SYSTEM DESIGN

Group name

First Airbenders

Project name

COMFORT HOME



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# Hardware

The indoor climate control system consists of several components which interact with each other. The hardware required is as follows:

1. STM32 Nucleo-64 development board with STM32F303RE MCU.
2. ETRX357 Zigbee module.
3. CM1106 CO2 sensor.
4. SHT20 temperature and humidity sensor.
5. IAQ-Core VOC sensor.
6. Optional extensions, i.e. a fan, multiple CO2 sensors or other humidity and temperature sensors.

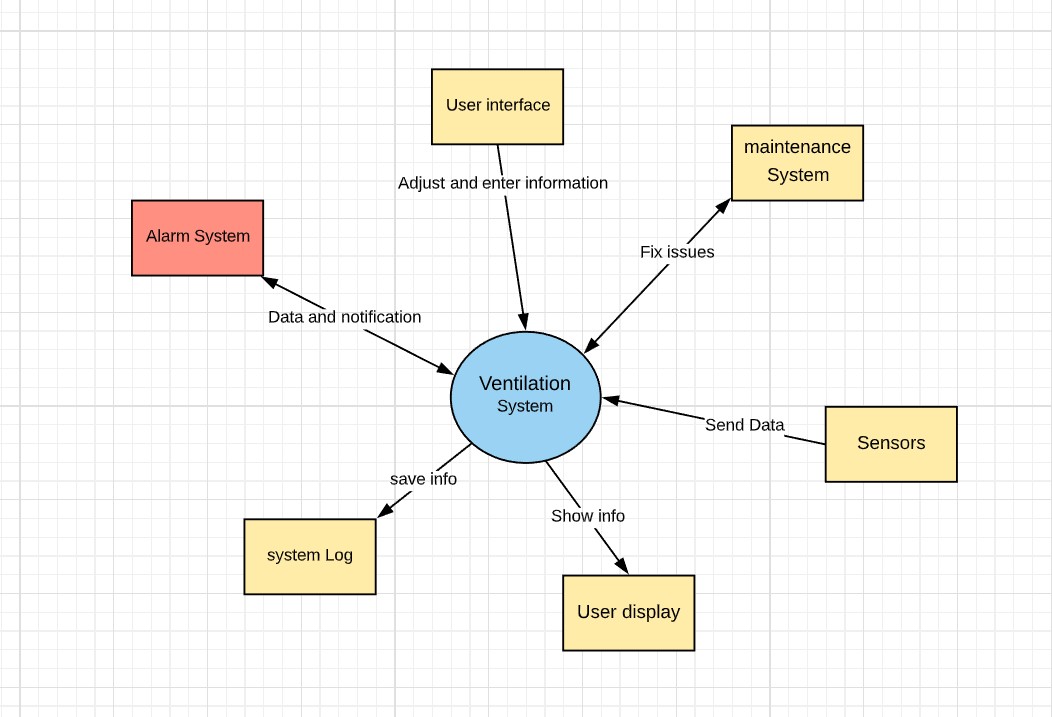
# Wiring diagram

A screenshot of a cell phone

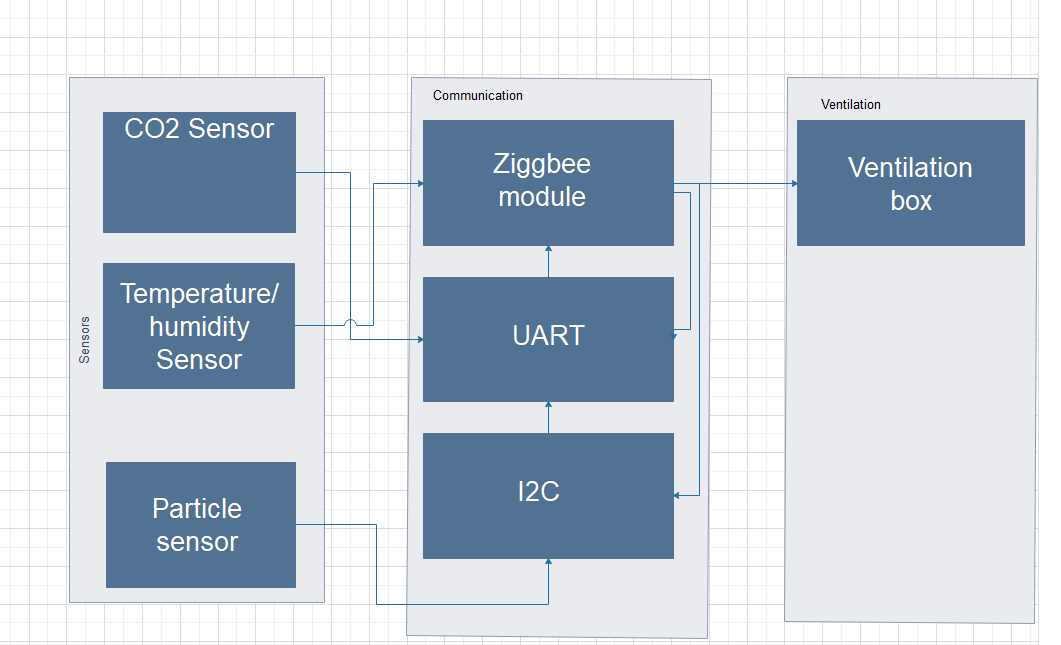
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# System design

## System context diagram



## System architecture diagram



# Communication protocols

The embedded board has a couple of sensors connected to it. Each one of them has to communicate with the board through a given communication protocol. They are as follows:

1. The temperature and humidity sensor uses I²C.
2. The VOC sensor uses I²C.
3. The CO2 sensor uses UART.

Communication between the Embedded board and the C# application will be based on a custom protocol which will be agreed on with 3 other

teams in the future. Communication will occur once every 15 minutes or at sudden changes of sensor readings.

# Control flow diagram



# State diagrams

## Embedded board states



## C# state

