Project IoT Security

Product Requirements

Team TBD

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**Document History**

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# Objective

The objective of this document is to document the requirements of IoT-based smart sensors designed to be integrated into smart buildings with increased security through encryption and authentication.

# Scope

The scope of this document is to define the requirements necessary to satisfy the client and the designers of the project. This document aims to be a summary of everything needed to complete the project, from start to finish.

# References

## Cited Documents

“IP Rating Chart.” *DSMT.com*, http://www.dsmt.com/resources/ip-rating-chart/.

“Learn the Basics of Hazardous Waste.” *EPA*, Environmental Protection Agency, 26 Apr. 2019, https://www.epa.gov/hw/learn-basics-hazardous-waste#hwid.

“Radio Spectrum Allocation.” *FCC.gov*, Federal Communications Commission , 7 May 2019, https://www.fcc.gov/engineering-technology/policy-and-rules-division/general/radio-spectrum-allocation.

## Acronyms

EPO Engineering Purchase Order

ER Engineering Release

POC Proof of Concept

# Functional Requirements

## ****Device Function****

The project will not need a user interface; however, the source code will need to be well documented in order to ensure that other teams can implement this module within the entire MAHIVE framework. The device itself can be as simple as closing a circuit on a wire, or it can implement specialized hardware like motion trackers.

# Mechanical Requirements

## Spatial Requirements

The sensor should not interfere with normal operation of doors, building functions, etc.

## Mounting / Interface Requirements

The sensor should be able to mount onto a door/wall/computer desk as needed.

## Appearance Requirements

The final product should be discreet and should not draw much attention, to prevent tampering.

# Electrical Requirements

## Operational Voltage

The sensor must be supplied with constant voltage within 7-12V (if using Arduino Mega).

## Operational Power Capability

The sensor will be supplied either with 7.5V DC power, or with 9V battery.

# Software Requirements

1. Create a device that will record events and send the event data to the MAHIVE server.
2. Write and comment the code in a modular fashion so other teams can implement this project with minimal effort.
3. The project will send events to the MAHIVE server in a JSON format.
4. The project will encrypt the data before sending it.
5. The project will establish authentication to the MAHIVE server using a public / private key method also known as 2 key.

# Environmental Requirements

## Temperature

The device(s) are expected to have full operational capabilities in indoor environments at a normal room temperature (between 60°F and 80°F).

## Environmental Sealing

All electrical components shall be at least IP50, meaning they will be protected from limited dust intake which could interfere with its normal usage. They will not be protected from water intake, so caution must be exercised when handling these devices around liquids. If we determine an electrical component needs a higher level of protection from either solids or liquids, the IP rating standard may be increased.

# Regulatory Requirements

## EPA Requirements

Some devices in our project may contain Lead. The disposal of all parts must comply with the EPA Hazardous Waste regulations and be recycled or transported and disposed of properly at the landfill.

## Radio Frequency Requirements

Any wireless communication performed by the devices must comply with FCC Regulatory standards. Communication must be done within 9 kHz and 275 GHz, as these are the bands allocated for terrestrial radio communication.

# Cost Requirements

## Prototype Cost

The total cost of materials for the prototype shall not exceed $50.

# Schedule Requirements

The following are the major Project Milestones:

* Approval of Requirements Sept. 36, 2019
* Concept Design Review Nov. 22, 2019
* EPO of needed parts Oct. 10, 2019
* Design Validation Plan Due Oct. 24, 2019
* EXPO Registration Deadline Jan. 28, 2020
* ER Review (w client & instructor) Feb. 21, 2020
* Complete Prototype build April 5, 2020
* UI Design EXPO May 1, 2020
* Final Report / Drawings due May 8, 2020