



# ELEX-4560-0 - Telecom & Networks Project

## **Project Requirements**

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February 23, 2022

# 1 Introduction

With our product, users can get alarm when the temperature, particular, and moisture exceed the preset value. Users can set out product in their home, office, workshop and etc. to get info when accident fire, leakage and other unexpected even happen and get a stragate to reslove it.

## 2 Must Have

### 2.1 Temperature Detection

#### 2.1.1 Description

Temperature detection is one of the main feature in our project, the sensor should create a analog signal accroding to temperature.

#### 2.1.2 How to Test

Microcontroller must set a digital-high on a pin when temperature exceed a preset value.

### 2.2 Particular Detection

#### 2.2.1 Description

Particular detection is one of the main feature in our project, the sensor should create a analog signal accroding to particular.

#### 2.2.2 How to Test

Microcontroller must set a digital-high on a pin when particular exceed a preset value.

### 2.3 Moisture Detection

#### 2.3.1 Description

Moisture detection is one of the main feature in our project, the sensor should create a analog signal accroding to moisture.

#### 2.3.2 How to Test

Microcontroller must set a digital-high on a pin when moisture exceed a preset value.

### 2.4 XBee Wirless Transmission

#### 2.4.1 Description

Wireles transmission is an improtant role in out project design. By using the wireless transmission design, user can git rid of the annoying wire and has more fixbility to place the sensors.

### **2.4.2 How to Test**

When the microcontroller transmits a digital-high, XBee should be able to create a wireless signal on the sensor side and transmit it to the server side.

## **2.5 Alarm System**

### **2.5.1 Description**

Alarm system is the part that communicates between human and machine. User should be able to know the status about the place where the sensors are.

### **2.5.2 How to Test**

When any of the sensors trigger a digital-high, the Raspberry should be able to trigger an alarm to the user. (e.g. flashing light, beep)

## **2.6 Long-duration Operating**

### **2.6.1 Description**

User may not be comfortable when they need to pay attention to the device frequently especially change battery. Our product should run for a long time without any maintenance.

### **2.6.2 How to Test**

Our product should be able to run for at least two weeks without changing battery (measured by power usage and battery capacity) and a stability (less or equal than one error per two weeks)

## **3 Nice to Have**

### **3.1 Enclosure**

#### **3.1.1 Description**

It is nice to have an enclosure that is printed by a 3D printer to fit all the parts.

#### **3.1.2 How to Test**

An enclosure created by 3D printer.

### **3.2 Water Proof**

#### **3.2.1 Description**

Our product should be able to work in any unexpected environment. Water proof is a main factor to cause electronic failure.

### **3.2.2 How to Test**

Sensor can remain work when water fall from above.

## **4 Wishes**

### **4.1 Email Notice**

#### **4.1.1 Description**

User may not often stay around alarm system. It is nice to have email notice when they are away.

#### **4.1.2 How to Test**

Recieve a email when alarm is tirggered.

### **4.2 LCD Display**

#### **4.2.1 Description**

Having a human interface is not necessary but it is nice to have real time information.

#### **4.2.2 How to Test**

Can diaplay real-time temp/particular/moisture parameter with a refresh rate of 10 sec.

### **4.3**

#### **4.3.1 Description**

#### **4.3.2 How to Test**