FuelCell Addendum – Wet/Dry Gas Controls for 890

D. Johnson, Scribner Associates, Inc.
1/24/2003, Ver. 1

Introduction

This addendum describes the wet/dry gas solenoid control implementation in FuelCell Version 3.3b and later for 890 Fuel Cell Test Systems.

The FuelCell software should be installed and the system tested without wet/dry controls prior to enabling these controls.

Hardware Support

For 890B units, the anode uses Digital Output line 8, the cathode uses digital output line 9.

Note that this is a "zero based" numbering where the Digital Outputs are labeled 0 through 15. If they are labeled 1-16, use outputs 9 and 10 for the anode and cathode, respectively.

For the 890C, "burp valve" signal lines are used.

Contact Scribner Associates for further instructions on access to these signal lines in the Load Unit.

Enabling Wet/Dry Support

Wet/Dry solenoid support is enabled by manually editing the "fuelcell.ini" file on the computer. At this time, it cannot be configured through the Instrument Configuration screens in the FuelCell program.
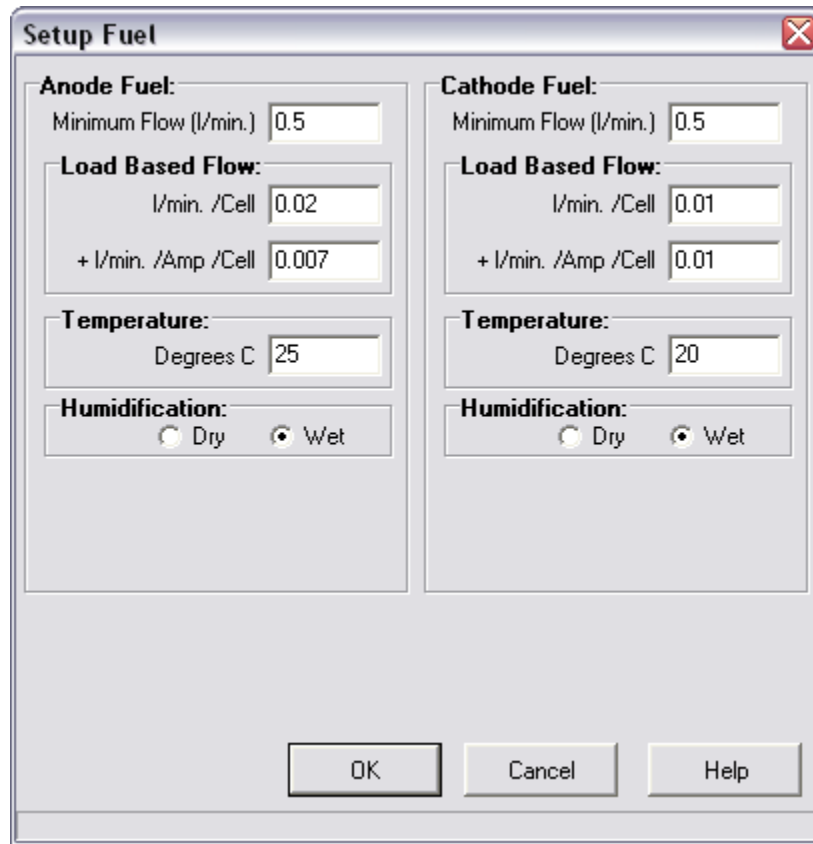
- Open the fuelcell.ini located in the C:\FuelCell\ directory file using Notepad.

- Add the EnableWetDry=1 line to the end of the [System] section of the ini file as shown below. Note that other settings in the [System] section may differ from those shown below.

[System]
EnableAnodeGas=1
EnableAnodePurge=1
EnableAnodeTemp=1
EnableCathodeGas=1
EnableCathodePurge=1
EnableCathodeTemp=1
EnableCellTemp=1
EnableWetDry=1

- Save and close the fuelcell.ini file.

Wet/Dry Settings in the Setup Fuel screen.

The wet/dry controls are in the Setup Fuel screen as shown below.

Setup Fuel

Anode Fuel:
Minimum Flow (l/min.) 0.5

Load Based Flow:
l/min. /Cell 0.02
+ l/min. /Amp /Cell 0.007

Temperature:
Degrees C 25

Humidification:
○ Dry   ⊙ Wet

Cathode Fuel:
Minimum Flow (l/min.) 0.5

Load Based Flow:
l/min. /Cell 0.01
+ l/min. /Amp /Cell 0.01

Temperature:
Degrees C 20

Humidification:
○ Dry   ⊙ Wet

OK   Cancel   Help

Note: When shutting down the system, the background wet/dry settings remain applied to the unit.

The background settings are saved so that the next time the system is started, the controls will default to their previous settings.

Changing wet/dry settings from the Experiment List:

As with other fuel controls, the wet/dry condition can be changed in an experiment list by inserting a "Setup Fuel" experiment into the list.

Changing wet/dry conditions from an Arbitrary Control Experiment:

The wet/dry settings can be changed by an action line in an arbitrary control file. The action is described below, for more information on the operation of the Arbitrary Control experiment, consult the main FuelCell manual.

```
' Action = 26      set wet/dry gas valves
' example      26    1    0
' set anode valve to wet
' set cathode valve to dry
' Note: Wet = 1, Dry = 0
' Note: The actual valve has the opposite polarity. Power off = wet, Power on = dry
'
```

Recording Wet/Dry Data:

The state of the wet/dry valves is displayed in the measured parameters list. In the Anode Fuel and Cathode Fuel sections, the Wet/Dry value is 1 if it is in the wet condition and 0 when dry.

Items that are checked will be saved in the data file.

Anode Fuel
☑ Temp (C):19.00
☑ Flow (l/min):0.503
☑ Wet (1=wet):1
Cathode Fuel
☑ Temp (C):20.00
☑ Flow (l/min):0.505
☑ Wet (1=wet):1
Impedance
☐ Freq (Hz):0
☐ Real (Ohm):0
☐ Imag (Ohm):0
☐ Mag (Ohm):0
☐ Angle (Deg):0
Control Signals
☐ Ctrl Status:0
☐ Ctrl Mode:0
☐ Ctrl Value:0
☐ Cell Temp (C):110.0
☐ A. Temp (C):25.00