

PRODUCT SPECIFICATION

TITLE	DATE	REV
Product Requirements	26 Sep 2019	1

# IoT Sensor Node Product Requirements

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### Document History

Rev Number	Date	Modified By	Reason
0	09-25-2019	Xueren Wang	Initial Release
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### 1. Objective

The object of this product is to Develop a low-power Internet-of-Things (IoT) enabled smart sensor node that is capable of generating, processing, and storing locally generated sensor data (i.e. position, identification, sensory info, etc.) and communicating through optical means to an optical wireless communication (OWC) hub.

### 2. Functional Requirements

#### *a) What it should do*

Nodes collect indoor information data like room temperature, humidity and store the data for a month. OWC hub can ask for the data to further processing and send to the computer or other devices.

### 3. Physical Requirements

#### *b) Spatial Requirements*

Product can be hung on the wall or be deployed on the desk. Node we plan to design is about in length, width and tall. OWC hub is about .

#### *c) Weight/Mass Requirements*

The node may be hung on the wall so the node is restricted to a weight of 5 pounds. And for the hub it should be put on the desk so there is no specific restrict on the weight.

#### *d) Mounting / Interface Requirements*

Product should be designed can be mounted on the wall and there should be one or two inform lights to show the working states about the nodes

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### ***e) Appearance Requirements***

The nodes and hub should be designed in small boxes which can be mounted on the wall or deployed on the desk in the room.

### ***f) Durability Requirements***

Each sensor node can work for 1 month continuously by independent power supply like button battery.

### ***g) Reliability Requirements***

Though bit error rate test, the data receiving from sensor node shall have 10% or less error rate.

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### 4. Electrical Requirements

***h) Operational power***

The node should be powered with off-grid power sources like battery.

***i) Transmit distance***

Sensor nodes should respond to OWC hub over 10 meters long with visible spectrum.

***j) Transmit speed and BER***

The data rate between sensor nodes and OWC hub should more than 100Kb/s with less than .

***k) Storage Capability***

The sensor node could store about one month data if collects data every hour.

### 5. User Requirements

***l) Functionality***

Put sensor nodes in the test room and connect the OWC hub to one PC or desktop.

***m) User Interface***

User could use the PC connected the OWC hub to collect data from sensor nodes.

### 6. Environmental Requirements

***n) Temperature***

The Product is expected to have full operational capabilities in environments in normal room temperatures ranging from 10 celsius degree to 43 celsius degree.

### 7. Cost Requirements

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### *o) Prototype Cost*

Cost to build a POC (Proof of Concept) prototype shall not exceed \$1000.

### *p) Production Requirements*

Only one completed product is needed for this project and will include four sensor nodes and one OWC hub.

## 8. Schedule Requirements

The following are the major Project Milestones:

- Approval of Requirements Sep. 26, 2019
- Concept Design Review Oct. 15, 2019
- Purchase Order Oct. 22, 2019
- Finish one prototype node and test hub Dec. 10, 2019
- Engineering Release Review Feb. 21, 2019
- Complete Prototype build April. 5, 2020
- UI Design EXPO May. 1, 2020
- Final Report / Drawings May. 7, 2020