

Automated Golf Course Irrigation Management System

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Our Motivation

Golf Courses require a large amount of water to maintain their grounds. For economic and environmental reasons we wanted to create a system to optimize the irrigation process.

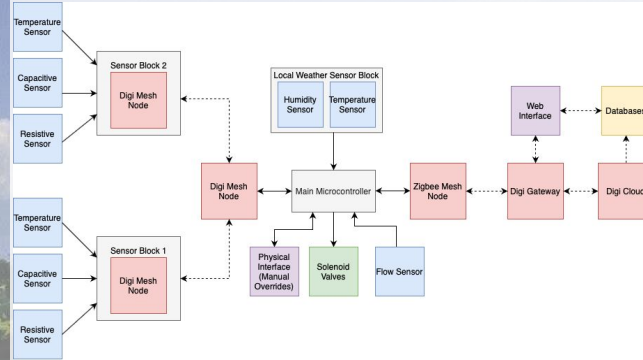
Design Goals

1. Design and build a sensor module to monitor soil conditions
2. Design a microcontroller based user interface to allow for manual override of the system and automatic watering
3. Create an online dashboard for the client to see the live data
4. Design a Zigbee wireless network for communication between system components

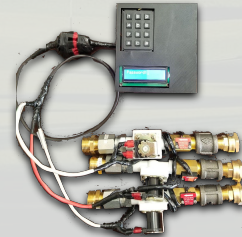
System Features

1. Local weather sensor in parallel with online weather information to accurately predict local precipitation and avoid over watering
2. Easily expandable, low power and cost effective
3. Uses sunrise and set times to optimize watering time
4. Flow sensors to measure water usage

Full System Block Diagram

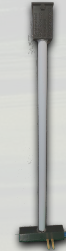


User Interface and Solenoids



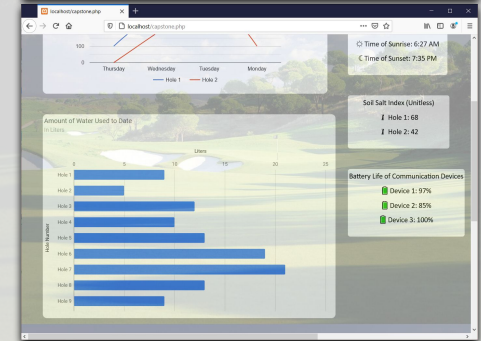
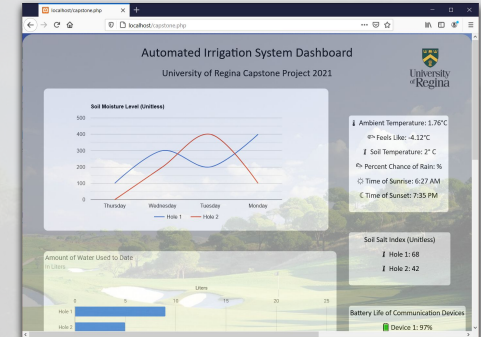
1. Contains 2 Xbee chips
2. Uses temperature and humidity sensor to predict local chance of rain
3. Controls solenoids and monitors water flow

Sensor Module



1. Capacitive sensor to quantify soil moisture
2. Resistive sensor to measure salinity
3. Temperature sensor to read soil temperature

System Dashboard



Dashboard Displays:

1. Xbee node battery life
2. API weather data for area
3. Amount of water used
4. Soil moisture, salinity and temperature data
5. Sunrise and set times