A screenshot of a cell phone

Description automatically generated

System Design Document

# Hardware:

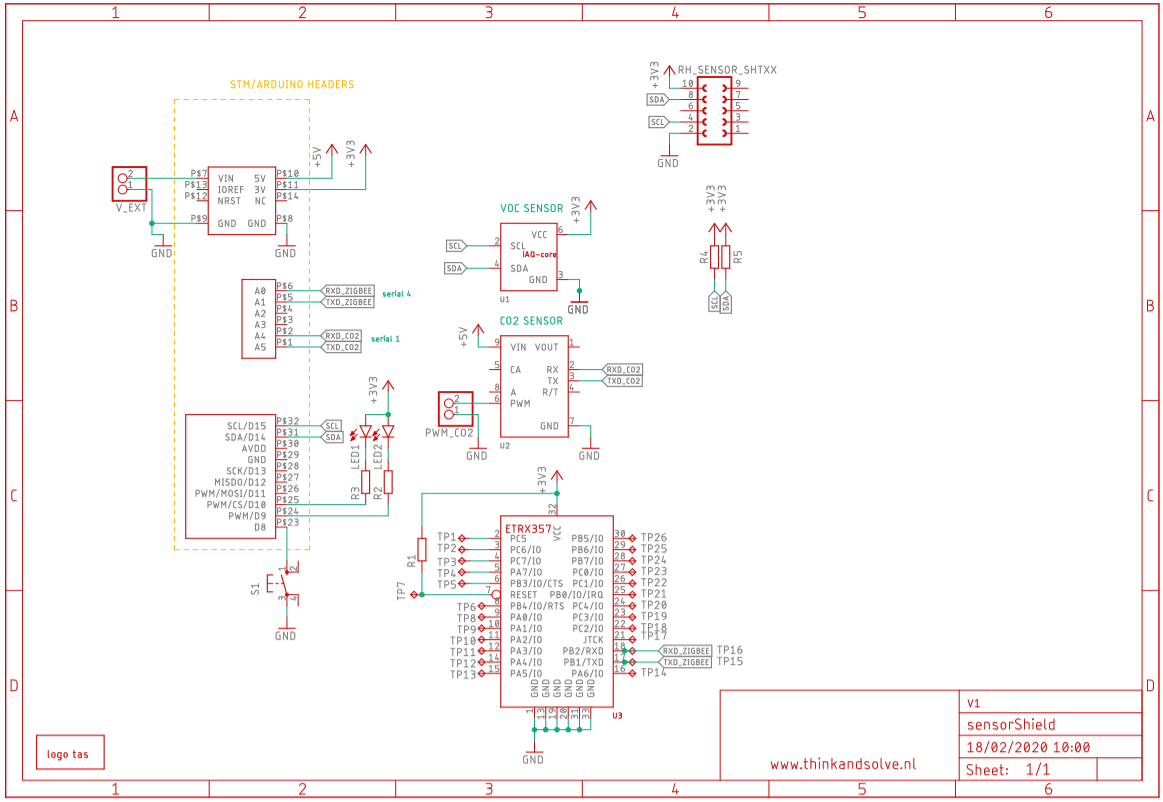
## Actuators:

* Embedded board (STM Nucleo 64) – Arm Cortex M3/M4
* ETRX357 Zigbee module (UART, AT-Commands)

## Sensors:

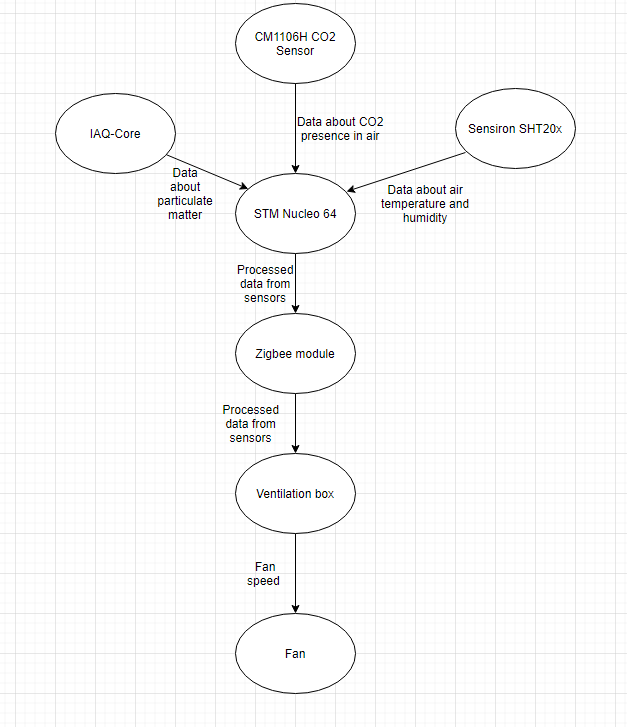
* Cubic CM1106 CO2 sensor (UART)
* Sensirion SHT20x humidity/temperature sensor (I2C)
* Sensirion SPS30 Particulate Matter sensor (I2C/UART)

## Wiring diagrams:

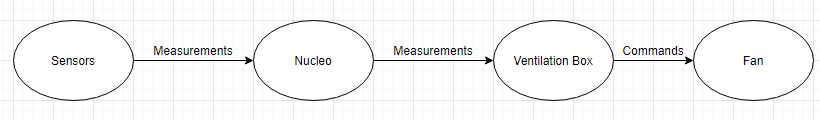


# System design

## System architecture diagram



## System context diagram



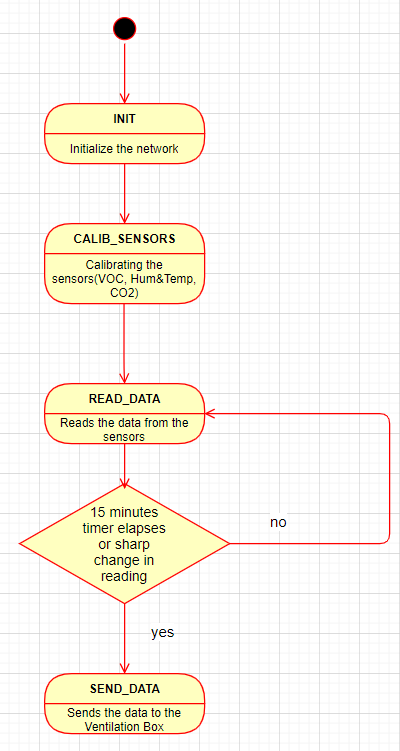
# Communication protocols

Messages are sent every 15 minutes and at sharp changes of CO2, matter, temperature or humidity.

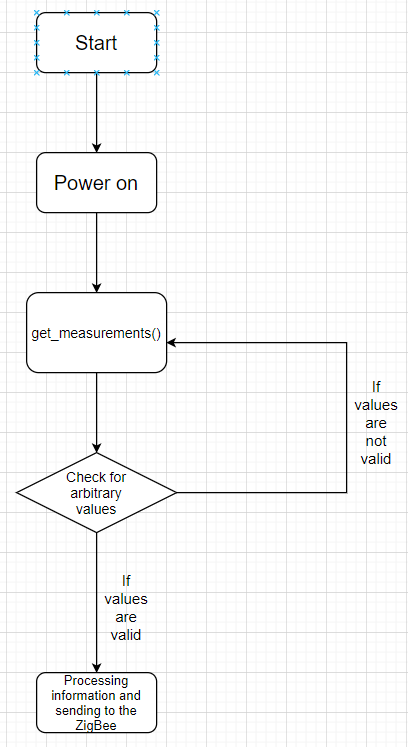
STM Nucleo – master;

ZigBee Module – slave;

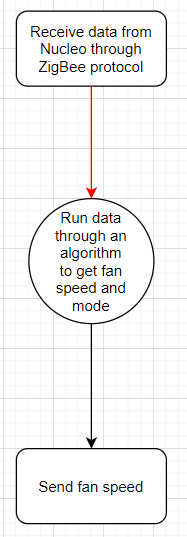
# State diagram

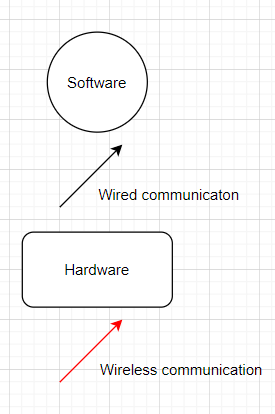


# Control flow chart



* The flow chart for the communication between the modules and the ZigBee.
* The flow chart for the communication between the ZigBee and the Ventilation Box.





* The flow chart for the communication between the Ventilation Box and the fan.

