultrasonic sensor to count the visitors. The count is then sent to the cloud by using a LoRa module through a gateway. The data from the cloud database can be accessed by the head of the store through a mobile application. So that the head of the store has always an observation over visitors. However, this project is a low-cost model for the actual idea. A more accurate and efficient system can be developed by using highly accurate sensors instead of basic ones.

PROJECT COMPONENTS :

1. Arduino Nano
2. LoRa Ra-02 Module
3. Ultrasonic sensor HC-SR04
4. Heltec ESP32 LoRa

PROJECT BOARD :

Arduino Nano:

The Arduino Nano is an ATmega328P microcontroller-based board that is miniaturized and compact size. It's especially much comfortable to use on breadboards and mini size application-specific PCBs. It's every way similar to UNO in specifications, programming, and connectivity with a smaller form factor. It operates at a frequency of 16MHz and a voltage of 5V. It's a 30 pin board consisting of 6 analog pins and 14 digital pins.

LoRa Ra-02 Module:

The LoRa Ra-02 module is an SX1278 LoRa Series, Spread Spectrum technology-based wireless transmission module. It is a module based on SEMTECH's SX1278 series wireless transceiver. It adopts advanced LoRa spread spectrum technology, with a range of communication spread in kilometers. It can be used for long-distance spread spectrum communication and compatible FSK remote modulation and demodulation. Despite offering a long range of data transmission it's data rate is lesser than other short-range wireless communications like Wi-Fi, ZigBee, etc.

However, it is much advantageous in point of communication range. LoRa Ra-02 can be used in a variety of networking applications; like home automation, security systems, remote system control, etc.

HC-SR04 Ultrasonic sensor:

It is a 4 pin module, having Vcc, trigger, Echo and Ground pins. This sensor is used in many applications like measuring distance or sense objects. It has two eye-like projections on the front side which forms a transmitter and receiver.

Heltec ESP32 LoRa :

It is a highly integrated product. It is based on ESP32 + SX127x. It has a LoRa function and OLED display. It is the best choice for smart cities, smart homes, and IoT applications.

Customized PCB:

PCB design brings electronic circuits to life in the physical form. The PCB design is used to place the components and routing to define electrical connectivity on a manufactured circuit board using some software.

Arduino IDE:

Arduino IDE is a cross-platform application that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards.

Google Firebase Database:

Firebase's real-time database is a cloud-hosted database. It is used to build apps with our android and javascript SDKs, all of the clients share one real-time database instance and automatically receive updates with the newest data.