

Progress Report

Over the last three and a half months, Aquamatic Technology's have completed the design and have started on the implementation of The Spa Chemistry Control System, a plug in and forget system, for maintaing pool and spa chemistry for the average consumer.

Design Phase:

The Design Phase consisted of:

- 1 - Requirements Analysis
 - 1 - Background
 - 1 - Chemistry of Pools
 - 2 - Existing Solutions
 - 2 - Interface and User Needs
 - 1 - Existing Pool owners
 - 2 - Manual Methods of Control
 - 3 - Scope of Project
 - 1 - What part of consumer needs to be focused on
 - 2 - Chemical Control Issues
 - 3 - Consumer Cost Constraints
- 2 - System Specification
 - 1 - Block Diagrams
 - 1 - General System Overview
 - 2 - Process Overview
 - 2 - System Architecture
 - 3 - Hardware
 - 1 - Pumps
 - 2 - Valves
 - 3 - Microcontroller
 - 4 - Sensors
 - 1 - Chlorine/ORP
 - 2 - pH
 - 4 - Amplifier / Power Considerations
- 3 - Technical Specification
 - 1 - System Requirements and Benchmarks
 - 1 - Performance
 - 2 - Failsafe
 - 3 - Quality
 - 4 - Cost
 - 5 - Physical Constraints
 - 6 - Safety
 - 7 - Testing
 - 8 - Maintenance
 - 9 - Documentation

Requirements Analysis

This device is targeted towards the average consumer, for an end user; Aquamatic Technology has invested significant time and effort, in narrowing down the scope of this device, to keep both costs down, and to provide the simplest interface with

the end user. With both of those goals in mind the scope has been limited to only maintain pool chemistry, and only warning the user of error conditions. During the research phase, the relevant chemical equilibrium have been researched, as well, many current owners, as well as Pool supply employees have been contacted to focus the scope on what needs to be accomplished. The final scope and capabilities of this device have been narrowed to a select set of functionality by this research, based on cost considerations and what provides the most value to the end user.

System Specification

Starting with the scope, Aquamatic Technology have developed a proposed system block diagrams and general PID diagrams. After acceptance of the proposal more technical diagrams were developed along with electrical schematics of the system. Utilizing internet, books and in store visits, the specific parts to be used have been selected and ordered or picked up as applicable, including: pumps, valves, microcontrollers and the sensors needed. A decision to move away from a non-computerized solution to one utilizing a PIC was made during this phase due to decreased cost and development time. Also, the User Interface has been designed, including the faceplate to provide the user with relevant information. As well as the general look and size of the unit.

Technical Specification

Since this project is neatly split along electronic and mechanical portions, the team has been split along the same lines. All of our parts have been ordered, and while waiting for parts to be delivered the team has been researching more specific details on how to integrate the pieces ordered, and will be building the various parts as the pieces arrive. We expect some bugs or glitches integrating the Mechanical and Electrical systems, hence leaving ourselves a good block of time to complete this portion of the project. Past that we are under our initially proposed budget. So far all of the funding has come out of pocket for the team, but as things arrive, the appropriate forms will be submitted to the Whitmore Fund for reimbursement.