

## FlowCell Release Notes

### FlowCell 1.5h – August 2023

- OLE: In a stepped sweep, if 1 point/step is created using equal step time and data interval, the HFR measurement can prevent a point from being recorded correctly. Corrected

### FlowCell 1.5g – May 2023

- From version 1.5b, the Background current range may be used instead of the range selected in an experiment step. Corrected.

### FlowCell 1.5f – Oct 2022

- If a multiple level tree structure is used in the experiment list, and the experiment list is collapsed, Run All may not run the innermost steps in the multilevel tree. Corrected.
- If data cannot be saved to a file for 60 seconds, an alarm message is displayed.

### FlowCell 1.5e – Sept 2022

- Overriding default EStop actions can create an invalid ALSET command. Corrected.
- Live meter values for conductivity and other signals might not update when in Power Supply mode. Corrected.
- OLE: If an 857 is turned off and then back on while the software is running, it would not reconnect and resume control. The device is not recognized as the same unit because the case of the USB path changes. Corrected.
- Add Tree structured experiment list.
- Add multi-Window arrangement with the graphs displayed in a separate window.
- Add Insert Block experiment type.
- Added HFR values displayed with units of mOhm \* cm<sup>2</sup>
- Add menu option Experiment | Undelete. This will insert the most recently deleted experiment into the experiment list at the current location.
- When running an experiment list, the repeat loop count may not be fully visible. Corrected.
- Default ini file for 620 contains StationType=620 instead of 600e. Corrected.
- Default ini file for 857e contains wrong AOut settings. Corrected.

- Added alarm sound and Mute button.
- Additional support for alternate alarm email smtp settings.

#### FlowCell 1.5d – May 2022

- Add termination "goto" options
- Add Marker experiment step
- If a Flow is disabled in Instrument Config, but the matching Flow Temperature was previously enabled, the Temperature will appear on the main screen. Corrected.
- When using a Power Supply, the min and max E and I are only tested during experiments, not during background operation. Corrected.
- If multiple MultiGraph windows are displayed, the program will crash when the program is closed. Corrected.
- When a new step is inserted that is the same type as a previous step within the list, the new step will default to the same settings as the old step. The data file name and experiment description will now be cleared instead of being copied.
- If an alarm occurs that shuts down the fuel, allow the flow setpoints to be forced to ini file defined values. This allows the purge gas to be turned on.
- Offset added for pump flow calibration in the FlowCell.ini file.
- When using a Power supply, the Min and Max Voltage and Current alarm text is reversed. Corrected.
- Experiment List is hard to read in Windows 11. Corrected.

#### FlowCell 1.5c – February 2022

- Added Date\_Time as a saveable data value. Located in the Ctrl section of the values list
- Change Potential Limits in Cell Setup screen to use Power Supply .ini file ratings. Allows voltages >5V
- Added Description line to the Repeat Loop step.
- When operating in background mode and recording in background mode, a timing error of x0.0024 is introduced. This does not occur when running experiment steps and recording in background. Corrected.
- The I termination settings in CV and ScanV steps had fixed 7A limits. Corrected.

#### FlowCell 1.5b – September 2021

- OLE: Modified "Live" data stream to avoid measuring during HFR. Prevents noise in the panel meters and in background data that is measured at the background rate during an experiment list.
- OLE: A galvanic sweep with a power supply may save data every second instead of one point per step.
- Add indents for Repeat Loops
- Add Base Data file support
- Add support for Temperature Watchdog

#### FlowCell 1.5a – June 2021

- OLE: Add support for MaxCode values when autoranging 881 FRA
- OLE: If FRA gets an overload signal, it will not clear the overload signal after new, non overloading measurements. Corrected.
- OLE: The ini file setting [System]EnablePS=0 now fully disables all power supply communications
- OLE: For OLE 2.0, change HID timeout to accommodate Window 7
- Correct a problem where the temperature setpoints may be frozen when turned back on after an alarm
- Add Arbitrary File Sequence viewer.

#### FlowCell 1.4h:

SOC is available in the Popup Meter menus in the ETS configuration instead of the Redox config. Corrected.

Add automatic naming of the main program caption to reflect /station name used for multiple systems on a single pc

Added support for operating dual 857/600 units on a single pc.

OLE: Changed OLE to Delphi compiler 10.3.

OLE: Add error message if a temperature controller rejects a setpoint. Possibly because it is over the SPL

#### FlowCell 1.4g:

- Ini file setting [Impedance]FastBackground=1 forces the background mode to sample 100points/sec during impedance measurements.
- l/min and ml/min capitalization is not consistent. Standardize with L/min and mL/min
- Collection rates may be marked as L/min instead of mL/min. Corrected

#### FlowCell 1.4f:

- If the background mode is set to PSTAT, but an experiment step performs a PS function, the PS may be limited to 20A (the PSTAT limit). Corrected
- Changed FRA Stop mode to Immediate
- Add alarm settings for N2 and low water to the default 600 series ini file.
- Added Copy to Background checkboxes for Setup Cell and Setup Flow screens.
- SOC alarm may not operate correctly in 857b and 857e configurations and could trigger in 600a config.
- "FRA not found" message could be display when "FRA Overload" occurred. Corrected

#### FlowCell 1.4e:

- In stepped scans, the instrument doesn't report correct vertex numbers. This can result in extra points at the end of a scan. Corrected by using the Scan State to help detect the end of scan.
- Added arbitrary control experiment step
- Text of Background file name may overlap other text. Corrected

#### FlowCell 1.4d:

- If EStop is engaged, the firmware will continuously setback the temperatures and eventually crash. By default, EStop is now disabled if Fuel, Cell and Temp are all off
- Added Shutdown MinI and MaxI to Setup Cell screen. These parameters will shut down the system as defined in the .ini file.
- Add support for systems with AMG gas control.
- Add support for dual pump, dual gas/humidifier for each side of the cell.
- Allow HFR frequency to be a function of the dc current.
- Modified 881 FRA operation to allow long integration at high frequencies. Previously limited by 880 command limits.
- OLE: Changed Mutex wait period from 5 seconds to 10 seconds. Allows more time when system is initializing.
- Added support for FC-EL interlock
- Added new controls for AMG, 892 and 4 Flows to the Instrument Config screen
- In the warning screen listing files that will be overwritten, the full file name may not be visible. Corrected by right justifying and adding wordwrap.
- When check boxes for data values are changed, they are only re-read when starting an experiment. They are now r-read when clicking on the Graph menu item.
- If a MultiAxis Graph is used with Time set to display Seconds, it may freeze when adding new Y-axis parameters. Corrected.

#### FlowCell 1.4c:

- OLE: Further modified USB-HID enumeration to ignore a second error. Also only items with a vid\_ffff value are now interrogated.
- Added support for alarms on the Aux voltage and SOC voltage signals.
- Limit Power Supply sweeps to 0.5 sec steps
- Modified alarms to decouple triggerable state from alarm action. Changed default alarms so that Cell and Temp are removed for all alarms.
- Aux signals from the 892 can now be scaled together on the MultiData graph using the GroupAxis ini file setting.
- Prevent the internal 857 voltage min and max alarms from operating when in PS mode.
- Limit Power Supply step interval to a minimum of 0.25 sec.
- If Ini Com Port for Power Supply Port=0, Automatically search ports 1-8.
- If Ini Com Port >0, but Power Supply not found at that address, search ports 1-8.

#### FlowCell 1.4b

- Added function: [Help](#) | [View PDF Manual](#)
- If an ini file is resaved in in UTF-8 text format, it will not be read. Corrected.
- If the cursor focus is on the measuring experiment list and the mouse wheel is actively being rotated at the moment the experiment lists ends a "Grid Index out of Range" error may occur. Corrected.
- OLE: A change to Windows causes the OLE to crash when it is interrogating HID devices for vendor and product names in order to find the 857. Corrected.

#### FlowCell 1.4a

- Increase size of graph data buffers from 10000 to 30000 points.
- Change power supply support to 'per step' operation.
- OLE: On startup, when reading the decimal place from an external temperature controller, it will retry 3 times if it fails to get a response.
- Problem changing from a smaller range to the 20A range within an experiment list. Corrected.
- OLE: Added time to data to account for lost time during step transitions. The extra time appears as missing data points at the start of static steps.

- FileValid function is used to test to make sure the selected data file is valid. It can indicate an invalid name when it is actually valid. Corrected.
- OLE: Added support for 881 FRA
- Updated code to XE4 compiler.
- Improved Unicode support. This corrects issues with a superscript 2 in "cm<sup>2</sup>" being displayed incorrectly.
- Improved FRA Cell Voltage range selection. May reduce noise level.

#### FlowCell 1.3f:

- Changed "Anode" and "Cathode" parameters in the .ini file to Neg and Pos
- When the Setup Cell screen is changed after startup, the current range labels may be incorrectly displayed as 7, 0.7 0.07, 0.07 instead of 20, 7, 0.7, 0.07. Corrected
- Estimated duration may be incorrect when using pressure change steps. Corrected

#### FlowCell 1.3e:

- The software may re-alarm when restarting flow/pstat/temp even though the alarm source has been corrected. The OLE now directly monitors the digital bit so that it can clear the status as soon as the alarm is corrected.
- A galvanic sweep may apply an incorrect current before starting the sweep. The sweep used the correct currents. Corrected.
- The installer would overwrite the FuelAux.ini file, losing any modifications the user had made. Corrected
- The SCF command in newer firmware cannot handle the 2 spaces used before the 4.8 and 9.6 kbaud rates. The extra space has been removed.
- Corrected a problem where graphs saved in a setup file were not recreated with the correct axes.
- Scanning experiments with more than 1 cycle now require both vertexes to be used.
- Change Aux892 alarms so that alarms for 32 channels can be defined in a scrolling window.
- If only 892 Module #2 was defined, Aux signals were not displayed. Corrected.
- Using "terminate" within a scanning experiment may not terminate. Corrected.
- Add experiment duration estimate. Add Cell Capacity parameter to help calculate duration in CC steps.

#### FlowCell 1.3d:

- Add tubing size selection to the installer.
- Unified flow rate unit wording and capitalization to standardize on mL/Minute

#### FlowCell 1.3c:

- Add Time correction for data measured with firmware 1.18 and earlier. Adds 0.1 second every 410 data points.

#### FlowCell 1.3b:

- Correct a problem where an experiment may not stop correctly if it is stopped before the first point is measured.
- Add Aux982 alarm limits using the Aux892 button in the Background section. These alarms are performed in the FuelCell program, not the OLE.

#### FlowCell 1.3a:

- Change default FRA ranges to Auto: 50mV Minimum

#### FlowCell 1.2g:

- OLE: Icon moved from the taskbar to the stat/notification area

#### FlowCell 2.1f:

- Add support for the 20A model
- Add support for Windows 10