

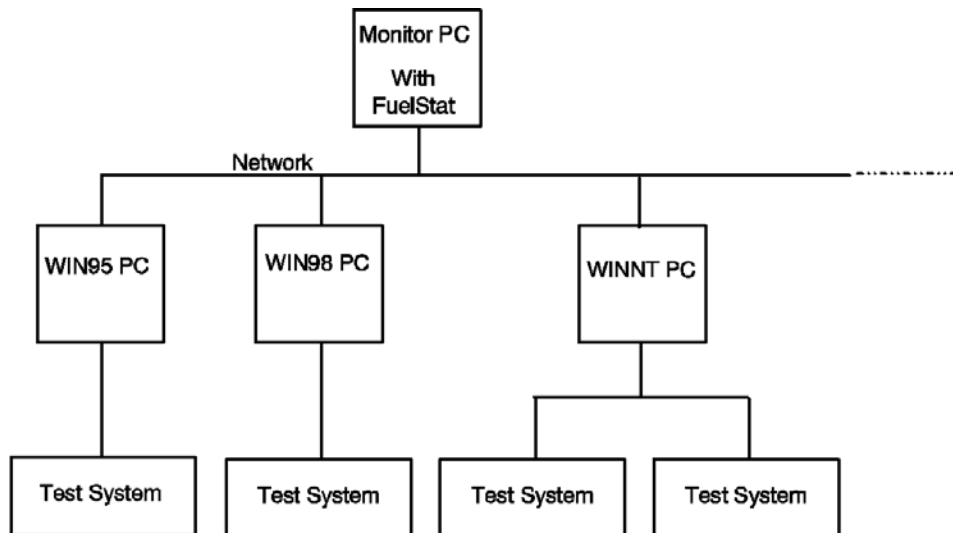
FuelCell Addendum – *FuelStat* Monitoring Software

FuelStat is used to monitor the status of multiple 840/850/890 series Fuel Cell Test Systems from a separate computer that is part of a local Microsoft network. *FuelStat* is run from a computer networked to the computers running *FuelCell* Version 2.0 or higher.

This permits local or remote monitoring of the status of many fuel cell test systems. No provisions are made for remote control of the test systems, only monitoring is provided.

A summary of the operating conditions of each fuel cell test system is provided in chart format. Simple graphs are displayed showing the operating parameters of the cells under test.

FuelStat software and Microsoft Excel must be installed on the monitoring computer to provide this function.



Installation

To install *FuelStat*, insert the Scribner software CD. In Windows Explorer, go to the CD\FuelCell Directory, and double click on FuelSt.exe. This will create a directory named \FuelStat\, copy all required files to this directory, and create a desktop icon named *FuelStat*.

Click on the *FuelStat* icon on the desktop or select Start | Programs | FuelCell | FuelStat.

Using *FuelStat*

Before *FuelStat* can display the status of the Fuel Cell Test Systems, each of the systems must be registered with *FuelStat*. An example of the **FuelStat Main Menu** is shown below.

display the *FuelStat* information in Excel. Close Excel, Close *FuelStat*, restart *FuelStat*, and click on **Start Excel**.

Note: An Excel template file is provided with *FuelStat* that controls the layout of the Excel screens. Because *FuelStat* is updating the Excel screens frequently, you may encounter communications errors between *FuelStat* and Excel, if the layout is modified while running *FuelStat*. To make changes to the Excel template, see section 10.6 *Modifying Excel Templates*.



Using Excel with *FuelStat*

When *FuelStat* starts Excel, the Excel screen should appear as shown below. Three Excel worksheets are used.

Raw Data

The 'Raw Data' worksheet contains the information as directly transferred from *FuelStat*. Because *FuelStat* directly communicates with this worksheet, this worksheet should not be altered in any way except to change the width of columns.

Station Name	Status	Time (Sec)	I (A)	E (V)	E Comp (V)	E Half (V)	E Half Comp (V)	Temp Cell (C)	Temp Cathode (C)	Temp Anode (C)
Quimby-1	Operating	23367.818	0	0.38337	0.38337353	0.3861812	0.386181206	23		22
Quimby-2	FuelCell Offline									
Herman-1	FuelCell Offline									
Herman-2	Operating	23154.324	0	0.46944	0.46943572	0.5868404	0.586840391	24	24	23

Formatted Data

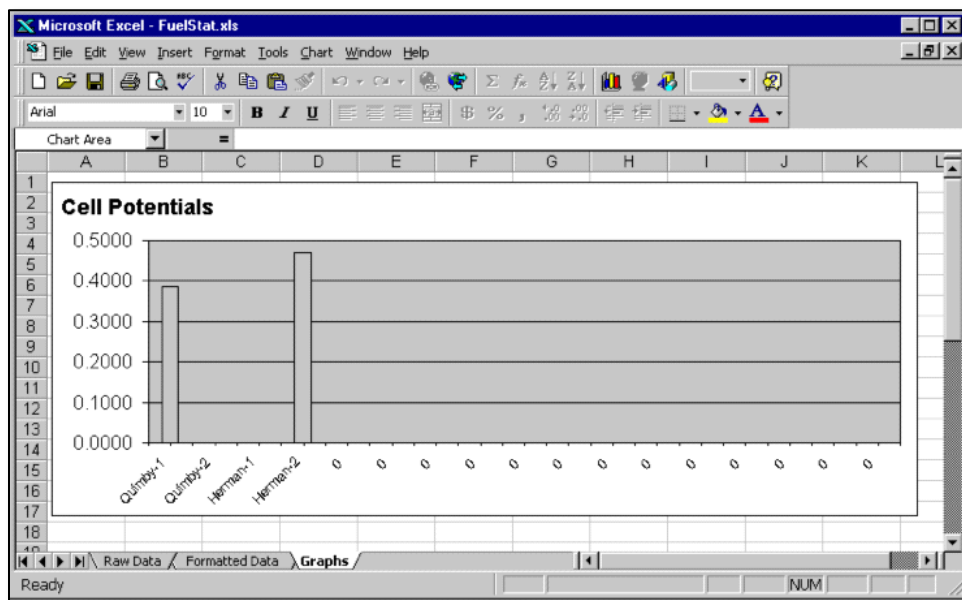
This worksheet page takes the information from the raw data worksheet and displays it in a more convenient format. For example, the raw data only shows total current. The

formatted data also shows current density calculated from the total current and surface area values from the raw data.

Station Name	Status	Time (days)	I (mA/cm ²)	E (V)	E Comp (V)	E Cathode (V)	IR (mOhm*cm ²)	Temp Cell (C)	Flow Cathode (cc/min)
Quimby-1	Operating	0.109	0	0.3670	0.3670	0.0047	#DIV/0!	24	-25.73
Quimby-2	FuelCell Offline	0.000	#DIV/0!	0.0000	0.0000	0.0000	#DIV/0!	0	0.00
Herrman-1	FuelCell Offline	0.000	#DIV/0!	0.0000	0.0000	0.0000	#DIV/0!	0	0.00
Herrman-2	Operating	0.107	0	0.4693	0.4693	-0.1169	#DIV/0!	25	-28.92
0	0	0	0.0000	0.0000	0.0000	0.0000	#DIV/0!	0	0.00
0	0	0	0.0000	0.0000	0.0000	0.0000	#DIV/0!	0	0.00
0	0	0	0.0000	0.0000	0.0000	0.0000	#DIV/0!	0	0.00

Graphs

This worksheet contains graphs derived from the formatted data. Built-in graphs include cell voltage of each *FuelCell* station as well as the current density-voltage relationship.



Modifying Excel Templates

FuelStat displays data and graphs in Excel using a pre-formatted template file. When *FuelStat* is installed, it creates two copies of the template. The used template is named *fuelstat.xlt*. A second copy named *backup copy of original Fuelstat.xlt* is also available. Never save changes to the backup copy.

To alter the template:

1. Shut down *FuelStat* and start Excel
2. From Excel, load the *fuelstat.xlt* template file (usually located in the directory c:\fuelstat\).

Note: Do not load the spreadsheet file *fuelstat.xls*. This is a temporary file and will be overwritten the next time *FuelStat* is used.

3. Modify the template file and save any changes.

Note: Make sure that the file is saved using the original *fuelstat.xlt* name, and in the original directory.

4. Exit Excel
5. Restart *FuelStat* and click on Start Excel to check the behavior of the new template.