FuelCell Release Notes

FuelCell 4.6e – August 2023

- Added [Alarms]AlarmExternalExe = setting to run an external program if an alarm occurs.

- Updated configuration .ini files. Added 840 1 kW option. Changed default Control Speeds to 250 W and larger units.

FuelCell 4.6d – March 2023

- In the installer, if FuelCell.ini does not exist but FuelCell1.ini exists, there is no option to create a new hardware configuration. Corrected.

- Setup files that contain cm2 axes graphs from versions 4.3f-h will not load. Corrected.

- OLE: Handle any unknown exceptions that might occur in gpib output/input routine

- Changed how HFR is disabled when the current is zero to prevent noise data points.

- The OLE window is displayed if a chiller is connected, even if there are no communications errors. Corrected.

- OLE: When in Pstat Open Circuit mode, the 885g low voltage alarm is not active. Added alarm test in software.

- In the Arbitrary Control experiment, a Pause/Action=-1 step can have an undefined parameter which can cause a program exception. Corrected.

- If Pstat is active, the last Load HFR value will continue to be displayed. Corrected, it will now blank the display of HFR during Pstat steps.

- In version 4.5c, the, "Avg %" parameter was hidden for the PSTAT Scan V and Scan C setup screens when preforming a linear sweep. This parameter is now re-exposed.

- Installation of multiple stations on a single pc does not work as described in Addendum. If FuelCell1.ini exists, there is no option to create a new hardware configuration. Corrected.

FuelCell 4.6c – Oct 2022

- OLE: Improved the handling of a USB PSTAT disconnect and reconnect.

- 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.

FuelCell 4.6b – Sept 2022

- Hide Baud Rate setting in Instrument Configuration.

- If hardware is not turned on, but the ini file indicates that an FRA is available, the PSTAT impedance step is now available.

- When re-starting an experiment list that starts with non-recording steps like Change Cell or Change Fuel, the DateTime value in the data file might reflect the time of the first run, not the time of the restart. Corrected.

- OLE: Modified GpibIn and GpibOut routines to prevent unprintable characters from being modified with some Japanese language or other computers.

- Improved simulated response when operating in Demo Mode.

- OLE: Refactoring to separate flow, reformer and pressure control functions.

- Added HFR values displayed with units of mOhm * cm2

- In the Pstat/Gstat sweep experiment, the precent averaging may be displayed when not actually in use. Corrected.

- If a Reformate/Mixing Gas is enabled as the Main Gas, the check box for other Reformate/Mixing Gas channels may not be displayed correctly when re-editing a Setup Fuel screen. Corrected.

- Renamed "Minimum Pressure" to "Minimum Pressure Setpoint". Added a new "Minimum Pressure" that will create an alarm if the pressure goes below the selected value.

- Add a fixed 3 C standoff to the temperature watchdog operation when near the setpoint.

- If the software is installed with no hardware, it doesn't know the firmware # and may not display the current range option. Corrected.

- 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.

- Pressure Setup screen may have blank space on the right side. Corrected

- Added alarm sound and Mute button.

- Added a LoadE setpoint to arbitrary control files.

- Additional support for alternate alarm email smtp settings.

FuelCell 4.6a – May 2022

- Added Date_Time as a savable data value. Located in the Ctrl section of the values list

- Added Description line to the Repeat Loop step.

- Prevent extra warnings from autodetecting the presence of an fra in a new system.

- If the USB cable is removed and reinserted for an 850g, there was no attempt to reconnect the usb communications. The usb path is now recreated, however the success of reestablishing communications depends on the exact state of the 850g at the moment that the usb was disconnected.

- If FRA is not connected, and configured as Not Available, the OLE will still test for an fra and give a read error message during startup. New options of Not Used and Auto Detect added

- OLE: The PSTAT step termination may trigger on the first data point after a step starts. Changed to wait for the 2nd point before monitoring the termination conditions

- The PSTAT Scan V and Scan C setup screens show the "Avg %" parameter when preforming a linear sweep. This parameter is not used and is now hidden.

- When using a Power Supply in the Background mode, if the current is set to zero, it will go to the Minimum current rather than zero. Corrected.

- On some PCs, if the Gpib High Speed cable length is changed, the gpib driver locks. The CZLib gpib library has been modified to avoid using this function.

- Arbitrary control termination limits did not function. Corrected.

- If multiple MultiGraph windows are displayed, the program will crash when the program is closed. Corrected.

- Setup files, Inserted setup files and data files previously all used the same default folders. They now each have their own defaults, based on the most recent file of a particular type.

- 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.

- Added a red title bar to the Alarms window.

- A Notify Only alarm method has been added to the 892 Aux signal alarms.

- When warning about duplicate files, the same file can be listed more times than the number of duplicates. Corrected.

- Add [PressureInfo] EditMin=1 ini file setting to allow the minimum pressure to be edited in an experiment list step.

- If Cell Temperature is not used, the firmware will still check for over limit values and the software will alarm. Corrected.

- Modified Arbitrary Control function 41- Measure Impedance to allow AC amplitude to be set as percent of DC.

FuelCell 4.5c – Oct. 2021

- HFR frequency of 10kHz is used, even when other values are entered. Corrected.

- Add warning if Pstat Scan/Hold step does not contain either a Hold or Scan step.

FuelCell 4.5b – Sept. 2021

- Add indents for Repeat Loops

- Add cell temperature watchdog limit

- If Cell Temperature is disabled, it can still create an over temperature alarm. Corrected

- OLE: Change default Pressure AnodeDecimal and CathodeDecimal to 0

- OLE: Adding support for 885g disrupted the handling of in buffer value of 4294967295 in 885a units. Corrected.

- OLE: Add support for logging 1000 lines of comms prior to a command error.

- RH values are now displayed as >100% if humidifier temperature is higher than the cell temperature.

FuelCell 4.5a – June 2021

- Added cell temperature watchdog alarm to Instrument Config | Alarms. Alarm is displayed if the cell temperature does not increase due to a misplaced thermocouple.

- OLE: 890B hardware is no longer supported.

- OLE: For G series, clear the current interrupt values if current interrupts are turned off.

- OLE: Moved to software compiler version 10.3. Replaced WinUSB and Serial Port components.

- Use of the XG Power Supply could freeze the OLE user interface. Corrected

- OLE: Clear all Superlogics 8067 safe mode on startup, even if watchdog is not used.

- A small delay before using the OLE Connect function to allow hardware to be enumerated. The delay has been moved into the OLE so that it will also be used for Toyo software.

- OLE: If the PSTAT is overloaded, and invalid bias rejection value error will occur when measuring impedance. Corrected.

- OLE: If FRA gets an overload signal, it will not clear the overload signal after new, non overloading measurements. Corrected.

- FuelCell will allow PSTAT/GSTAT impedance setup even if the 885g does not have an fra. Corrected.

OLE: If a PSTAT step terminates on voltage or current, and is then followed a non-PSTAT step, the termination bit may be active for a future PSTAT step. Corrected.

- Scan steps allow a step size that is negative or 0. Corrected to always be positive

- OLE: added support for 885g v3.05 firmware with modified response length

- Prevent Stoich from being used with an Inert gas. This is an impossible combination.

- Add Base File Name support for data files.

- If the 850 does not contain an FRA, but the PSTAT does have an FRA, the PSTAT impedance will not be measured. Corrected.

- Added Arbitrary File Sequence viewer.

- OLE: For G series with firmware<5.09, clear the current interrupt values if current interrupts are turned off.

- OLE: For G series with firmware>=5.09, read Active Load Type from RDCFG command.

FuelCell 4.4e

- Changed 'Standby' section of the ini file to "Background" to differentiate from the Standby Mode

- In an Arbitrary Control step, if the current range is changed, an uninitialized variable could create a EInvalidOp error. Corrected

- OLE: If the starting process is very slow, i.e. e system with FRA, rs485 PSTAT, pressure, ramp temp and pressure, AMG, Humidifier drain watchdog, the SetPressure might be updated before initial values are received from FuelCell. This could lead to an invalid pressure ramp rate that can freeze the startup for 30+ seconds. Corrected.

- If a g unit and an e unit are operating at the same time and the g unit is closed, it can close the gpib interface and crash the e unit. Corrected.

- A user should only be able to start a single instance of a station. If a user clicks a desktop icon many times, it is possible to start a second copy of FuelCell before the first one in registered.

- In G series units, measure 892 channels 2 times per second instead of 1.

- Send FUEL 0 to clear any alarms before sending FUEL 1

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

FuelCell 4.4d

- OLE: Added additional information if no load is found

- OLE: Added additional information if FuelCell.ini has no serial number

- Added support for Temperature Stabilization

- Added support for Goto function during step termination

- Highlighting only a "Repeat Begin" line and starting can crash FuelCell. Corrected.

- Added "Change FRA/HFR" experiment step to allow the background 880/881 settings to be changed in an experiment list.

- Added support for temperature ramp in g series load.

- Corrected a problem where the serial number is not correctly read from a "8851" PSTAT with no FRA

- Updated pdf manual and help file

FuelCell 4.4c

- Add support for Sorenson XG power supply.

- Changed function that loads setup files to avoid unicode problems if a user modifies a file and resaves it in Notepad with a different encoding.

- The Anode Water Low, Remove Temperature and Cathode Water Low, Remove Temperature alarm function remove both temperatures instead of just the alarming humidifier. Corrected.

- Cell Over Temp alarm now removes all temperatures, independent of "Alarms Reduce Temperature" settings. Host alarm removes all temperatures, independent of other settings.

- Add Arbitrary Control function for Aux897 relay control

- Changed FRA Stop mode to Immediate

- If the background conditions are changed while running a PSTAT/GSTAT step, it will stop the experiment. Corrected

- Uninitialized variable when starting an experiment, does not normally error. Corrected

- Direct control of Solartron 12xx FRA would display FRA Not Available. Corrected.

- If a sequence Load Control V, PSTAT Step, Load Control I is used. The Load control mode can get stuck in Ctrl V mode. Corrected.

- Modified one line experiment step description to include more information.

- Added message for FRA Overloads

- Modified the OLE "Cannot Connect" message to indicate usb and gpib were tested.

- Demo Installation will crash when started. Corrected and Demo Install information updated.

- If Mixing gas concentrations are 0, Instrument Config will give warnings even for unused mixing gasses. Corrected

- Added minimum temperature setting

- Add support for 855g without an FRA

- Add support for Dual Purge Gas for g-series systems. By default, it is enabled for 840 and 850 configurations.

- Corrected a problem in version 4.4a where the R2 DC voltage value is not measured correctly.

- Limit FRA frequencies to 20k for the Load, 40k for PSTAT

FuelCell 4.4b

- If "Cell temperature over limit" alarm is created, it will correctly alarm and shut down, but the cause of the alarm may not be listed. Corrected.

- OLE: If a load over limit alarm occurs when switching to background mode using a different current range than the experiment, the load is turned off but the fuel is on. Corrected.

= The added support for 885g can make older 885-HS units fail to be recognized, reports RSNUM=[blank] in SAI890OLE. Corrected.

- In the Instrument Config screen, Mixing Gas 1 will not allow a Pure Fraction value of 0. Corrected.

- If a mixing gas concentration tank is defined as having a Component Concentration 0, it will cause a divide by zero error when starting FuelCell. Instrument Config screen now checks for Conc=0.

FuelCell 4.4a

- The example .fcc files were inconsistent with column separators. They now all use [tab].

- The PureFraction value for Gas Mixing/Reformate can now be edited in the Instrument Config screen.

- Added Aux Temperature Address and Ramp settings to the Config screen.

- Add watchdog to SL8067 to shut off drain/refill after 15 seconds of lost communications

- Added a function to allow the Cell Temperature to track a measured Temperature.

- The 855 has an additional cell temperature reading with no setpoint. The Setup Cell screen now displays the alarm value for this signal.

- If a superlogics 8018 data contains the value -999, it will be marked as a communication failure. Corrected.

- When starting an experiment list, if an experiment list gives a warning for a file name or other message, and 'Cancel' is chosen, the system may crash when the list is edited.

- OLE: Changed Mutex wait period from 5 seconds to 10 seconds. Allows more time when system is initializing.

- OLE: If pressure is turned on, and then turned off while the "Excess Flow" is being applied, the Excess Flow is not removed. Corrected.

- OLE: If pressure is turned on using "Alternate Fixed Flow", and normal flow is set to "load based", and Mixing Gasses are used, the Mixing gas did not have increased flow. Corrected.

- 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.

FuelCell 4.3j

- Added function: Help | View PDF Manual

- Added function: Menu item Experiment | Skip PSTAT Scan/Hold to next segment

- On some pcs, if the gpib driver is not installed the OLE may crash on startup. Corrected.

- If a PSTAT step directly proceeds an Arbitrary Control step, the Arbitrary Control step will stall. Corrected by forcing the system to LOAD mode before Arbitrary Control steps.

- If an .ini file is resaved in UTF8 Unicode format, the OLE will not correctly read it. The communications fail on startup. The only command displayed in the OLE is "VER;". The semicolon indicates that the ini file was not fully readable and the StationType was not available, defaulting to an 890B. 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.

- Experiment steps that take no time such as Pressure and Fuel can give wrong values for the estimated duration. 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 885. Corrected.

FuelCell 4.3i:

- Increase size of graph data buffers from 10000 to 30000 points.

- If "Copy to Background" function is used in Setup Cell or Setup Fuel, after running and resaving, the setup file will have extra experiment lines. This was caused by an incorrect value fir the "IsStandby" parameter in the background settings. Corrected.

- 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.

- Improve the accuracy of the impedance estimated time duration, and display of Time Remaining.

- Add Pstat Scan/Hold experiment

- Improved timing of multistep PSTAT experiments to account for time lost during transitions.

- Add support for Save Every Nth setting in Pstat Potential Sweep experiment

- If external temperature controllers are set to 0.1 degree, the setting might not be automatically detected the first time FC is run after power up. Corrected.

- Default settings for the 855 sofc contained alarm settings for Aux3 (Mode7=4). This alarm bit is not used. Corrected.

- OLE: Added a more complete error message when a temperature setpoint exceeds the internal controller limits.

- Add support for ramping the gas flow rate.

- During and External Run step, Background data was not saved because there are no data acquisition settings in the experiment step. Changed so the Background rate and delta settings are now used to save the data from an External Run step.

- On some PCs (older single core cpu), an error message may be displayed when changing tabs in the Instrument Config screen. Corrected.

- The Aux Temperature value may get reset to 0 when re-entering the Setup Cell screen. Corrected.

- Add support for Aux894 option. Extra digital out signals available from the fuel setup screen.

- The spring 2018 version of Windows 10 added an option to the Region settings "Beta: Use Unicode UTF-8 for worldwide language support". If this is activated, certain characters like the superscript 2 used in cm² get reinterpreted and are displayed incorrectly. Changed TControl.GetText function to detect this problem and correct it. This only works for some instances. Recomend to turn the "Beta Unicode" setting off.

FuelCell 4.3h:

- Added 2kW 890e unit to the installer.

- FuelCell only displayed a maximum of 32 channels of data from the 892 modules. It now displays 48 (3x 892 units).

- Added support for Auto Humidifier Drain/Fill using arbitrary control function 46

- Added up and down arrows to enlarge and shrink the Setup Experiment window

- Some anode and cathode fuel values could not be displayed in the user defined meters. Corrected.

- Removed a 1 second dummy step at the beginning of a PSTAT Sweep V step

- PSTAT Constant V step duration was rounded to the nearest second, now rounded to the nearest 0.01 second

FuelCell4.3g:

- The description for a Change Fuel step will list the stoic parameters even when fixed flow is selected. Corrected.

- Merged the axes for multiple pressure values in the MultiAxis graph

- Auto-detect the decimal setting for external temperature controllers. Note: 16A/32A controllers. 76000 controllers require a Model=76000 line in the .ini file.

- Add Aux982 alarm limits using the Aux892 button in the Background section. These alarms are performed in the FuelCell program, not the OLE.

- If only 892 Module #2 was defined, Aux signals were not displayed. Corrected.

- Add Experiment Duration estimate

- FuelCell: The MultiGraph Cathode Temperature may have -999 for the first data point. OLE: Perform an immediate reading of temperatures to make sure they all have valid values before FuelCell startup.

- During installation, if the 850e is selected, the installer asks if the system is equipped with Automatic Wet/Dry.

FuelCell 4.3f:

- "List Index Out of Bounds" error can occur if background recording occurs at a fast rate for a long period. Graph is redrawn while the data point buffer is being reduced. Corrected

- Add MultiAxis graph

- The "All Alarms Reduce Temperature" function has been modified so that selected temperatures can be reduced. When only selected temperatures are reduced, it is done in software instead of hardware.

- Default .ini file for 855 100A unit had flow scaling for anode and cathode of 40 and 100 instead of 400, 1000 (2 liter, 5 liter). Corrected

- It now saves a list of open graphs in the setup file and re-opens them when using open setup.

- When autoBP is used, pressure can no longer be removed when humidifier temperatures are >95C.

- When setting humidifier temperatures >95C on systems with autoBP, a warning is displayed.

FuelCell 4.3e:

- Add Save to "Multiple Cycles" in Pstat Sweep Voltage step. This will cause each cycle to be saved to a separate file.

- Add Shutdown step to the experiment list

- Add Set885Booster function to control a current booster attached to the 885.

- OLE: A selection window is displayed to match a 885-HS unit to the corresponding Load. This window can potentially freeze the OLE (and FuelCell).

- Change fuelaux.ini file for 840e installation to add AMG (893) settings

FuelCell 4.3d:

- Force data file names to have .fcd extension. Previously, if test 0.5cm is entered, it would change to test 0.fcd. Now it changes to test 0.5cm.fcd

- Add Copy background settings to Setup Cell, Setup Fuel, Setup Pressure and Setup AuxPLC experiment list steps.

- The blue meters would display Presure (PSIG) even when the scaling is changed to kPa. Corrected.

- Add Cell temperature control mode. Allows the cell temperature to actively follow the humidifiers.

- Enable Baltic clamp without backpressure

- Installer: 890e 1kW, 500A would actually install ini file for 890zv. Corrected.

FuelCell 4.3c

- In Pstat ScanV step, Avgerage% can now be used with any stepped or scanned operation.

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

- Added Aux892 voltage/temperature values to the User Selected meters on the main FC screen.

FuelCell from 4.3b

- If impedance is measured after a PSTAT step, the attenuator may not be set correctly, resulting is very small amplitudes. Corrected.

- Add support for Baltic Cell Clamp fixture.

- [Custom] Add support for dewpoint/rh measurement from the 892 and dewpoint alarm.

- Add support for Windows 10