



Instrument Control for microfluidic perfusion platform

Client Overview

The client is a leading name in the life science industry providing cutting edge technologies and services for bioscience research and biopharmaceutical products such as cell culture & analysis, antibodies & assays, protein detection & quantification, industrial microbiology and many more. With more than 60,000 products which are used in research and analytical laboratories, scientific institutes, biopharmaceutical industries, chemical production and biotechnological drugs, the client is a billion dollar global player with around 10,000 employees, in 66 countries.

Challenges

Live cells can develop molecular complex reactions which respond to changing chemical environments. The key challenge is to understand these complex reactions and various cell properties which need time-resolved cellular analysis of various cell responses under different chemical environments. The lack of technologies for live cell analysis in controlled and time-varying environments further makes it difficult to execute.

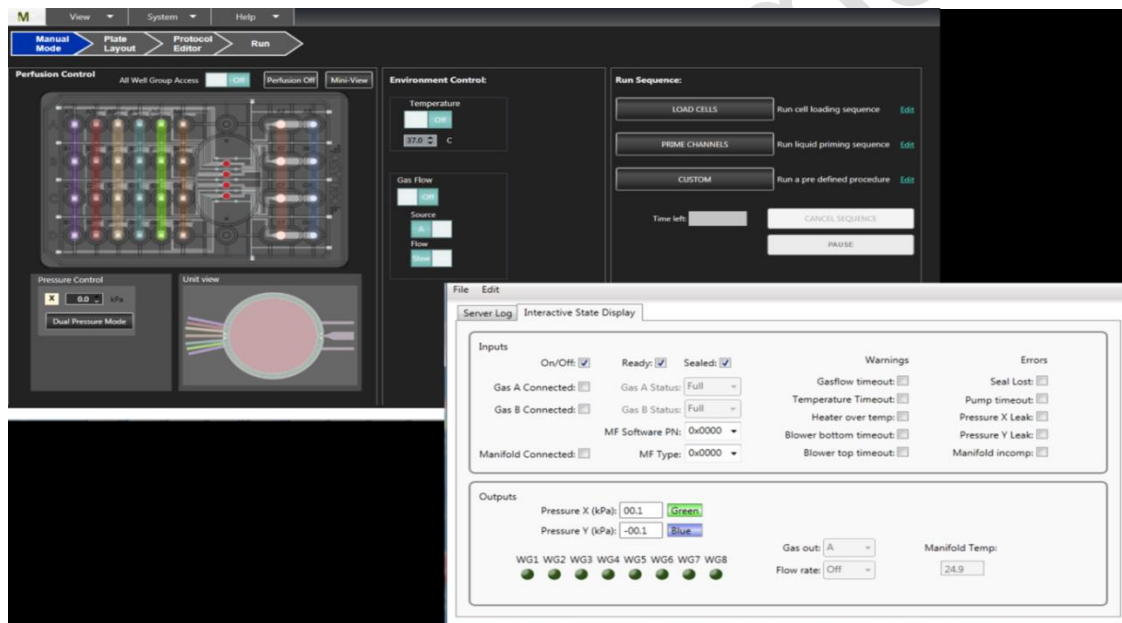
The client was looking for a competent software development and product engineering organization, having domain expertise together with informatics capabilities for developing software application for their microfluidic perfusion platform. One of the key requirements of client was that field engineers should be able to test the application without the availability of the instrument.

Solution (Instrument control application for microfluidic perfusion platform)

Optra Systems with its multidisciplinary team was found to be the perfect partner to address the client's unmet needs. Optra team developed intuitive and scalable software for a high-throughput microfluidic perfusion platform with a new spin in the field of live-cell imaging.

Optra Systems helped the client by setting up a competent team of SMEs and software developers-

- To build intuitive software application that helps performing experiments involving cell cycle analysis, cell migration and long-term time-lapse studies.
- To develop simulator with server log and an interactive display with three main features i.e. manual mode, plate layout, protocol editor.



- Features to set up an automated protocol for pre-programmed, walk-away perfusion changes over minutes, hours or days.
- Enable the programmable flow sequencing to monitor the experiment flow timings and avoid lapse of experiment due to time length.
- Developed user friendly application which was able to communicate with the instrument via serial-over-USB, using the Modbus protocol.
- Simulator was also developed having the functionality of the actual instrument.

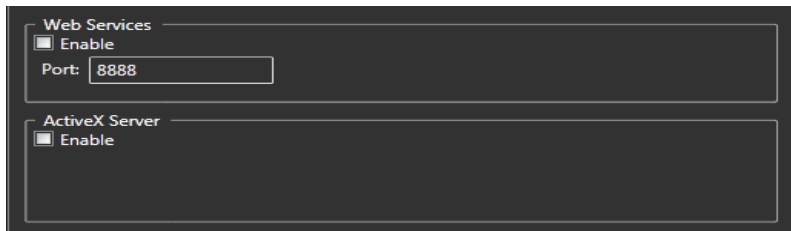
Optra Systems, Inc.

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Features' designed as per requirement:

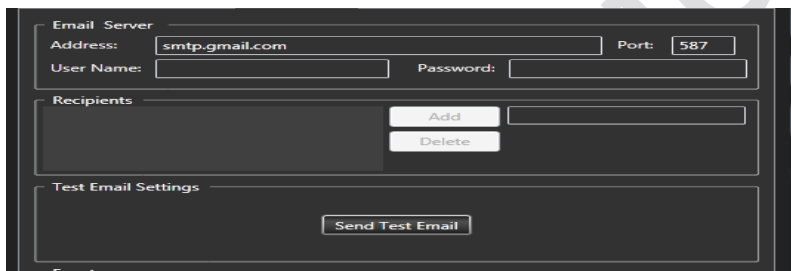
- Protocol format definition
- Plate definition XML format
- Displaying plate layout corresponding to the selected plate type by reading the XML plate definitions, matching manifold and graphics
- Developing simulator for the instrument
- Access the application with Web Services and External APIs



Web Services
 Enable
Port: 8888

ActiveX Server
 Enable

- Send email notifications to the user during the experiment run regarding various events

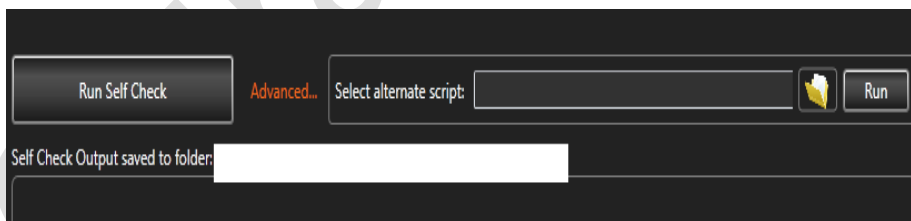


Email Server
Address: smtp.gmail.com Port: 587
User Name: Password:

Recipients
Add Delete

Test Email Settings
Send Test Email

- To check the instrument condition from application using Java Scripts



Run Self Check Advanced... Select alternate script: Run

Self Check Output saved to folder:

- Temperature calibration provides a means to calibrate the temperature to compensate for heat losses caused by the objective.

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Technology Environment

- C#,WPF, .NET 4.5 Framework
- MVVM, Install Shield for build creation
- Visual studio 2012
- Bit bucket as Code repository
- JIRA as Agile Project Management

Benefits

- Increased the productivity by automating the experiment (typically run with multiple steps for any duration) for long term control of cell culture environment for continuous media flow.
- Software-driven flow allowed the scheduled flow changes or choosing customized flow rates without any supervision thus analyzing the changes during the experiment became easier.
- This easy-to-use software is flexible and scalable and can generate simple solution-switching protocols or advanced flow profiles that overcome the limitations encountered with traditional microfluidic setups.
- Staying connected and facilitates feedbacks in real time basis thus helped to overcome the limitations encountered with the traditional microfluidic setups.

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About Optra Systems

Optra Systems is an ISO-certified global organization with deep domain expertise in medical devices, lab automation, life science informatics and healthcare IT solutions. The company provides a fully-scalable, cost-effective OptiShore™ delivery model. This enables customers to choose the optimal balance between on-site, on-shore, and off-shore development that will best address their budget and collaboration requirements. With Optra Systems, customers are able to shrink their time-to-market by leveraging practical, building-block based solutions. Committed to clear communication and total transparency, the company consistently meets or exceeds its clients' expectations. Offering a full complement of expert engineering and consulting services, Optra Systems is aligned to real business needs applied over the entire product development lifecycle. The robust, scalable and efficient IT infrastructure of the company, together with its outstanding project management team, consistently ensures superior results. Optra Systems' s global delivery model helps its customers cut costs by about 50% without compromising on quality and realize a 200% improved production cycle.

Visit Optra Systems today: <http://www.optrasystems.com>

Contact Optra Systems Today

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