Control and Visualisation Software for High Throughput Equipment for Ilika Technologies

Background

Ilika Technologies Limited specialises in accelerating the process of new materials discovery by the application of "high throughput" methods, involving the simultaneous application of experimental protocols to arrays of differently formulated samples.

An example of this type of activity led to the requirement for a purpose built instrument, capable of generating various voltage profiles, applying these to an array of electrochemical cells and performing high speed data acquisition of the currents flowing in the cells.

This in turn led to the requirement for a bespoke software application, running on a Windows^{TM} PC, and having the following features and capabilities:

(1) an instrument-like control panel enabling the user to set up experimental parameters, such as the characteristics of the required voltage waveforms and the data acquisition rate and sampling characteristics, to send these parameters to the special purpose signal generator (implemented in external hardware) and to start and stop the experiment

(2) a split screen having, alongside the control panel, a real time visualisation of the experimental array showing a colour representation of the instantaneous current in each cell

(3) a set of available graphical windows displaying various real time plots as the experiment proceeds

(4) comprehensive filehandling features including the ability to replay previously recorded experiments

(5) data analysis features specific to the electrochemical processes being studied

Project details

Timestar successfully bid, on a fixed price basis, to design and supply a bespoke software application as specified.

The software development was carried out principally at Timestar's Newcastle offices, but on site review meetings were held from time to time at Ilika's office/ laboratory complex in Southampton Science Park. Several aspects of the specification details, which had been fluid at the inception of the project, were ironed out during the course of the development.

After successful delivery of the initial application, 2 further smaller contracts were placed for enhancements to adapt the software to new experimental requirements.
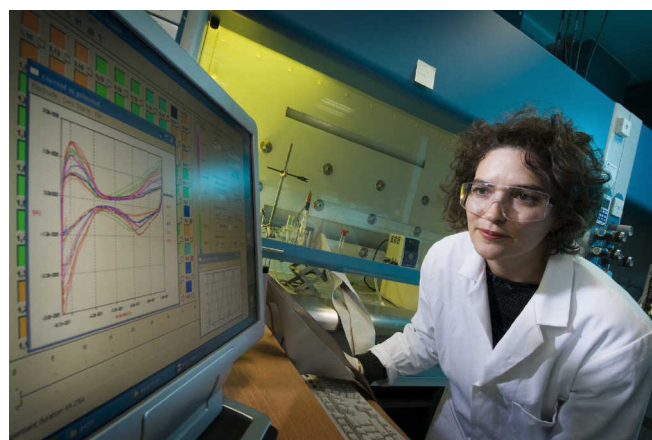

Figure 1: A scientist using the system in the lab

Success in service

The system has proved extremely reliable in service and has been used extensively for the electrochemical screening of novel battery and fuel cell materials.