Smart Irrigation System

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**Interface Control Document**

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Interface Control Document

for

Smart Irrigation System

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# Overview

Provide a brief overview of what this ICD will cover (i.e. scope).

This document will convey how the subsystems of the smart irrigation system will interface. The inputs and outputs will be all listed and how each of the systems deals with it.

# References and Definitions

Provide any references (i.e., standards documents) and definitions. Examples are shown below.

## References

**IEEE Standard 802.11**

**Standard for Wi-Fi networks**

**Refer to section 2.2 of the Functional System Requirements document for more references**

## Definitions

CCA Circuit Card Assembly

mA Milliamp

mW Milliwatt

MHz Megahertz (1,000,000 Hz)

TBD To Be Determined

TTL Transistor-Transistor Logic

VME VERSA-Module Europe

V Volts

AC Alternating Current

mm millimeter

# Physical Interface

Provide details on the physical interface. Examples are:

## Weight

### Weight of Microcontroller System

The microcontroller will be designed and the weight is to be determined.

| **Component** | **Weight** |
| --- | --- |
| ESP32-WROVER | TBD |
| Weather Resistance Case | TBD |

### Weight of Sensor System

A rain gauge will be utilized for the sensor system. The weight is to be determined as a specific model hasn’t been chosen.

## Dimensions

### Dimension of Microcontroller System

| **Component** | **Dimension** |
| --- | --- |
| ESP32-WROVER | 18mm x 31mm x 3.3mm |
| Weather Resistance Case | TBD |

### Dimension of Sensor System

A rain gauge will be utilized for the sensor system. The dimension is to be determined as a specific model hasn’t been chosen.

## Mounting Locations

### Mounting of Sensors

The sensors will be mounted around the homeowners yard to provide the optimum measurements of rainfall. Each of the sensors will account for different zones to provide the most accurate readings. Weather resistance case will also be mounted around the sensor to account for harsh weather conditions.

### Mounting of Microcontroller System

The microcontroller system will be mounted near the homeowners yard. To provide the most efficient connection between each subsystems (i.e sensors, control panel, and wifi), the system will be placed at the most optimum location which is the homeowners yard.

# Thermal Interface

**4.1 Thermal Protection of Sensors and Control Panel**

The rain gauge (sensor) will have casings that protects the device from overheating. The weather resistance case that was mentioned in section 3.3.1 will provide the thermal resistance. This will allow for better readings on measurements.

# Electrical Interface

Provide details on the electrical interface. Examples are:

## Primary Input Power

The sensor and microcontroller system input will consist of a 24 V AC source and an option of 120 V AC source. The power supply will power the microcontroller and sensor system. Specific voltage restrictions are yet to be determined because of some unknown parameters in the systems listed.

## Signal Interfaces

Rain gauge will be utilized for sensors. A specific model has not been chosen yet so the parameters aren’t available.

## User Control Interface

The user control interface will consist of the app and the hardware panel. The user input from either device will communicate with the microcontroller and will be used to access the optional interface the system will convey.

## Voltage and Current Levels

The ESP32 wrover microcontroller will operate in the 2.3 ~ 3.6 voltage range and around an average of 80mA for the operating current.

# Communications / Device Interface Protocols

Provide details on the protocols for communication. Examples are:

## Wireless Communications (WiFi and Bluetooth)

The microcontroller (ESP-32) has a built-in wifi interface utilizing the standard wifi interface, IEEE 802.11 g/b/n standards. This will allow the gateway to gather weather data from an internet source. In addition, the sensors will also be sending signals (data) to the microcontroller.

## Microcontroller input and output

The microcontroller has a mix of analog and digital output and input pins. These pins will operate in the 2.3V - 3.6 V transmitting signals.