Paper Prototype

For the paper prototype fair on November 7, you should bring a paper prototype of your project to class.

In addition, we expect you to have a GitHub repository for your final project, and to have this listed and linked to the course Github Readme.md. In your project's README.md file, you should list:

- Project Idea
- Team
- Rough form: this is your paper prototype (put photos on your GitHub, bring the actual thing to class)
- Expected parts: is there a display, a motor, batters, interface, etc? Where does the Pi/Arduino/other controller go?
- Interaction plan: how will people interact with your device?

Environmentally Efficient Smart Home Air Quality Network

A smart air monitoring system (IOT) is conceptualised. IOT operation is determined by sensors that monitor, measure and wirelessly transmit the information regarding air quality to the microcontroller and from remote data management center. A smart algorithm reviews the information from indoor air quality sensors and determines the operation of ventilation and exhaust systems. The entire unit operates autonomously to clean indoor air and minimize energy utilization. This smart system provides real time visualization and monitoring and emergency alerts if indoor pollutants exceed safe limits.

- This system is ductless, modular, smart, autonomous and self remediating. In the inlet or the ventilation system there is a air flow passage interconnecting the opening on the outer wall with the opening on the inner wall. Both the exhaust and ventilation system pump the air with a fan driven by a motor. A pre-filter (carbon) and a main filter (HEPA) are removably supported within the air filtration chamber for entrapping particulates having a size of 0.3 microns and greater. An ultraviolet light source is positioned within the ventilation system. An outlet grille/pollen proof net is supported proximate the air passage on the outer wall, and provides for the passage of air while substantially preventing the passage of larger pollutants. An inlet grille on the inner wall includes a louver assembly including a plurality of blades defining a plurality of convoluted passages. An air quality monitoring system is supported by the inlet and outlet unit, and provides an indication of ambient air quality to a controller which, in turn, varies operation of the exhaust and ventilation unit based upon the indicated ambient air quality.
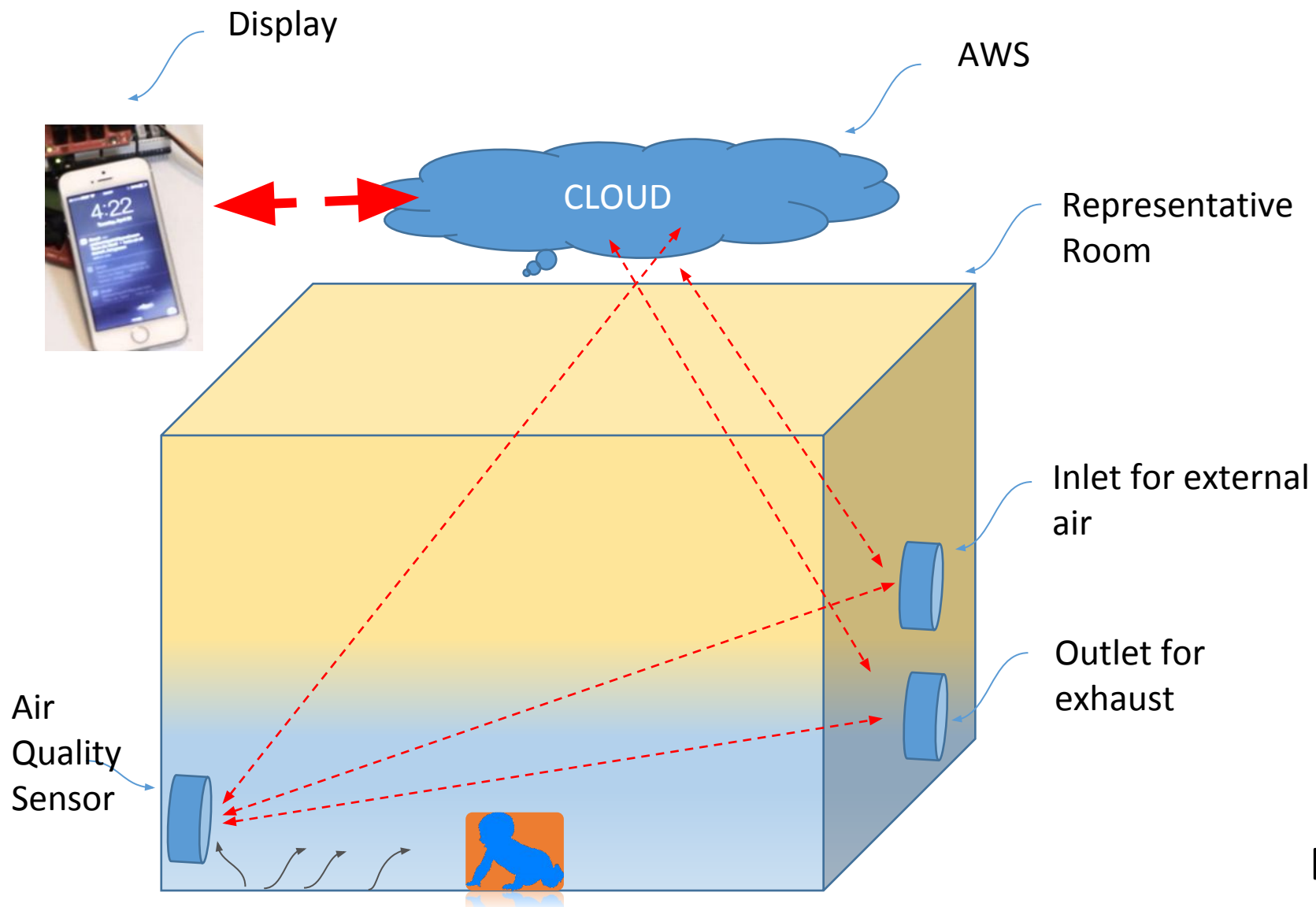
Display

AWS

CLOUD

Representative
Room

Inlet for external
air

Outlet for
exhaust

Air
Quality
Sensor

FIG. 1: Deployment of
Environmentally Efficient Air
Quality Network
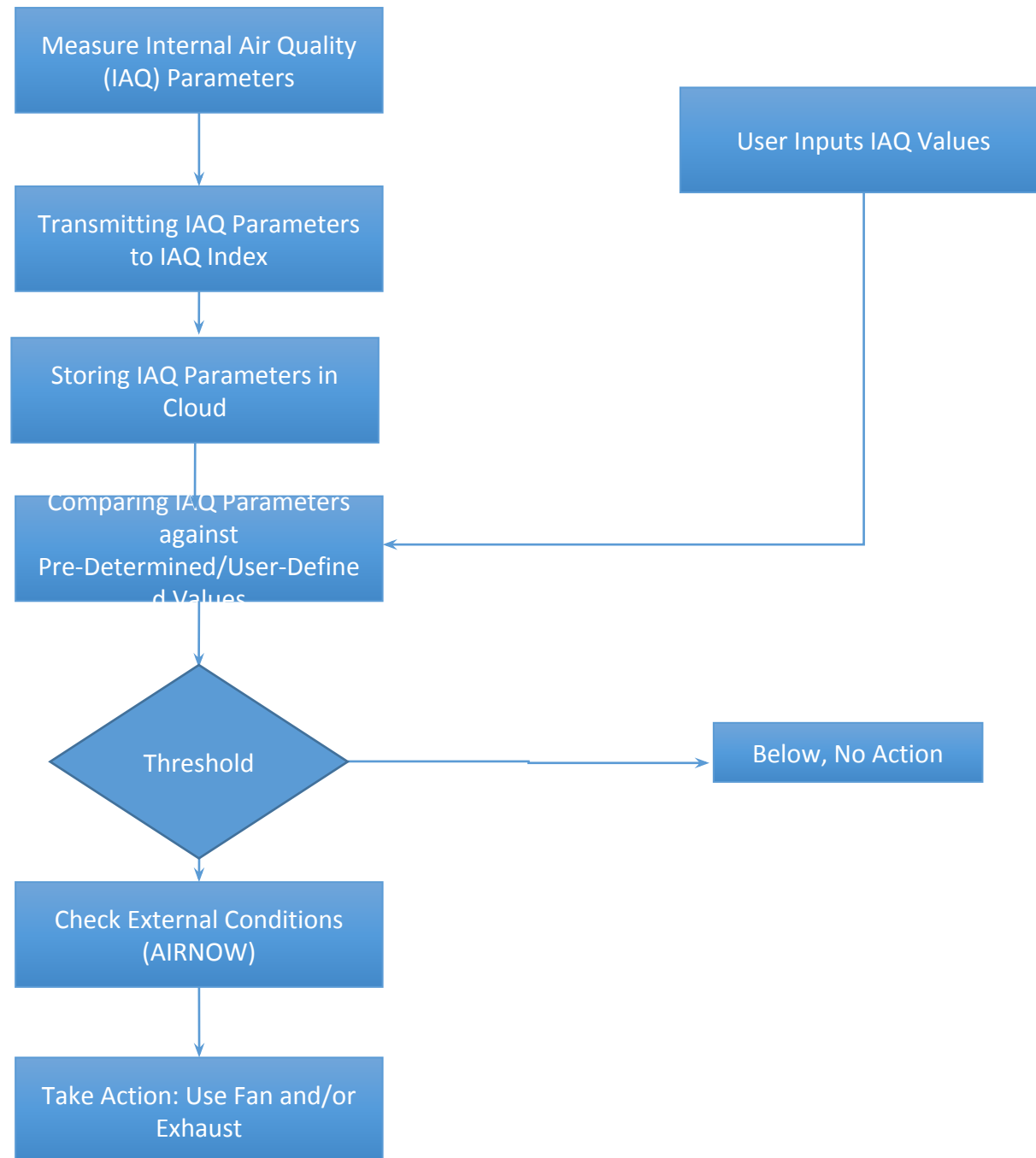
FIG. 2: IOT Control Chart for Environmentally Efficient Air Quality Network

App Display

Current Status: Good

V O C

PM 2.5

Current Temp & Humidity:

Vent: Off
Exhaust: On
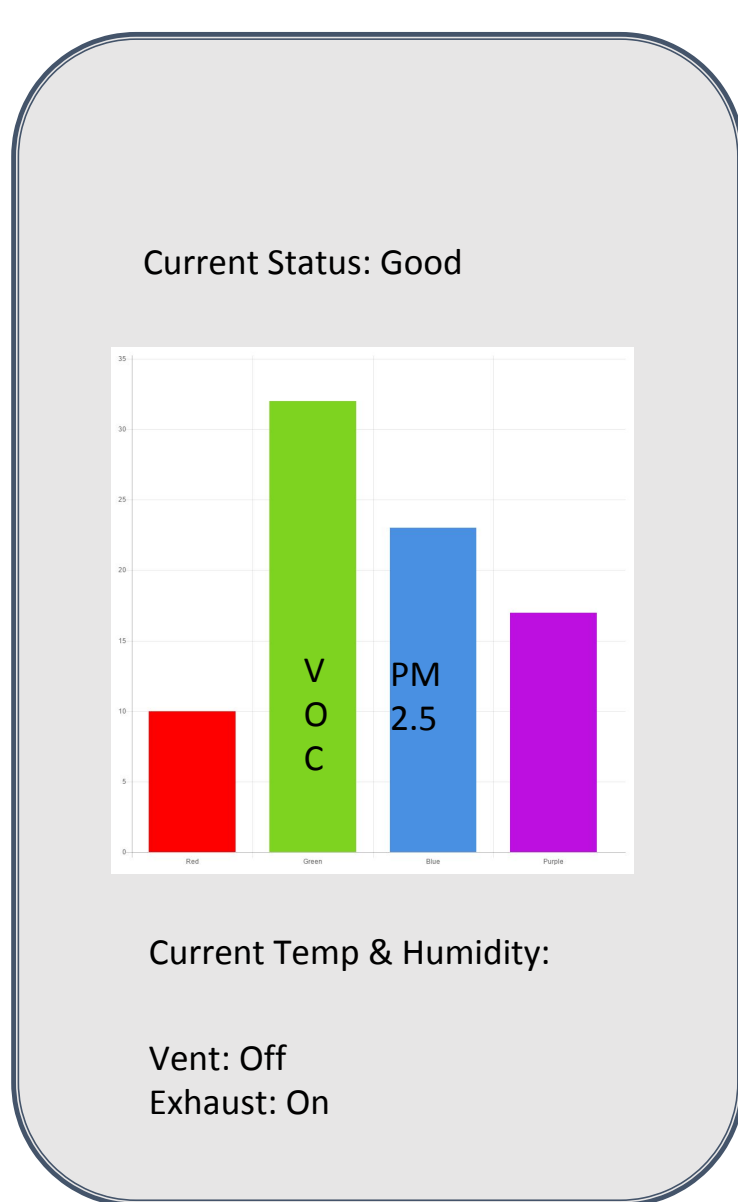
Emergency Alert !!!

CO Detected

1) Exhaust - Full Blast
2) 911 Information Sent
3) Sound Alarm played
4) Contnous Monitoring

FIG. 3: Smart Device User Interface

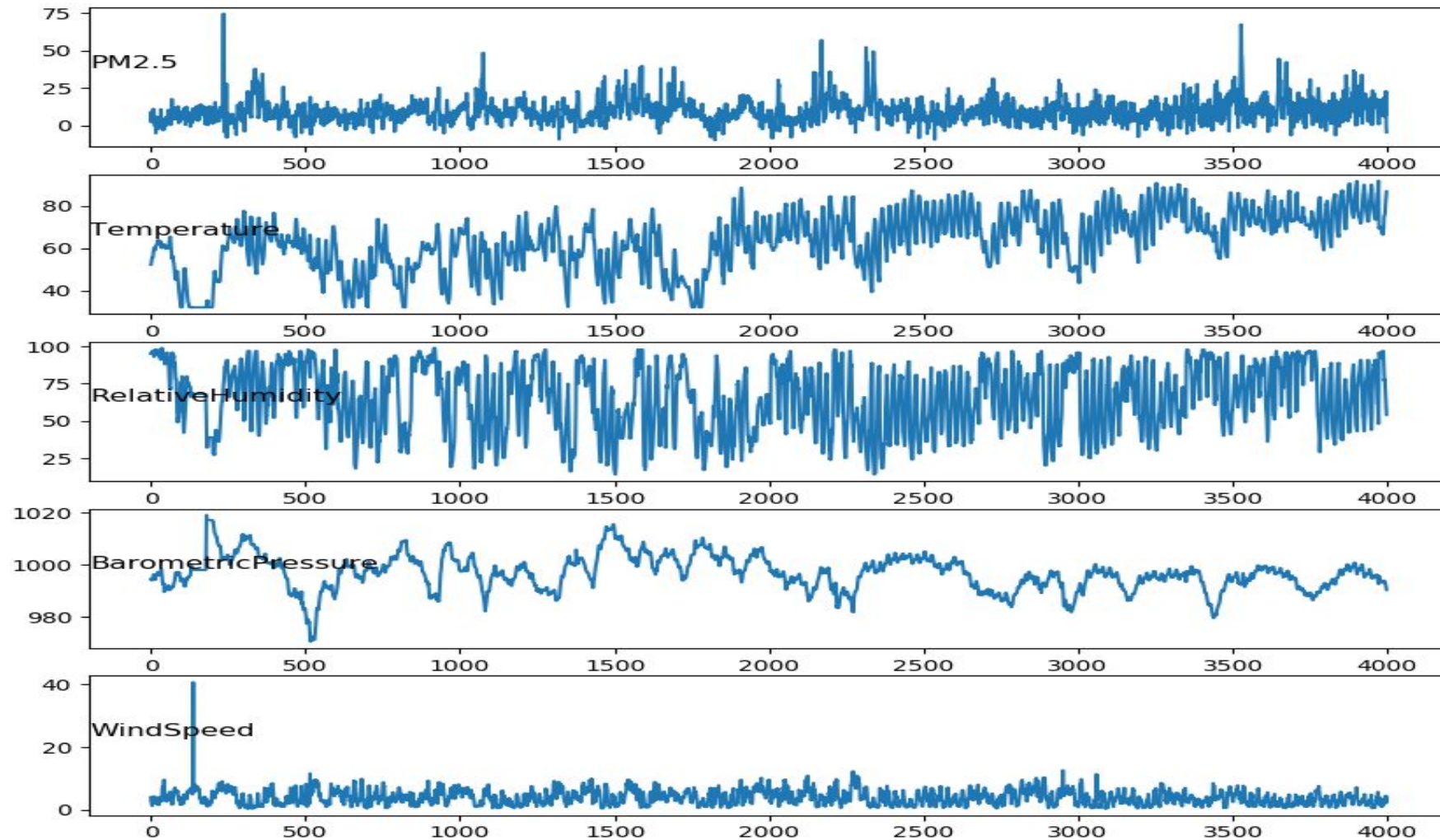Fig 4: Sensor Reading for Display and Decision Making
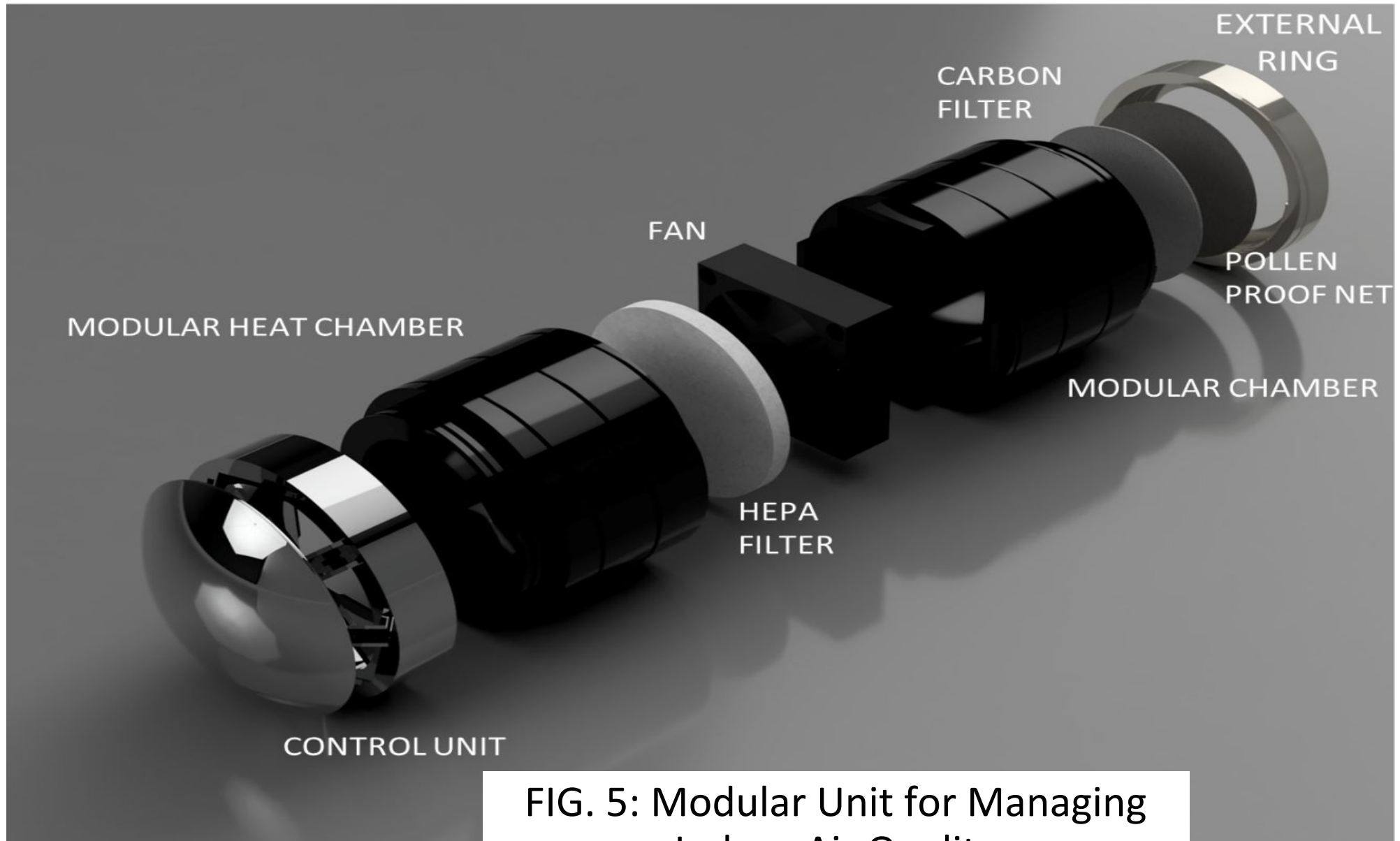Environmentally Efficient Air Quality Network
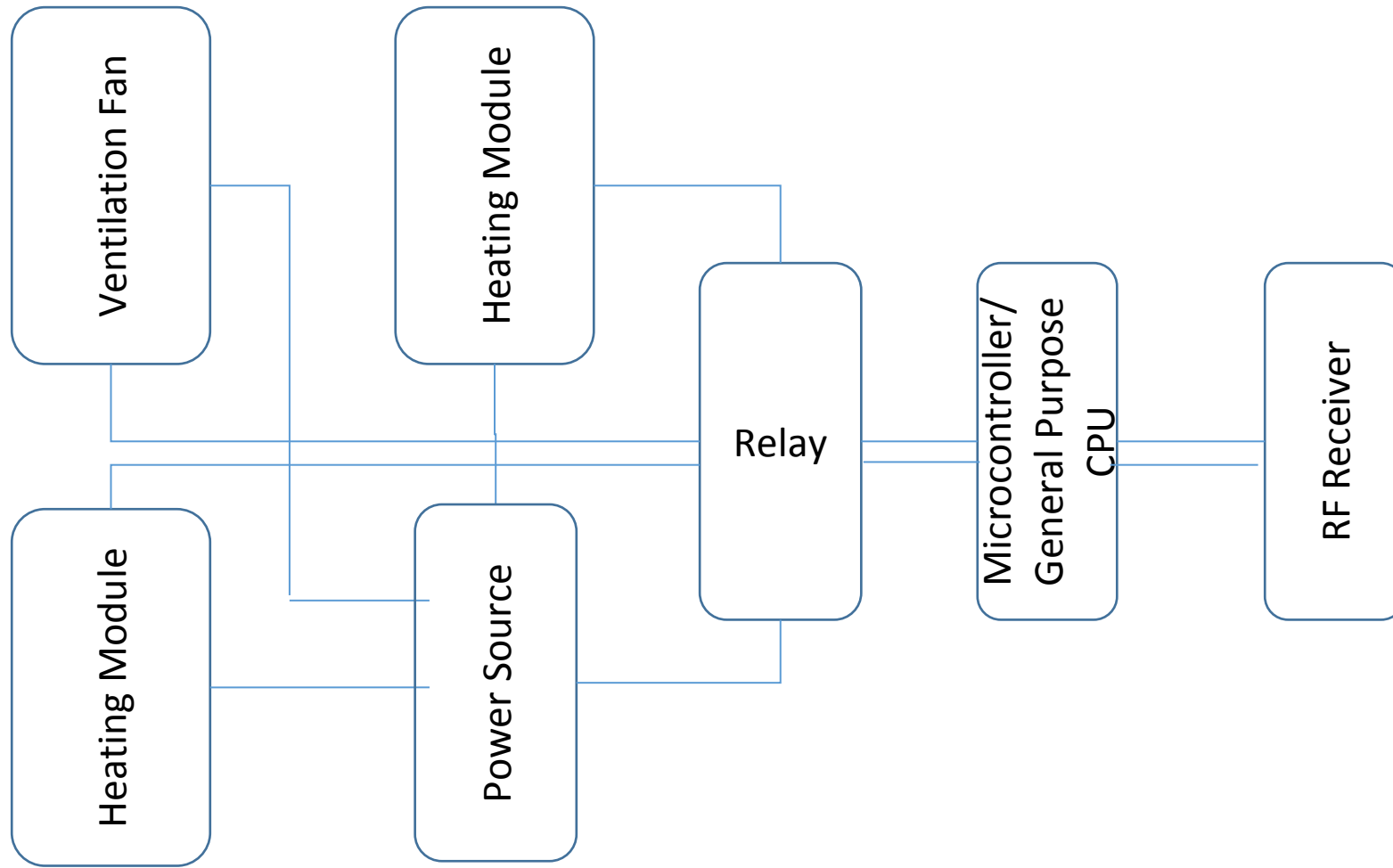
FIG. 5: Modular Unit for Managing Indoor Air Quality
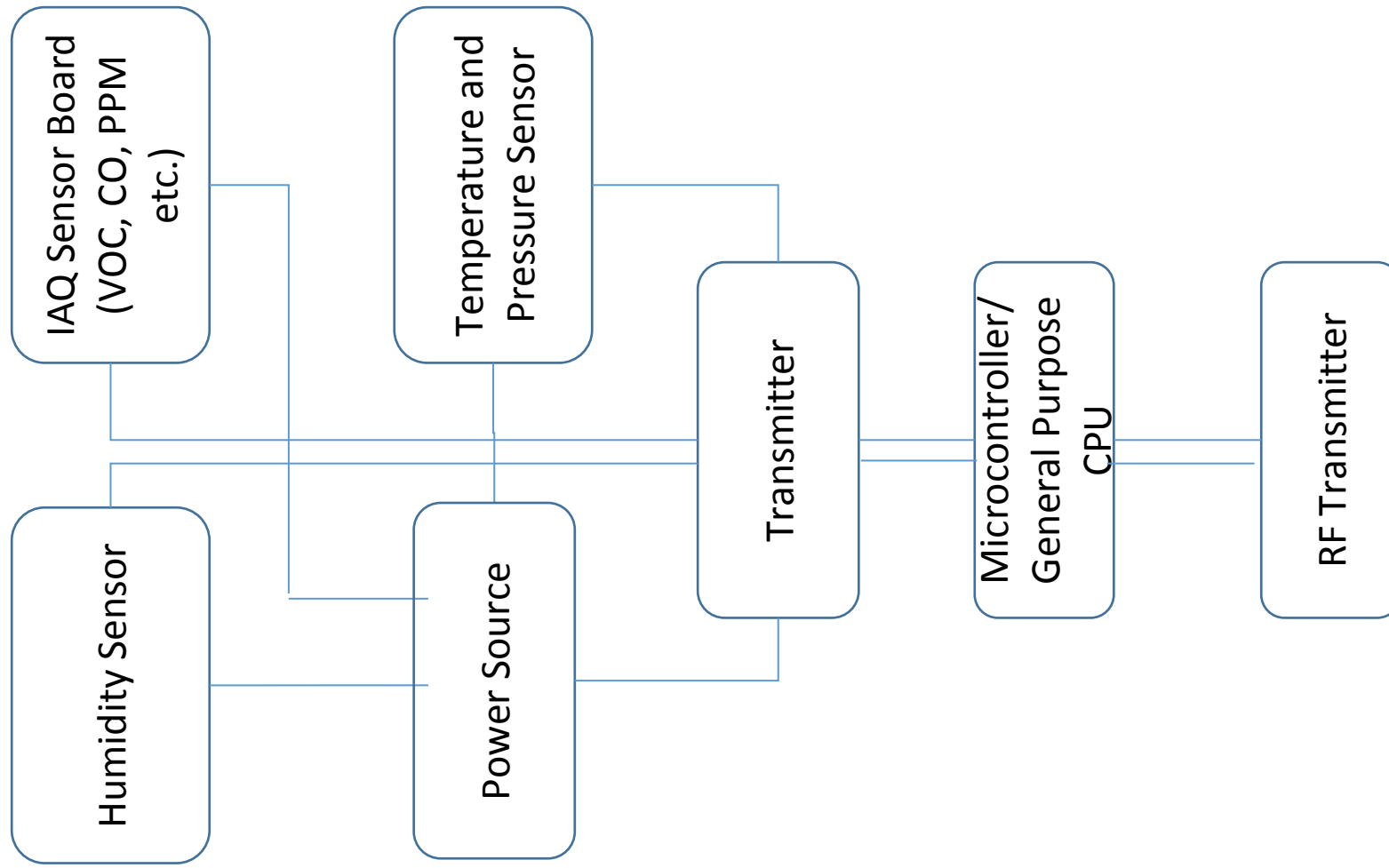
FIG. 6A: Control System

FIG. 6b: Control System