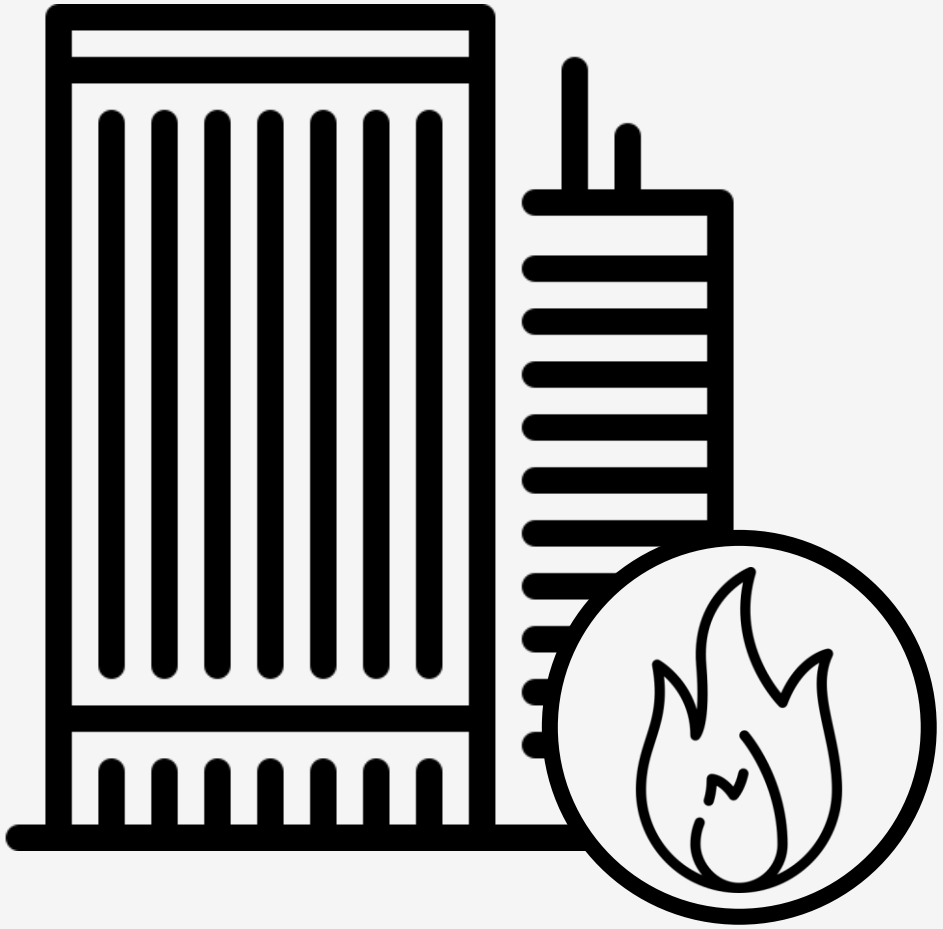
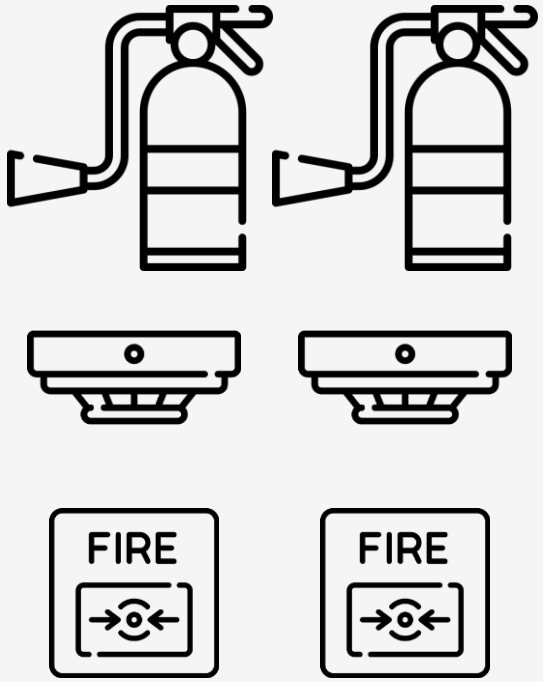


Smart Building
Fire Management System
With IoT

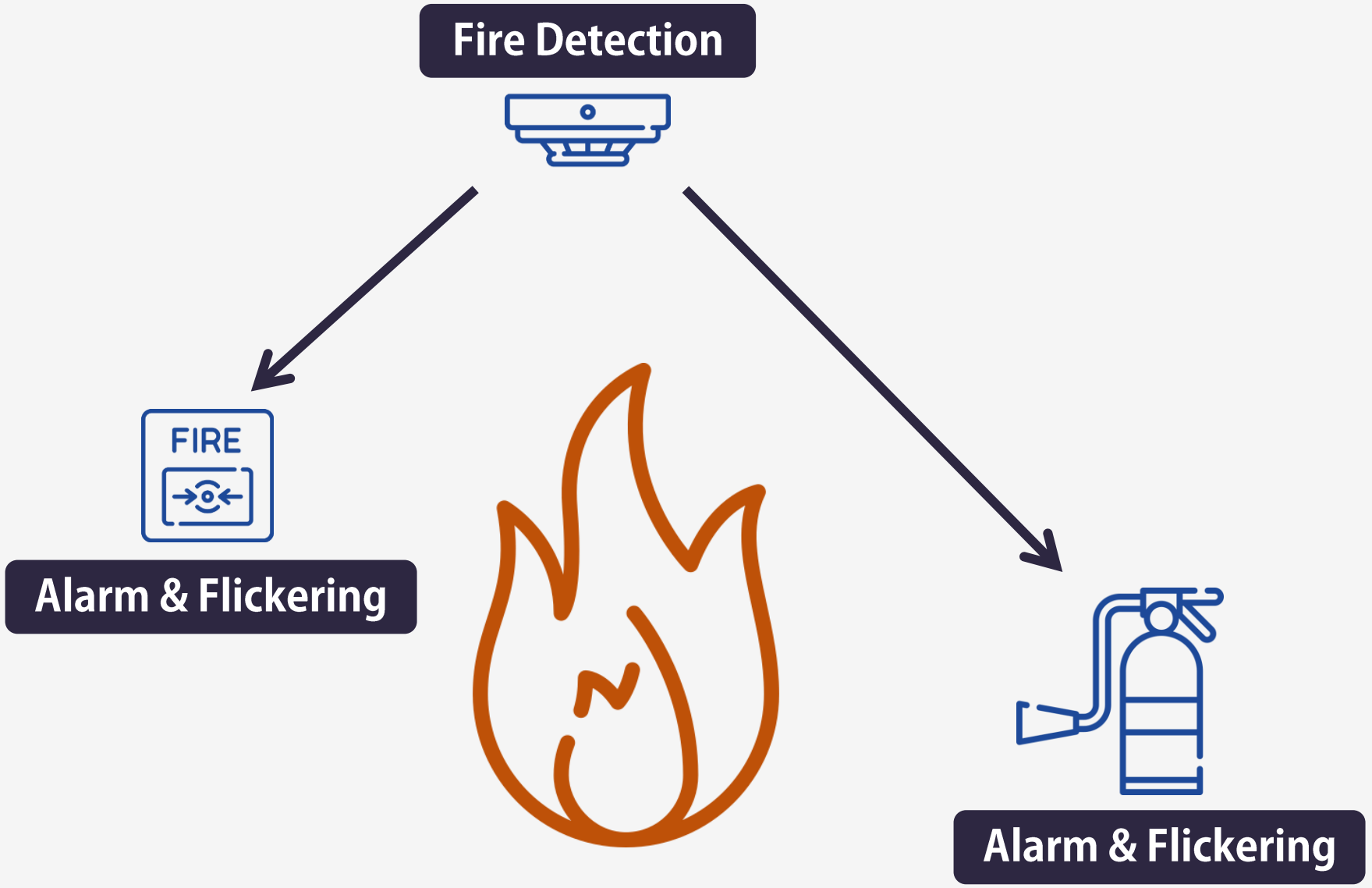
Wirelessly connected safety components

Function #1



Auto health check report

Function #2

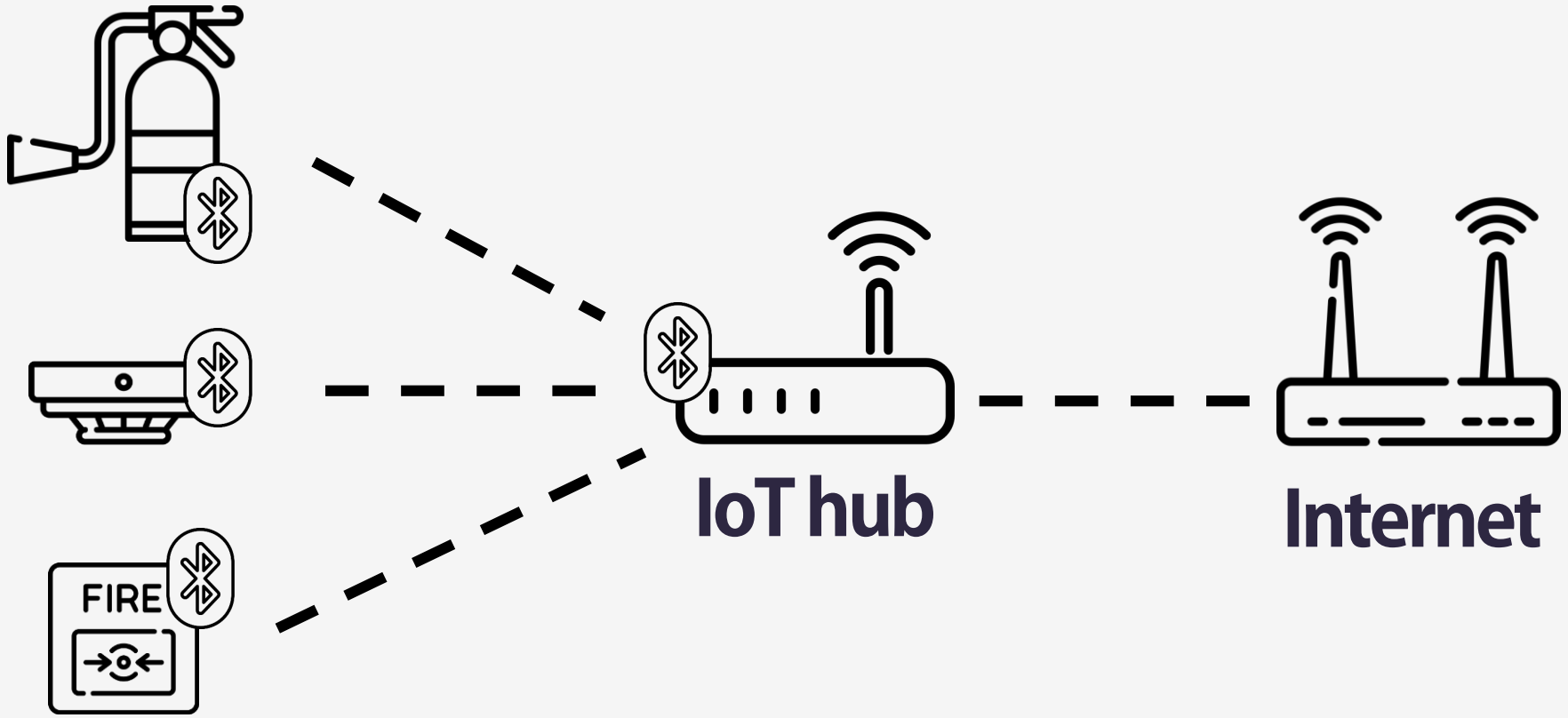


Challenges

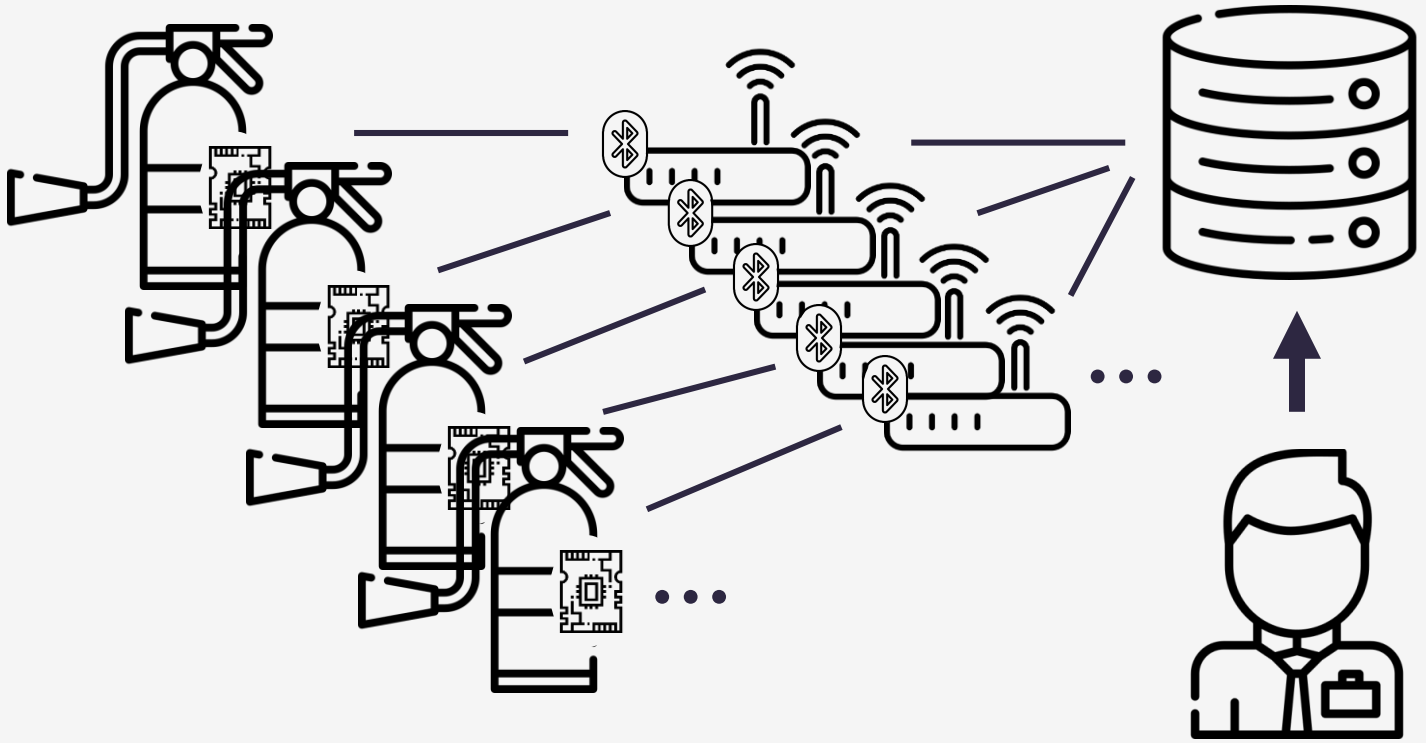
1. Fire extinguisher sensor

2. Low Power

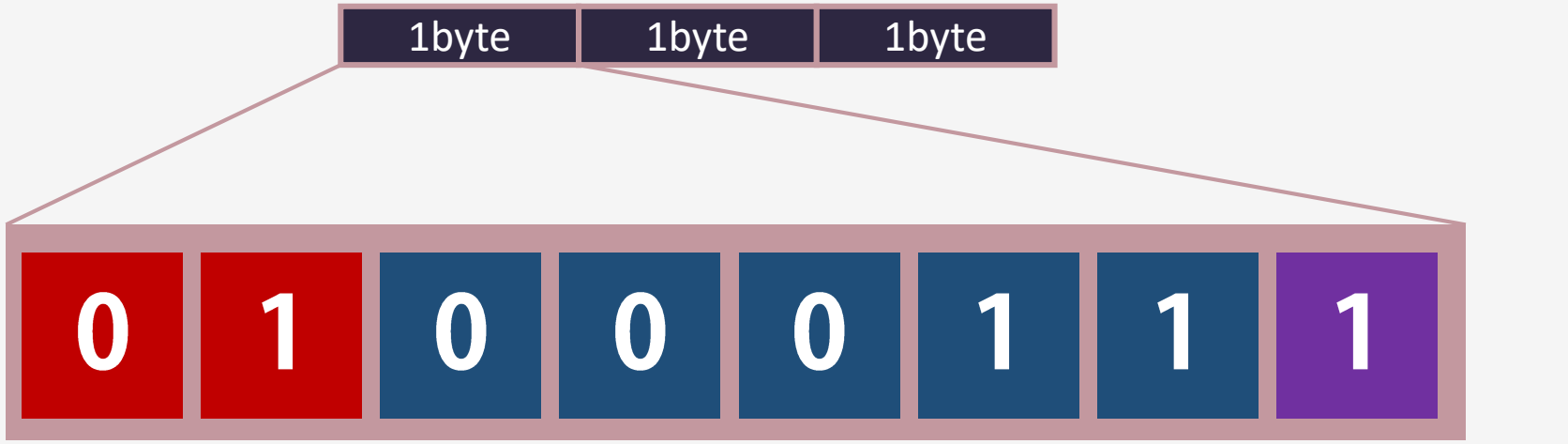
Network Topology



Network Topology



Protocol



Opcode Data Parity bit

Protocol

Opcode

00	Control
01	To_Hub
10	To_Obj
11	Reserved

Data

- Health check

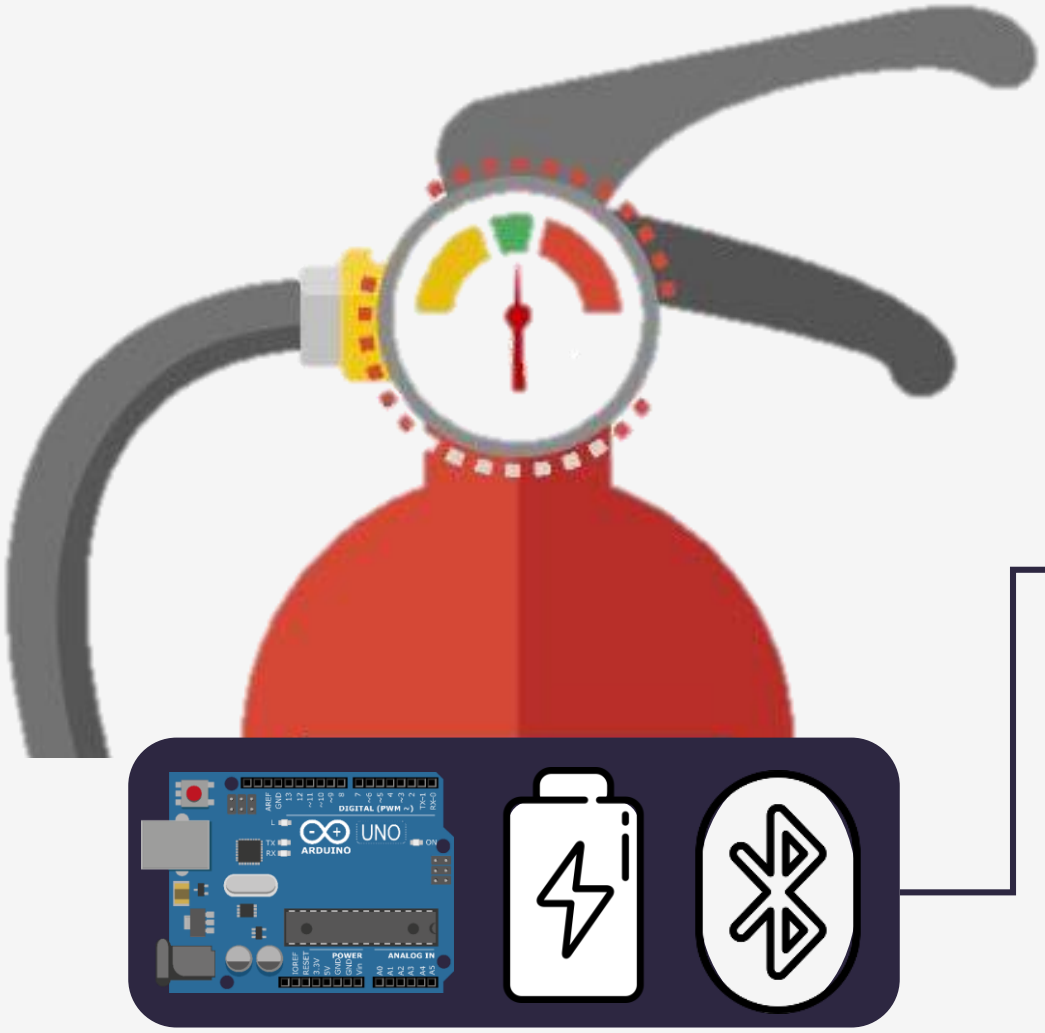
Parity bit

- Even parity

Send Alarm to all Objects : 10 00000 1

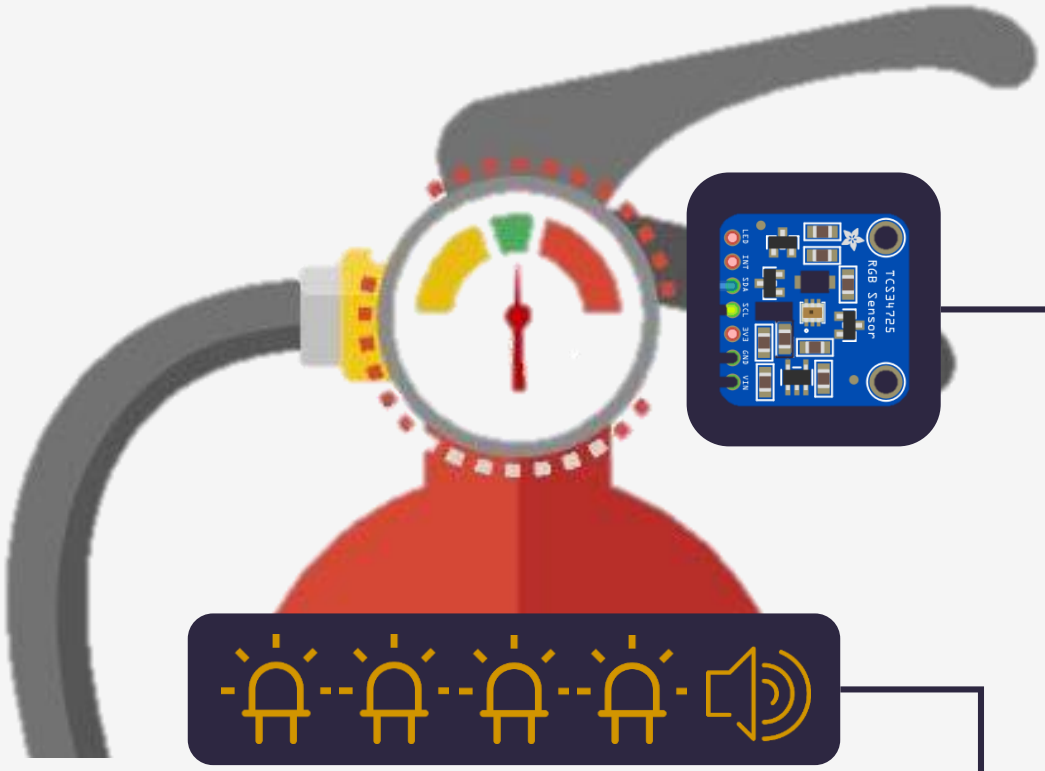
Report Health Check : 01 00011 1

Fire Extinguisher #spec



- Using Battery
  - Low power
- Bluetooth

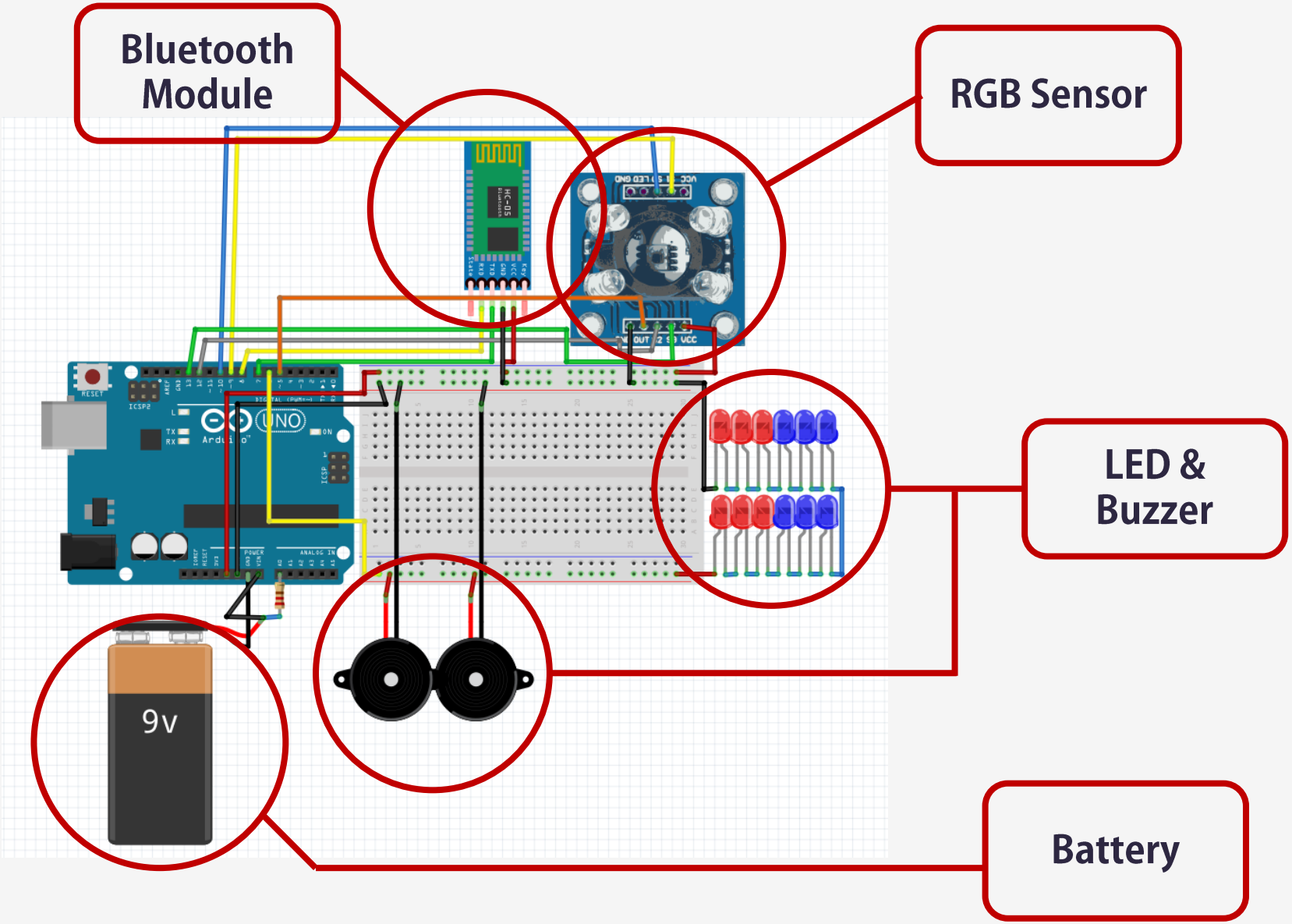
Fire Extinguisher #spec



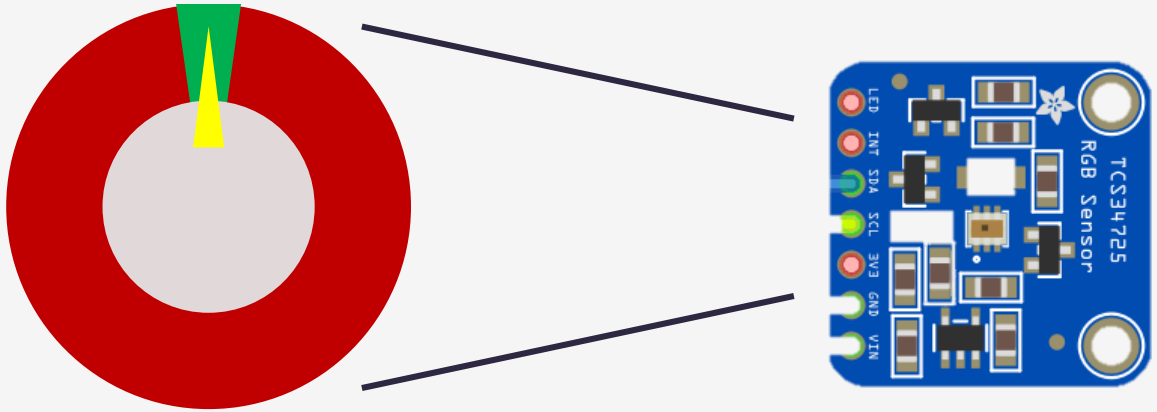
- RGB Sensor
  - Health Check

- LED : Flickering
- Sound : Alarm

Fire Extinguisher #spec



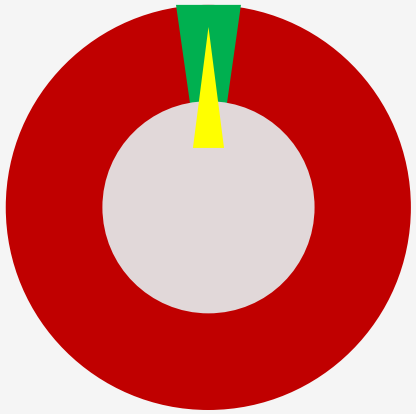
Fire Extinguisher #RGB sensor



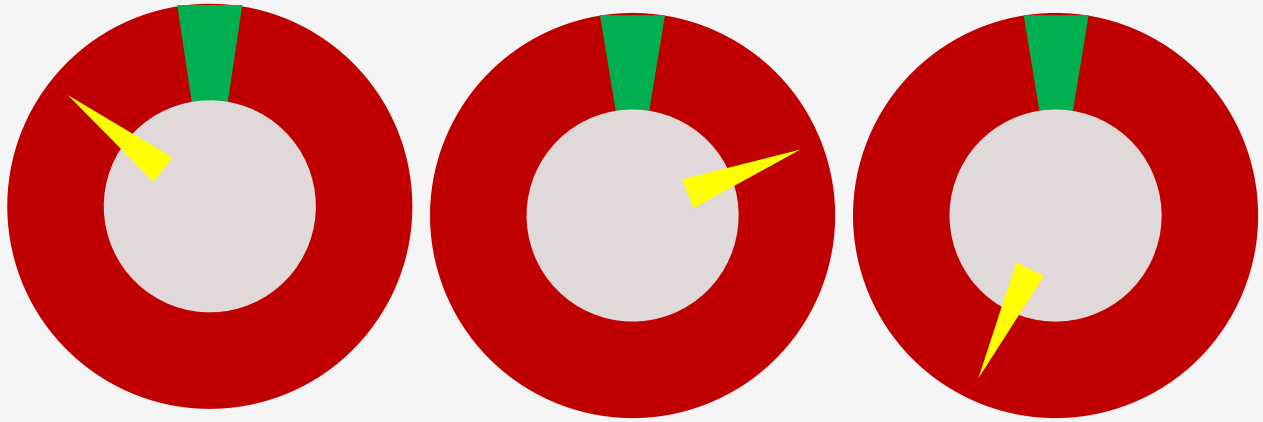
It is impossible for the color sensor to measure only a precise range

→ **Training large amounts of data**

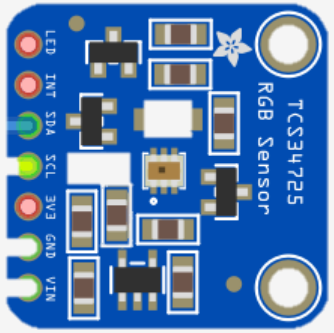
Fire Extinguisher #RGB sensor



Normal



abnormal



1. Divide into normal and abnormal cases and draw 10 test sets each.
2. Based on the test set, measure the sensor value 10 times and calculate the value.
3. Based on the measured value, the boundary value of the minimum error is found.

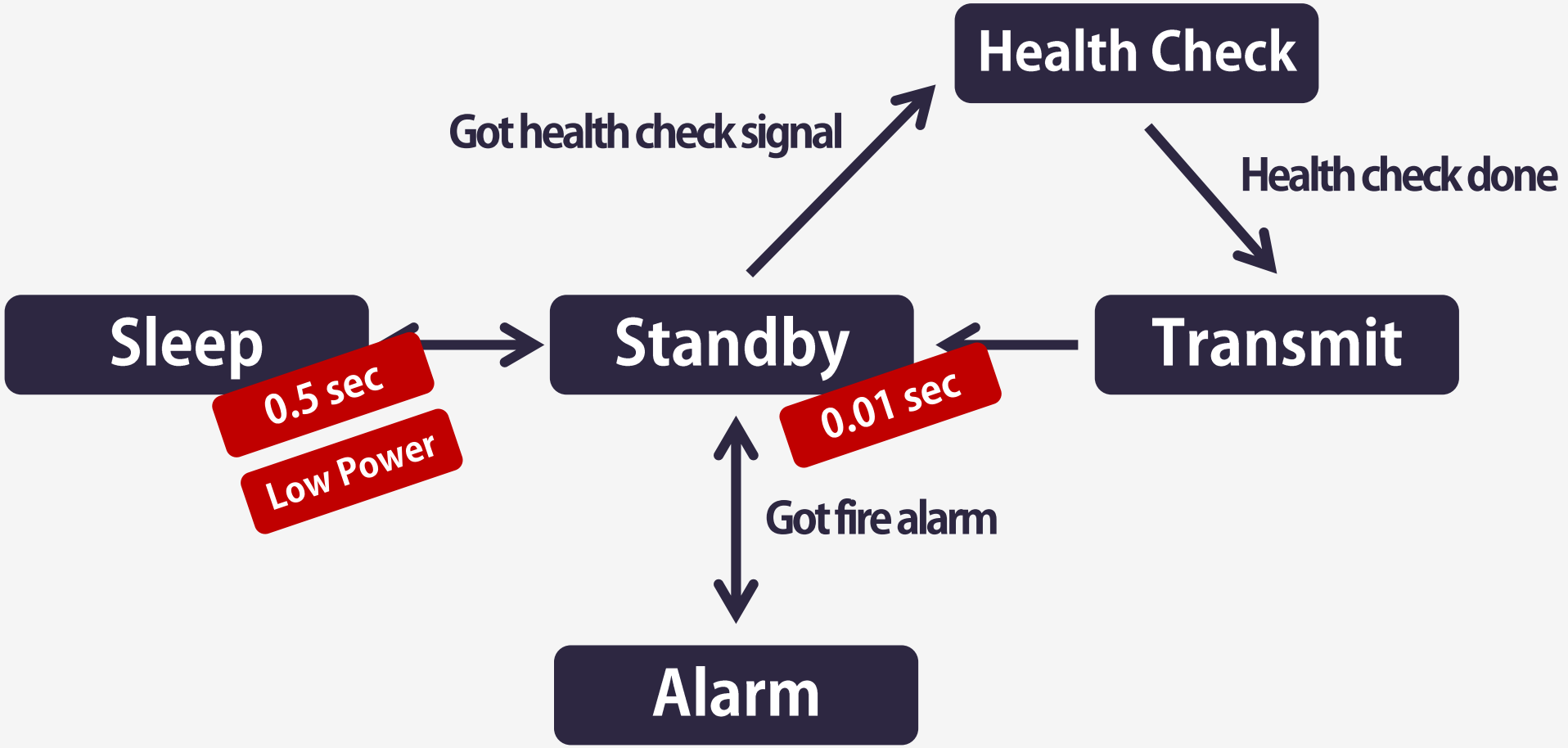
Fire Extinguisher #low power

#Low Power Mode (1.7 μA)

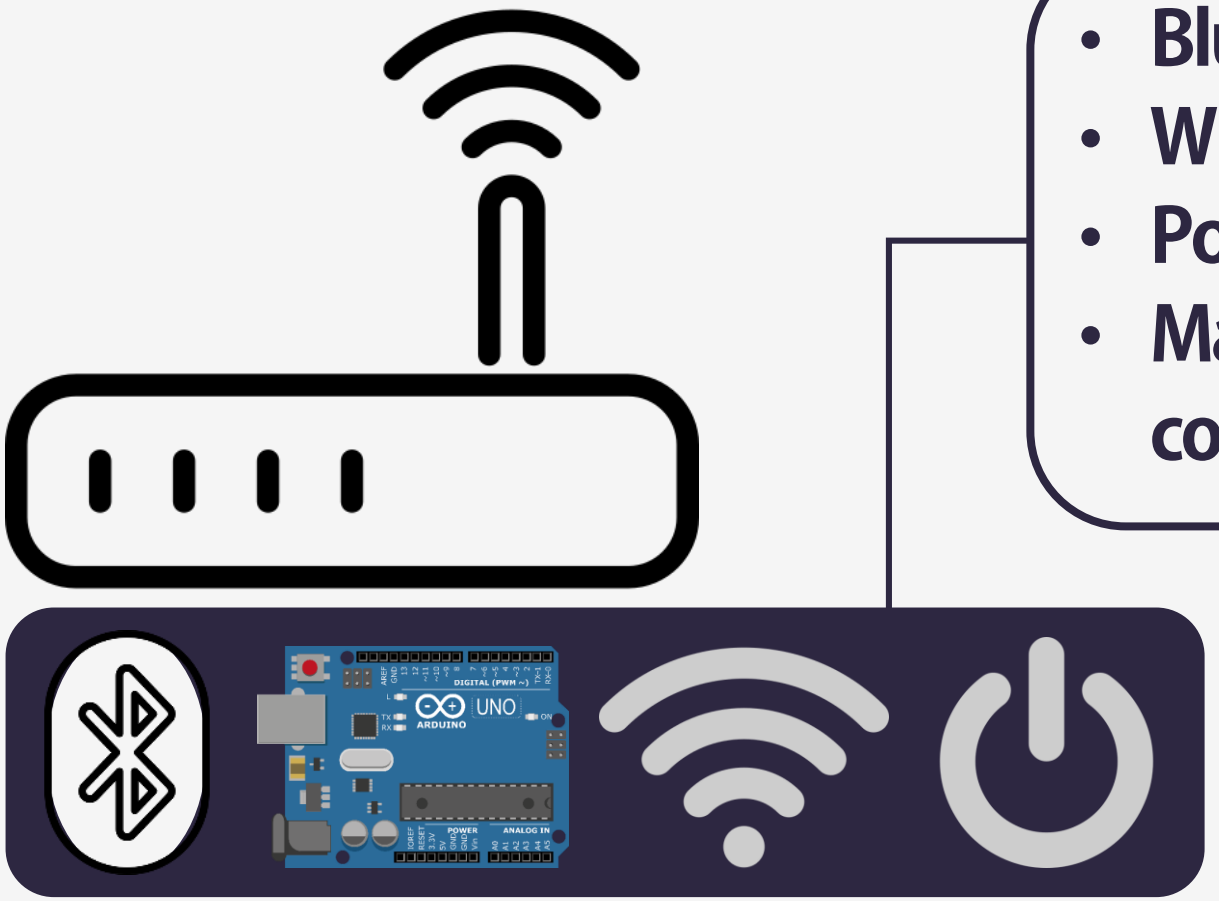
```
LowPower.powerDown(SLEEP_500MS,ADC_OFF,BOD_OFF);
```

About 6 times increase in usage time

Fire Extinguisher #state

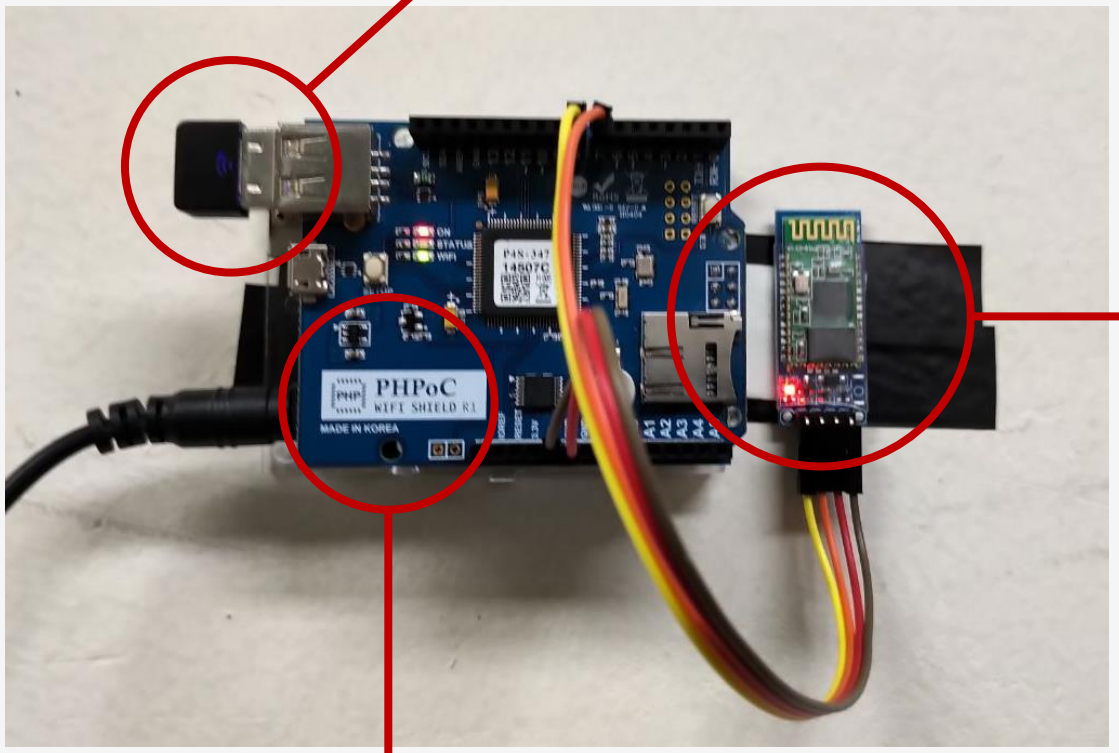


IoT Hub



- Bluetooth
- WIFI
- Power Connected
- Maintain the safety components

IoT Hub

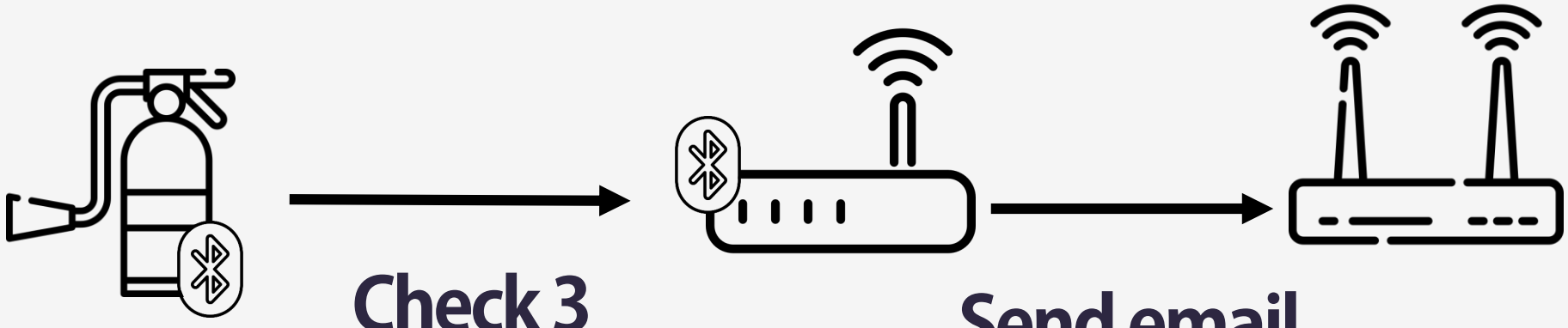


USB WIFI Connector

Bluetooth Module

PHPOC Shield

IoT Hub
#e-mail

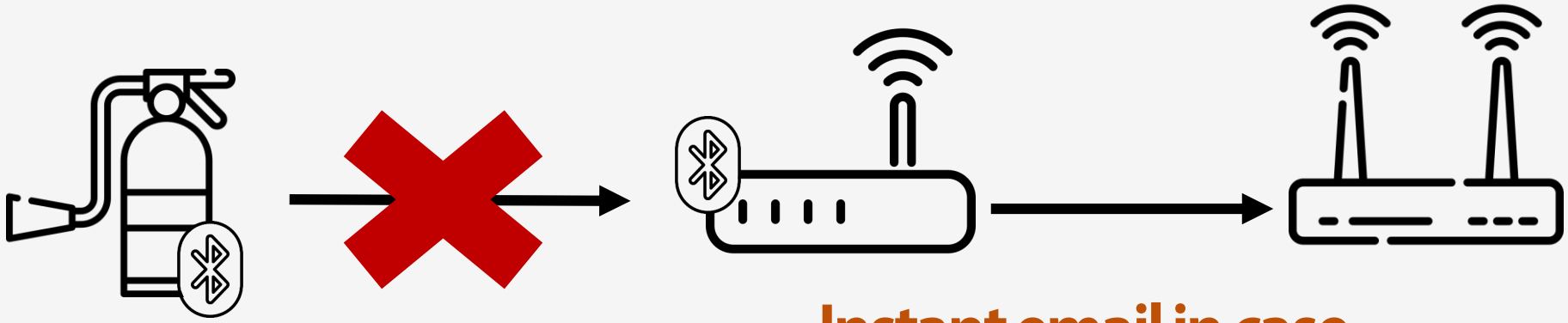


Check 3
times a day

Send email
once a day

Improved information reliability through multiple checks

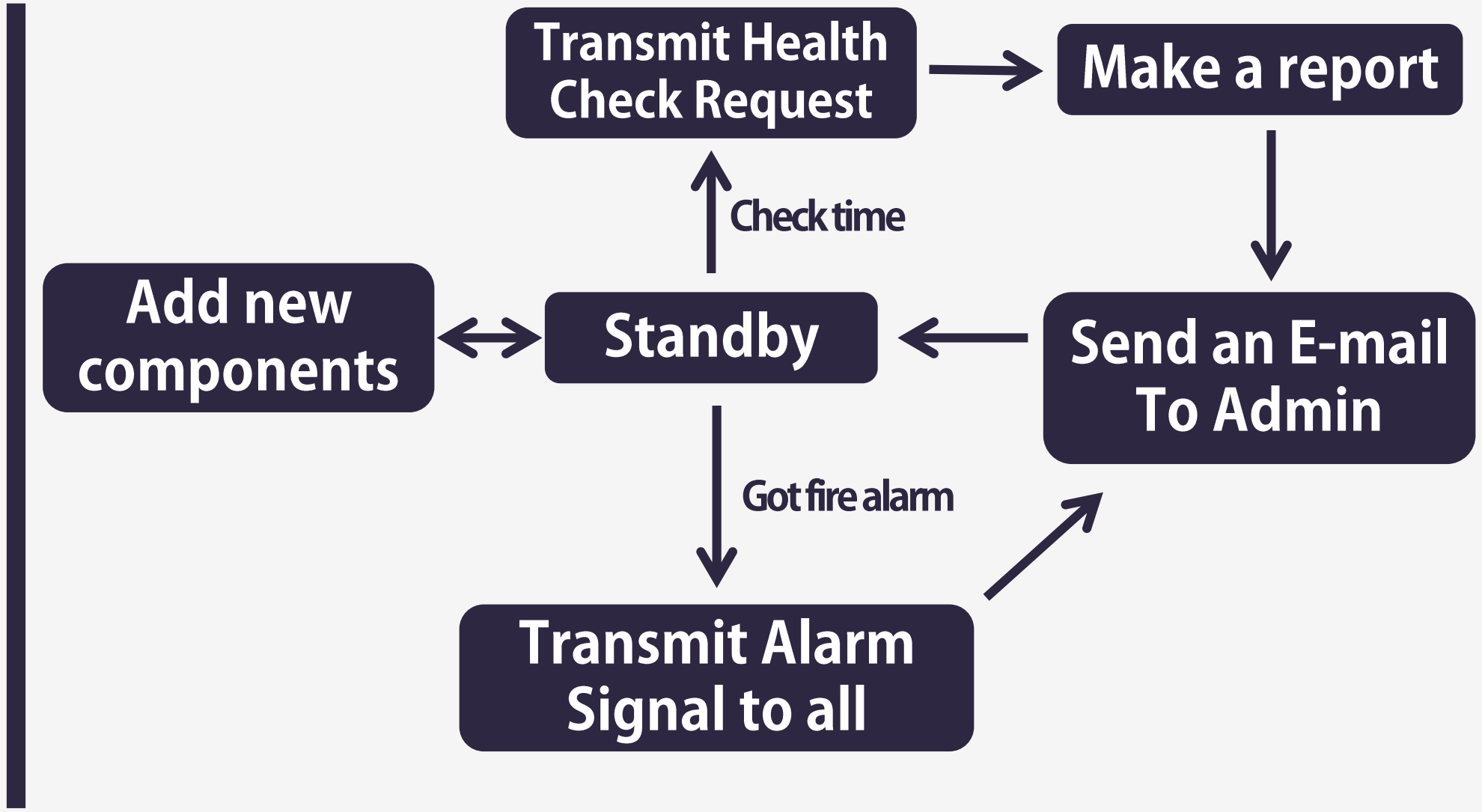
IoT Hub
#e-mail



Instant email in case of connection loss

Prevent device loss and improve security

IoT Hub
#state



Q&A