

## **ENVIRONMENTAL GROWTH CHAMBER TABLET APPLICATION AND SAAS SOLUTION**

### **SUMMARY**

Saturn Systems worked with Percival Scientific to develop a next generation mobile and enterprise solution to simplify the task of configuring their environmental growth chambers and greatly improve reporting and access to resulting test data.

### **THE CHALLENGE**

Percival Scientific's environmental growth chambers were originally built on a traditional push button/LCD interface with limited functionality and feedback. Their next generation product featured an updated custom control system that offered greater support for outside integration, with the goal of simplifying configuration and monitoring and improving reporting and analysis capabilities.

### **THE SOLUTION**

Saturn Systems developed an Android tablet application to replace the traditional industrial push button/LCD interface. The new application allows for ease of configuration and greatly enhanced feedback in the form of graphs and tables. In addition, a new cloud based Software as a Service (SaaS) solution was developed to interface with the control system and serve as a data repository, allowing researchers to centrally consolidate, compare and report on data from any number of growth chambers within their organization.

#### **Tablet Application**

The chamber control system manages multiple environmental outputs and sensors, including temperature, CO<sub>2</sub>, O<sub>2</sub>, humidity, multiple light sources and user configurable variables. The feature set of the tablet application was designed to simplify the complex task of configuration and monitoring of these parameters and associated cycles. To accomplish this, Saturn engineers collaborated with the customer's user interface design team to create a solution that offered intuitive configuration and monitoring of complex environmental parameters and cycles as well as reporting in the form of graphs and quick reference screens. The project required a combination of user interface design skills and experience implementing custom communication protocols over USB, WiFi and Bluetooth.

### **ABOUT THE CLIENT**

Percival Scientific is a worldwide leader in the design and manufacture of environmental growth chambers used by research organizations domestically and internationally to precisely control growing conditions in laboratory environments.





### **Cloud/SaaS Solution**

Where the tablet application provided a means to define and execute complex environmental cycles, the cloud based data repository offers a means to consolidate the resulting data, tracking actual conditions for all the environmental factors over time. The data consolidation allows for more powerful reporting options combined with the ease of access that a web interface offers. Saturn Systems recommended Microsoft's Azure platform backed by MongoDB as a scalable solution that easily handles the varying types of time series data produced by control systems. All development was completed using Microsoft .NET technology using an MVC architecture.

### **THE RESULTS**

The tablet solution is fully integrated as part of the product and has been well received by customers. The new interface has greatly simplified chamber configuration, and the new graphing features provide quick confirmation that experiments are operating correctly. The cloud/SaaS solution is currently in customer trials, and will offer enhanced and centralized access to raw experiment data and enhanced reporting.

*To learn more about Saturn Systems visit [SaturnSys.com](http://SaturnSys.com) or call (888) 638-4335.*