FuelCell Addendum – Auxiliary Controller Support

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Introduction

This addendum describes the FuelCell 3 software configuration for use with up to 16 Auxiliary Controllers. The controllers must be LOVE series 16A, 32A, 1600 or Omega 76000.

Software Support

Requires FuelCell versions 3.6 or later. The software version is displayed in the FuelCell program Help | About FuelCell… screen.

Hardware Support

Requires the 850C/e or 890B/C/CL/e/ZV load unit.

All Auxiliary Controllers must be connected to the 850/890 through an external RS485 communications port. Each controller must have a unique RS485 address. The allowable addresses are 10-19, 21-29, 31-39, .., 91-99. The addresses with hexadecimal letters (1A, 1B, *etc*.) cannot be used.

Each controller must be manually configured for RS485 address, baud rate, Auto/Manual mode, decimal precision.

Optionally, the SCAL and SCAH controller settings may be used to scale the process control read values displayed by the controller.

Enabling Auxiliary Controller Support

Support is enabled by manually editing the "fuelaux.ini" file on the computer. At this time, it cannot be configured through the Instrument Configuration menus in the FuelCell program.

Open "fuelaux.ini" file 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. If the FuelAux.ini file does not exist, it can be created using the Notepad Program.

The format of the ini file is shown on the following page. Each [AuxControl] section describes a single controller.

RS485Address (default=0) Sets the RS485 address of the controller. If 0, the controller is disabled.

Decimal (default=0) Sets the decimal display type. It must match the value manually configured in the controller. 0=XX, 1=XX.X, 2=X.XX, 3=X.XXX, 4= .XXXX

Model (default=32) Sets the type of LOVE controller, 32 = 16 and 32 series, 1600 = 1600 series and Omega 76000 series

SetMode (default=0) Sets the control mode. 0 = Auto, 1=Manual (0..100% scale), 2=no control (read back only)

SetMin (default=-1000) Sets the smallest setpoint value the user can enter in the setup screen

SetMax (default=1000) Sets the largest setpoint value the user can enter in the setup screen

SetScale (default=1) Used to scale the controller setpoint

SetOffset (default=0) Used to offset the controller setpoint
Controller Setpoint = (Setpoint entered in software * SetScale) + SetOffset

ReadMode (default=0) Controls the source of the read/display value. 0=measured process control value, 1=echo the setpoint value, 2=no read/display

ReadScale (default=1) Used to scale the read/display value

ReadOffset (default=0) Used to offset the read/display value
Display Value = (Measured Process Control Value * ReadScale) + ReadOffset

NameLong Defines the text displayed in the Setup Auxiliary Control screen. 60 characters maximum

NameShort Defines the text displayed in the Data Values list. This text is also used as the column description in the data file. 15 characters maximum

Example of fuelaux.ini file

Control #1 is a standard temperature controller. The temperature setpoint is limited to 0 – 100.

Control #2 is a manual setpoint control. The SetScale=20 will cause a user value of 5 will create a 100% manual setpoint in the controller. The user setpoint is limited to 0 – 5.

```
[AuxControl1]
RS485Address=41
Decimal=1
SetMode=0
SetMin=0
SetMax=100
SetScale=1
SetOffset=0
ReadMode=0
ReadScale=1
ReadOffset=0
NameLong=Auxiliary Temperature #1 (C)
NameShort=Aux Temp 1

[AuxControl2]
RS485Address=42
Decimal=1
SetMin=0
SetMax=5
SetMode=1
SetScale=20
SetOffset=0
ReadMode=0
ReadScale=1
ReadOffset=0
NameLong=Manual Setpoint Control (0-5 = 0-100%)
NameShort=Aux 2
```

Using Auxiliary Controllers

Background Settings

The Setup Aux Controllers button is used to access the Setup Auxiliary Controls screen. 

The Setup Auxiliary Controls screen is shown below.

Note: When shutting down the system, the Auxiliary Control setpoints 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 Auxiliary Control settings from the Experiment List:

As with other controls, the Auxiliary Control conditions can be changed in an experiment list by inserting a "Change Auxiliary Controls" experiment into the list.

Changing Auxiliary Controls from an Arbitrary Control Experiment:

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

```
' Action = 29       set auxiliary control
' example       29      1     55
' set auxiliary control #1 to 55
29    1     55
29    2     3.5
```

Recording Auxiliary Control Data:

The Auxiliary Control read values are displayed in the Aux. Signals section of Data Values list.

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