

FuelCell Addendum – Teledyne Cooling Loop

D. Johnson, Scribner Associates, Inc.

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Introduction

This addendum describes the FuelCell3 software configuration for use with a Teledyne AC system.

Software Support

Requires FuelCell version 3.5g3 or later. The software version is displayed in the FuelCell program Help | About FuelCell... screen.

Hardware Support

Requires the 890C Load Unit.

The cooling liquid flow is controlled through a Love 32A controller. The controller is configured to use a manual setpoint. The controller uses a 0-100% manual setpoint. Scaling factors must be calculated based on the pump flow rate range.

Note: The controller must be manually configured to use the extended decimal precision so that it displays xx.x instead of xx. Refer to the controller manual for its configuration.

Enabling Flow Loop Support

The Loop Flow setting replaces the Aux Temperature setpoint normally displayed in the Setup Cell screen. 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 file “fuelcell.ini” located in the C:\FuelCell\ directory file using Notepad. If your computer does not display file name extensions, it will be listed as a “Configuration Settings” file.

- Add the “EnableAuxControl=1” line to the [System] section of the ini file as shown below. Note that other settings in the [System] section may differ from those shown below. The order of the lines is not important.

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

Add the AuxControlAddress, AuxControlDecimal, AuxControlSetMode, AuxControlSetScale and AuxControlReadMode values as shown below.

```
[RS485]
CellAddress=1
AnodeAddress=2
CathodeAddress=3
AuxControlAddress=35
AuxControlDecimal=1
AuxControlSetMode=1
AuxControlSetScale=20
AuxControlReadMode=1
```

In this example it is assumed that the controller is at RS485 address 35.

The AuxControlDecimal=1 setting matches the decimal setting xx.x

The AuxControlSetMode=1 indicates that the controller will be used in manual setpoint mode (0 is the Auto mode).

AuxControlSetScale=20 converts from the users units (0-5 LPM) to the controllers units (0-100%)

AuxControlReadMode=1 causes the setpoint value to be echoed as measurement value instead of reading an actual process control value from the controller (0 will cause it to report the measured process control value).

Create the [Aux] section and add parameters as shown.

```
[Aux]
AuxControlNameLong=Loop Flow Rate Setpoint (0-5 LPM)
AuxControlNameShort=Loop Flow(lpm)
AuxControlSetMin=0
AuxControlSetMax=5
```

The “Long” name is used in the Setup Cell screen to describe the parameter. Approximately 60 characters can be used in the description. Longer text may not display properly.

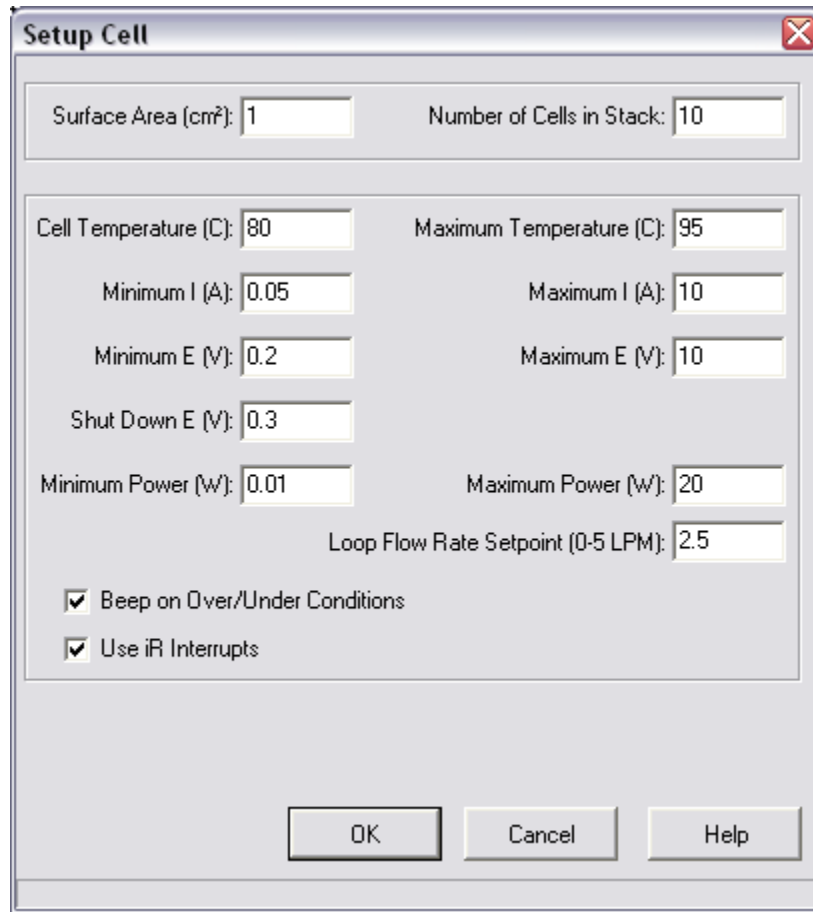
The “Short” text is displayed in the Measured Data Values portion of the FuelCell screen and is used as a column header if the parameter is recorded to a data file. Text should be as short as possible (less than ~15 characters) in order to fit in the available space.

AuxControlSetMin and AuxControlSetMax limit the user to a range of 0 to 5

Save the modifications and close the FuelCell.ini file.

Loop Flow Rate settings in the Setup Cell screen.

The Loop Flow Rate control is shown in the Setup Fuel screen as shown below.



The screenshot shows a dialog box titled "Setup Cell" with a close button (X) in the top right corner. The dialog contains several input fields and checkboxes. The fields are arranged in a grid-like fashion. The "Loop Flow Rate Setpoint (0-5 LPM)" field is highlighted with a red border. The checkboxes "Beep on Over/Under Conditions" and "Use iR Interrupts" are checked.

Surface Area (cm ²):	1	Number of Cells in Stack:	10
Cell Temperature (C):	80	Maximum Temperature (C):	95
Minimum I (A):	0.05	Maximum I (A):	10
Minimum E (V):	0.2	Maximum E (V):	10
Shut Down E (V):	0.3		
Minimum Power (W):	0.01	Maximum Power (W):	20
		Loop Flow Rate Setpoint (0-5 LPM):	2.5

Beep on Over/Under Conditions
 Use iR Interrupts

OK Cancel Help

Note: When shutting down the system, the Flow Rate setpoint 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 Loop Flow settings from the Experiment List:

As with other cell controls, the Loop Flow condition can be changed in an experiment list by inserting a “Setup Cell” experiment into the list.

Recording Loop Flow Rate Data:

The state of the Loop Flow setpoint is displayed in the measured parameters list. Note that it is not a measured value, it is identical to the setpoint currently in effect.

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

