

IOT BASED SMART HELMET FOR COAL MINING TRACKING

AIM:

Design and development of IOT based smart helmet for coal mining tracking.

PURPOSE:

Natural hazardous are very common in nature and we can't avoid them. But coal mine accidents are made by man and can be prevented. Especially, coal mine workers sacrifices their life while doing their duty. By adding technology to coal miner's helmet, we can provide tracking and security to mine workers. By adding few sensors like temperature, humidity and gas to miner helmet, we can track miners condition easily through IOT server. The proposed project title is IOT based smart helmet for coal mining tracking using Arduino.

DESCRIPTION:

WIFI module (ESP8266) connected to Arduino through UART port. Sensors like DHT11, LDR, and MQ series connected to Arduino digital and analog pins respectively. DC light connected to Arduino digital output pin through relay.

WORKING:

DHT11 sensor can detect temperature and humidity and it was arranged on top of helmet.

Few gases released in underground coal mines, these gases detected by Mq series sensors like MQ4 for methane, Mq135 for air quality, MQ2 for carbon monoxide. LDR senses Light and Dark condition and enable Light when it detects dark. Arduino displays all this information on lcd display and sends information to IOT server. Monitoring people can track coal mine workers condition based on sensor values.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontroller	:	Arduino Uno
Crystal	:	16 MHz
LCD	:	16x4 LCD display
IOT module	:	ESP8266
Temperature Sensor	:	DHT11
Humidity Sensor	:	DHT11
Methane Sensor	:	MQ4
Air Quality Sensor	:	MQ135
Carbon Monoxide	:	MQ2
Light Sensor	:	LDR
Relay	:	12v DC Electromagnetic
Light	:	5v DC
Buzzer	:	5vDC
Power Source	:	12v 1 amp DC battery

SOFTWARE:

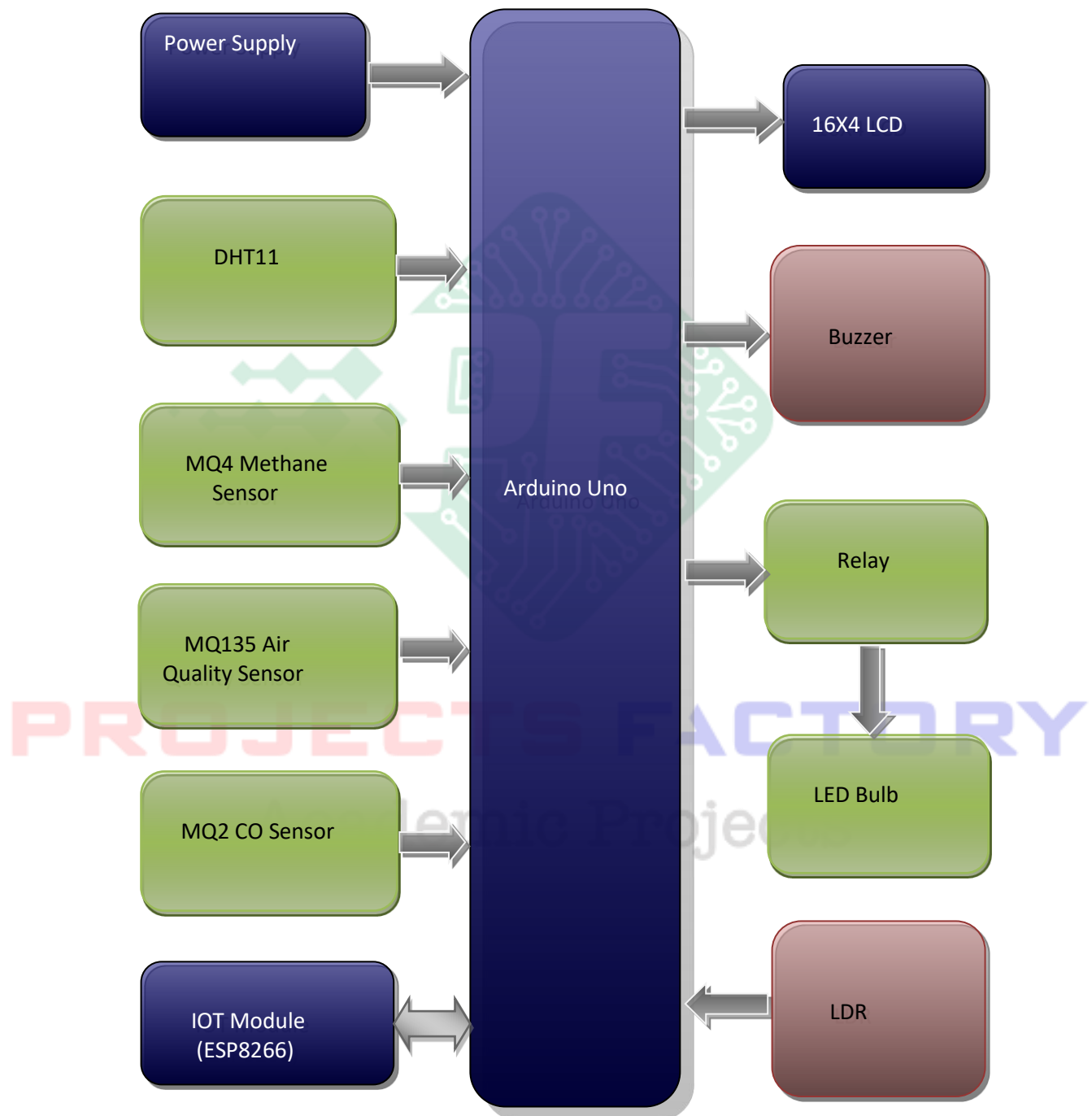
Arduino IDE

Proteus based circuit diagram

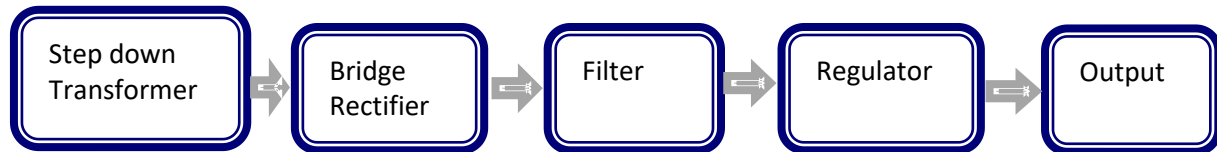
APPLICATIONS:

- IOT coal mine helmet
- Coal miner tracking
- IOT based intelligent helmet

BLOCK DIAGRAM:



POWER SUPPLY BLOCKDIAGRAM:



INTERFACES COVERED:

- We have covered Arduino programming
- IOT Module (ESP8266) interface with Arduino and PC
- Light interface through relay
- DHT11, LDR and MQ series gas sensors

PROJECTS FACTORY
Academic Projects