**AIR QUALITY MONITORING**

Description:

An air quality monitoring system is a crucial tool in assessing and ensuring the cleanliness of the air we breathe. It consists of an array of sensors that constantly measure different air pollutants, ranging from particulate matter to harmful gases. These sensors are strategically placed in various locations to gather real-time data, providing a comprehensive view of air quality conditions.

Components Required:

Hardware:
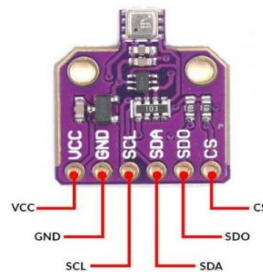
BME680

- The BME680 is the first gas sensor that integrates high-linearity and high-accuracy gas, pressure, humidity and temperature sensors. It is especially developed for mobile applications and wearables where size and low power consumption are critical requirements.
- This sensor helps us to check the air quality with high accuracy.So,it will be helpful to detect the pollution in the cities.Because,according to air qualities the safety measures will be published to community.
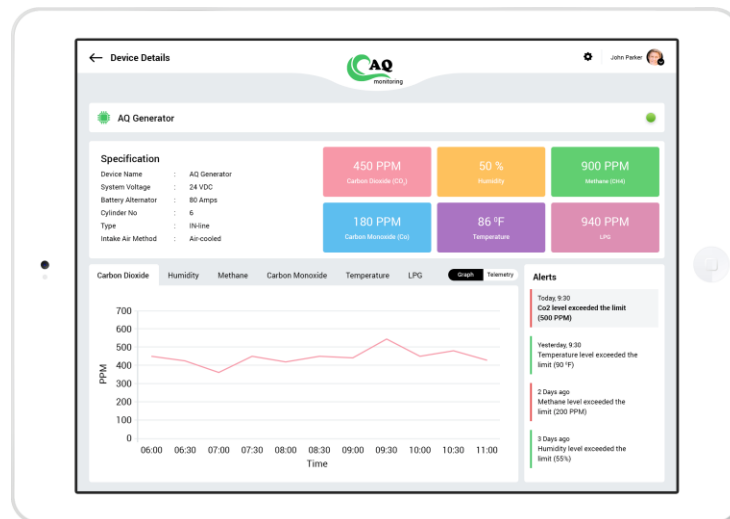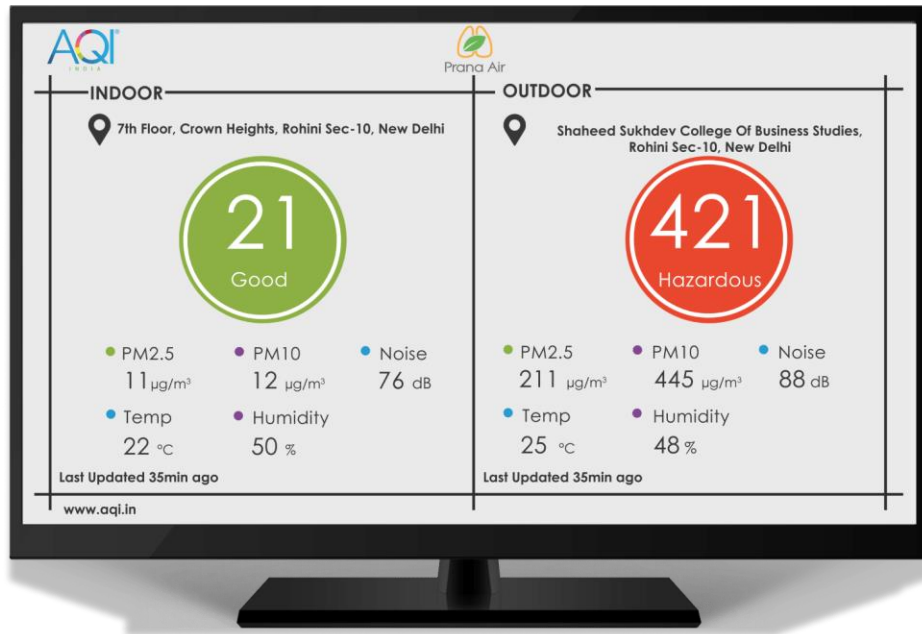
Jump Wires

- A jumper wire is **an electric wire that connects remote electric circuits used for printed circuit boards**. By attaching a jumper wire on the circuit, it can be short-circuited and short-cut (jump) to the electric circuit.
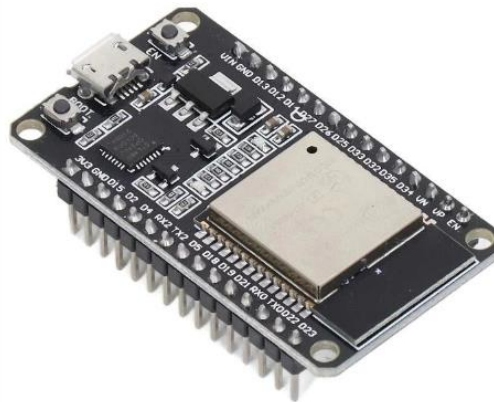
ESP-32

- ESP32 can perform as a complete standalone system or as a slave device to a host MCU, reducing communication stack overhead on the main application processor. ESP32 can interface with other systems to provide Wi-Fi and Bluetooth functionality through its SPI / SDIO or I2C / UART interfaces.
- ESP32 is a series of low-cost, low-power system on a chip microcontroller with integrated Wi-Fi and dual-mode Bluetooth.

Graphical User Interface

INDOOR

7th Floor, Crown Heights, Rohini Sec-10, New Delhi

21 Good

- PM2.5 11 $\mu g/m^3$
- PM10 12 $\mu g/m^3$
- Noise 76 dB
- Temp 22 ℃
- Humidity 50 %

Last Updated 35min ago

www.aqi.in

OUTDOOR

Shaheed Sukhdev College Of Business Studies, Rohini Sec-10, New Delhi

421 Hazardous

- PM2.5 211 $\mu g/m^3$
- PM10 445 $\mu g/m^3$
- Noise 88 dB
- Temp 25 ℃
- Humidity 48 %

Last Updated 35min ago

Device Details — John Parker

AQ Generator

Specification

Device Name	:	AQ Generator
System Voltage	:	24 VDC
Battery Alternator	:	80 Amps
Cylinder No	:	6
Type	:	IN-line
Intake Air Method	:	Air-cooled

- 450 PPM Carbon Dioxide (CO₂)
- 50 % Humidity
- 900 PPM Methane (CH4)
- 180 PPM Carbon Monoxide (Co)
- 86 ºF Temperature
- 940 PPM LPG

Carbon Dioxide | Humidity | Methane | Carbon Monoxide | Temperature | LPG | Graph | Telemetry

PPM

700
600
500
400
300
200
100
0

06:00 06:30 07:00 07:30 08:00 08:30 09:00 09:30 10:00 10:30 11:00

Time

Alerts

Today, 9:30
Co2 level exceeded the limit (500 PPM)

Yesterday, 9:30
Temperature level exceeded the limit (90 °F)

2 Days ago
Methane level exceeded the limit (200 PPM)

3 Days ago
Humidity level exceeded the limit (55%)

**Air Quality Monitoring System (Web App)**

Cloud:

Arduino Cloud is a platform offered by Arduino to empower users to streamline the development process of IoT (Internet of Things) projects. It allows users to remotely manage, configure, and connect their Arduino boards and devices to the Internet, simplifying the integration of various sensors and actuators. Through a user-friendly interface, one can visualize data, set up automation rules, and monitor real-time events. Integrated with the Arduino Web Editor, it provides a seamless development experience, enabling users to write, debug, and deploy code without needing any installation. Its integration capabilities promote easier management and broader scalability of IoT systems.
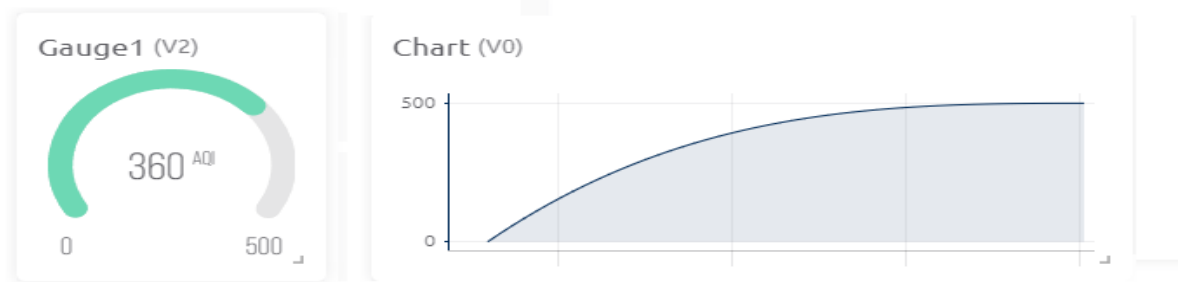
AIR QUALITY:

The Air Quality Index, or AQI, is the system used to warn the public when air pollution is dangerous. The AQI tracks ozone (smog) and particle pollution (tiny particles from smoke, power plants and factories, vehicle exhaust, and other sources), as well as four other widespread air pollutants.

- **Normal AQI:** AQI values at or below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is unhealthy: at first for certain sensitive groups of people, then for everyone as AQI values get higher.
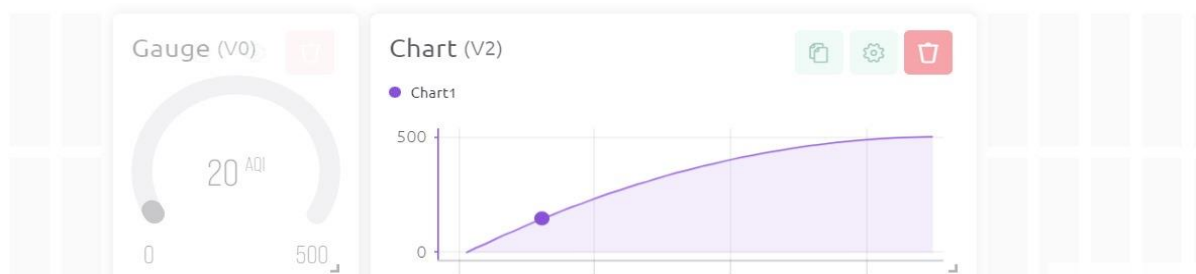
- **Good AQI:** AQI is 0 - 50. Air quality is considered satisfactory, and air pollution poses little or no risk.

- **Satisfactory AQI:** AQI is 0 - 50. Air quality is considered satisfactory, and air pollution poses little or no risk.

- **Moderate AQI:** The AQI is between 51 and 100. Air quality is acceptable; however, pollution in this range may pose a moderate health concern for a very small number of indi- viduals. People who are unusually sensitive to ozone or particle pollution may experience respiratory symptoms.

- **Very Poor: an AQI value over 300 to 400represents hazardous air quality.**

- **Sever: while an AQI value over 300 represents hazardous air quality.**

Precautions:

Stay informed about the local air quality levels.

Use air conditioning in cars and homes when AQI levels are high.

Avoid using tobacco or candles, and minimize activities that generate indoor pollutants, such as frying foods, sweeping, and using cleaning products.

If you have respiratory conditions, such as asthma or COPD, ensure you have your medication and follow your doctor's advice. Avoid using gas-powered lawn equipment or fireplaces when AQI levels are elevated. Consider using masks, such as N95 respirators.

Overview:

The BME680 is a state-of-the-art environmental sensor that's at the forefront of monitoring air quality in today's tech-driven world. Engineered to detect a wide range of gaseous pollutants, this tiny powerhouse combines sensors for gas, pressure, humidity, and temperature. Upon detecting changes in the environment, BME680 captures this data and sends it to the cloud in real-time. Through advanced cloud computing capabilities, the raw data is processed, analyzed, and transformed into meaningful insights, primarily the Air Quality Index (AQI). For end-users, this presents an unparalleled convenience. Whether you're at home, in the office, or on the move, accessing AQI data is just a click away. By logging into a dedicated portal or app, users can view real-time AQI readings, assess health risks, and make informed decisions, whether it's about going for a jog or turning on indoor air purifiers.

The marriage of BME680's precise sensing abilities with cloud technology ensures that everyone, everywhere, is a step closer to breathing cleaner, safer air.