Cellcorder®
Battery Analysis System
User's Guide

590-2085-501A/SL-29400/4200–002_Rev6

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Cellcorder Battery Analysis System User's Guide

Document Revision	6
Part Number	590-2085-501A/SL-29400/4200–002_Rev6

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1 General Product Description

The Cellcorder Battery Analysis System BAS creates and manages ADF battery files. The user creates ADFs by;

- manually entering data,
- capturing Cellcorder/CRT or hydrometer data, or
- importing Cellcorder/CRT CDFs, or older CLC–200 DAT files.

The BAS can do the following:

- Append data to a file.
- Create and print customized reports with all or selected data.
- Create site setup information.
- Display data in bar graph and tabular formats.
- Manually create a battery file by entering data from another source and saving the file.
- Modify data and save the file.
- Update CLC–200 and CRT firmware.

The BAS interfaces with the CLC–200 and CRT/Cellcorders. The key differences are:

- The CLC uses serial communication and has no infrared IR port,
- The CRT–300 has no serial port but has IR communication and Smart Media memory card capability and
- The CRT–400 has a USB port and has IR communication capabilities.

> *NOTE:*
> *Where applicable, alternate shortcut buttons and descriptions appear.*

This version of the BAS program offers several features:

- The user can view and analyze multiple strings and generate reports that contain data for more than one string. Using multiple string reports results in smaller printed reports.
- A trial version of a PDF file generating program is available at installation. If the user does not have a program that creates PDF files, install this program to create reports in PDF format for use and distribution. A logo can be placed on the first page of reports. This can be any BMP file image.

- To speed up program setup, the installation of the infrared IR virtual port driver is available during BAS program install. This feature is for use with computers that have an IR port for communicating to the CRT.
- A USB flash hard drive and port are available on the new CRT-400 for easy data transfer to pc. (Smart Media memory card is still used with the CRT-300.)

Safety Information

It is extremely important to read and to understand the safety precautions outlined in the Legal Warranty Safety section of the CRT–400 User's Guide and those printed elsewhere in this manual and/or corresponding manuals before using the Cellcorder® and the BAS software. Proper installation, use and testing are essential to the correct functioning of the software and the Cellcorder.

1.1.1 If Questions Come Up

If the user has questions, contact Vertiv at 954–377-7101 or fax 954–377-7042; request Battery Analysis System BAS or Cellcorder assistance.

System Requirements

The following are the minimum system requirements for the Battery Analysis System software.

- Version 2.01A01or later firmware for the CRT–400 Cellcorder, Version 1.00A25 or later firmware for the CRT–300 Cellcorder, or Version 2.00 or later firmware for the CLC–200 Cellcorder.
- Microsoft Windows™– 2000 or XP.
- Pentium4™ 1GHz or higher microprocessor.
- 128M of memory for Windows 2000, 256M for Windows XP.
- 150M of hard disk space for program installation. 1G of space for data storage.
- CD|DVD drive.
- An IR (infrared) computer port if IR communication between the computer and CRT is required.
- USB port on computer for transferring data via USB flash drive.

Helpful Reading

It is a good idea to read through the following manuals before using the CRT and BAS Software.

- Battery Analysis System User's Guide, pn 4200–002
  i.e. this book
- Cellcorder CRT User's Guide, pn 4200–038, 4200–070 or CLC–200 Instruction Manual, 4200–001.
- USB manufacturer's instructions. Belkin Components, Smart Media or other instructions.
- Hydrometer/data-logger manual, if a hydrometer is used.
- Uninterruptible Power Supply UPS manufacturer's instruction manual, if a UPS is used.

2 BAS Software Installation

During installation, the options to install the following are available:

- a PDF writer,

> *NOTE:*
> *If Adobe Writer and software is already installed on the pc, then do not install the PDF writer made available with this software.*

- an IR driver, and
- a sample database.

Insert BAS Installation CD Into PC

Before BAS installation, close all other programs.

To install the program, insert the CD into the computer.
The CD is equipped to auto start to install the program.

Figure 1. Insert CD

If the CD does not auto start, select **Start|Run** from the Windows task bar.

Figure 2. Start|Run

From the Run window, type d:\setup (or other drive letter that corresponds to where the DVD|CD is), or select Browse to find the DVD|DC drive, then follow the instructions.

Figure 3. Installing When CD Does Not Auto start

After installation, an icon appears on the desktop.

Figure 4. BAS Icon

PDF File Program

If a program such as Adobe Acrobat® is not installed on the pc and the user wants to create BAS reports in PDF format, the user may install a trial version of the Docudesk™ PDF writer during BAS program installation. After 15 trial uses, the user may purchase the writer program from Docudesk: www.docudesk.com.

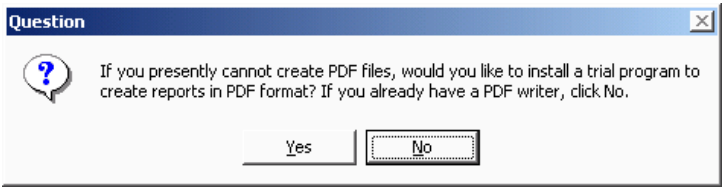


Figure 5. Installing the PDF Writer

When installing the Docudesk PDF writer, a window may indicate that the user needs a Postscript interpreter. When the user selects Next>, the Ghostscript program installs.

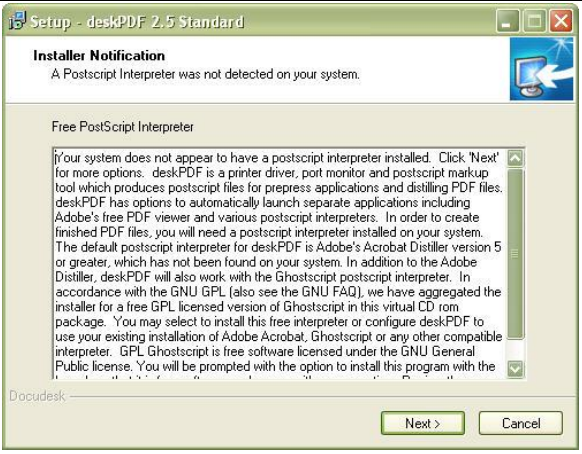


Figure 6. Postscript Interpreter Installation

NOTE:
To install the PDF writer later, browse the BAS CD to the Docudesk PDF folder and click the ***deskPDF25Std–Setup.exe*** *install file.*

Infrared IR Communication Driver

Once the user has finished installing the PDF writer and interpreter, a window will ask the user to install the IR driver.

Figure 7. IR Driver Install Window

If the user wants to communicate by IR and is using Windows 2000 or XP and the computer has an IR port, then install the IRComm2K IR port driver to allow the computer to communicate via IR.

If the user attempts to install the IR driver on a computer with no IR port, the user will receive the warning, “There is no infrared adaptor installed on this system.” The user may continue with driver installation, but the driver will not do anything until an IR adaptor is installed.

2.1.1 Determine Com Port For IR Communication Driver

During IR installation, select a COM port.

> *NOTE:*
> *Ports (in use) are not available for IR Communication and the installation wizard will indicate those ports that are in use.*

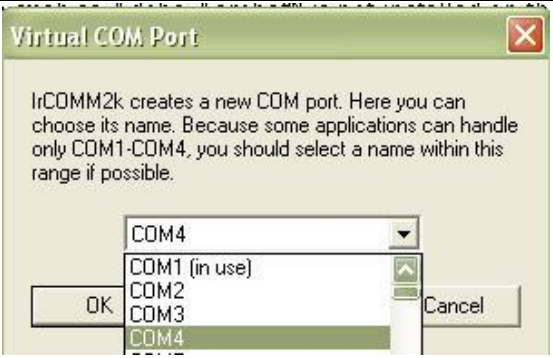
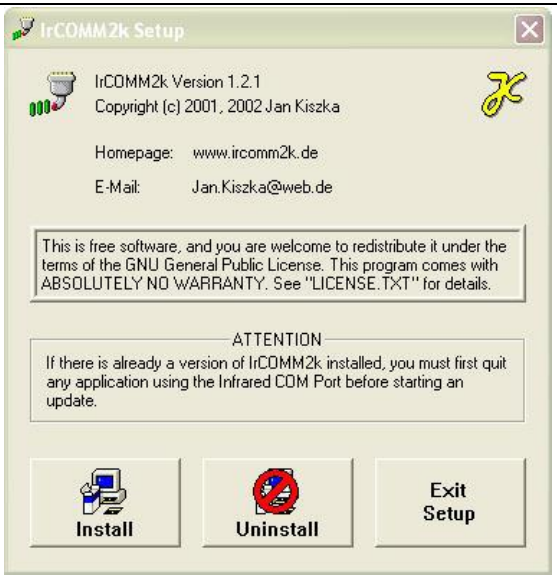


Figure 8. Select Com Port For IR Communication



Once the user has selected the port, the IRComm2K Setup window appears.

At this window, the user may choose to install the IR driver or exit without installing.

Figure 9. Install IR Driver

NOTE:
To install the IR driver later, go to My computer and access the program files.

In Figure 10. Install IR Driver Later, the Program Files are kept on the C: drive.

Go to C:\Program Files\alber\Alber Battery Analysis\IR driver, select Setup.exe, and follow the instructions.

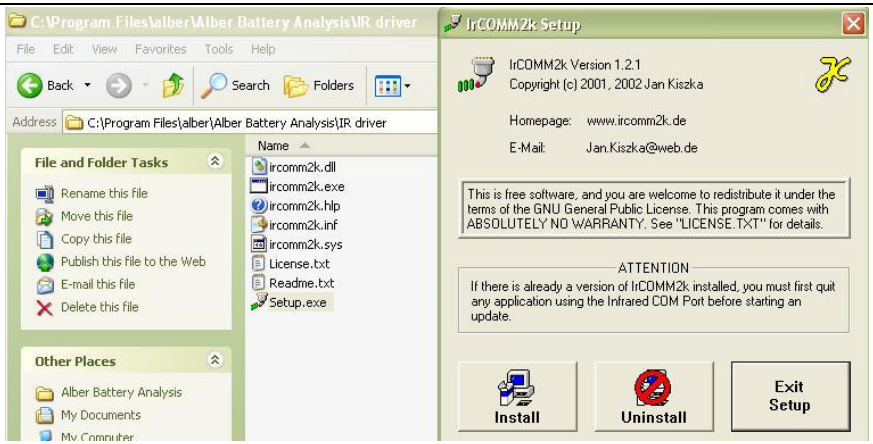


Figure 10. Install IR Driver Later

3 Start The Battery Analysis Software BAS Program

To start the BAS program, double–click the BAS icon on the desktop. Most BAS program functions can start using Main Menu selections or Toolbar buttons.

Figure 11. BAS Desktop Icon

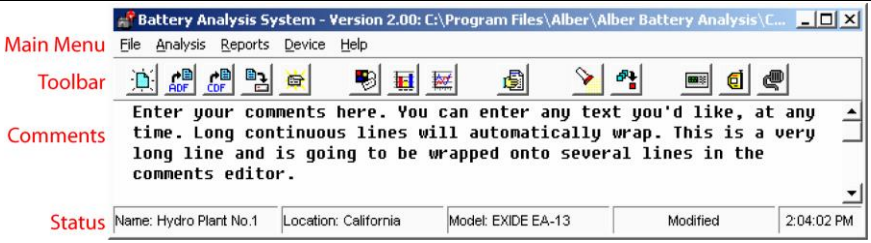


Figure 12. BAS Main Window Explained

The main window contains the **Main Menu, Toolbar,** battery file **Comments** and **Status** areas. Some toolbar buttons are not active unless a battery file is open.

Understanding The Main Menu Functions

Figure 13. Main Menu Toolbar;
File, Analysis, Reports, Device, Help

Figure 14. File Drop Down Menu

Figure 15. Analysis Data Set|Detail| Comparison

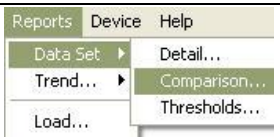


Figure 16. Reports Data Set|Detail| Comparison| Threshholds

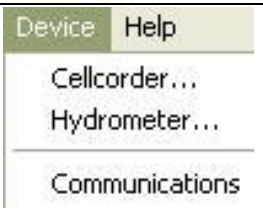


Figure 17. Device|Cellcorder| Hydrometer| Communications

Figure 18. Analysis Trend|Cells|Cell Averages

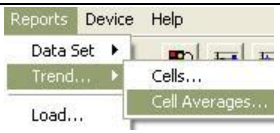


Figure 19. Reports Trend|Cells|Cell Averages

Figure 20. Help

3.1.1 Main Menu File|Item

> *NOTE:*
> *Some File Menu items described have no toolbar button equivalents.*

Item	*Explanation*
New	Opens the New ADF box for manually creating or downloading a battery file.
Open	Opens files in the Cellcorder ADF and CDFs subdirectories.
Reopen	Opens recently opened ADFs.
Save As	Saves an ADF with an existing or new name.
Close	Closes the currently open file.
Configuration Editor	Displays the Configuration File Editor windows.
Search	Opens File Search Tool, which reports on file locations.
Import	Brings DOS (DAT) files into an ADF.

Item	*Explanation*
Extract	Copies selected data sets from the open ADF to another ADF.
Merge	Copies selected data sets from an ADF into an open ADF. Not as flexible as File|Extract.
Properties	Accesses the General, Details, Intertier, Comments and User Defined windows.
Preferences	Selects display options.
Exit	Closes the BAS program.
Clear File List	Clears the list of recently opened files that appears when the user clicks File|Reopen.

Toolbar

NOTE:
Place the cursor over toolbar buttons to display descriptions.

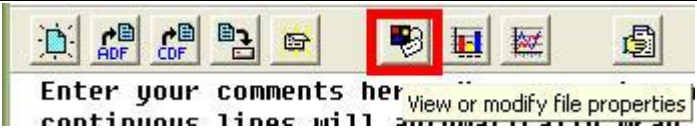


Figure 21. Cursor Over Toolbar Button With Message

Figure 22. Toolbar

3.1.2 Toolbar Buttons Explanation

	Create a new data file
	Open an accumulated data file ADF
	Open a cell data file CDF

	Save the current file
	Close the current open accumulated data file ADF
	View or modify file properties
	View battery data set graphs
	View battery cell trend graphs
	Create a data set detail report
	Search for data files
	Import Cellcorder files into an ADF
	Start the Cellcorder interface
	Start the hydrometer interface
	Configure communications options

3.1.3 Comments

When an ADF, battery data file is open, the Comments area displays user notes, such as battery maintenance information. Enlarging the main window vertically enlarges the Comments area.

Edit the Comments by using File|Properties….

NOTE:
File|Properties is accessible only when a file is open

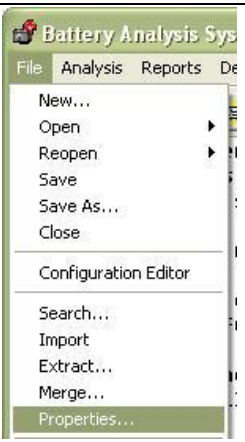


Figure 23. File|Properties

File|Properties…opens up to the General tab. Select the Comments tab on the File|Properties window.

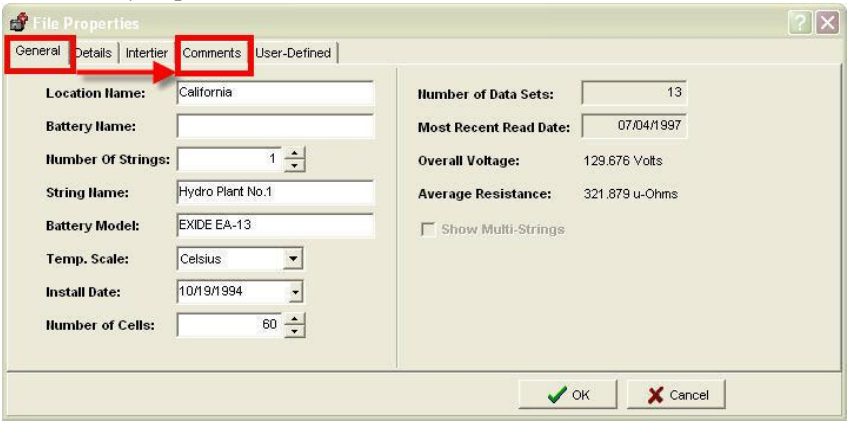


Figure 24. File|Properties|Comments Tab

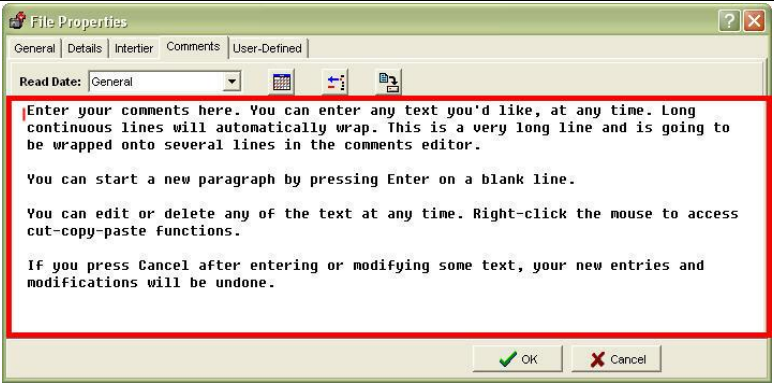


Figure 25. File|Properties|Comments

Edit as necessary within the space provided and press OK when completed or Cancel if necessary.

To hide Comments, select File|Preferences and uncheck the box next to Display File Comments on main window.

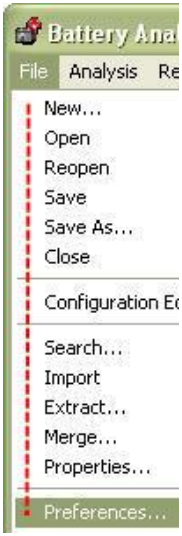


Figure 26. File |Preferences

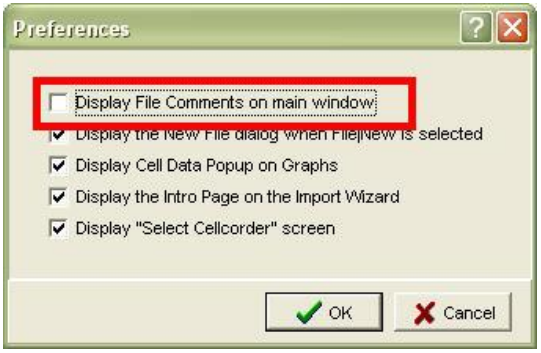


Figure 27. Preferences

Press OK once completed with the preference selections or Cancel if necessary.

Status

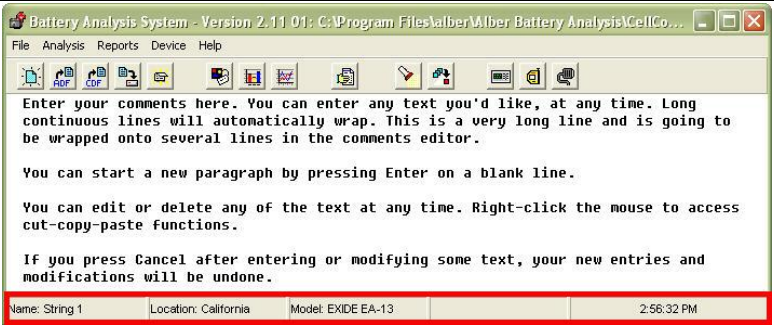


Figure 28. Status Bar

The Status bar at the bottom of the BAS window displays Name, Location, Model, file modification status, and time: active when a battery file is open. File Modification Status shows **Modified** when a file has been changed but not saved.

Figure 29. Status Bar – Modified – Indicates File Has Been Changed

File Types

The BAS program uses several file extensions.

Extension	*Explanation*
ADF	Accumulated Data File Contains sets of readings or imported data or CDFs.
BLF	Battery List File Used by the Battery List Editor under the Browse button on the Configuration Editor. The BLF file is created from battery model data entered by the user.
CAL	Calibration file One file for *each* Cellcorder in use.
CCF	CRT Configuration file Contains site setup information. One file for *all* Cellcorders in use.
CDF	CRT Cell Data File. One file for each battery string.

Extension	*Explanation*
CSV	Excel® Compatible CSV File Format The CRT now creates a CSV file when a CDF Cellcorder data file is created. The CSV file is used by Microsoft Excel to display data in spreadsheet format.
DAT	A battery data file created by the older DOS BAS program.
DB	A battery data file created by the older DOS BAS program.
PRG	CLC-200 Firmware upgrade file - typically overwrites the previous version.
QRP	A report file generated by BAS Ver 1.5.0.4 and earlier for the Report Viewer program.
UPG	CRT Firmware upgrade file Typically overwrites the previous version.
XLS	An Excel spreadsheet file created when graph data is exported in Excel format.
ZRF	A report file generated by BAS, Ver 1.7.0.8 and later for the Archive Reader program.

Make Backup Copy Of Sample Data

Use the sample file **Demo–60 Cell Hydro Plant Battery.ADF** to try features described in this manual.

> *NOTE:*
> *Be sure to save the modified sample file with a different name so that the original remains unchanged.*

Setting Preferences

Click File|Preferences to set display preferences.

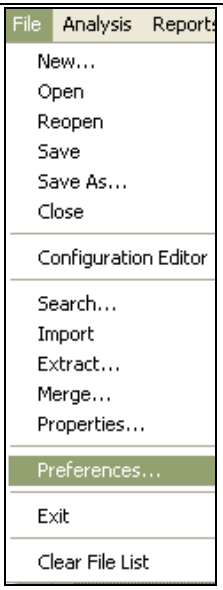


Figure 30. File|Preferences

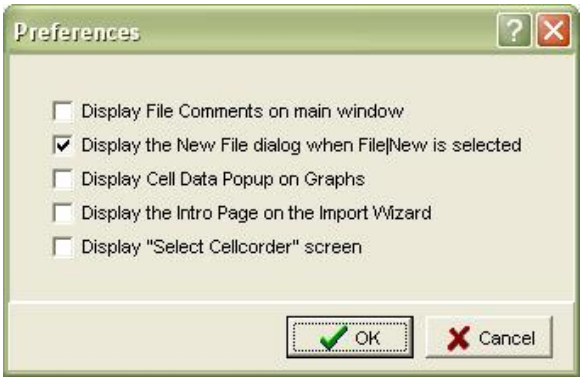


Figure 31. Preferences

File Comments

Displays the battery file comments area in the main window.

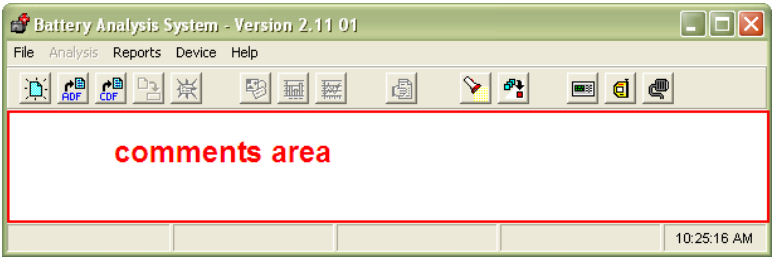


Figure 32. File|Preferences|Comments Area

New File

Causes the New ADF box to appear when File|New is selected.

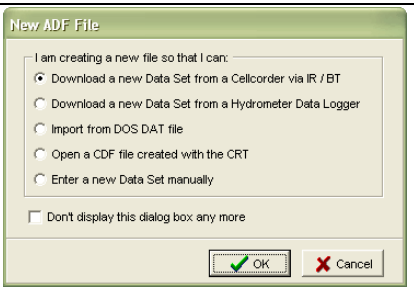


Figure 33. File New ADF Window

Cell Data Popup

Displays the Cell Data window on Bar Graph and Trending windows. This window displays cell data when a bar is clicked.

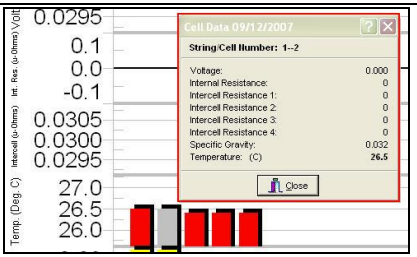


Figure 34. Cell Data Pop-up Window

Intro Window

Displays the Import Wizard introduction window.

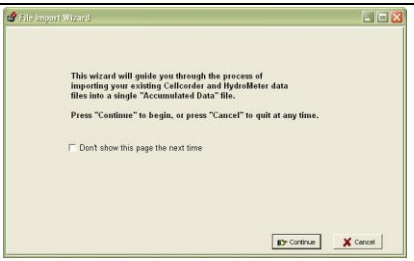


Figure 35. File Import Wizard

Select Cellcorder

Displays the CRT or CLC–200 option when the user starts the Cellcorder interface.

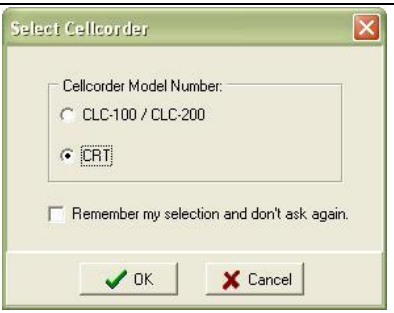


Figure 36. Select Cellcorder Window

Communication Setting: Default COM Port

Before connecting any device, such as a Cellcorder or Hydrometer/data logger, to the pc for data transfer, and if/when using *Bluetooth*® and/or IR, click Device|Communications to open Communication Settings.

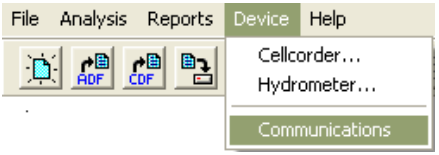


Figure 37. Device|Communications

Select a default COM (serial) port.
Press OK once the COM port is chosen or Cancel if necessary.

Figure 38. Communication Settings

NOTES:
If a message indicates that the port is unavailable, press OK and make another selection. The IR Com port will not be the same as the Bluetooth Com port, the Com port must be changed in BAS as necessary. Refer to 0 Quick-Check COM Ports PC/BAS on page 19 for more specific directions.

The COM port remains selected until it is manually changed or the user selects another port using the Cellcorder or hydrometer setup windows.

Figure 39. Choose Another Communications Port

Press  on the toolbar to Configure Communication Options.

Quick-Check COM Ports PC/BAS

If not already on, power on the PC.

Go to the PC's desktop, right-click on My Computer and scroll down to Properties.

Figure 40. My Computer|Properties

The System Properties window opens, select the Hardware tab.

Figure 41. System Properties|Hardware

Select Device Manager.

Figure 42. System Properties|Hardware|Device Manager

Scroll down to Ports (COM & LPT). In the example to the right, the *Bluetooth* COM Port is set to COM6 and the Virtual IR COM Port is set to COM4.

Figure 43. Ports (COM & LPT)

Start the BAS program, double–click the BAS icon on the desktop.

Figure 44. BAS Desktop Icon

Figure 45. Configure COM Port BAS

Click on the COM port icon and use the ▼down arrow to choose the appropriate COM port for the desired device.

Figure 46. Configure Appropriate COM Port

4 The IMPORTANT Configuration File Editor

NOTE:
It is highly recommended to set up configurations/sites prior to using the CRT/BAS for the first time for future ease of use.

To use the Cellcorder to create the file, refer to the Cellcorder User's Guide.

The CCF is the file that keeps all site information, it is important not to overwrite this file and it is important to keep a backup of this file.

This section describes how to use the BAS Configuration Editor to create and edit the configuration file, CCF.

Start the BAS program, double–click the BAS icon on the desktop.

Figure 47. BAS Desktop Icon

Select File|Configuration Editor from the Main Menu.

Figure 48. File|Configuration Editor

Multiple Sites - IMPORTANT

If more than one Cellcorder is used to read data at multiple sites, and one computer is capturing all the data, the CCF file must originate and be maintained using the Configuration Editor. This avoids having a different CCF file on each Cellcorder.

NOTES:

Once the CCF or BLF has been edited and changed, keep backup copies for future reference.

Any site created on the CRT and then linked to a CDF data file is added to the CCF file when the Previewer/BAS program opens the CDF.

General Tab – Configuration Editor

The Configuration File Editor opens the CCF file or, if none exists, indicates Site 0 of 0 on the General tab.

To create a CCF file if none exists, start completing the text boxes provided with the required information;
Location Name, Battery Name, Number of Strings, String Name, Model Number, Number of Cells, Install Date, Charger Frequency, and Cell Voltage Range.

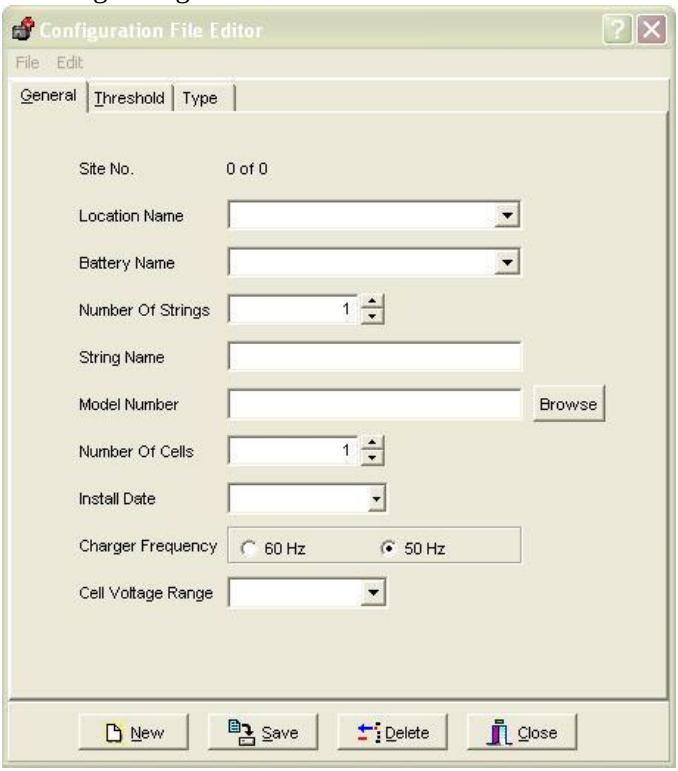


Figure 49. Configuration Editor

The following table is provided for entry explanation:

Site No.	Indicates what site is being displayed, as determined by the location, battery and string names selected.
Location Name	Type the location name of the battery installation.
Battery Name	Assign a unique name to the battery. The user cannot have two identical battery names under the same location name. Selecting different batteries changes choices in the String box.
Number of Strings	Select the number of strings that are associated with the battery.
String Name	Type a name for each string. The user cannot have two identical string names under the same battery name.
Model Number	Type the model number of the cells or click  to open the Battery List Editor. Refer to next section.
Number of Cells	The default total number of cells is 256. Normally, type the total number of cells in the string. The user may change the number for custom configurations.
Install Date	Type the battery installation date.
Charger Frequency	Selecting 50Hz or 60Hz lets the Cellcorder reject 50Hz or 60Hz ripple and harmonics.
Cell Voltage Range	Select the voltage range of the cells being tested.

NOTE:
Date and Time Format are automatically determined from the user's pc setup.

Figure 50. Configuration Editor|File|New| Save|Import|Exit

File|New has been discussed in the previous pages.

File|Save saves the CCF.

Use File|Import on the Configuration Editor to add sites from another CCF file.

If an existing battery/string name exists, an Error message window opens, select OK to go back and enter different information.

Figure 51. Error Message

Figure 52. Configuration Editor|Edit|Delete|Sort

Edit|Delete will delete the entire Site No#.

Edit|Sort sorts the CCF file on location, battery and string names.

4.1.1 Model Number/Browse/Battery List Editor Window

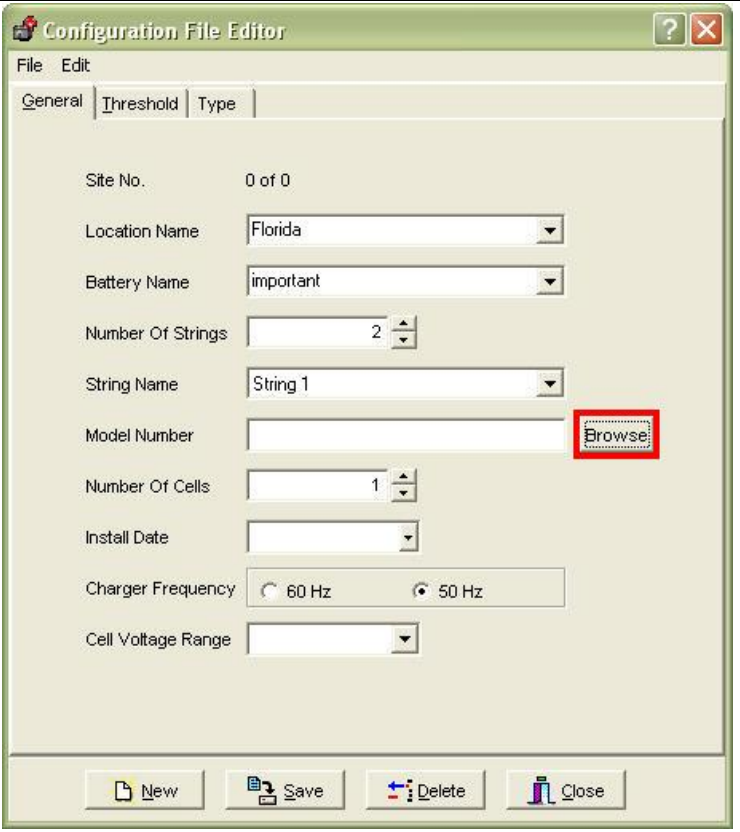


Figure 53. Configuration Editor

From the General Tab within the Configuration File Editor, the user may click 

to select from a variety of previously defined battery types within the file Battlist.blf.

The Battery List Editor allows the user to transfer preset parameters to the Threshold and Type tabs as well as entering the Battery's Model Number.

NOTE:
Data from the Battery List Editor is saved into the BLF file. To save and transfer the parameters to the Threshold and Type windows, click Save *then* OK.

The user must still complete the General tab.

Click Delete to remove a selected battery manufacturer and model setup from the Battery List Editor window.

Once Browse has been selected, the Battery List Editor window appears.

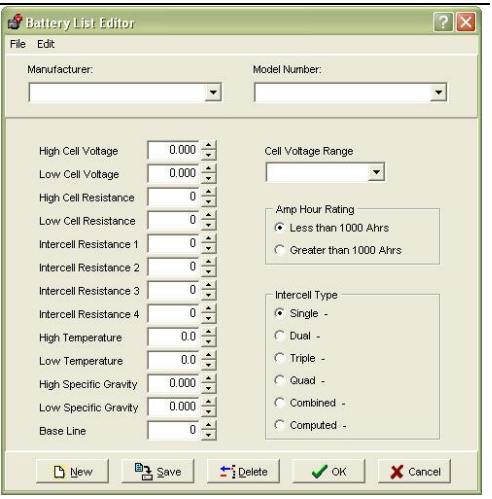


Figure 54. Battery List Editor

Select File from the Battery List Editor main menu.

At this time, the user may enter a New Battery and its information.

Alternatively, as in this scenario, the user has decided to import the already provided Battery List File by selecting Import From Another Battery List File.

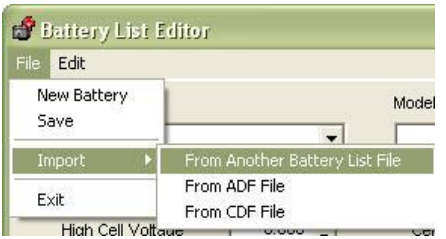


Figure 55. Import From Another Battery List File

Save and Exit are self-explanatory options here too.

Locate the 'newest' Battlist.blf file provided with the BAS setup CD/or edited by the user.

Highlight the file and press Open.

Figure 56. Helpful Battlist.blf

NOTE:
It is important to track all changes made in the Battlist.blf in case the file becomes corrupt. The user may always download the original Battlist.blf file from www.alber.com.

The set of instructions are for recovering the Battlist.blf file from the web and may be skipped by the user.

This file was developed to aid the user and to help populate typical values within the BAS for typical batteries used in the field.

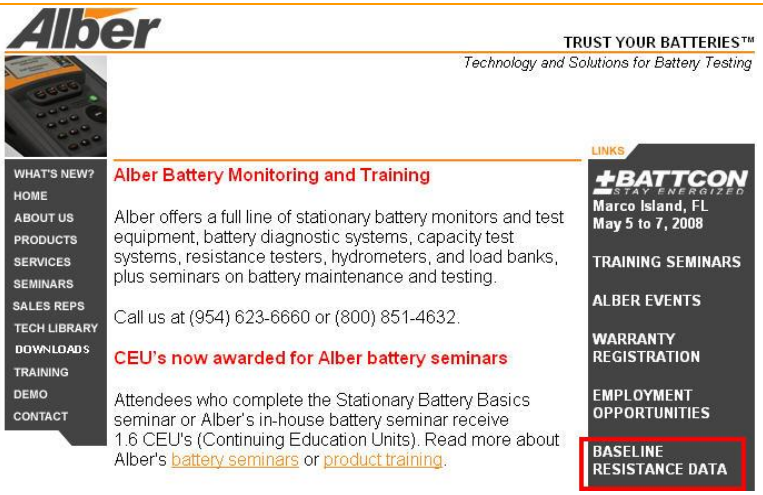


Figure 57. www.alber.com Baseline Resistance Data/Battlist.blf

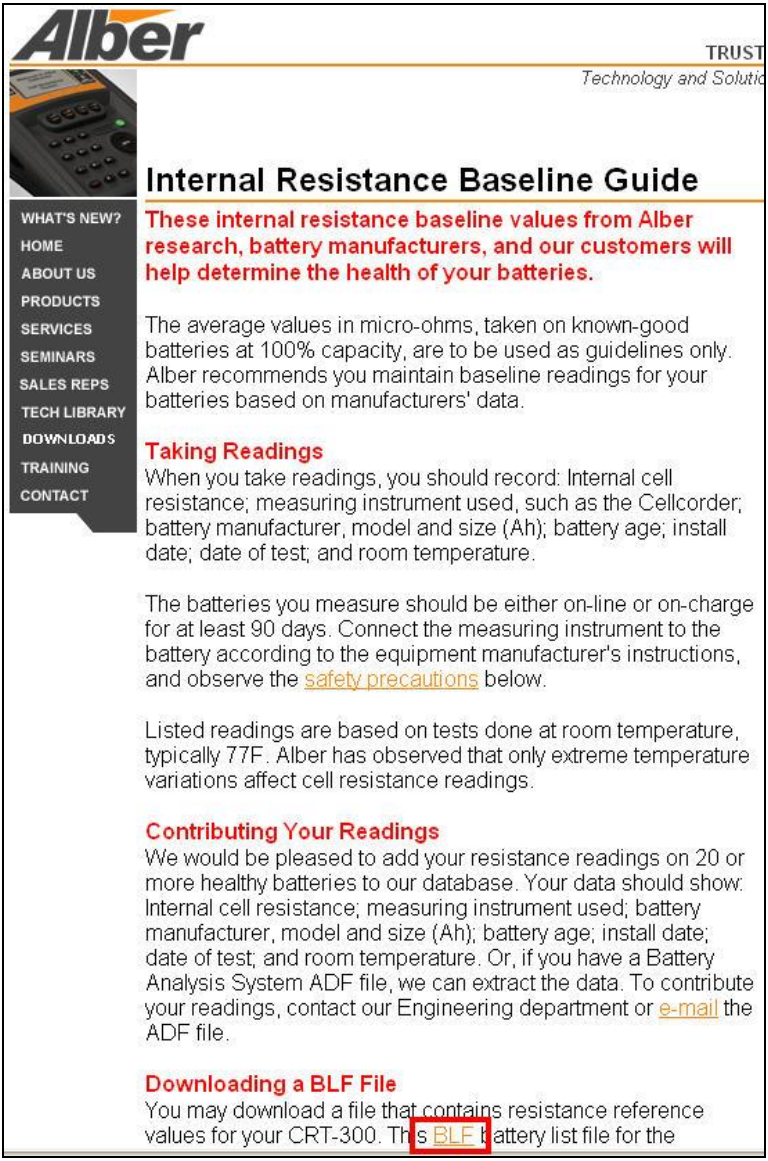


Figure 58. BLF On The Website

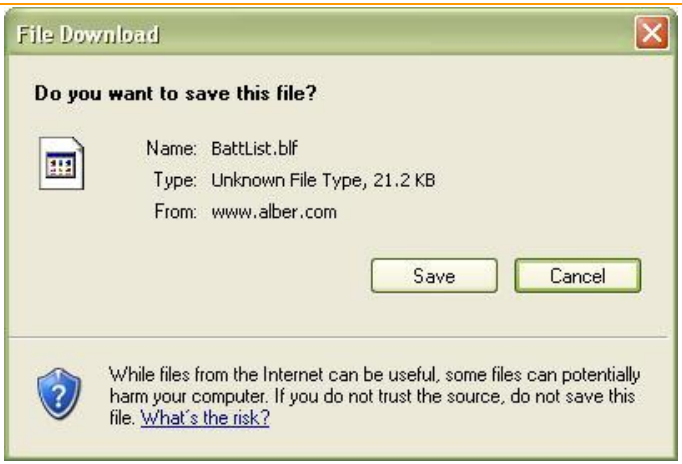


Figure 59. File Download BLF

Figure 60. C:\Program Files\alber\Alber Battery Analysis

Select Save and navigate to C:\Program Files\alber\Alber Battery Analysis or where the user may have program files stored to save the Battlist.blf for importing into BAS later.

The battlist.blf usually populates the Battery List Editor so the user can choose the Manufacturer, Model Number, Cell Voltage Range and enter all other necessary information for this battery. When the BLF is downloaded from the web, it may be necessary to import the BLF file as in the previous instructions.

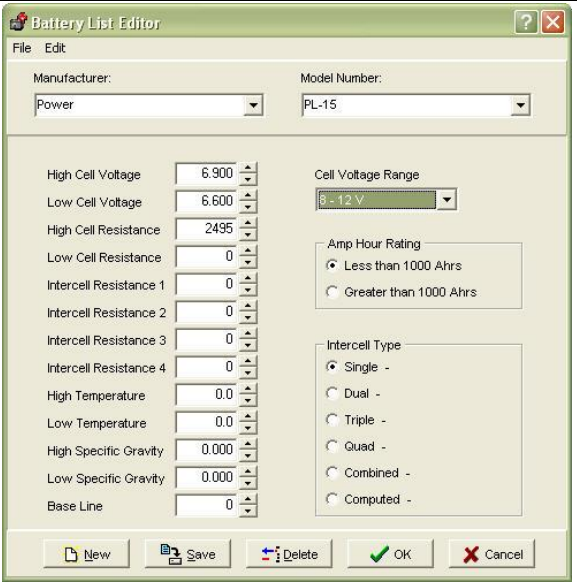


Figure 61. Imported Battlist.blf

NOTE TO TRANSFER PARAMETERS:
Select a Manufacturer and Model Number from the drop–down lists now populated by the Battery List File and click OK *to transfer the provided information to the Threshold and Type tabs.*

Figure 62. File| New Battery

Add a New Battery – To add parameters for a new battery manufacturer and model, click File|New Battery from the main menu.

Type in Manufacturer, Model Number, Voltages, resistances, temperature, specific gravity, cell voltage range, amp hours, and intercell type.

In the **Base Line** box, type the typical resistance of a known good cell for the type of battery.

Click Save to save the parameters for the new make and model in the list.

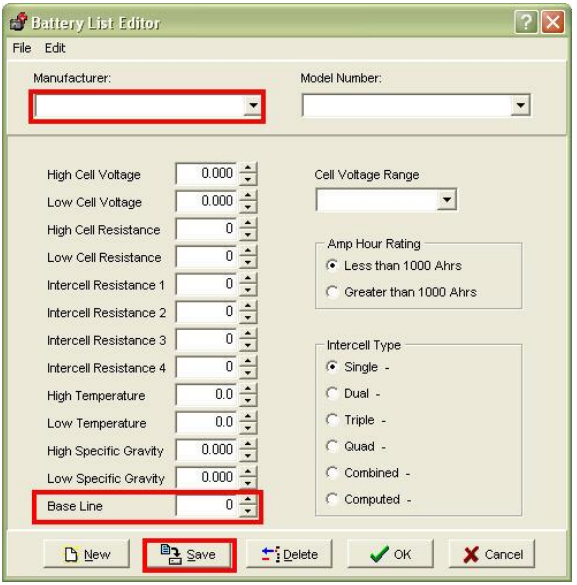


Figure 63. Battery List Editor New Battery

NOTE:
Data from the Battery List Editor is saved into the BLF file. To save and transfer the parameters to the Threshold and Type windows, click Save *then* OK.

Click Delete to remove a selected battery manufacturer and model setup from the Battery List Editor window.

Threshold Tab – Configuration Editor

Data in the Threshold tab configures the Cellcorder unit.

Use the Threshold tab to set low and high limits for voltage, resistance, temperature, and SG.

Select the Temperature Unit in C for Celsius or F for Fahrenheit.

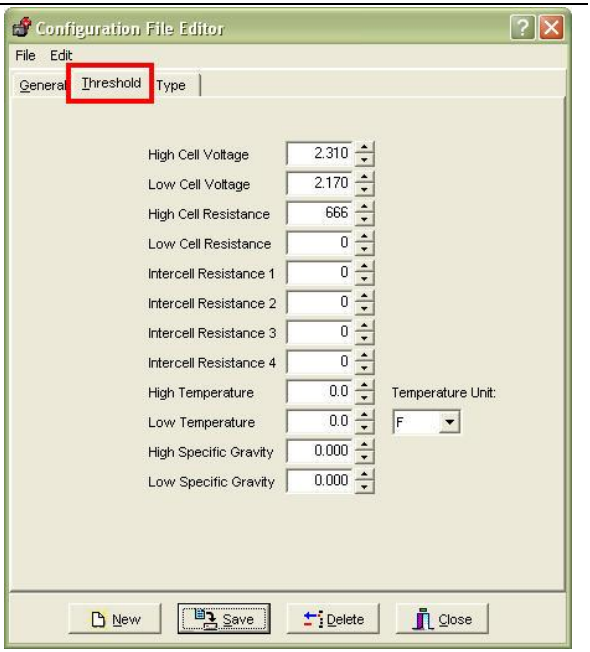


Figure 64. Threshold Tab

NOTES:
Threshold levels cannot be set to zero.

During testing, two beeps on the Cellcorder indicate limits are exceeded.

The Threshold Tab is not used for changing the display colors or threshold levels in the BAS program.

The Temperature Unit function, C or F is used for CRT setup and does not convert temperatures from F to C or C to F.

To convert temperatures in the program, use Temperature Scale/Temp. Scale on the File Properties window|General tab.

Press OK once Celsius or Fahrenheit appears as the selection or Cancel if necessary

Figure 65. File|Properties

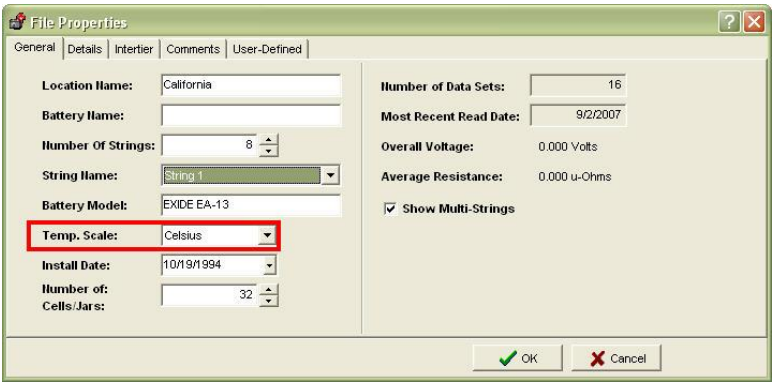


Figure 66. File|Properties|General Tab|Temp. Scale

Type Tab – Configuration Editor

Use the Type tab to set the Amp Hour Rating and Intercell Type.

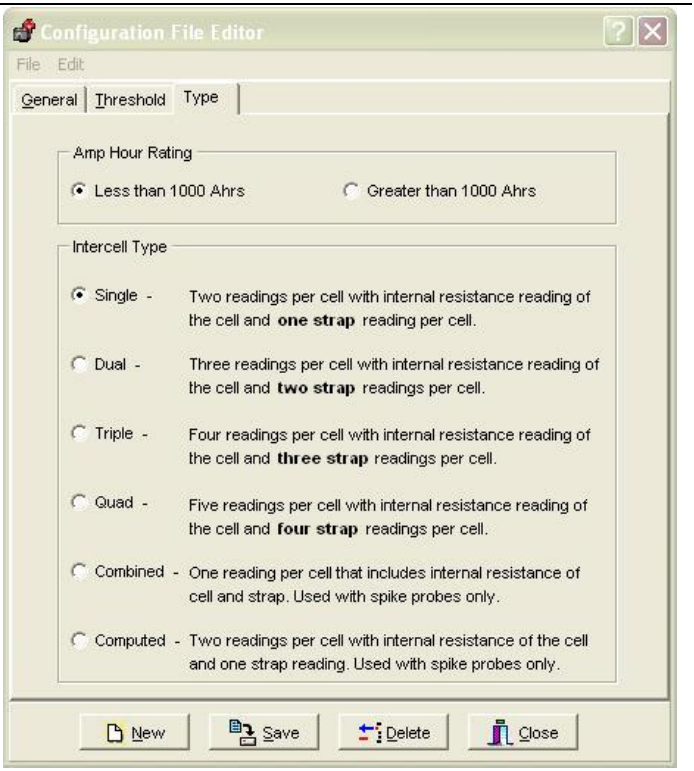


Figure 67. Configuration Editor Type Tab

4.1.2 Amp Hour Rating

Select the battery size, smaller or larger than 1000 Ah. This sets the length of time the Cellcorder applies a load during a load test.

> *NOTE:*
> *Select how many Intercell Connections IC per cell will be read (one to four) by choosing **Single**, **Dual**, **Triple** or **Quad**, or select **Combined** or **Computed.***

4.1.3 Single Testing

If the user is testing batteries with (2), two terminals and the batteries are connected in series.

4.1.4 Dual Testing

If the user is testing batteries with (4), four terminals and the batteries are connected in series.

4.1.5 Triple Testing

If the user is testing batteries with (6) six terminals and the batteries are connected in series or if (3) three positive terminals are connected together and the (3) negatives are connected together.

4.1.6 Quad Testing

If the user is testing batteries when each negative of (3) negative terminals are connected to each positive of the (3) positive terminals of the next battery.

4.1.7 Combined Testing

Combined testing is done in one-step using only two leads and does not require the use of the third intercell lead. Connect the positive lead to the positive post of the cell being tested. Connect the negative lead to the positive post of the next cell. The reading combines the cell resistance/Rc plus the intercell resistance/Ric. Using Combined, no μΩ values are displayed for Ric1 to Ric4. Combined is faster than Computed, but does not separately indicate cell and intercell resistance values, whereas Computed does.

> *NOTE:*
> *The combined mode of testing can be used on the last cell of a series.*

4.1.8 Computed Testing

Computed testing requires two steps using two leads. First, attach the leads to the positive and negative terminals of a jar connected to a second jar via an intercell connection, then perform the resistance test. Then, move the negative lead to the positive terminal (with the intercell connection) of the second jar and perform the resistance test. The CRT subtracts the lower Rc and displays two resistance readings: the cell Rc and the computed intercell Ric. Use Computed to determine if a problem is in the cell or in the intercell connection. Refer to Application Note CC–002–A for connection diagrams located in the CRT User's Guide or on the website.

NOTE:
The computed mode of testing can be used on the last cell of a series.

Refer to Application Note CC–002 and the Cellcorder CRT User's Guide to determine the intercell number and resistance lead connections.

Save

After entering all information into the General, Threshold and tabs of the Configuration Editor, click Save.

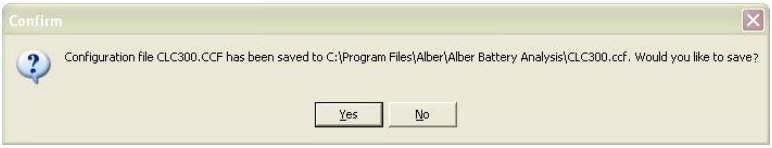


Figure 68. Saving The CCF

When this window appears, click Yes or No as appropriate.

- To save on the pc, locate where the program files are stored and save: in this case, the program files are stored on the local hard drive, C:\Program Files\alber\Alber Battery Analysis.
- To save to the memory card for CRT-300, put the card in the drive, navigate to the memory card drive, and save the file.
- To save to the USB device for CRT-400, insert the USB device and navigate via Windows Explorer to save the file.
- To transfer the CCF file to the CRT, refer to the *CRT User's Guide*.

CAUTION:

It is highly recommended that a backup copy of the configuration file CCF be kept safe in another location for the future, such as the USB device and the PC or a network drive within a backup folder and the local drive of the pc.

CAUTION:

REMEMBER, clicking **Delete** removes all configuration settings for the displayed location, battery and string. All associated set up data will be permanently lost.

5 The Basics Of The ADF: Accumulated Data File

An ADF:

- can be constructed manually,
- can be captured and converted from the CRT's *.CDF via IR, *Bluetooth* or USB and from the hydrometer data logger, or
- imported from a data file.

New data sets can also be appended i.e. sets of readings to the file. This allows for easy data management since only one file is maintained.

NOTE:
Date and Time Format are now automatically determined from the computer's setup.

Two sets of readings with the same date in the same file are not allowed.

Although an ADF can contain data from many Cellcorders or hydrometers, data can only go into the file only once per day, because the date identifies sets of readings.

The user can create a battery data file by entering the information. This file can be maintained manually or automatically by adding data to it from the Cellcorder or hydrometer data logger later.

Create A New ADF

To start the BAS program, double–click the BAS icon on the desktop. Most BAS program functions can start using Main Menu selections or Toolbar buttons.

Figure 69. BAS Desktop Icon

NOTE:
Select File|Preferences. Make sure the box next to Display the New File dialog when File|New is checked.

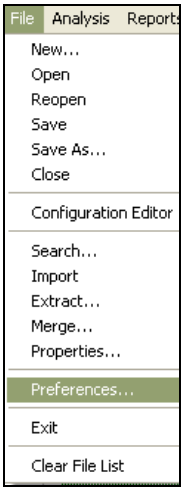


Figure 70. File|Preferences

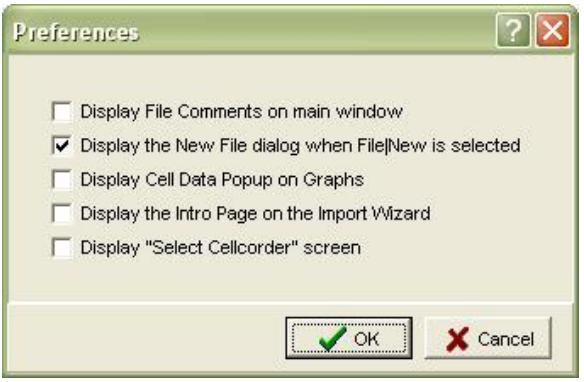


Figure 71. New File Dialog Under File|Preferences

To create an ADF, click File|New to display the New ADF window.

Figure 72. File|New

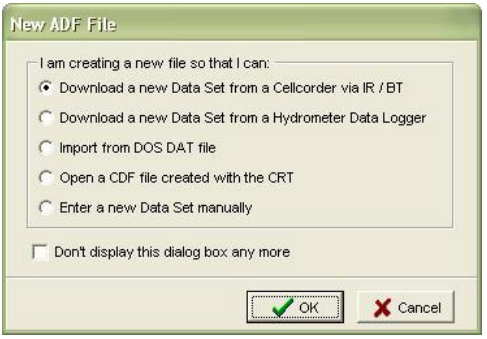


Figure 73. New ADF

Select a method to create the ADF by clicking into the radial button. The options include download from a Cellcorder or hydrometer, import a DOS DAT file, open a CDF, or enter data manually.

Press OK or Cancel if necessary.

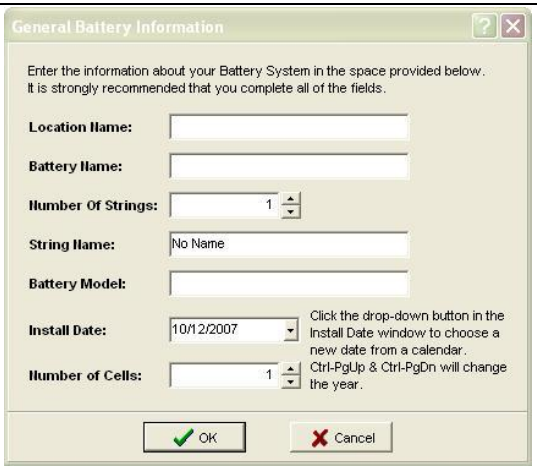


Figure 74. General Battery Information Window

For all but *CDF, clicking OK displays the General Battery Information window.

*

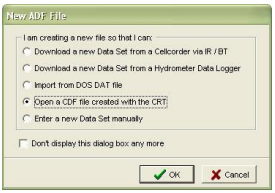


Figure 75. Open CDF

NOTE:
*If opening an existing CRT file *.CDF, setup information is extracted from the first file encountered during import.*

NOTE:
Details can always be edited and updated under File|Properties|General.

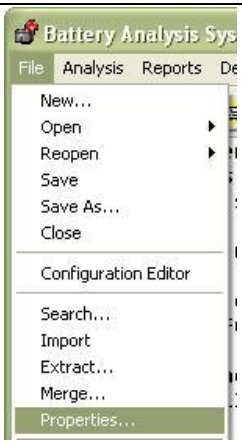


Figure 76. File| Properties

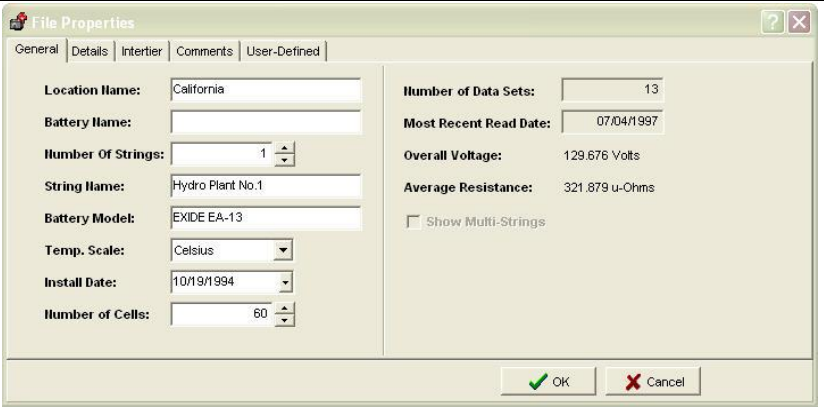


Figure 77. File|Properties|General

Open|Reopen An ADF For CRT Data

If *not* creating a new ADF and an ADF is not currently open, do these steps:

Click File|Open.

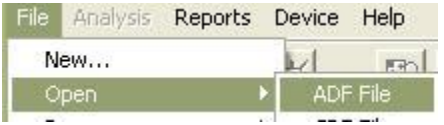


Figure 78. File Open ADF

Select the file from the Open an ADF window, by highlighting the file and clicking Open.

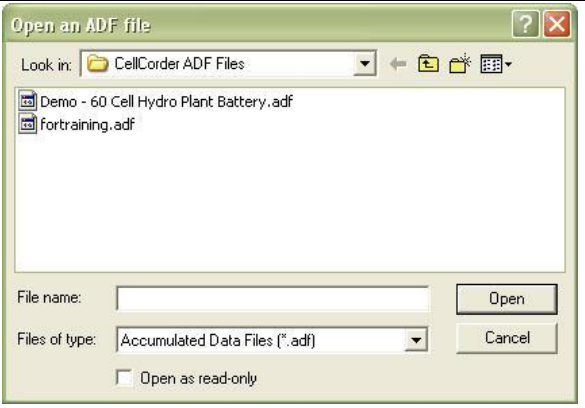


Figure 79. Open an ADF File

To Reopen select File|Reopen and open a file from the dropdown list.

Figure 80. File Reopen Existing ADF

6 File Properties – Editing Battery Data In The ADF

This chapter describes the five File Properties windows, which the user may use to edit battery data:

- General Properties
- Details
- Intertier Properties
- Comments
- User Defined Properties

Open a file.

NOTE:
If a CDF is opened, the software will import it into an ADF. For this example, the DEMO ADF is to be opened.

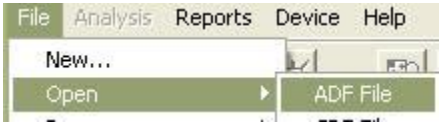


Figure 81. File Open ADF

Now click File|Properties.

NOTE:
The user must click File|Save to save changes made in these windows.

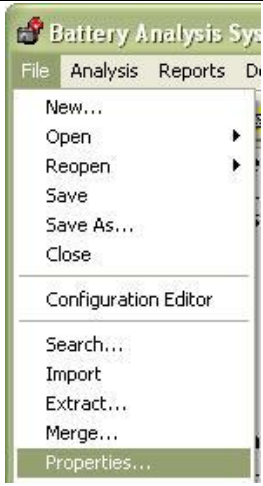


Figure 82. File|Properties

General Tab

Use the General tab to edit details such as battery name, model, location, and install date. Temperature scale and number of cells affects the battery data file.

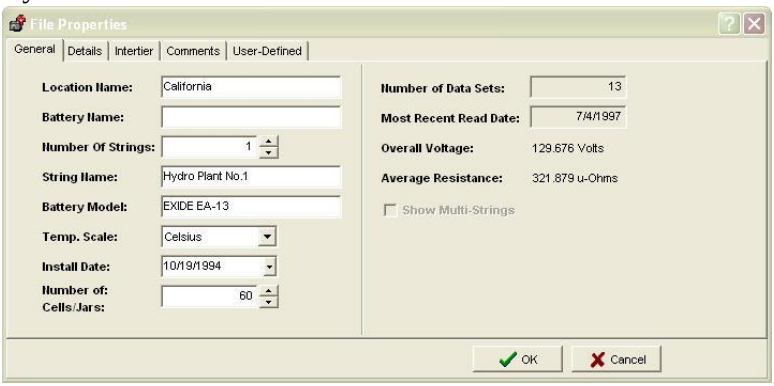


Figure 83. File Properties Window |General Tab

Edit the **Location Name**, **Battery Name**, **Number of Strings**, **String Name**, **Battery Model, Temp. Scale, Install Date** and **Number of Cells** in the boxes provided.

NOTE:
The user cannot have identical battery names under the same location name or identical string names under the same battery name.

Number of Strings	Select the number of strings that are associated with the battery.
Temperature Scale	Select Fahrenheit or Celsius to convert temperatures throughout the program. *NOTE:* *This selection does not change the values of data in the file. This selection does change the way in which the values are presented only.*
Install Date	Edit the date the battery was installed.
Number of Cells	This selection is normally set to the number of cells in the battery, but may be used to limit the number of cells shown on charts artificially. Number of Cells affects most data displays, graphs, reports, and calculations. Changes to this setting, however, do not affect actual cell data. No data is lost by reducing the number of cells; the excess cell values simply become unavailable to the program until the number is changed back to its original value.
Number of Data Sets	Changes each time a set of readings is imported to the file.
Most Recent Read Date	Indicates when the last set of readings was taken.
Overall Voltage and **Average Resistance (internal resistance)**	These values are calculated on the most recent set of readings.

Show Multi-Strings

Check this box to include more than one string in viewing window analysis or to include in printed reports.

NOTE:
Do not select for strings of 30 cells or more because graphs will appear overly compressed.

Details Tab

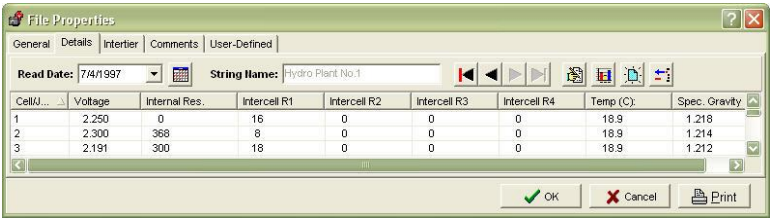


Figure 84. File|Properties|Details

The Details tab displays a table of values for all cells with data. Columns display cell number, cell voltage, internal resistance, intercell R1 to R4 resistance, temperature, and specific gravity. This list view can display cell data in colors based on threshold values, and intertier cell data in bold. To display a list view, open a file, then click File|Properties|Details.

NOTE:
Data is arranged as record oriented; typically, each column represents a field of a record, and each row one record.

To sort on a column (ascending/descending values), mouse click the column header.

To change column order, use the pc's mouse to drag the column header onto another header, then release the mouse button.

To change column width, use the pc's mouse to drag the dividing line between two headers.

Right–click over the list view or press <Shift> <F10> to access this menu to Show Threshold Colors, Set Thresholds, Graph, New, Edit, Modify Read Date, Delete and/or Cancel.

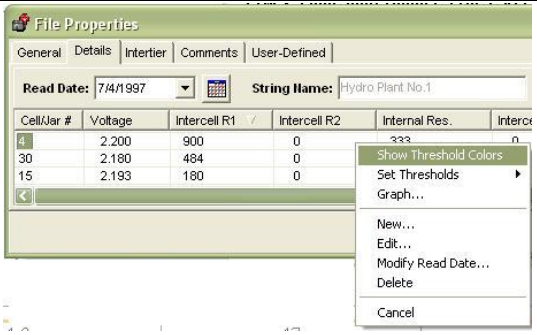


Figure 85. Right Click On Details List

6.1.1 Right–Click|Show Threshold Colors

To show data in color, right–click the list view. If Show Threshold Colors is not checked on the pop–up menu as shown in *Figure 85. Right Click On Details List*, right-click to highlight Show Threshold Colors to enable color. This also causes the list view to indicate intertier cell data in bold font.

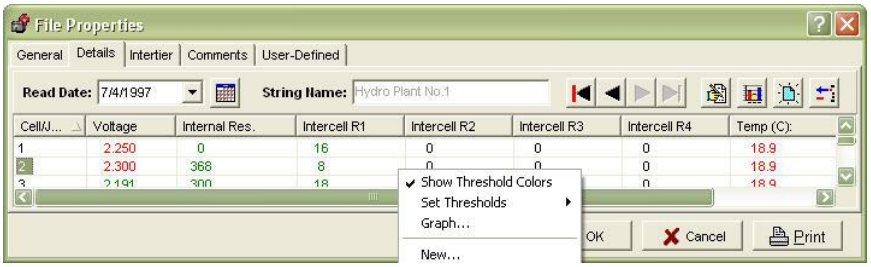


Figure 86. Show Threshold Colors

6.1.2 Right–Click|Set Thresholds

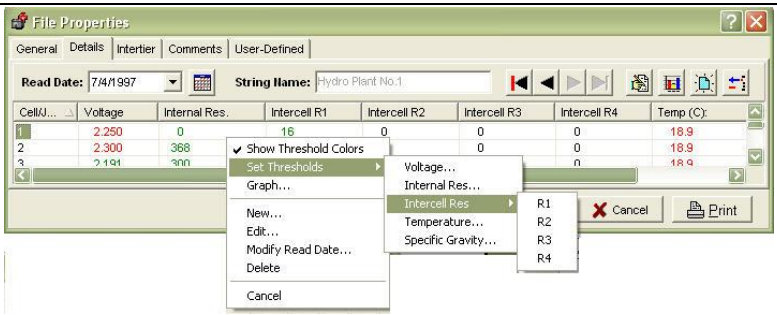


Figure 87. Set Thresholds

To set threshold levels and colors, click Set Thresholds on the right-click menu.

To Set Thresholds for Voltage, right-click, highlight Set Thresholds and then highlight Voltage.

Check **Enable Threshold Analysis** to display colors in the list on the Details tab.

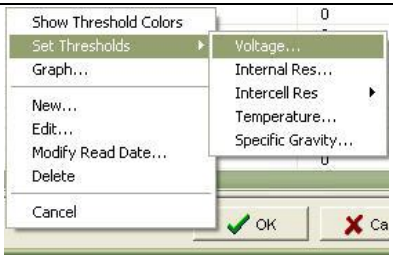


Figure 88. Set Thresholds|Voltage

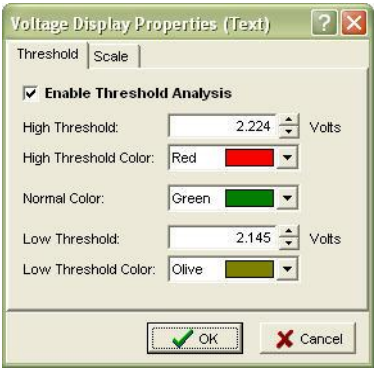


Figure 89. Voltage Display Properties|Threshold

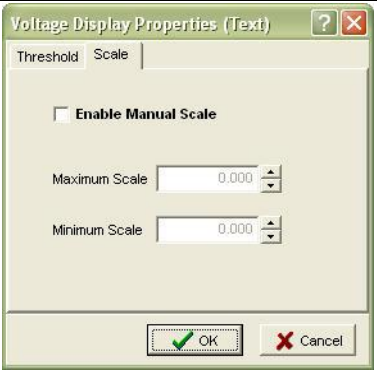


Figure 90. Voltage Display Properties|Manual Scale

NOTE:
High and low threshold levels cannot be set to zero.

The user may change the default colors on the Details tab at any time.

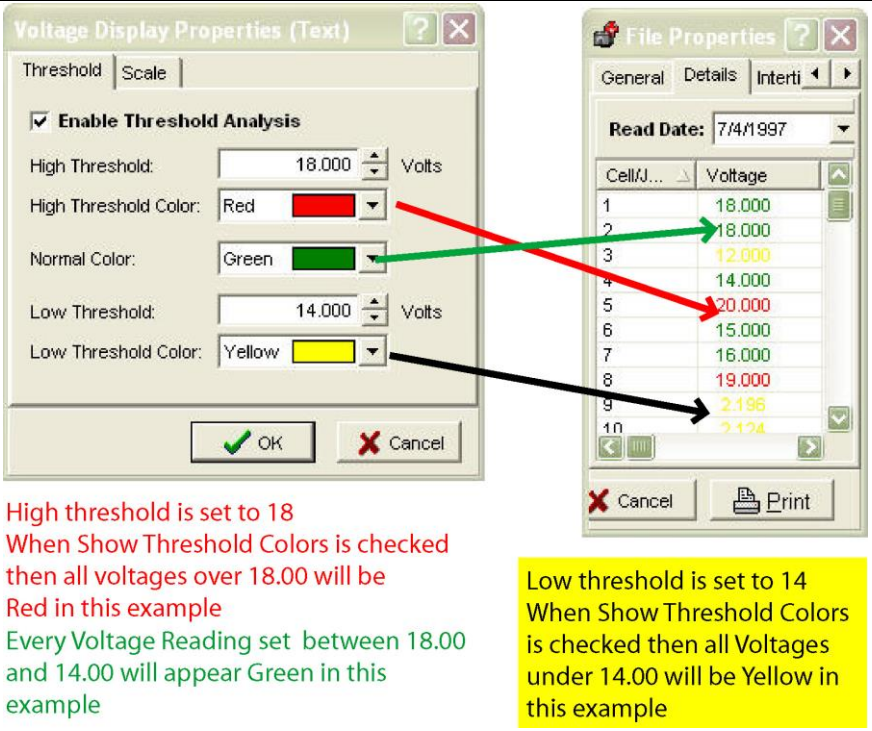


Figure 91. Example Show Threshold Colors Voltage

To Set Thresholds for Internal Resistance , right-click, highlight Set Thresholds and then highlight Internal Res...

Check **Enable Threshold Analysis** to display colors in the list on the Details tab.

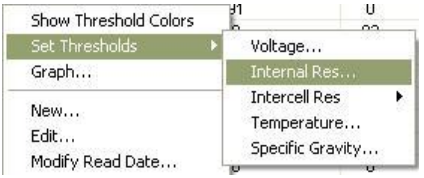


Figure 92. Set Thresholds|Internal Res…

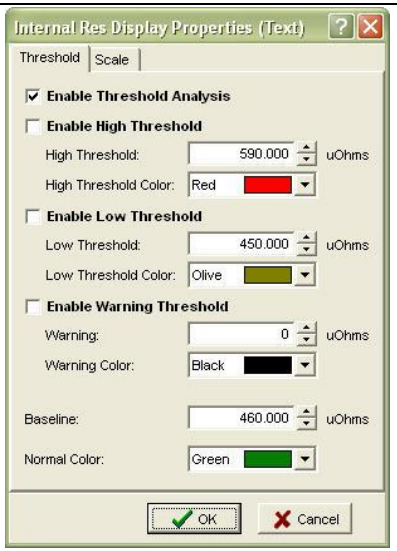


Figure 93. Internal Resistance Display Properties|Threshold

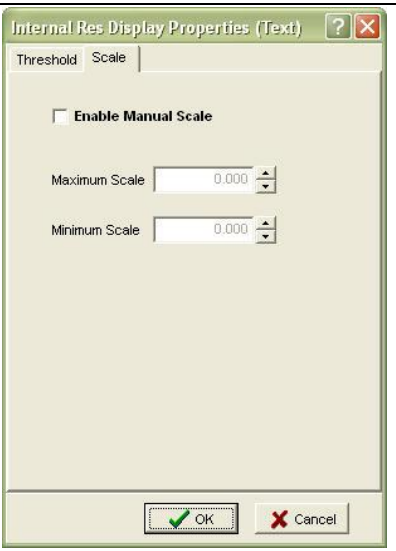


Figure 94. Internal Resistance Display Properties|Manual Scale

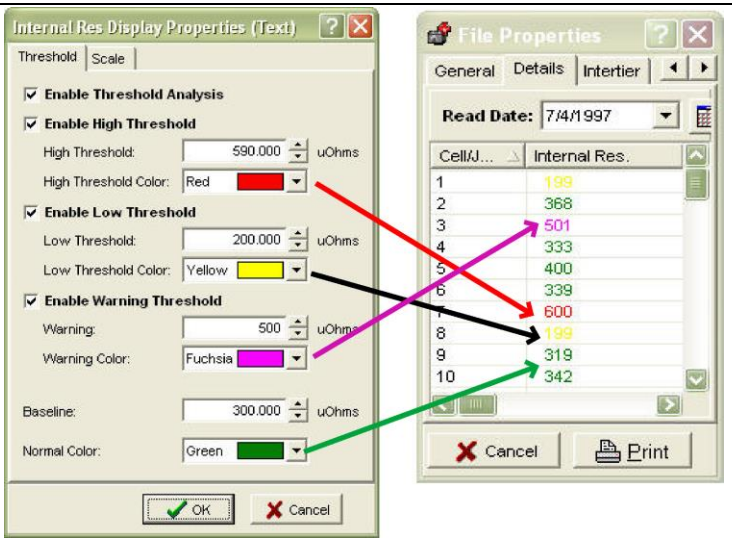


Figure 95. Example 2

High threshold is set to 590.000
When Show Threshold Colors
is checked and Enable High Threshold is checked
then all voltages over 590.000 will be Red in this example

The Warning threshold is set to 500
When Show Threshold Colors
is checked and Enable Warning Threshold is
checked then all voltages over 500 will be
Fuschia in this example

Low threshold is set to 200.00
When Show Threshold Colors
is checked and Enable Low Threshold is checked
then all voltages under 200.000 will be yellow
in this example

Baseline is set to 300.000
When Show Threshold Colors
is checked then all voltages
between the Warning Threshold setting
and Low Threshold Setting 590.000 will be Green
in this example

Details values take on colors as shown in Figure 95. Example 2.

NOTE:
Normally, set the High Threshold level 25% to 30% above the baseline value. After setting levels and colors, click OK.

Resistance readings above the Baseline indicate cells that are showing signs of deterioration.

Only the Internal Resistance setting has Baseline.

To Set Thresholds for Intercell Resistance r1-R4 , right-click, highlight Set Thresholds and then highlight Intercell Res and the appropriate intercell: R1, R2, R3 or R4.

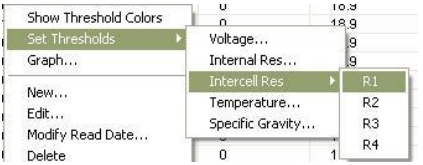


Figure 96. Set Thresholds|Intercell Res ▸ R1

Check **Enable Threshold Analysis** to display colors in the list on the Details tab.

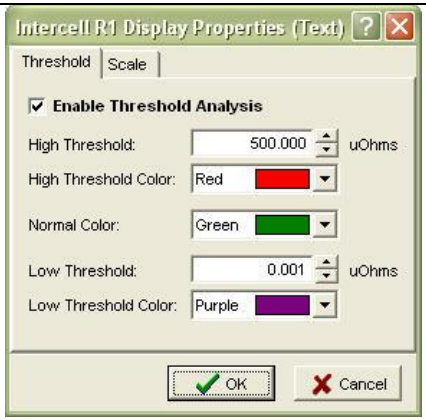


Figure 97. Intercell R1 Display Properties|Threshold

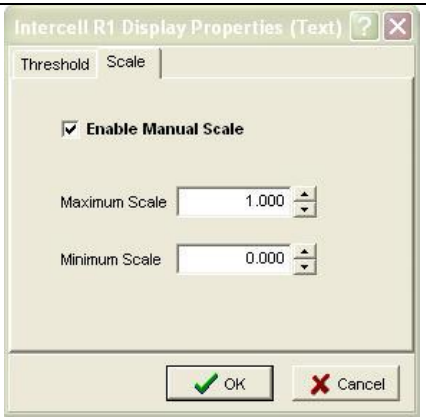


Figure 98. Intercell R1 Display Properties|Manual Scale

NOTE:
For an interesting effect, set Normal color to white. Normal values appear hidden, and only values that violate thresholds are visible.

6.1.3 Choosing a Data Set

Figure 99. Choose Data Set/Read Date

The Read Date box at the upper left indicates the date of the Data Set being displayed. Click the drop–down list to view another date.

6.1.4 Changing the Read Date

Modify read date of this data set  *or* Right–click|Modify Read Date.

To change the read date of an existing Data Set, select a Data Set from the Read Date box, then right–click the list view and choose Modify Read Date. Type a new date or click the date box drop–down button and use the calendar.

Figure 100. Right–click|Modify Read Date…

> *NOTE:*
> *The user cannot select a date being used by another Data Set in the file.*

6.1.5 Editing Cell Data

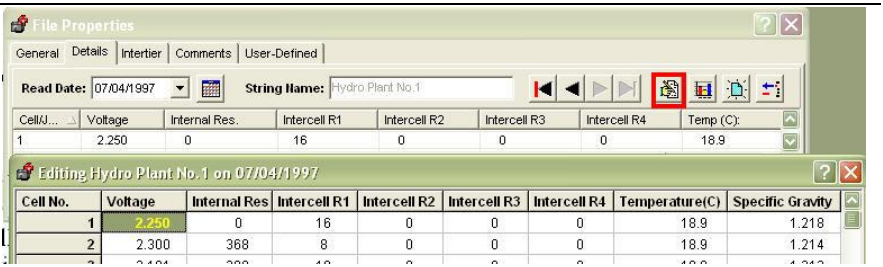


Figure 101. Edit Cell Data Value In File Properties Details Tab – Bottom Window In This Figure Is The Cell Data Grid Editor

Edit the values of the selected cell  *or* Right–Click|Edit *or* double–click cell.

To use the Cell Data Grid Editor to change Details tab data, double–click a cell/jar# within the list or right–click the list view and choose Edit.

The editor indexes to the row clicked.

Use the mouse, Tab or Arrow keys, highlight data to change, type the new data, and press the Enter button on the pc's keypad to record changes in the list.

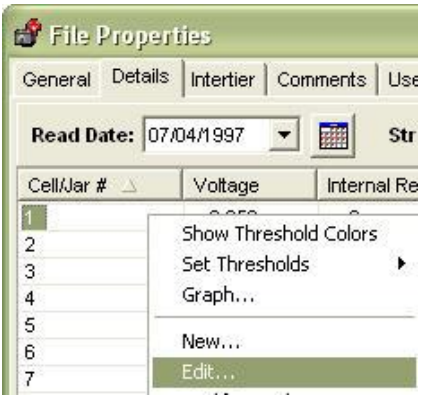


Figure 102. Right-click Edit

The Grid Editor shows changes in red.

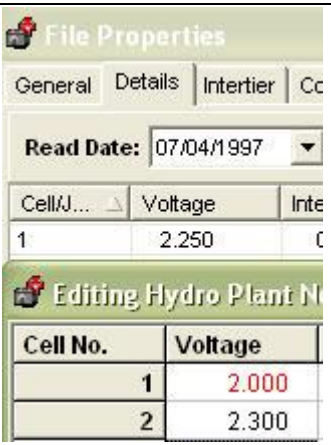


Figure 103. Cell Data Grid Editor Changes

When editing is complete, click OK.

NOTE:
Unlike the list view, the Cell Data Grid Editor does not display threshold colors or identify intertier cells.

6.1.6 Configuring Detail Threshold Colors

The Details tab can display cell data in color. The threshold levels that determine the colors are the same as those for graphs, but Details list color choices are independent of graph colors.

Intertier Tab

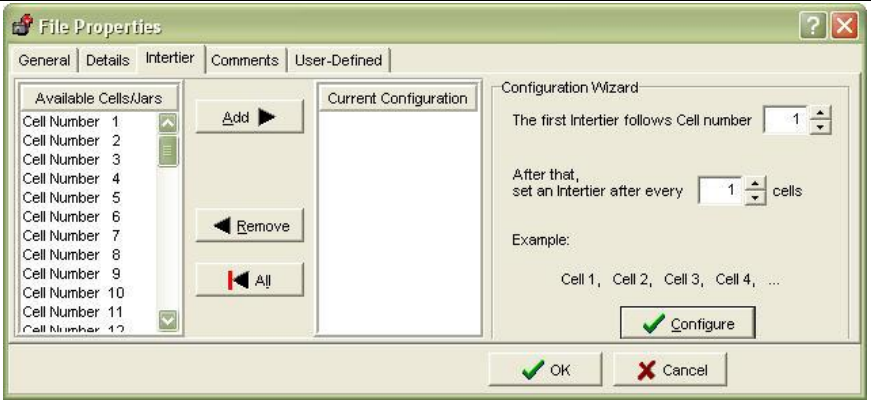


Figure 104. Intertier Tab|File Properties

The Intertier tab allows the user to mark cells in a battery as intertier cells to indicate they are on the boundary of an intertier connection, manually or automatically

> ***NOTE:***
> *Be certain Number of Cells on the File|Properties|General tab is correct before marking intertier cells. Marking intertier configuration affects intercell resistance calculation. Cells marked as intertier cells are ignored when calculating high, average, and low intercell resistances for a series of cells because intertier cells have much higher intercell resistance than other cells.*

By convention, only the cell with the lower cell number is marked. For example, if Cell 10 is the last cell of one string and connected to Cell 11, which is the first cell of the next string, only Cell 10 is marked as an intertier cell. To configure intertier cells, open a battery file, then open the Intertier tab.

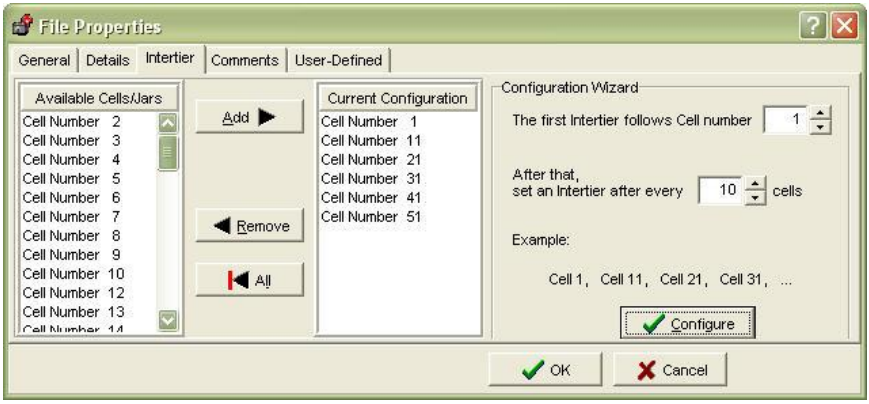


Figure 105. File Properties|Intertier Tab

On the Intertier tab, **Available Cells** lists cells not designated as intertier cells. When first displayed, the list contains all the cells for the battery, since none are yet marked. **Current Configuration** lists cells marked as intertier cells. The **Configuration Wizard** is one of the three ways the user can create an intertier configuration.

1

Select cells in either list, then click Add, Remove or All.

Add	Moves selected cells from Available Cells to Current Configuration.
Remove	Moves selected cells from Configuration to Available
All	Moves all cells from Configuration to Available.

To select multiple cells, hold the Ctrl key down and click cell numbers. To select a group of cells, click the first cell in the group, hold Shift down, then click the last cell in the group. When the configuration is finished, click OK.

2

Select one or more cells in either list and drag them onto the other list. When finished, click OK.

Use the Configuration Wizard to create an intertier configuration automatically

> *NOTE:*
> *First if necessary, click* All *to clear Current Configuration.*

3 On the Wizard, fill in the **First intertier follows cell number** and the **Set an intertier after every # cells** boxes. The Wizard Example area shows the start of the sequence. Click Configure to display the results in the Current Configuration list. The user may edit the list using Add or Remove. When finished, click OK Cancel as necessary.

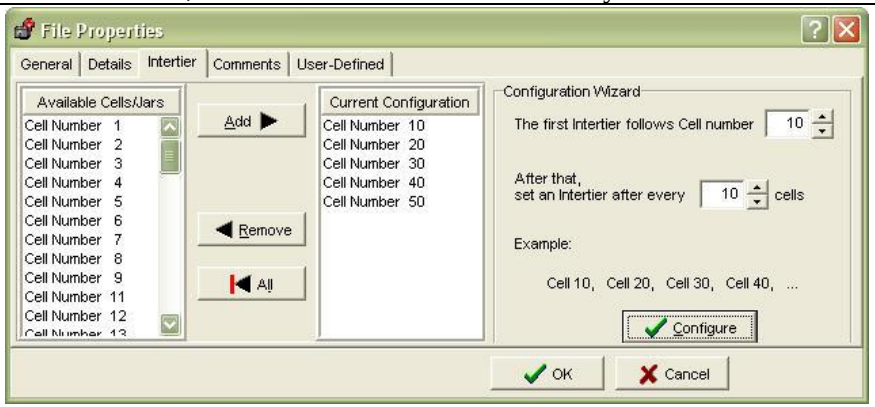


Figure 106. Configuration Wizard|Intertier Tab|File Properties Window

As an example, if a 59-cell battery has intertier cells at 10, 20 and 30, enter 10 in **First intertier follows Cell number** box and it will automatically populate the **Set an Intertier after every # cells** to indicate an intertier every 10 cells, beginning with cell number 10.

Comments Tab

The Comments tab has a text editor for typing comments, such as the date and type of readings taken or when connectors were cleaned.

> ***NOTE:***
> *To copy or paste comments, highlight the text, right click the Comments area to open the edit menu, click Copy. Click Paste to place the text.*

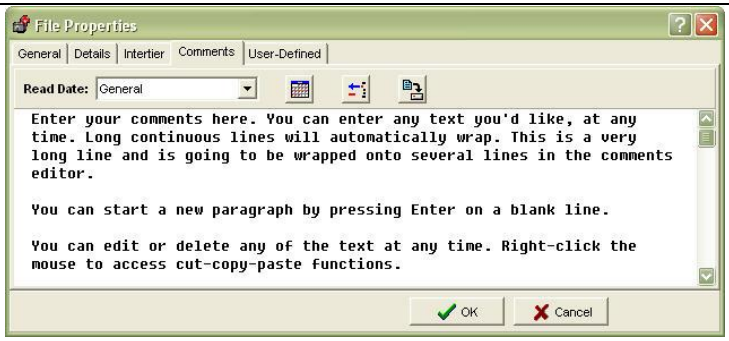


Figure 107. File Properties|Comments Tab

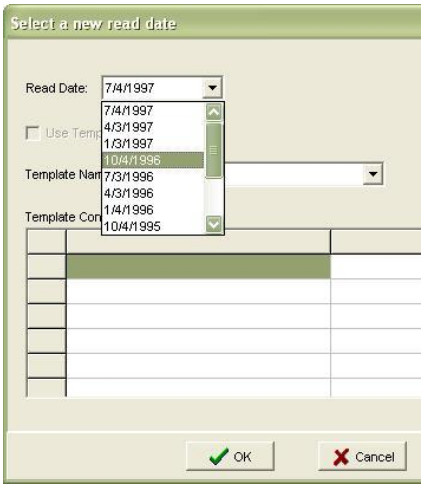


Figure 108. Select A New Read Date

Create a new comment for a read date by clicking  , select from the Read Date drop–down list, then click  as necessary.

6.1.7 Read Date

The Create a new comment for a read date by clicking , select from the Read Date drop–down list, then click OK Cancel as necessary. allows the user to associate comments with a Read Date.

In the Properties|Comments tab, type the comments to be associated with the Read Date.

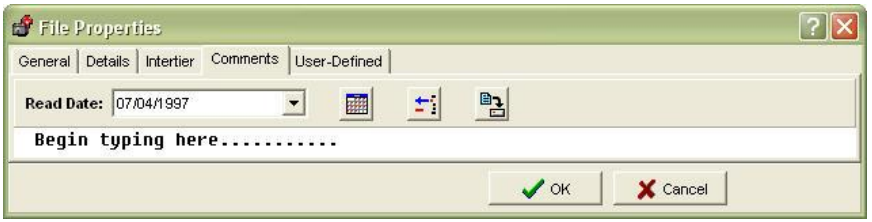


Figure 109. File Properties|Comments Tab Begin Typing

6.1.8 Create And Use A Template

To save information entered into the Comments tab as a template, click the Save As New Comment Template button .

A confirmation window opens and asks for confirmation, press Yes or No as appropriate.

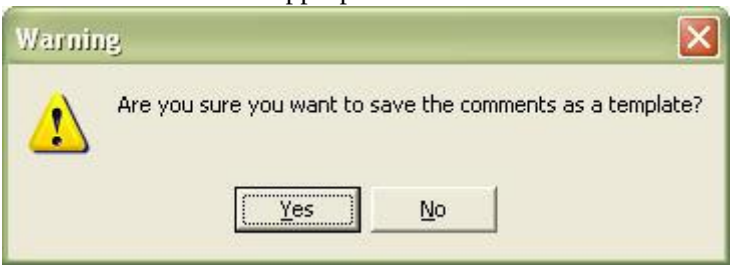
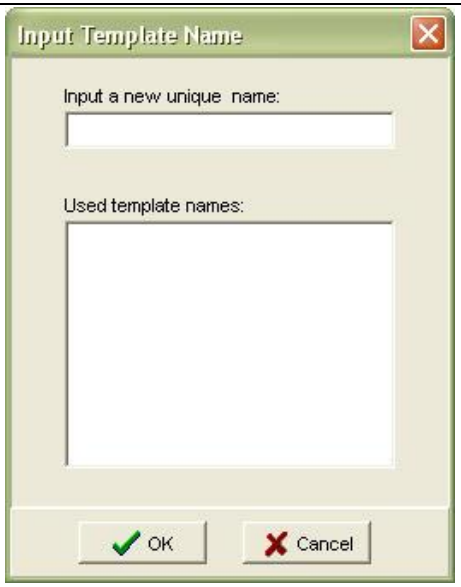


Figure 110. Warning To Confirm Comments Template



In the Input Template Name window, type a unique template name in the box provided and then click OK or Cancel as necessary.

Figure 111. Input Template Name

6.1.9 Create A New Comment For A Read Date

To use a template, from the Comments tab, click the Create New Comment for Read Date button . In the Select a New Read Date window, choose a Read Date, check Use Template, choose a Template Name, then click OK. The template text appears in the Comments tab and will be associated with the Read Date.

> *NOTE:*
> *Templates can be assigned only to dates not already in the Read Date list on the Properties|Comments tab.*
>
> *If a template exists, then the template can be chosen in the Read Date window.*

6.1.10 Delete A Template Name 

To remove a Comments Template Name, press  and the Select a New Read Date window opens, select the template name from the drop–down list, then click 

.

NOTE:
A warning window will ask the user to confirm deletion.

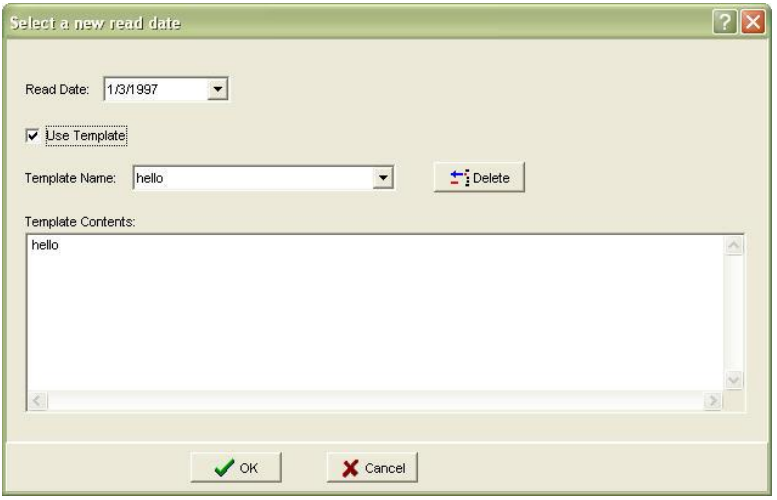


Figure 112. Use Template Delete Key

6.1.11 Delete Comments 

To remove Comments, press  .

NOTE:
If the Comments area does not appear in the main software program window, check File|Preferences or enlarge the window vertically.

User–Defined Tab – Properties

Use the User–Defined tab to list reference notes. The notes, which can be included in reports, might identify pilot cells or equipment such as chargers.

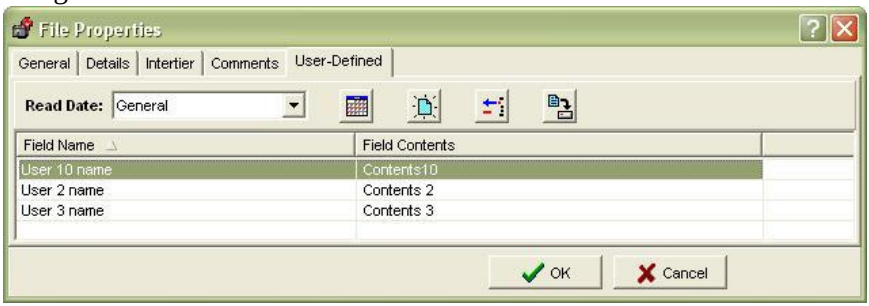


Figure 113. File Properties|User-Defined Tab

6.1.12 Create A New User-Defined Field

To add a field, click the **Create a New Field** button. Single click into a highlighted line to type the field name; double click to type field contents. Click OK or Cancel as necessary.

6.1.13 Delete A User-Defined Field

To delete a field, highlight the line and click the **Delete Selected Field** button.

6.1.14 Create New Fields For A Read Date

The Select a New Read Date window allows the user to associate fields with a Read date. Click the Create New Fields for Read Date button, select from the Read Date drop–down list, then click OK or Cancel as necessary.

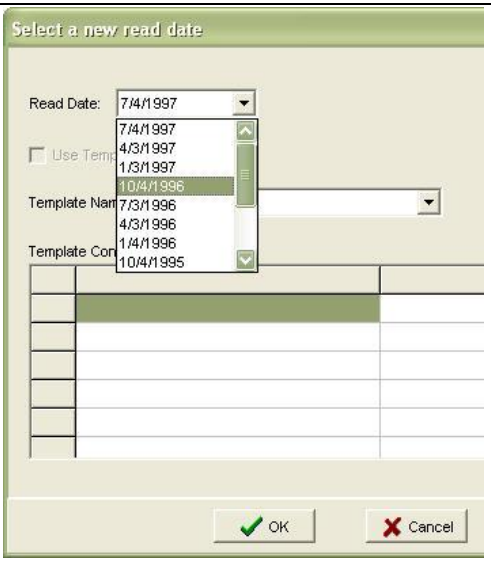


Figure 114. Select A New Read Date

On the User–Defined tab, click Create a New Field button and add field details. Single click into a highlighted line to type the field name; double click to type field contents.

6.1.15 Save As A New Field Template

To save a User–Defined tab as a template, click the Save as New Field Template button. At the Input Template Name box, type a template name then click OK or Cancel as necessary.

> *NOTE:*
>
> *Templates can be assigned only to dates not already in the Read Date list on the User–Defined tab.*

7 Specific Methods Of Creating ADFs

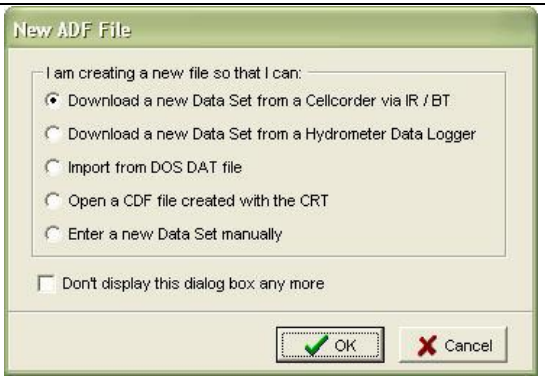


Figure 115. New ADF

The window above shows different ways the user may create new ADFs.

IMPORTANT NOTE:

*Either create a new *.ADF or Open/Reopen an existing *.ADF.*

NOTE:
It is highly recommended to set up configurations/sites prior to using the CRT/BAS for the first time for future ease of use. See Chapter 4.

To use the Cellcorder to create the file, refer to the Cellcorder User's Guide.

Download A New Data Set From CRT *(.CDF) Via IR

NOTE:
If both the Cellcorder and hydrometer data logger have data for the same parameters, it is important which data the user captures first, because data captured last overwrites data captured first. For example, if the user captures Specific Gravity SG and Temperature data from the Cellcorder first and then the hydrometer, the hydrometer data will overwrite the Cellcorder data.

This process captures cell voltage, resistance data, and site setup data, including location names, dates, and thresholds.

To start the BAS program, double–click the BAS icon on the desktop. Most BAS program functions can start using Main Menu selections or Toolbar buttons.

Figure 116. BAS Desktop Icon

IMPORTANT NOTE:

*Either create a new *.ADF or Open/Reopen an existing *.ADF, refer*

on page 21 or wait until the Battery Data Capture window appears to create a new file or open an existing file.

To create an ADF for CRT data, do the following. Create a new data file  or on the Main Menu, click File|New.

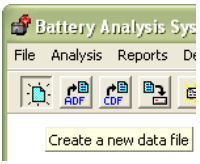


Figure 117. Create New ADF

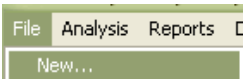


Figure 118. File New

In the New ADF file window, click into the radial button; Download a new Data Set from a Cellcorder via IR/*Bluetooth*. Press  or  if necessary.

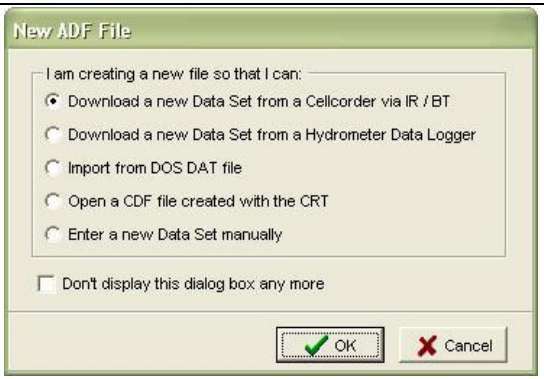


Figure 119. New ADF Window

In the General Battery Information window, type: Location Name, Battery Name, Number of Strings, String Name, Battery Model, Install Date, and Number of Cells measured in the string.
After filling in the information, press OK or Cancel if necessary.

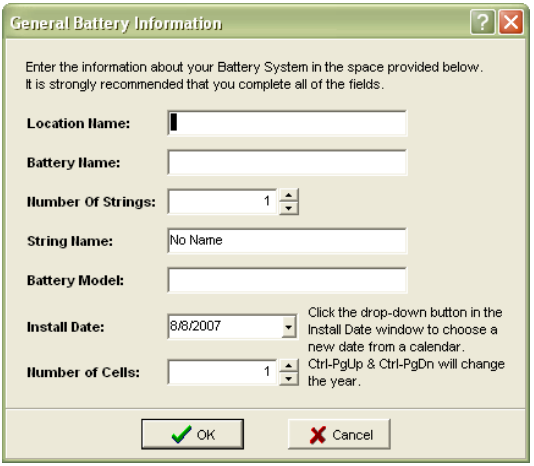


Figure 120. General Battery Information

NOTE:
It is best to accommodate multi-string information within the General Battery Information window at the beginning of a session.

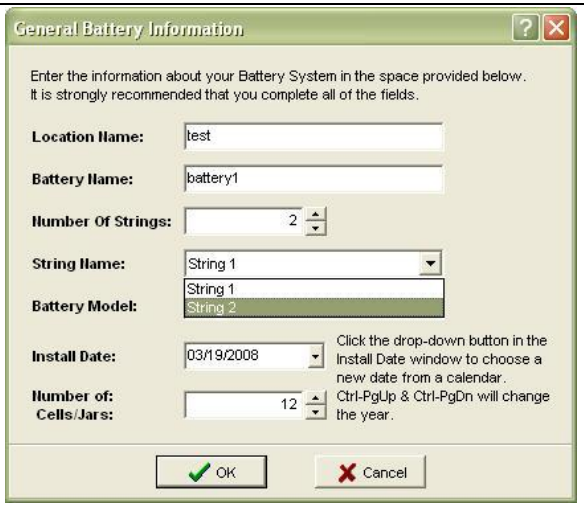


Figure 121. Multi-String Information In The

General Battery Information Window

In the Select Cellcorder window, choose CRT.

Press OK or Cancel if necessary.

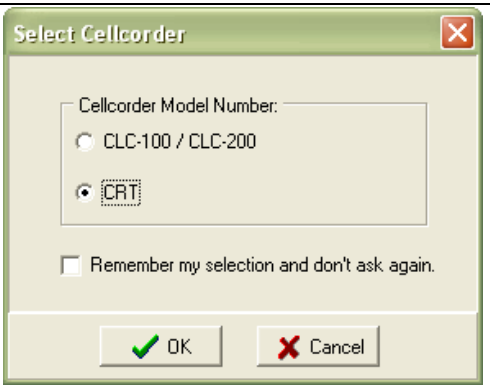


Figure 122. Select Cellcorder

NOTE:
If the Remember my selection… box is checked, this window will not continue to appear.

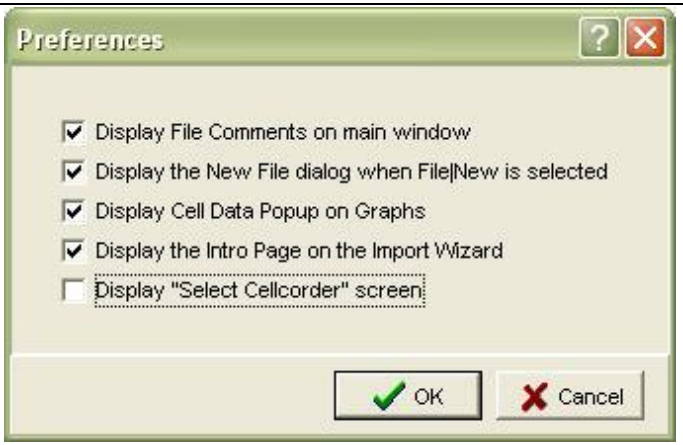


Figure 123. Do Not Display Cellcorder Screen

NOTE:
If the Select Cellcorder preference is not selected under preferences, this window will not appear.

The Instructions for CRT window opens.

Make sure the CRT is powered ON.

Press the 

button

then press the button to send.

Press to choose the IR method of transfer.

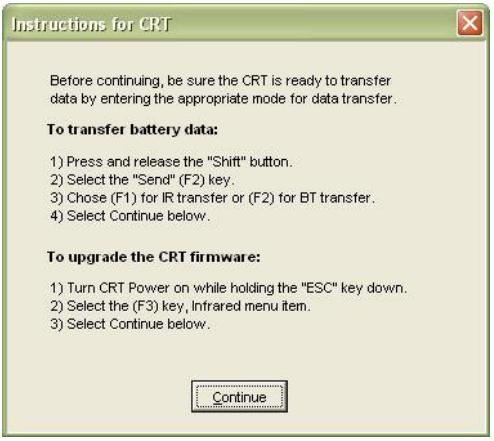


Figure 124. File Open ADF

Align the CRT and the Computer IR ports as the CRT screen indicates.
Press Continue in the BAS.

Figure 125. Align IR Ports

The CRT Interface window opens.
Choose to Include Configuration to capture the data by checking in the box provided.
Press Capture.

NOTE:
Com. Status: Idle

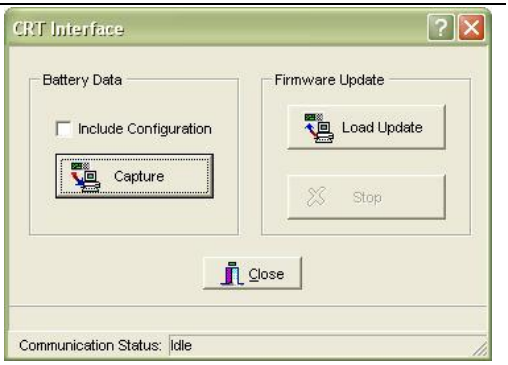


Figure 126. Capture

NOTE:
If a new or reopened ADF is not already open, this window appears.

Figure 127. Battery Data Capture Create New/Open By Name

Choose to create a new, untitled file or:
Choose a specific file by name.

Press OK or Cancel if necessary.

Confirm and/or edit as necessary all information within the Cellcorder Battery Data Capture window.
Press OK or Cancel if necessary.

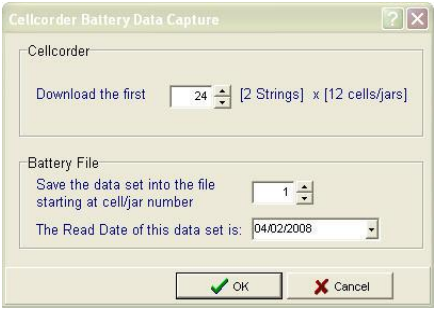


Figure 128. CRT Battery Data Capture

Once OK has been chosen, making sure that the IR ports are still aligned, select Capture.

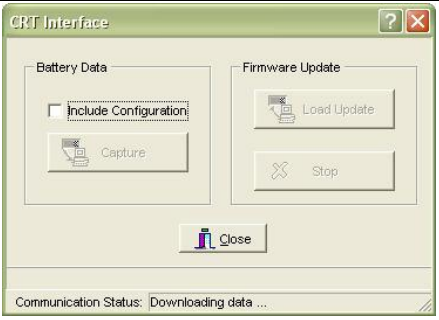
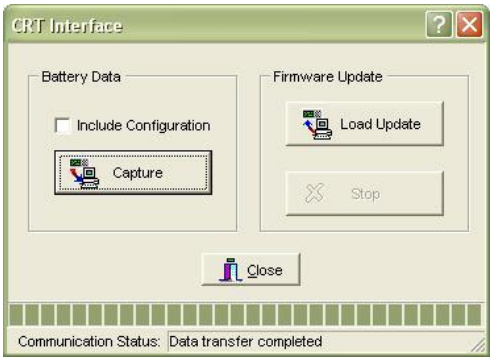


Figure 129. CRT Interface Data Capture/Downloading Data

NOTE:
Communication Status: Downloading data.

AND:
Communication Status: Data transfer completed.



Press Close once completed.

Figure 130. Data Transfer Completed.

Download A New Data Set From CRT *(.CDF) Via *Bluetooth*

NOTE:
If both the Cellcorder and hydrometer data logger have data for the same parameters, it is important which data the user captures first, because data captured last overwrites data captured first.

For example, if the user captures Specific Gravity and Temperature data from the Cellcorder first and then the hydrometer, the hydrometer data will overwrite the Cellcorder data.

This process captures cell voltage, resistance data, and site setup data, including location names, dates, and thresholds.

7.1.1 Bluetooth Pair/Connect PC/CRT

Power on the laptop/pc.

Figure 131. Laptop

Figure 132. BAS Desktop Icon

Start the BAS program, double–click the BAS icon on the desktop. Minimize the program.

Figure 133. My *Bluetooth* Places Icon

Locate the My *Bluetooth* Places on the pc's desktop or taskbar and double-click on the icon so that the My *Bluetooth* Places window displays.

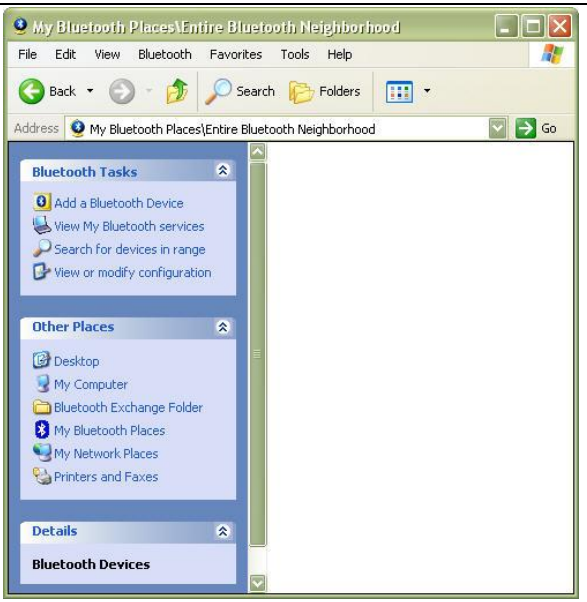


Figure 134. My *Bluetooth* Places\Entire *Bluetooth* Neighborhood Window Initial Pairing *Bluetooth*/PC

NOTE:
Some devices may appear depending upon the user's location and available Bluetooth devices within range.

Power the CRT on.

Press the SHIFT button then press F2 SEND, and F2 SEND again to choose *Bluetooth* option for pairing.

Figure 135. CRT

Wait until the CRT initializes.

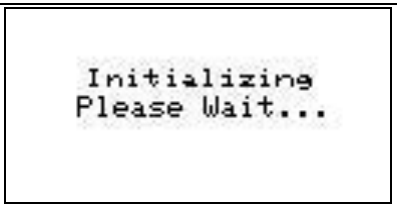


Figure 136. Initializing Please Wait (CRT)

Then wait for the, Ready for data transfer LCD screen on the CRT.

Figure 137. Wait for data transfer need better graphic

NOTE:
Once the CRT has been paired with the PC for the first time, the PC will normally recognize that the CRT was paired with the PC previously and the PC/CRT will pair automatically in the future when the CRT/PC are within range of one another and the CRT has been initialized.

Go to My *Bluetooth* Places\Entire *Bluetooth* Neighborhood window.

If the list is unpopulated and this is the first time pairing the CRT with the PC, then choose to Search for devices in range.

Figure 138. Search For Devices in Range

When the Cellcorder appears in the list, right click on the name/icon and choose to Pair Device from the drop down menu.

Figure 139. Pair Device

Type '0000' into the *Bluetooth* security code box and select OK, or Cancel, or Help, if necessary.

Figure 140. *Bluetooth* Security Code For Cellcorder Device

A checkmark next to the Cellcorder will indicate that the Cellcorder is paired with the pc.

Figure 141. Paired Cellcorder And PC

Now, right click on the device once again and select Connect Com0.

A new window COM0 will display with the *Bluetooth* serial port chosen.

Figure 142. *Bluetooth* Connect

NOTE:
It is important to record the Bluetooth serial port, COM#.

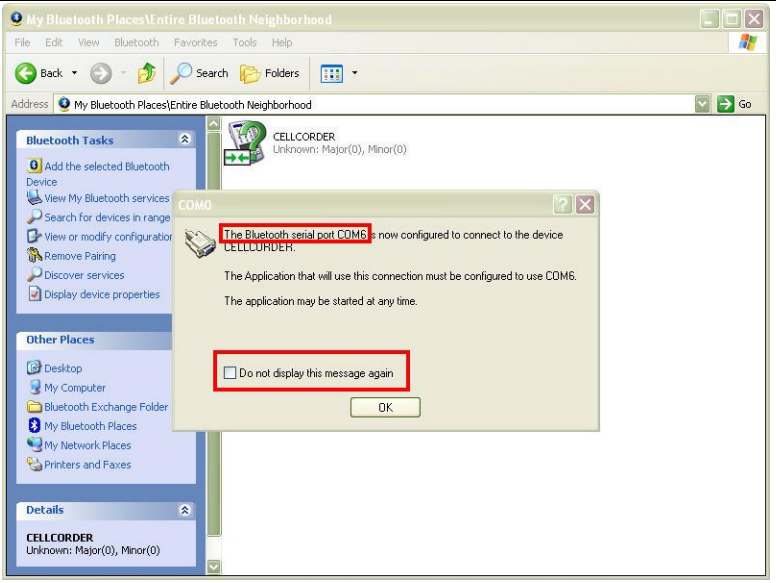


Figure 143. Record The *Bluetooth* Serial Port COM#

Figure 144. Communications Button/Com Port

Go back to the BAS and select the Communications Button on the Main toolbar.

When the Communications Settings window opens, use the down arrow to synchronize the serial COM# port with the recorded *Bluetooth* serial port COM#.

Figure 145. Serial Port COM#

Figure 146. CRT

Once the COM port has been recorded, Power On the CRT, then press 

on the CRT to cancel, and 

to go back to the Main Menu on the CRT to begin downloading the data.

7.1.2 Begin Battery Data Capture via Bluetooth

Go to the BAS and select the Cellcorder Interface Button.

Figure 147. Cellcorder Interface Button

Press the Cellcorder Interface button.

In the Select Cellcorder window, choose Model Number.

Press 

or 

if necessary.

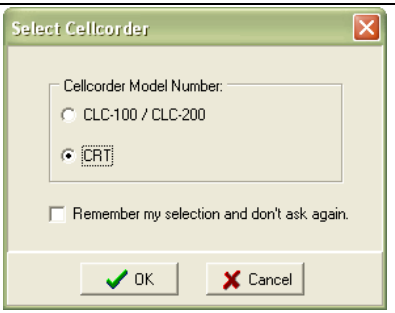


Figure 148. Select Cellcorder

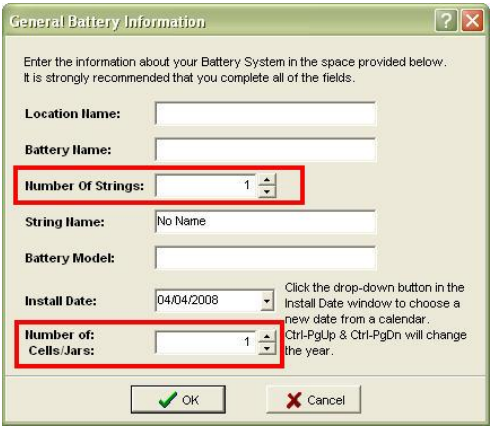
NOTE:
If the user wishes to have the software remember the selection, then click into the space provided to check the box to Remember.

Choose to create a new file or open a specific file by name when the Battery Data Capture window appears.
Press OK or Cancel if necessary.

Figure 149. Battery Data Capture

If the user has chosen to create a new file, then the General Battery Information window appears.

The user can choose to enter all information at this time or to save time, the user may choose to press OK and edit information once the download is completed.



NOTE:

It is recommended to enter at the very least, the Number of Strings and the Number of Cells.

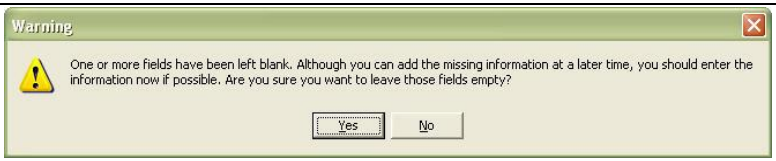


Figure 150. Warning Regarding Blank Fields

If the user chose to edit the information later, a warning window will appear. Select Yes to continue the download.

The Instructions window for the CRT opens.

Follow the instructions within this window.

NOTE: Check COM port on PC to make sure it matches the BAS chosen COM port.

Do not select Continue here before following the Instructions for CRT.

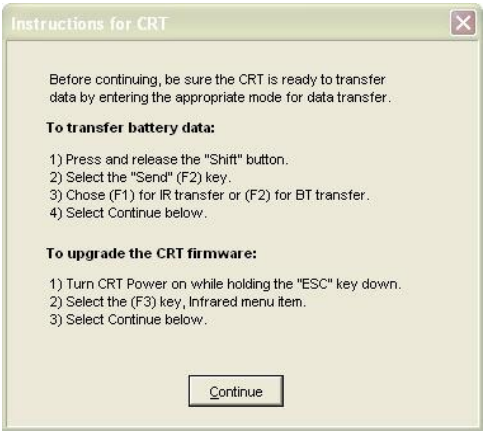


Figure 151. Instructions for CRT

Power CRT on.
On the CRT, press the SHIFT button then press F2 SEND, and F2 SEND again to choose *Bluetooth* option for pairing.

Figure 152. CRT

Wait until the CRT initializes.

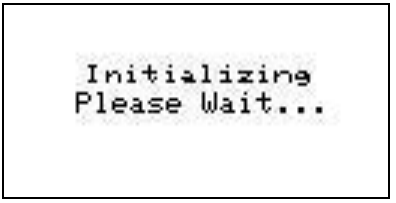


Figure 153. Initializing Please Wait CRT

Then wait for the, Ready for data transfer LCD screen on the CRT.

Figure 154. Wait For Data Transfer

Press Continue in the BAS.

NOTE: Check the Include Configuration box to transfer settings like battery name and thresholds.

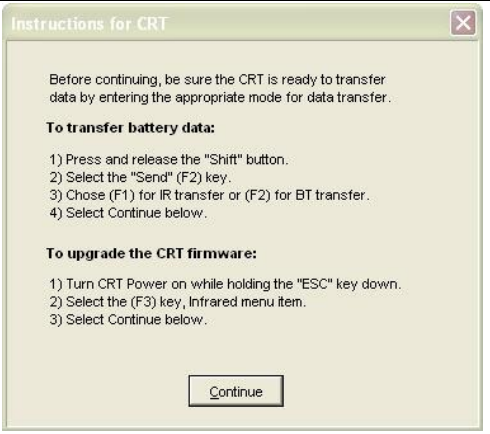


Figure 155. Instructions for CRT

The CRT Interface window opens.

Choose to Include Configuration or not to Include Configuration by checking in the box provided.

Press 

to continue.

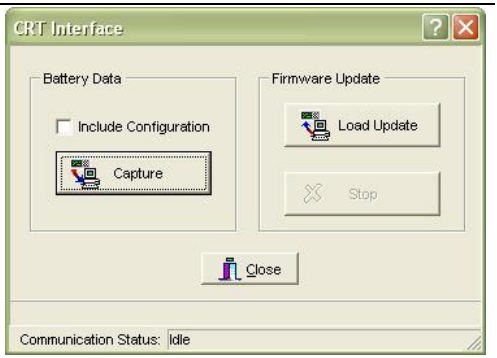


Figure 156. CRT Interface Capture

Confirm and/or edit as necessary all information within the Cellcorder Battery Data Capture window.
Press 

or 

if necessary.

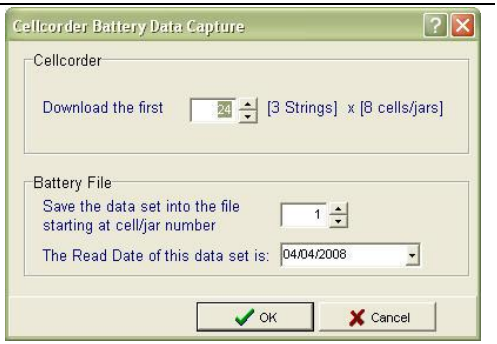


Figure 157. Cellcorder Battery Data Capture

The Cellcorder Battery Data Capture window appears.
Download the First ## Cells defaults to the Number of Cells on the File|Properties|General window. It is the maximum number of cells from which data will be captured and usually matches the number of cells in the battery.
Set **Save the data set into the file Starting at Cell Number ##** to the cell number the CRT should start downloading data to, typically 1. Thus, Cellcorder Cell 1 data is recorded in the file under Cell 1, and so on.
Set the Read Date for this Data Set. Type a date or click the drop–down calendar button.

NOTE:
Change the starting cell number when more than one

Cellcorder records data from the same battery. For example, on a 256–cell battery, one Cellcorder tests cells 1 to 128 and stores the data in Cellcorder locations 1 to 128. The other Cellcorder tests cells 129 to 256 and stores in 1 to 128 as well. Capture the first Cellcorder with the starting cell number set to one and capture the second into the same file with the starting number set to 129.

To start capturing, click OK.

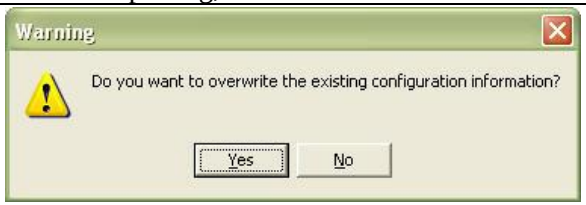


Figure 158. Warning

If information will be overwritten, a warning window appears. Press Yes to continue.

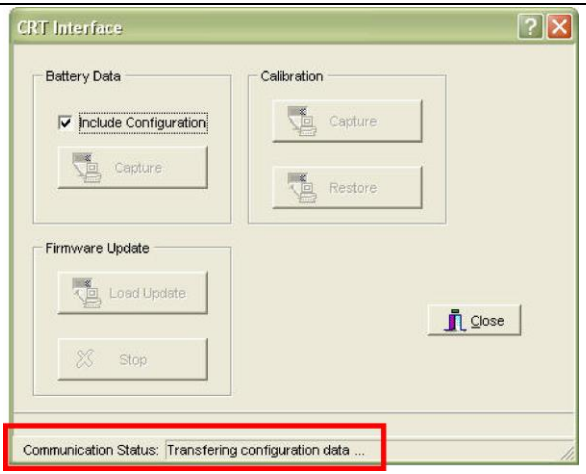


Figure 159. Transferring Data

NOTE:

The Communication Status shows; Transferring configuration|cell data.

The CRT displays Sending data for Cell n.

When done, Communication Status shows Data transfer completed.

NOTE:
If capture fails, verify the correct COM port and Number of Cells is selected and, if using Windows 2000 or XP, the IR port driver is installed.

- After 

, close the CRT Interface window.
- On the Cellcorder, to return to the Main Menu, press Cancel.
- Data can be viewed on the File|Properties window.
- To save the captured data in the ADF, click File|Save.

Capture Hydrometer Data

This chapter describes how to capture data from the hydrometer data logger to the computer via IR or RS–232 serial cable. Choose to create a new ADF or reopen an existing ADF.

NOTE:
If both the Cellcorder and hydrometer have data for the same parameters, it is important which data the user captures first, because data captured last overwrites data captured first. For example, if the user captures SG and temperature data from the Cellcorder and then the hydrometer, the hydrometer data will overwrite Cellcorder data.

Create a new data file

by pressing  on the toolbar.

or

on the Main Menu, click File|New.

Figure 160. Create New ADF

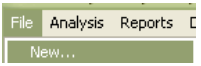


Figure 161. File New

In the New ADF window, click Download a new Data Set from a Hydrometer Data Logger.

Press OK once the option is chosen or Cancel if necessary.

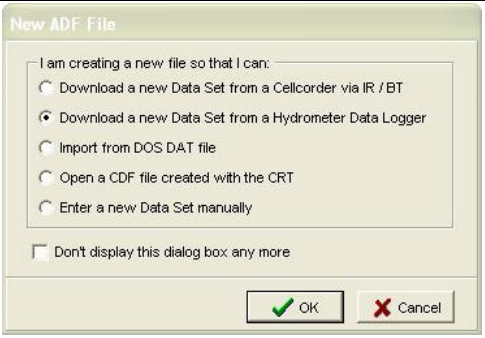


Figure 162. New ADF Window From Hydrometer Data Logger

7.1.3 Open|Reopen An ADF For Hydrometer Data

If *not* creating a new ADF and an ADF is not currently open, do these steps:

Figure 163. File Open ADF

Click File|Open and select the file from the Open an ADF window.

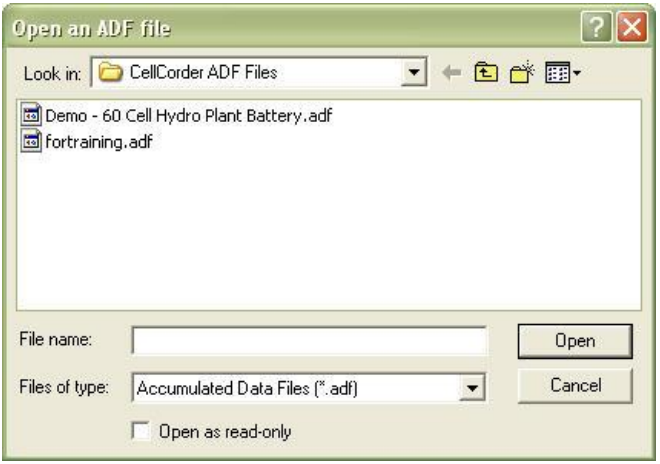


Figure 164. Open ADF Window

To Reopen select File|Reopen and open a file from the dropdown list.

Figure 165. File Reopen Existing ADF

In the General Battery Information window, type:
Location Name, Battery Name, Number of Strings, String Name, Battery Model, Install Date, and Number of Cells measured in the string.

Once filled in, press OK or Cancel if necessary.

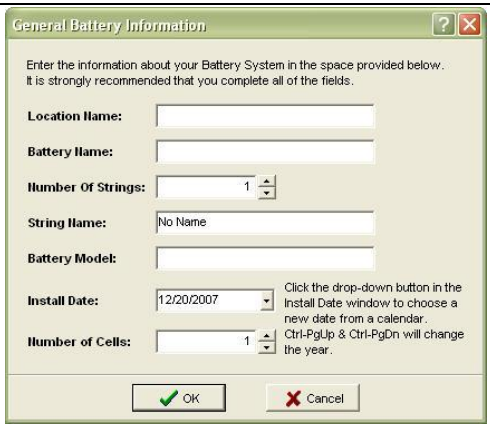


Figure 166. General Battery Information

Read the Instructions for transferring data via IR.
Turn data logger On.
Choose string A, B, C, D, E, F, G, or H by pressing
Make sure the LED next to the chosen string is blinking.
Line up computer IR with the data logger IR.
Select Continue.

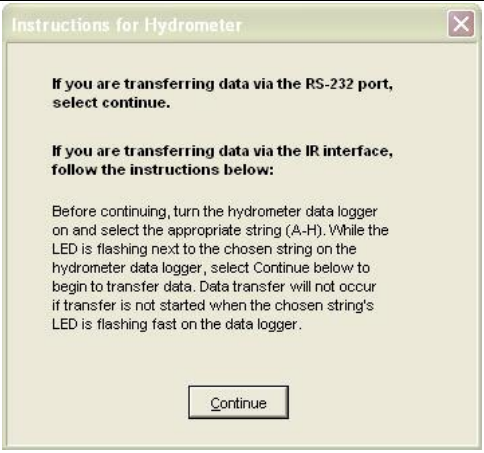


Figure 167. Instructions For Hydrometer Data Transfer

NOTE:
Up to eight strings can be stored on the data logger and only one may be downloaded at a time.

Line up the IR port of the data logger with the IR port on the PC.

Figure 168. IR Bottom Of Data Logger

Choose the starting cell number.

Check the Temperature Unit.

Select 

.

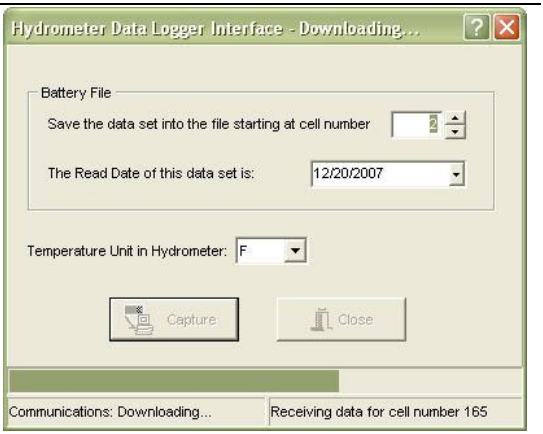


Figure 169. Hydrometer Data Logger Interface Shows Communications: Downloading

Once complete, click OK on the Information window.

Figure 170. Successful IR Download

NOTE:
If the user wishes to have the software remember the selection, click into the space provided to check the box.

Hydrometer Data Logger Interface

This section describes data transfer via the hydrometer data logger to a computer via IR or RS–232 cable; captures Specific Gravity|SG and Temperature data.

NOTE:
The data logger can contain data for eight strings of 256 cells or 2048 readings only.

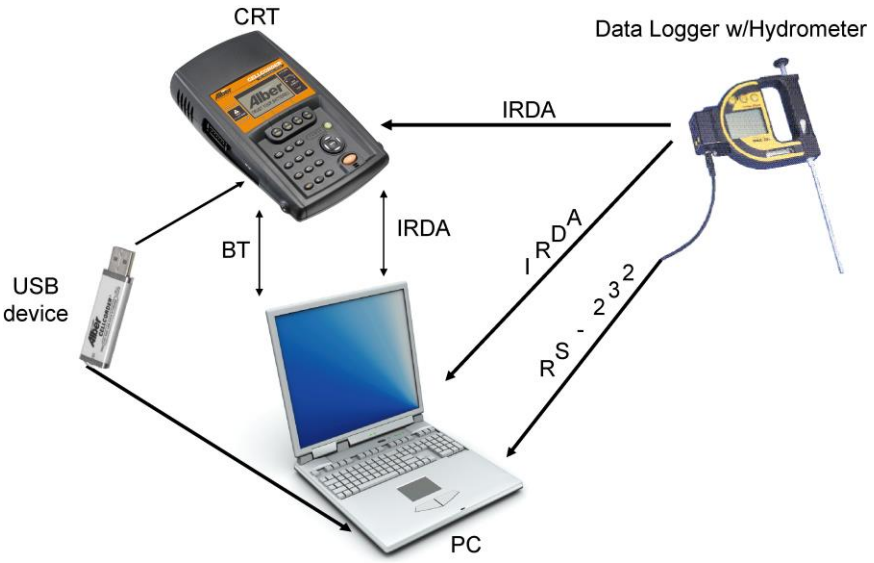


Figure 171. Capture Hydrometer Data

7.1.4 Transfer Data Via RS–232 Port|Cable

If using RS–232, insert the RS–232 cable into the data logger and then insert the opposite end of the cable into the RS–232 port on the PC.

To power on the data logger press the ON/ON button.

NOTE:
This process may be easier to do if the data logger is disconnected from the hydrometer.

Figure 172. Data Logger Front View

Press SEL/DEL/SEL to select the channel/string A-H from which data will be transferred.

NOTE:
The data logger LEDs indicate status as follows:
***Fast** – A-H LED flashes fast: Channel has data and is selected.*
***Steady** – LED is on: Channel has data but is not selected.*
***Slow** – LED flashes slowly: Channel is selected but has no data.*

Now, click Continue on the Instructions for Hydrometer window.

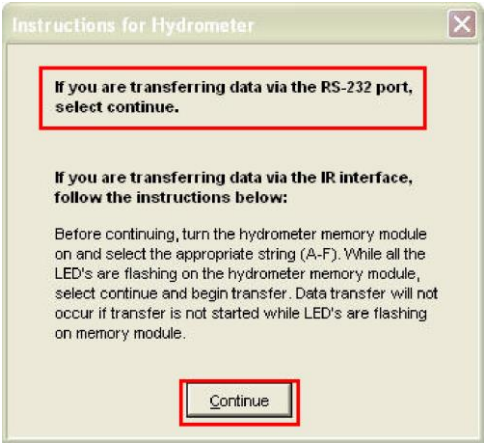


Figure 173. Now Click Continue

The Hydrometer Interface window appears.
Set ...Starting at Cell Number nn to the cell number the hydrometer should start downloading data to, typically 1. Thus, hydrometer Cell 1 data is recorded in the file under Cell 1, and so on.

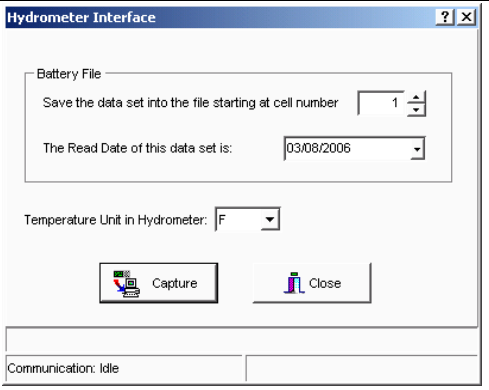


Figure 174. Hydrometer Interface

NOTE:
Change the starting cell number when more than one hydrometer records data from the same battery. For example, on a 256–cell battery, one hydrometer tests cells 1 to 128 and stores the data in hydrometer locations 1 to 128. The other hydrometer tests cells 129 to 256 and stores in 1 to 128 as well. Capture the first hydrometer's data with the starting cell number set to one and capture the second hydrometer's data into the same file with the starting number set to 129.

- Set the **Read Date for this Data Set**. Type a date or click the drop–down calendar button.
- Set the **Temperature Unit in Hydrometer** box to C or F to agree with how hydrometer temperature readings were made.

CAUTION:

This setting does not convert the readings from C to F or from F to C.

- To start capturing, click 

.

The progress bar moves and the Interface box shows **Receiving data for cell number**. When done, the message **The hydrometer has successfully downloaded n cells** appears.

NOTE:
The Communications status indicates when it is Downloading… the data.

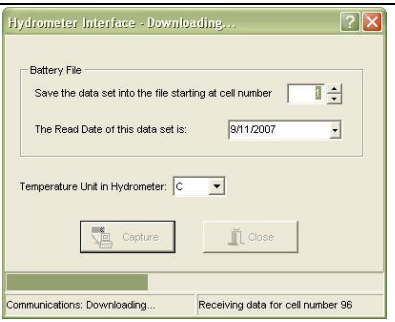


Figure 175. Hydrometer Data Logger Interface

7.1.5 Capture Data Via IR

On the hydrometer module|data logger, press the ON/ON button.

NOTE:
This process may be easier to do if the data logger is disconnected from the hydrometer.

Press SEL/DEL/SEL until the LED is flashing FAST next to the desired string to select the channel/string A-H from which data is to be transferred.

Figure 176. Data Logger Front View

NOTE:
The data logger LEDs indicate status as follows:
***Fast** – A-H LED flashes fast: Channel has data and is selected.*
***Steady** – LED is on: Channel has data but is not selected.*
***Slow** – LED flashes slowly: Channel is selected but has no data.*

Press  on the menu bar of the BAS software.

Read the Instructions for Hydrometer in the window on the computer.

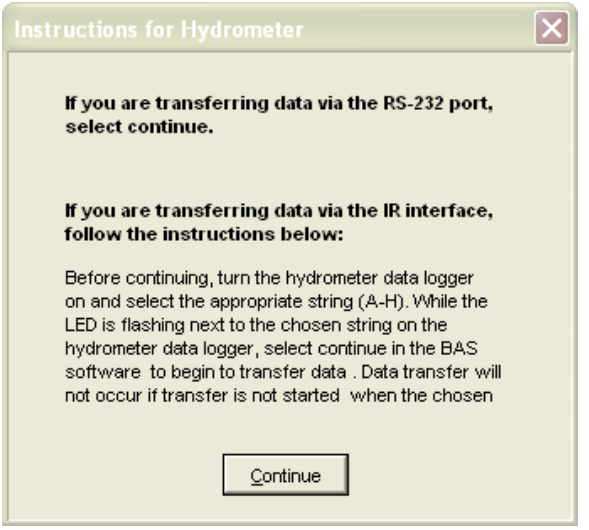


Figure 177. Instructions for Hydrometer

NOTE:
Read the instructions carefully before selecting Continue right away.

Choose to create or open a file by name.

Figure 178. Battery Data Capture Window

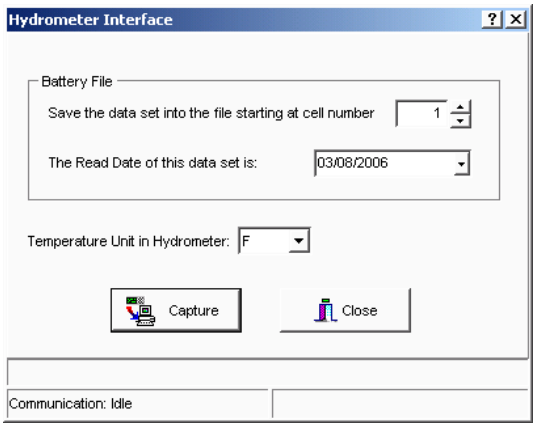


Figure 179. Hydrometer Interface

Align the data logger and computer IR ports, press 

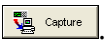
. Set ...Starting at Cell Number nn to the cell number the hydrometer should start downloading data to, typically one. Thus, hydrometer Cell 1 data is recorded in the file under Cell 1, and so on.

> *NOTE:*
> *Change the starting cell number when more than one hydrometer records data from the same battery. For example, on a 256–cell battery, one hydrometer tests cells 1 to 128 and stores the data in hydrometer locations 1 to 128. The other hydrometer tests cells 129 to 256 and stores in 1 to 128 as well. Capture the first hydrometer with the starting cell number set to one and capture the second into the same file with the starting number set to 129.*

- Set the **Read Date for this Data Set**. Type a date or click the drop–down calendar button.
- Set the **Temperature Unit in Hydrometer** box to C or F to agree with how hydrometer temperature readings were made.

  CAUTION:

  This setting does not convert the readings from C to F or from F to C.

- To start capturing, click 

.

The progress bar moves and the Interface box shows **Receiving data for cell number**. When done, the message **The hydrometer has successfully downloaded n cells** appears.

IMPORTANT NOTE:
If using IR, all hydrometer data logger LEDs must flash about once per second when Capture is clicked. If not, push the data logger On button, select the string, and click Capture again. Flashing lasts about 12 seconds after pressing On.

NOTE:
If capture fails, verify the correct COM port and Number of Cells is selected. If using IR, verify all hydrometer module|data LEDs are flashing. Also, verify the IR port driver is installed.

- After capture, 

the Hydrometer Interface.
- If using RS–232, disconnect the serial cable. The hydrometer data logger powers down after a few minutes of inactivity.
- The user may review the data on the File|Properties windows.
- To save the captured data in the ADF, click File|Save.

Import From DOS-DAT File

This chapter describes how to:

- Create a new ADF for imported data.
- Import CLC–200 DOS/DAT files and,
- To open and import a CDF and import it into an ADF.

NOTE:

Use the File Import Wizard button  , *and select only DAT files related to the ADF being appended.*

To create an ADF for CRT data, do the following.
Create a new data file by pressing 

or

on the Main Menu, click File|New.

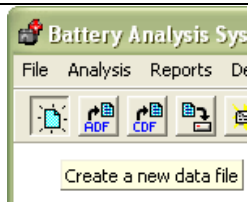


Figure 180. Create New ADF

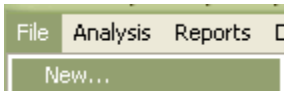


Figure 181. File New

In the New ADF window, click into the radial button adjacent to **Import from DOS DAT file.**

Press  or  if necessary.

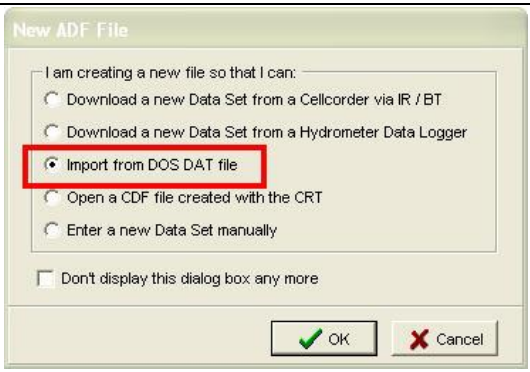


Figure 182. New ADF Window From Cellcorder Data File

In the General Battery Information box, type Location Name, Battery Name, Number of Strings, String Name, Battery Model, Install Date, and the Number of Cells measured in the string. Press OK or Cancel if necessary.

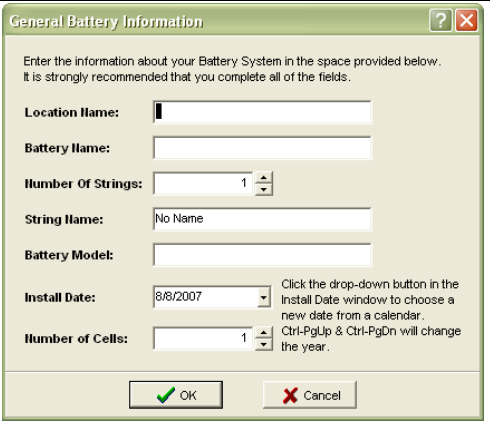


Figure 183. General Battery Information

NOTE:
If the user has not chosen the CRT previously and checked off the Remember my selection, the following window may appear.

In the Select Cellcorder window, choose CRT.

Press OK or Cancel if necessary.

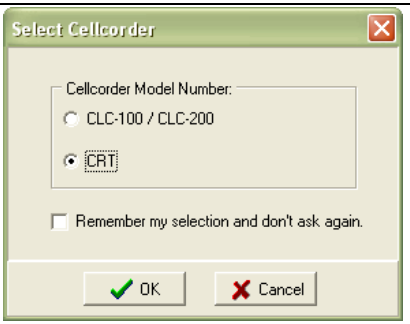


Figure 184. Select Cellcorder

NOTE:
If the user wishes to have the software remember the selection, click into the space provided to check the box to Remember.

The File Import Wizard window appears.

Press Continue or Cancel if necessary.

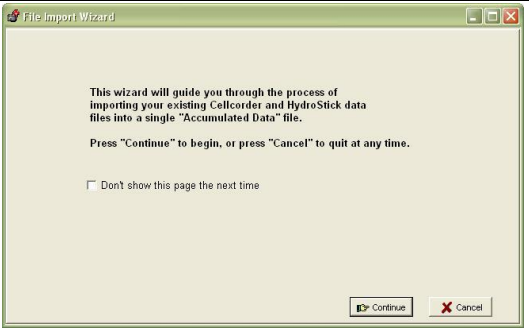


Figure 185. File Import Wizard

The File Import Wizard button may be used as well. Select only DAT files related to the ADF being appended.

The File Import Wizard Step 1. DOS data file window appears.

Press Continue, Back or Cancel as necessary.

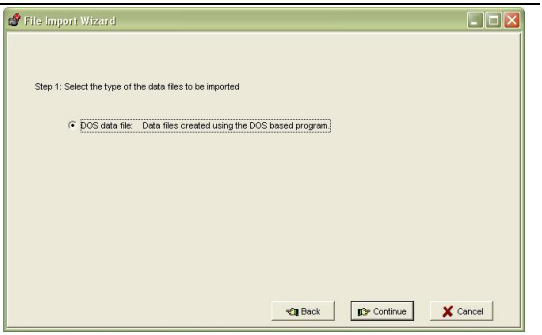


Figure 186. File Import Wizard Step 1. DOS Data File Window

Step 2. explains to the user to Browse

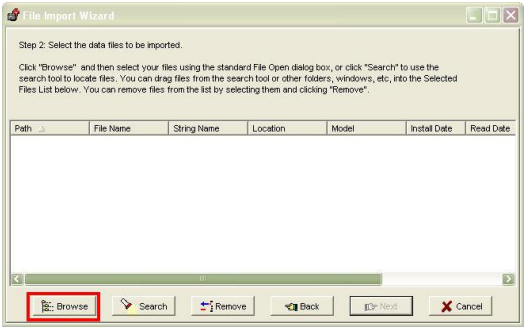


Figure 187. Step 2. Browse For DOS *.dat File

Navigate to the desired location; in this case a dos_dat folder on the local hard drive.

Figure 188. Navigate To DOS *.dat Files

Highlight the file and click Open and/or Cancel as necessary.

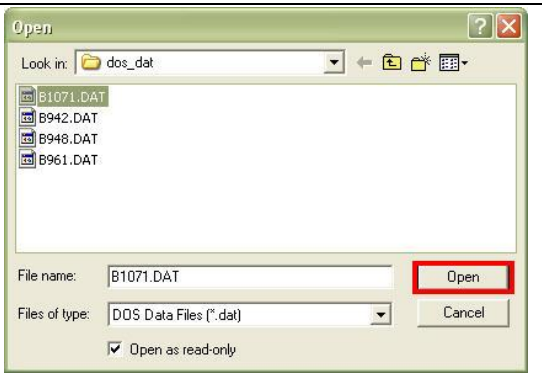


Figure 189. Open DOS File

The file will populate the comments section of the window.

Now, select Next.

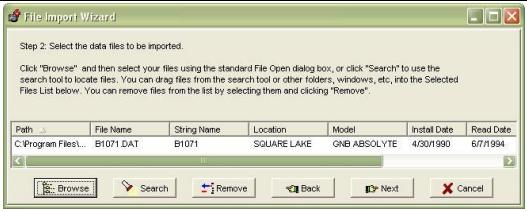


Figure 190. Step 2. DOS *.dat Import

Figure 191. Step 3. Finish DOS File Import

Now, select Finish.

NOTE:

If you have an older version of the software, other instructions may appear in Step 3. newer versions no longer display further instructions for easier use.

To Reopen select File|Reopen and open an ADF file from the dropdown list.

Figure 192. File Reopen Existing ADF

Open CRT Data (*.CDF) File On USB Device

Once all readings have been taken with the CRT and saved on the USB flash hard drive, remove the USB flash hard drive from the CRT.

Figure 193. USB Flash Hard Drive Inserted Into CRT

NOTE:
Make sure the LED next to USB is not lit as it indicates when the USB device is being accessed.

*The Cellcorder saves data in the file format, *.CDF.*

Insert the USB flash hard drive into the computer where the BAS software is installed.

Figure 194. USB Flash Hard Drive Inserted Into PC

NOTE:
A Microsoft Window may open to ask what to do with the files on the USB device; please refer to the PC's Operating Instructions if necessary.

Double–click the BAS icon on the desktop to open the software.

Figure 195. BAS Desktop Icon

Click File|Open|CDF.

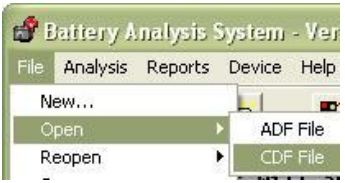


Figure 196. File|Open|CDF

In the Open a CDF file window, use the Look in: dropdown menu to locate the Removable Disk that symbolizes the USB flash hard drive.

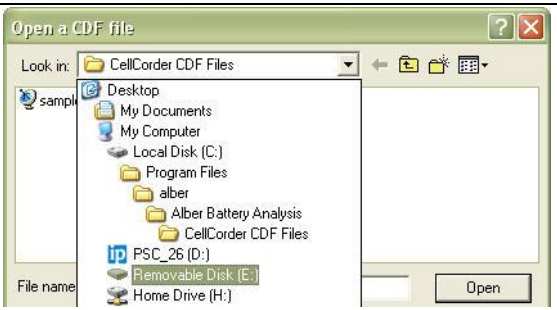


Figure 197. Removable Disk: USB Device

Navigate to the desired data file, *.CDF.

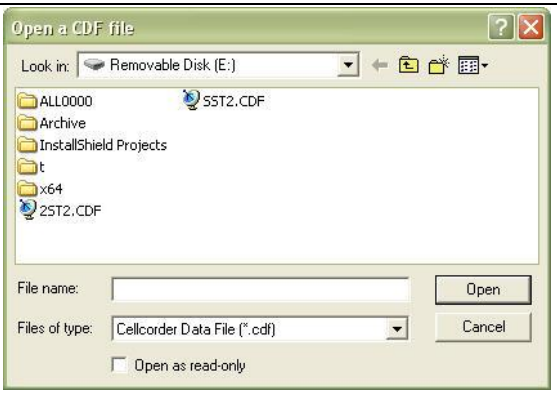


Figure 198. Removable Disk: USB Device

NOTE:
Depending upon the computer's settings, navigating to the file may be different.

Scroll down to the desired file, highlight it and click Open.

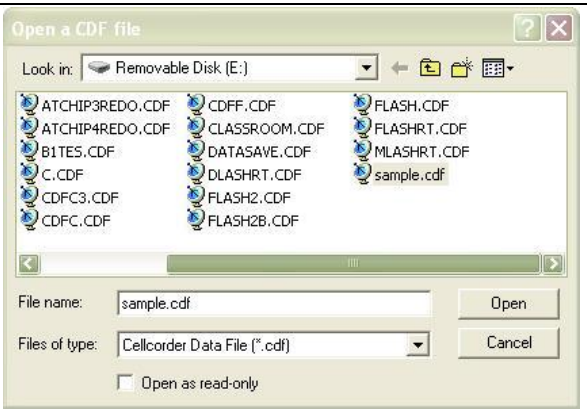


Figure 199. Open A CDF From The USB Device

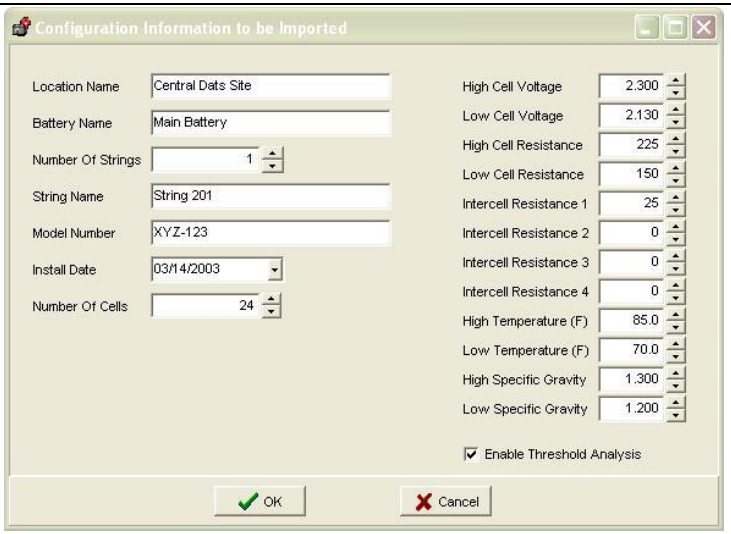


Figure 200. Configuration Information To Be Imported

Verify and check the Configuration Information to be Imported. Press OK once all checks and edits are completed or Cancel if necessary.

If an ADF is not presently open, or has been closed, then this Confirmation window will open. Choose to Import to an existing file, Create a new file or Cancel.

Figure 201. Confirmation Import CDF| Create New|Import To Existing

If an ADF is open, then this window will display. Choose to Import to the open ADF, Import to a different ADF, Create a new ADF or Cancel.

Figure 202. Import File Confirmation

Create An ADF Manually

The user may create a battery file by entering the information. This file can be maintained manually or automatically by adding data to it from the Cellcorder or hydrometer later.

To create a file manually, do the following.

Click  or File|New.

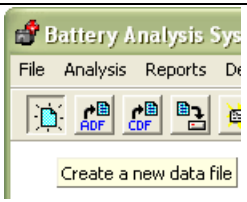


Figure 203. File New Button

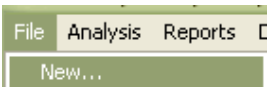


Figure 204. File|New

In the New ADF window, click into the radial button, **Enter a new Data Set manually.**

Press OK or Cancel if necessary.

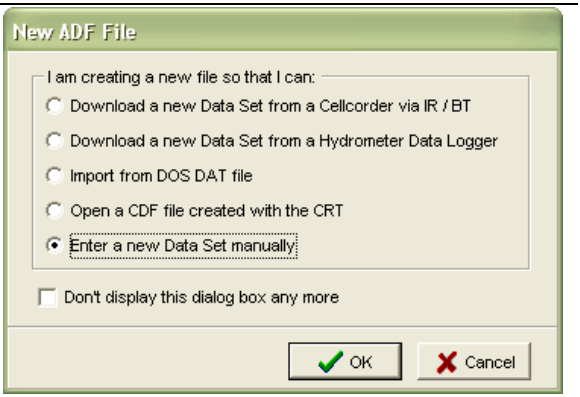


Figure 205. New ADF|Manual Data Set

In the General Battery Information window, type Location Name, Battery Name, Number of Strings, String Name, Battery Model, Install Date, and the Number of Cells measured in the string.

Press OK or Cancel if necessary.

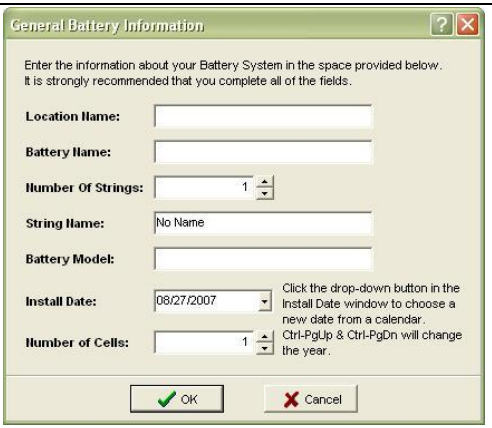


Figure 206. General Battery Information

This sets up File|Properties|Details with the correct number of cells. In the Read Date window, enter the date that readings were taken.

Press OK or Cancel if necessary.

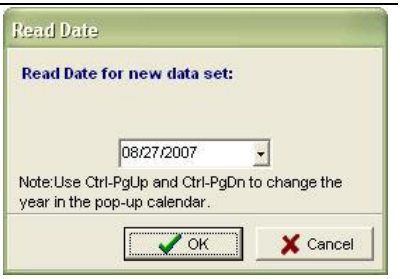


Figure 207. Read Date

The File Properties window pops up with the Details tab available. To edit a value, double–click the cell number in the data table.

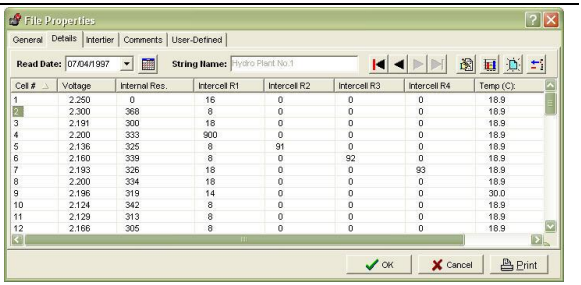


Figure 208. File Properties Details

The Cell Data Grid Editor opens for easy editing.

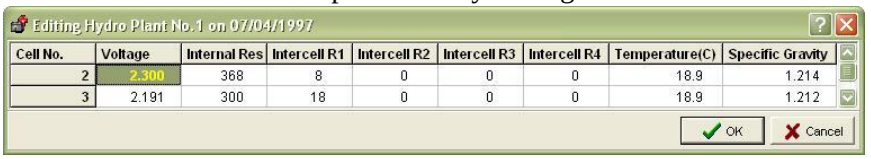


Figure 209. Cell Data Grid Editor

Use the Editor to edit cell data for a specific read date (a single Data Set). After editing values, click OK once the selection is edited or Cancel if necessary to close the Editor and now click OK, Cancel or Print as needed.

NOTE:
The user can also open the Grid Editor by clicking the "Edit the values of the selected cell" button on the File Properties Details tab.

Figure 210. File Properties Details tab

NOTE continued:

Or values may be edited by right clicking the cell within the File Properties Details Tab and selecting Edit.

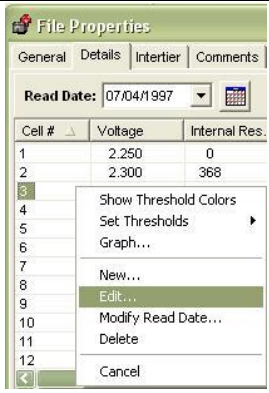


Figure 211. File Properties Details Cell|Right Click Functionality

To save the new file, click  Or File|Save, assign a file name, and save in the ADF subdirectory (recommended).

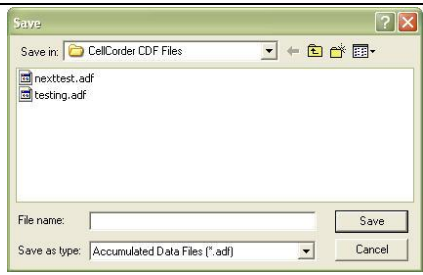


Figure 212. Save ADF

To add another read date, on the File|Properties|Details window, click the Create a New Data Set button, select a new read date, and edit the values.

Figure 213. File Properties|Details|New Data Set

Figure 214. New Data Set Read Date Window

NOTE:
To delete a data set, click the Delete this Data Set button.

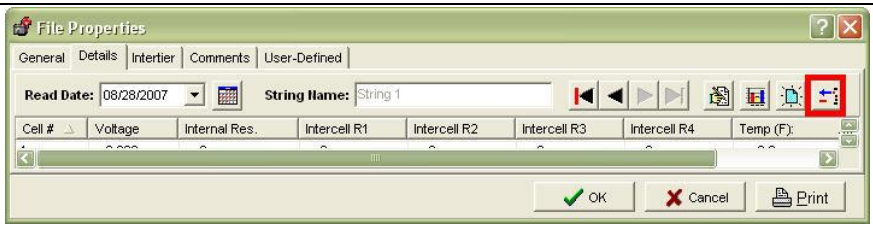


Figure 215. File Properties|Delete Data Set

A warning will ask if the user wishes to delete the open Data Set.

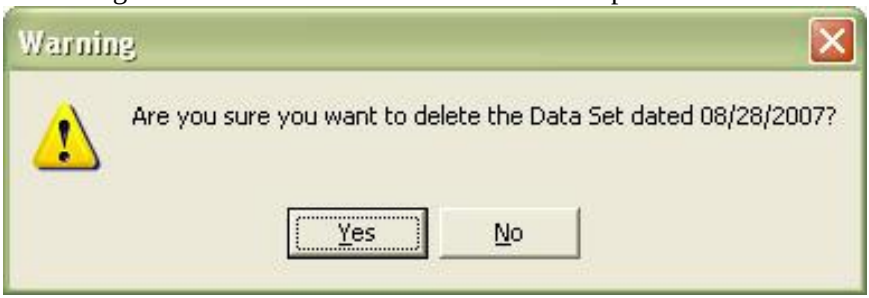


Figure 216. Warning Ask For Confirmation On Delete

8 File Search Tool: Search For Files

The File Search Tool provides reports on battery locations.

To start the File Search Tool, click File|Search or press  on the toolbar.
The File Search Tool window displays with the File Name tab open.

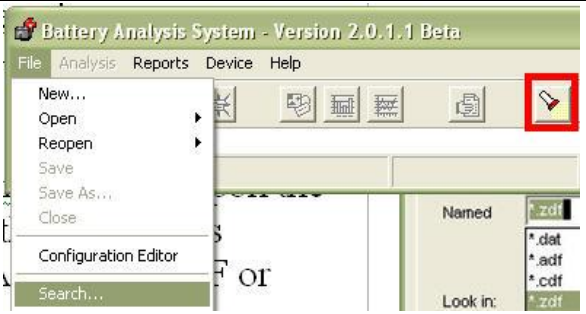


Figure 217. File|Search 

File Name Tab

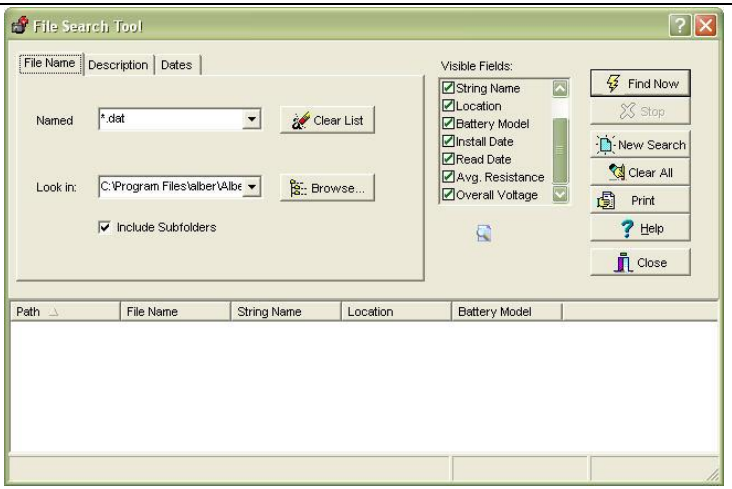


Figure 218. File Search Tool Window| File Name Tab

Search criteria depends upon the type of file that the user is seeking: DAT, ADF , CDF. Use the drop down list to choose the type of file to be found. The asterisk (*) finds all files with the specified extension.

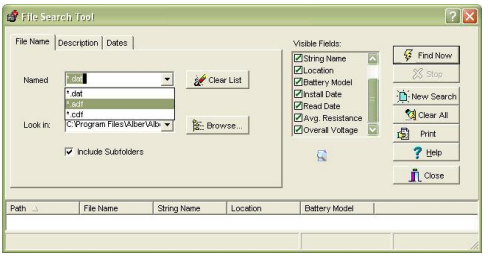


Figure 219. File Search Tool

The search begins at the directory specified in the Look In box and all subdirectories if Include Subfolders is checked.

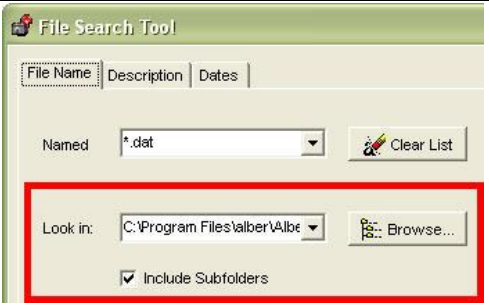


Figure 220. Search|Look in:

Press Browse... to navigate to the file folder to be searched.

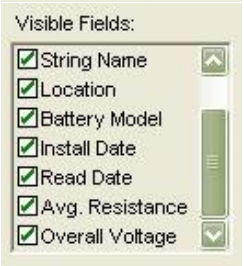
Figure 221. Browse

NOTE: The Parameters and User Defined tabs|windows appear only for ADFs.

Figure 222. ADF Parameters & User Defined Tabs

8.1.1 Buttons|Tabs Explained

The following items appear on all File Search Tool windows.

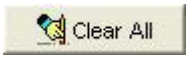


Click into a check box to display the desired item(s) to be included in the results search list.

Path	File Name	String Name	Location	Battery Model
C:\Program Files\...	Demo - 60 Cell H...	Hydro Plant No.1	California	EXIDE EA-13
C:\Program Files\...	fortraining.adf	String 1	California	EXIDE EA-13

Find Now – Starts the search process after search parameters and subdirectories are set.

Stop – Stops the search process.

	**New Search** – Clears the list of search results found previously.
	**Clear All** – Clears the list of search results and clears search parameters on other File Search Tool windows.
	**Clear List** – Clears all names typed into the Named box. Names remain in the drop–down list until the user click this button.
	**Print** – Creates a report of files selected in the search results list.

Description Tab

Type a string, battery or location name or partial name to limit search results to the name. The search returns results that match exactly. For example, if a file contains battery model **Exide EA–13,** and the user types **ea–** in the Battery Model box, the search results will list the Exide EA–13 file and all other files containing the substring EA–.

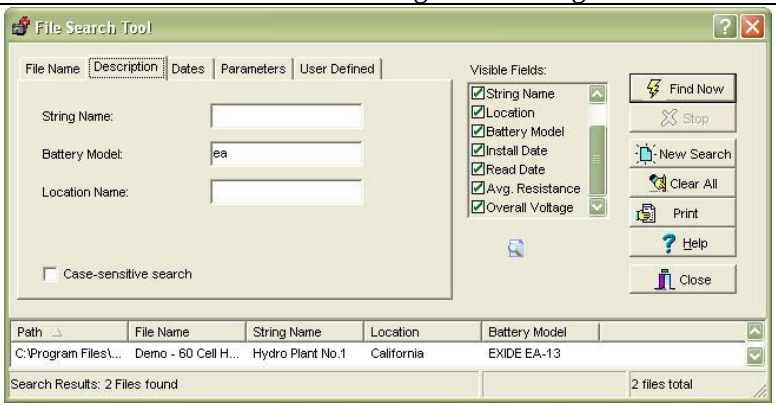


Figure 223. File Search|Description Tab

Dates Tab – Install Date, Read Date

Type a date or click the drop–down calendar.

> *NOTE:*
> *Either Install Date or Read Date can be used to search for files.*

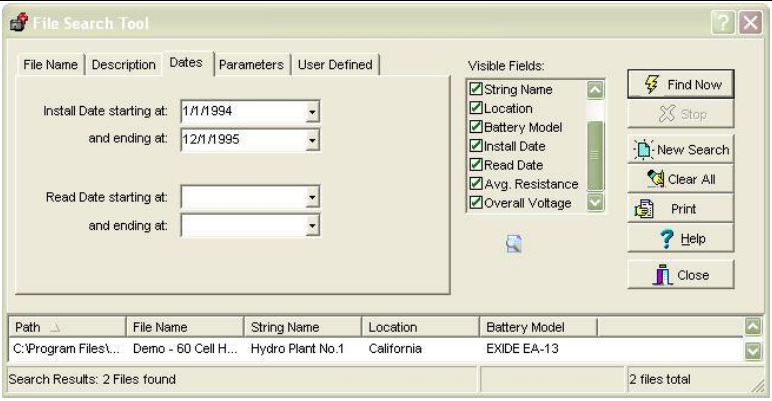


Figure 224. File Search|Dates Tab|Install|Read

Parameters Tab (ADF Files Only)

The Parameters Tab limits search results to files that meet defined voltage, resistance, SG or temperature levels. The Parameter Search can find one value or compare two values.

WARNING:
Parameter searches may be time consuming.

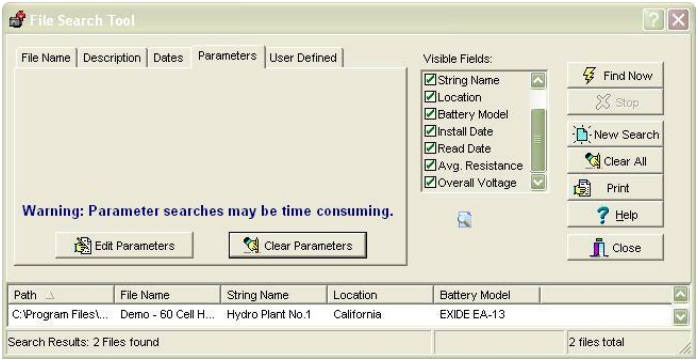


Figure 225. File Search|Parameters Tab

To set up a Parameter Search, click 

.

The Parameter Search Criteria window appears.

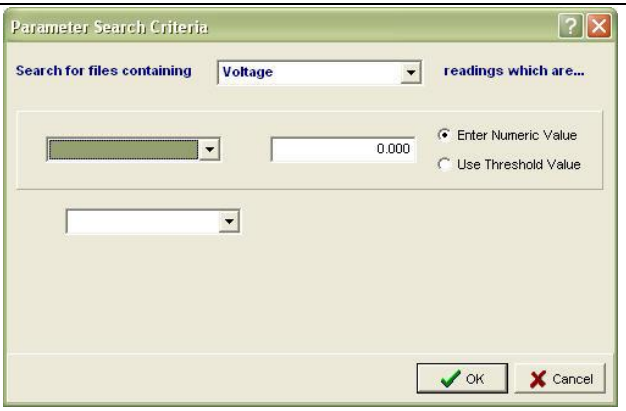


Figure 226. Parameter Search Criteria

Search for files containing – Select a battery parameter from the drop–down list: Voltage, Internal Resistance, Intercell Resistance (1 to 4), Temperature, Specific Gravity, Overall Voltage or Average Resistance. Comparisons use a comparative operator NOT EQUAL TO, EQUAL TO, LESS THAN, LESS THAN OR EQUAL TO, GREATER THAN, and GREATER THAN OR EQUAL TO. Select a comparative operator from the drop–down list.

Click **Enter Numeric Value** or **Use Threshold Value**, then type a numeric value or select a threshold value of Low, High or Baseline.

> *NOTE:*
> *When a search is based on a threshold value, these values are not known until each file is opened, and values may not be configured appropriately. Use threshold comparison knowing that results may be inconsistent with the search criteria.*

Select a logical operator **NOT, AND** or **OR** from the drop–down list. When this box is blank, the second panel closes and only the first expression is evaluated. If the user chooses **NOT**, the first panel closes and only the second expression is evaluated, as in **Voltage NOT Greater than 2.5**.

If applicable, select a second comparative operator from the drop–down list. After all criteria are set, click OK. The search criteria appear on the Parameters window. Clicking **Clear Parameters** removes the search criteria from the Parameters window but not from the Parameter Search Criteria box.

The **Search Read Dates** and **Cell Matches** buttons limit the search to most recent date or all read dates, and any cell or all cells.

User–Defined Window – Search

Main Menu > File|Search|Parameters
The User Defined window for ADFs limits the search to files where the Field Name and Field Contents match those on the File|Properties| User Defined window. Case Sensitive Search further limits the search to exact upper|lower case letters.

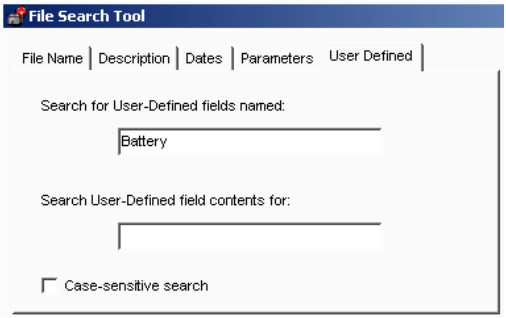


Figure 227. User–Defined Search Window

After search parameters are set, click **Find Now** to search for files in the Named box on the File Name tab. Files that meet all criteria appear in the results list. Only ADF search results include Average Resistance and Overall Voltage. The user may sort the results list columns by clicking the column headers. To open an ADF in the results list, right click an ADF name then select Open or double–click the file name.
To create a report of selected files in a summary report, hold <Ctrl> and click the file names or right–click the file names to display a menu. Click **Print** to display the File Search Report Setup box.

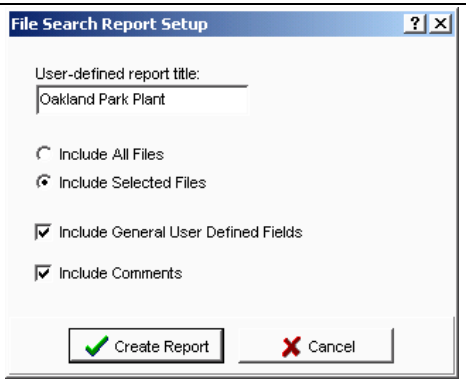


Figure 228. File Search Report Setup

Click **Include All Files** or **Include Selected Files** for the report. The user may also include comments or fields in the report. To create and view a report on window, click the **Create Report** button.

9 Managing Battery Data Files/ADF

It is important to use a consistent scheme for organizing battery data files and to use descriptive file names.

This chapter suggests how to create a file management system for multiple battery or site locations.

This chapter also describes the Extract and Merge functions. Both copy groups of Data Sets/sets of readings from one ADF to another, but Extract is more flexible. Both functions require opening one ADF.

Figure 229. File Extract or File Merge

Saving Battery Files

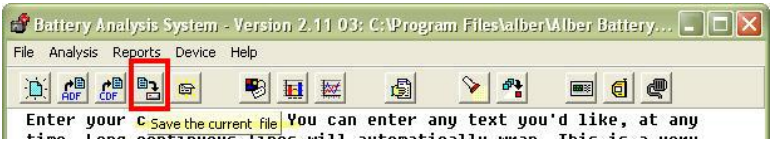


Figure 230. Save The Current File

Save the current file by pressing  on the toolbar

or go to Main Menu and select either File|Save or Save As…

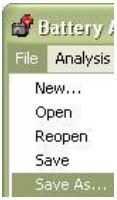


Figure 231. File Save/Save As

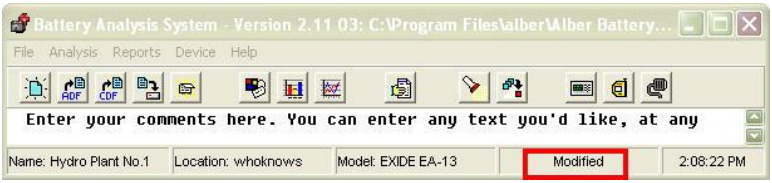


Figure 232. Status = Modified ADF

Whenever a battery file is changed, the main window Status area displays **Modified**; this means changes must be saved.

To save, click File|Save, or click File|Save As and select a subdirectory.

The following directory structure in Figure 233. Directory Structure is suggested for a system with multiple battery sites and batteries.

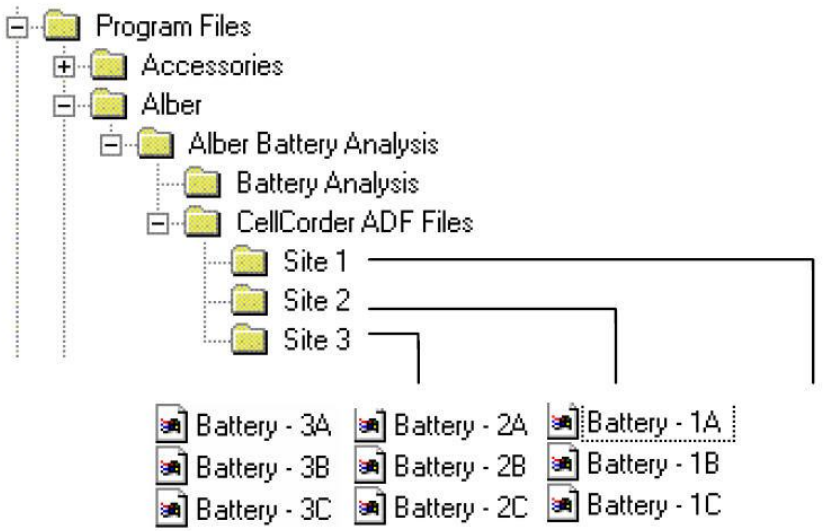


Figure 233. Directory Structure

At installation, the BAS program creates the directory structure shown above, except for the user–created location folders Site 1, 2 and 3. Battery files are saved under each location folder, thus providing an easy way to locate a file.

> *NOTE:*
> *Since each battery file represents many hours of labor, it is good practice to backup battery files at regular intervals to protect against data loss.*

Extracting Data Sets

Figure 234. File Extract

The Extract function copies selected Data Sets from an open ADF or source file to another file considered the destination file that may or may not exist prior to starting the process; if it does not exist, it will be created.

To use Extract, open the source file in the main window, then click File|Extract to display the Extract Data window.

In the Extract Data window, click the check boxes to select Data Sets (source files) to include in the destination file.

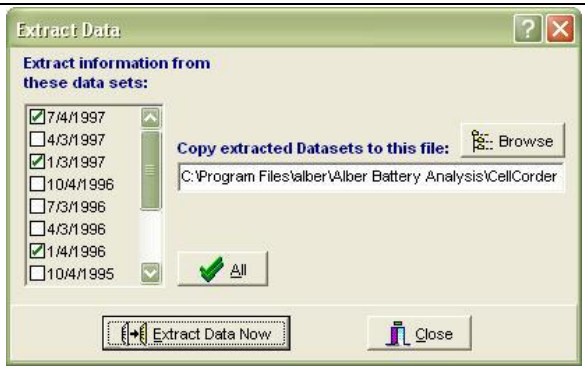


Figure 235. Extract Data Window

NOTE:

To select all Data Sets, click 

;
toggles between 

and 

when selected.

Next, choose a destination file. Either type the path and file name in the box provided or click 

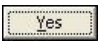
and select a file.

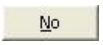
Finally, click 

.

Depending on the destination file, one of three things happen:

If the destination is a NEW file, the selected Data Sets are written and saved to it. This file is configured as a scratch file.

Select 

or 

as appropriate.

Figure 236. Scratch File

NOTE:
In a scratch file, the battery location and model boxes are empty. If the user edits the location and model boxes, it is no longer a scratch file.

When extracting data to an existing ADF, this window appears. Use the radial buttons to choose all information to be changed and extracted. Select 

or 

.

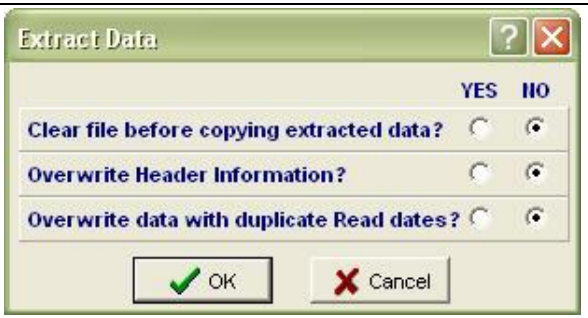


Figure 237. Extract Data To Existing ADF

If the destination is not a scratch file, Data Sets are copied from the source to destination file until a duplicate read date is encountered.

Figure 238. Warning Window Duplicate Date Options

At this point, a Warning window appears. Choose one of the following buttons to obtain the desired results.

Yes	Overwrites the identified Data Set.
Yes to All	Overwrites this Data Set and subsequent duplicate dates.
No	Does not overwrite the identified Data Set.
No to All	Does not copy this and subsequent duplicate Data Sets to the destination. Data Sets already copied will remain.
Cancel	Stops copying and leaves the destination file unchanged.

NOTE:
At the end of the process, the destination file Comments area describes the specifics of the extract.

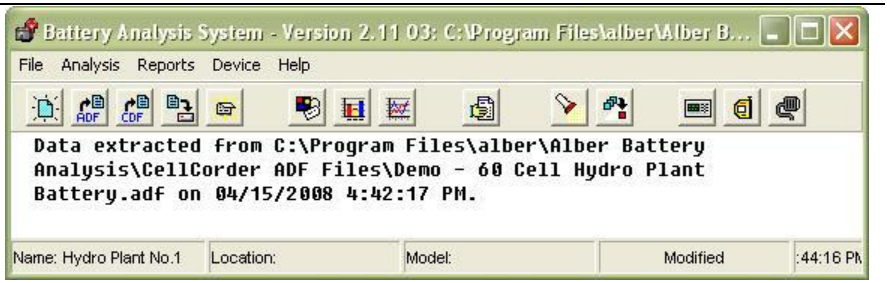


Figure 239. Extract Data Set Comments Destination File

Close the Extract Data window once all data has been extracted.

Merging Data Sets

Merge is the opposite of Extract, but less flexible. Merge copies Data Sets from a file other than the open source file into the open destination file, but does not allow individual selection of Data Sets.

Open the merge destination file, then click File|Merge.

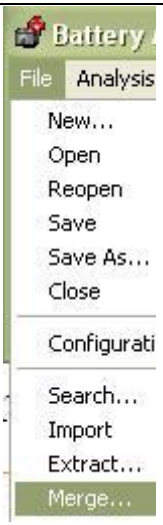


Figure 240. File Merge

NOTE:
If the destination file was modified but not saved, the user will be prompted to save before proceeding. The reason is that, if the merge is cancelled part way through, changes made to the destination file before starting the merge will be lost.

Select a source file from the window that appears after clicking Merge or Save.

Click Open to start the merge.

During Merge, Data Sets are copied from the source to destination file.

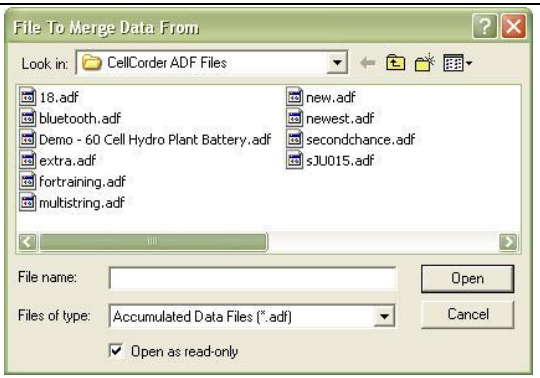


Figure 241. File To Merge Data From

If a duplicate read date is encountered, the Merge File Query box appears.

Figure 242. Merge File Query Duplicate Read Date

The actions for this box are the same as for the Extract process, with the following exception: **Save the File.** When the merge is complete, the modified destination file is not saved. Click File|Save to save the file or File|Close to close the file without saving thus discarding the modifications. Choose one of the following buttons to obtain the desired results.

Yes	Overwrites the identified Data Set.
Yes to All	Overwrites this Data Set and subsequent duplicate dates.
No	Does not overwrite the identified Data Set.
No to All	Does not copy this and subsequent duplicate Data Sets to the destination. Data Sets already copied will remain.
Cancel	Stops copying and leaves the destination file unchanged.

10 Data Analysis – Viewing Data And Graphs

The following sections describe how to view and customize the graph for window display, printing, and exporting data for report generation.

To view battery data set graphs, click on the toolbar or go to Main Menu, select Analysis|Data Set and either Detail or Comparison or Analysis|Trend and Cells or Cell Averages.

Figure 243. Main Menu > Analysis|Data Set|Detail

When using multiple strings, a Select Strings button; Select String(s) appears at the top of the window. To select strings, click the button to open a Select String Window. Click OK or Cancel as needed.

NOTE:
Descriptions in this chapter apply to the Data Set Detail, Comparison and Trend graphs.

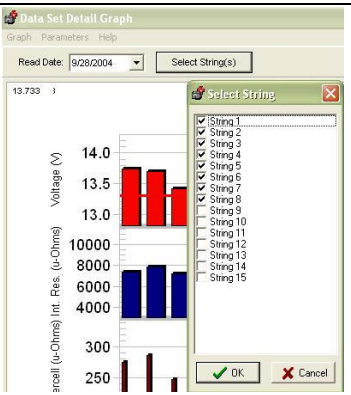


Figure 244. Select Strings

NAVIGATION NOTES:
To enlarge an area of interest on a graph, drag a rectangle across it. Be careful not to click on a bar within the graph while enlarging an area of the graph. To return to normal size, right click the bar graph and click Undo Zoom.

Figure 245. Undo Zoom

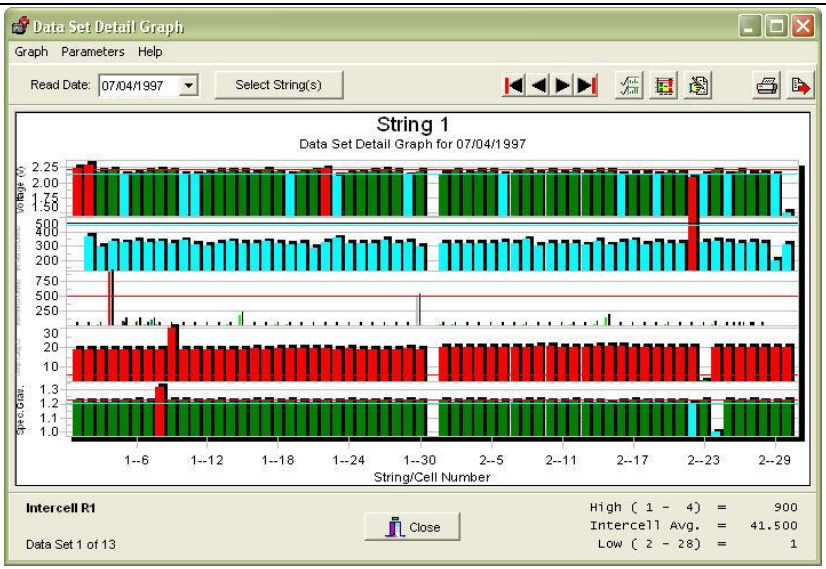


Figure 246. Data Set Detail Graph

Display Cell Data Within A Bar Graph

To display data for a cell click on a bar within the graph. The Cell Data window appears if enabled under File|Preferences. Cell Data displays the string|cell number, the cell Voltage, Internal Resistance, Intercell Resistances, Specific Gravity SG and Temperature when available.

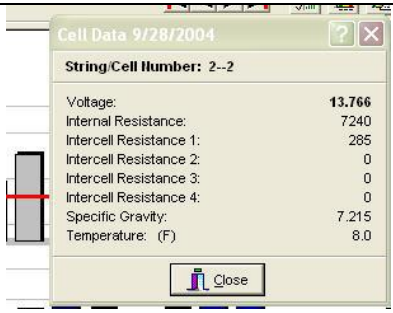


Figure 247. Graph Bar|Cell Data

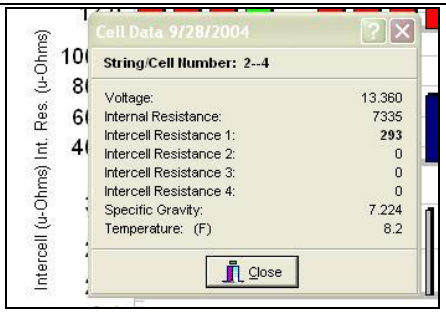
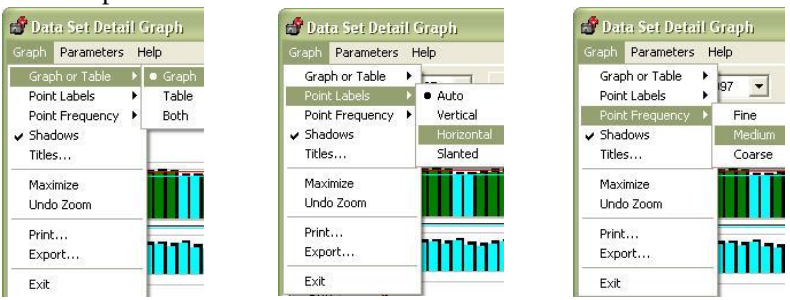


Figure 248. Graph Bar|Cell Data Bold Value Explained

The bold value indicates the area of the bar graph clicked.
For example, if the Voltage bar was clicked, the Voltage value is bold as in the previous figure.
For example, if the Intercell Resistance 1 bar was clicked, the Intercell Resistance 1 value is bold, in this case 293 is bold.

Graph Menus Explained

The Graph drop down menu list affects the graph BUT not the data or analyzing capability. Click Graph on the menu bar to display the shorter drop–down menu.



Or, for an expanded menu, right click the graph display area.

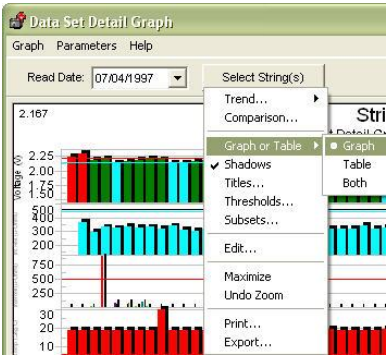


Figure 249. Graph Menus

10.1.1 Graph or Table

Chooses whether the Graph window displays a graph, a data table or both. For bar graphs only, not trend graphs.

10.1.2 Point Labels

Selects how the numbers appear along the bottom of the bar graph. Numbers can display vertically, horizontally or slanted. Select Auto to have the program choose the best style.

10.1.3 Point Frequency

Selects the numbering sequence along the bottom of the bar graph. Select Fine, Medium or Coarse to number every bar, every other bar or every third bar.

10.1.4 Shadows

Adds shadows on each bar in the graph. Click to toggle on or off.

> *NOTE:*
> *For bar graphs only, not trend graphs.*

10.1.5 Titles

Customizes the graph title and saves it in the ADF for each type of graph; Detail, Trend, etc. When found in a file during report generation, the customized titles appear on graphs in the report. Otherwise, the user-defined report title appears.

10.1.6 Maximize

Enlarges the graph to full window. Press Esc or click the top bar to return to normal size. Because the maximized graph is a copy, changes made to this graph may not be reflected in the original.

> *NOTE:*
> *The Maximize function is not the same as maximizing the program window size.*

10.1.7 Zoom and Undo Zoom

To enlarge a portion of the bar graph, place the cursor on the graph, hold the left mouse button down and drag across the cells of interest.

> *NOTE:*
> *The cursor changes to a magnifying glass.*

NOTE:
Click Undo Zoom on the Graph menu to return to original size.

Print The Graph 

10.1.8 Print

Prints the current display.

10.1.9 Export

Activates the export tool described in *Exporting Data*.

10.1.10 Exit

Closes the graph window.

Parameters Menu Explained

10.1.11 Trend

To analyze data in–depth, open the Parameters menu by clicking Parameters on the graph menu bar.

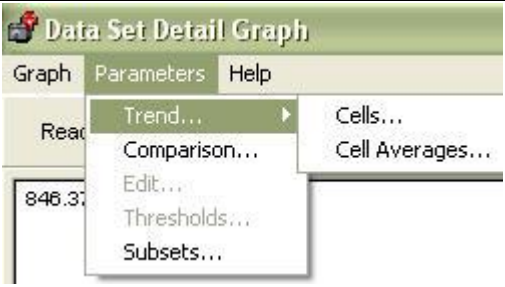


Figure 250. Parameters Menu

Figure 251. Main Toolbar|View Battery Cell Trend Graphs

Or go to the main toolbar and select  to View Battery Cell Trend Graphs.

Or choose Analysis|Trend and Cells or Cell Averages from the Main Menu.

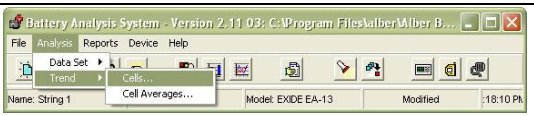


Figure 252. Main Menu|Analysis|Trend

10.1.12 Comparison

Accesses a Comparison graph that compares data between two Data Sets in the same battery file.

Figure 253. Parameters|Comparison

10.1.13 Edit

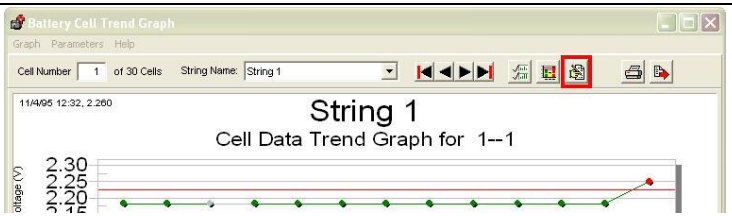


Figure 254. Parameters|Edit

Edit the value of the selected data item by clicking  or choosing Parameters|Edit from the menu.

Edit is only active when a bar is selected on the Details graph. Click a bar within the graph then click  to open the Cell Data Editor box. The user may change the selected parameter value and click  or  as needed.

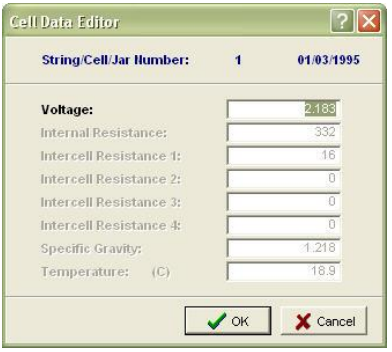


Figure 255. Cell Data Editor

10.1.14 Thresholds

Thresholds becomes active only when a bar is selected on the Details graph and a window opens to Display Properties; to edit and to enable threshold levels and colors for various parameters.

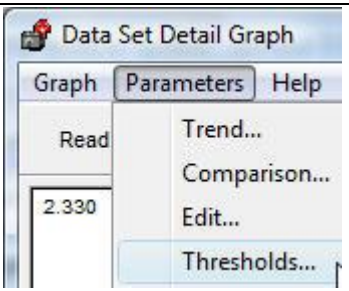


Figure 256. Parameters|Thresholds

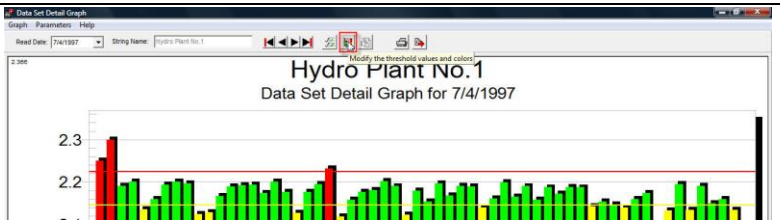


Figure 257. Parameters|Thresholds

The selected bar is grey and the Voltage Display Properties window will open for editing as well as a window to indicate Cell Data for the 'grey' bar selection.

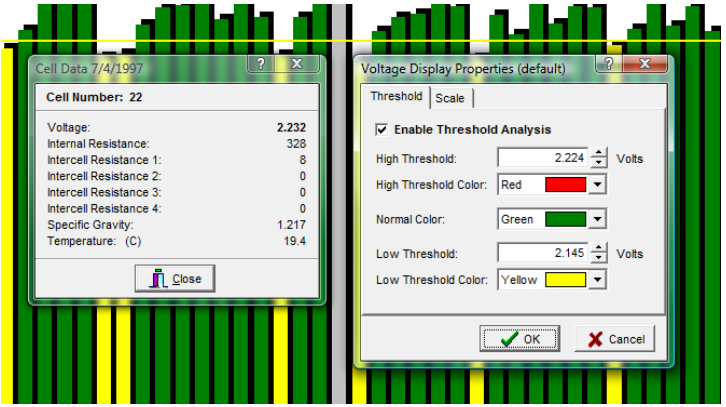


Figure 258. Display Properties

10.1.14.1 Setting Threshold Levels/Color Indicators

To set threshold levels and colors for parameters, click a bar on the graph, then click  to open the Display Properties window. Type new threshold level values in the boxes. High and low levels cannot be set to zero. Choose threshold colors from the drop–down lists. Check Enable Threshold Analysis to draw high and low threshold lines on the graph and display the bars in color, then click  . When a cell exceeds a threshold level, the bar on the graph bar inherits the color specified.

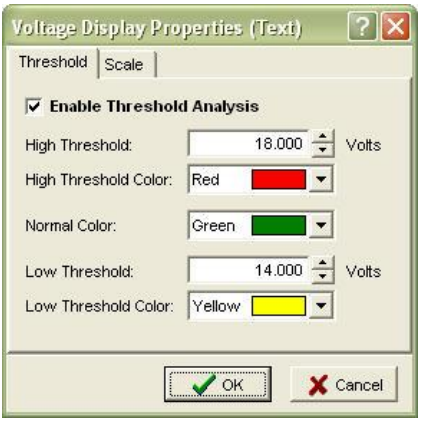


Figure 259. Threshold Colors for Bar Graphs

NOTE:
The title bar in the Display Properties window indicates which bar graph the user had selected before opening the window.

A Data Set Threshold Report will give a complete summary of violations if Enable Threshold Analysis is selected.

10.1.14.2 Setting Parameters|Thresholds|Scale

Use the Scale window to change the y–axis/vertical range displayed on a graph. Click Parameters|Thresholds| to display the Properties window and then select the Scale tab.

Click into the box next to Enable Manual Scale. Type the maximum and the minimum values in the boxes provided, then click OK. The bar graph display reflects the new scale.

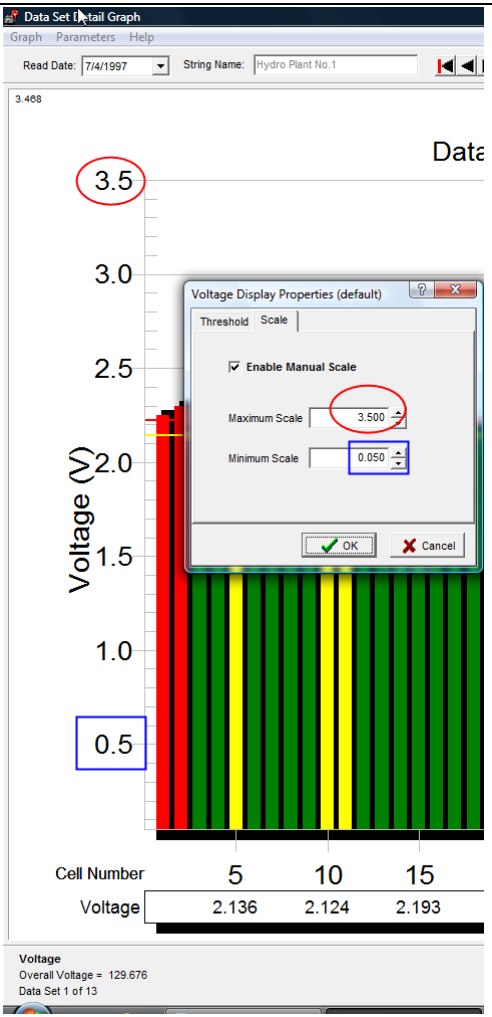


Figure 260. Parameters|Thresholds|Scale

10.1.15 Subsets

Displays the Data Subsets window that provides a pick list for parameters to appear on the same graph.

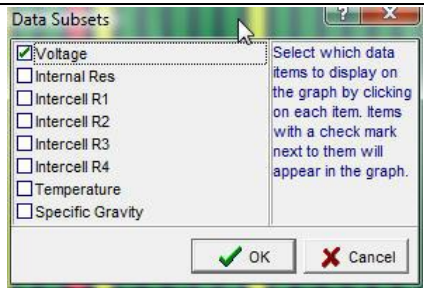


Figure 261. Voltage Only Subset

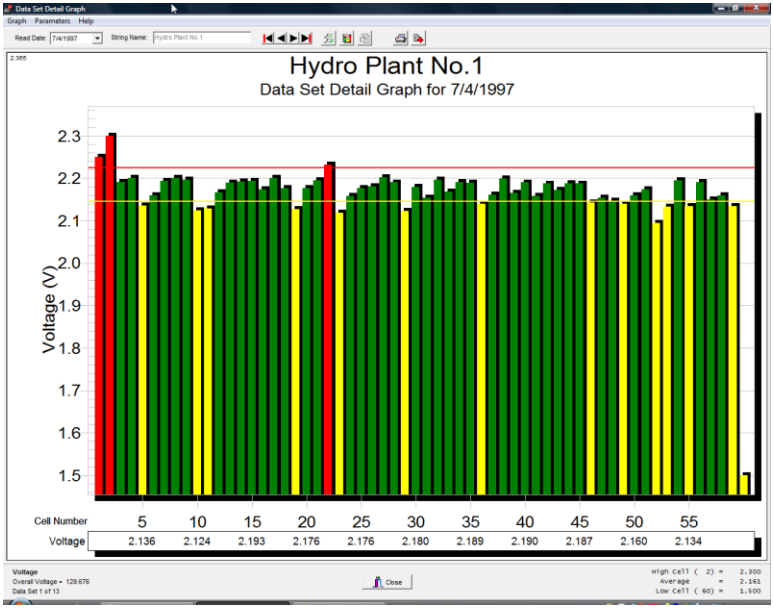


Figure 262. Graph With Voltage Only Subset Chosen

Check into the box provided to show data within the graph.

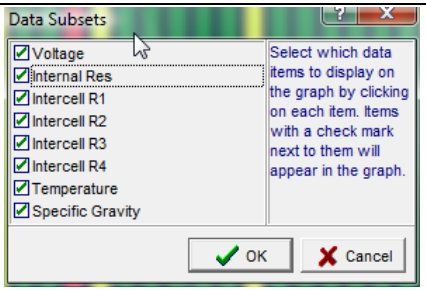


Figure 263. All Subsets Chosen

Figure 264. Graph With All Subsets Chosen

Comparison Graph Display

The Comparison graph compares the same parameter in two sets of readings.

As an example, to perform a voltage comparison, open a file with at least two Data Sets.

Click  ; the **View Battery Data Set Graphs** button.

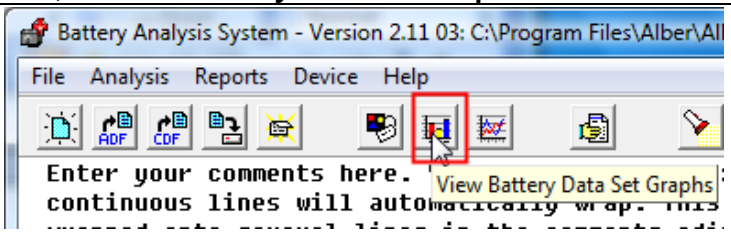


Figure 265. View Battery Data Set Graphs 

Click Parameters|Comparison.

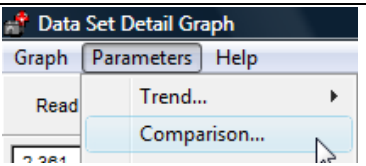


Figure 266. Parameters|Comparison

On the new graph, select a reference Data Set from the Read Date list.

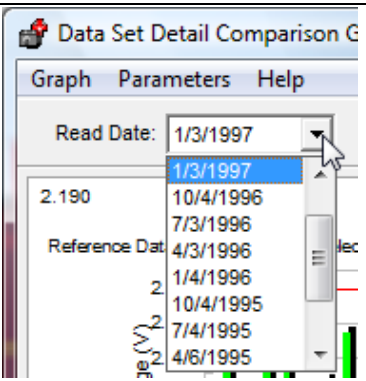


Figure 267. Data Set Read Date For Comparison Graph

Now click Graph|Set as Reference.

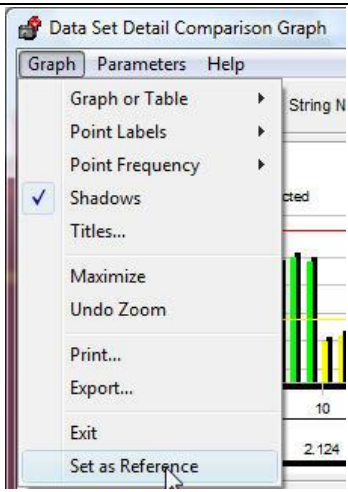


Figure 268. Graph|Set As Reference

The Reference Data Set Graph remains open.

Select a Data Set to compare to the Reference Data Set in the Read Date drop-down menu.

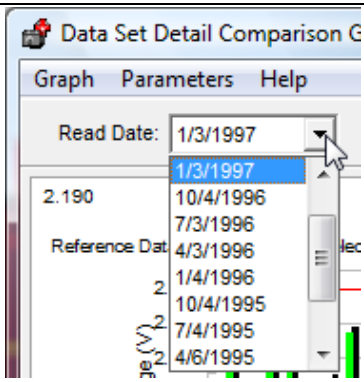


Figure 269. Select Date To Compare With Reference Data Set

The Dataset Comparison Graph displays two bars for each cell. The reference data bars remain fixed (10/04/1996), and the adjacent bars change as the user selects new Data Sets from the Read Date list.

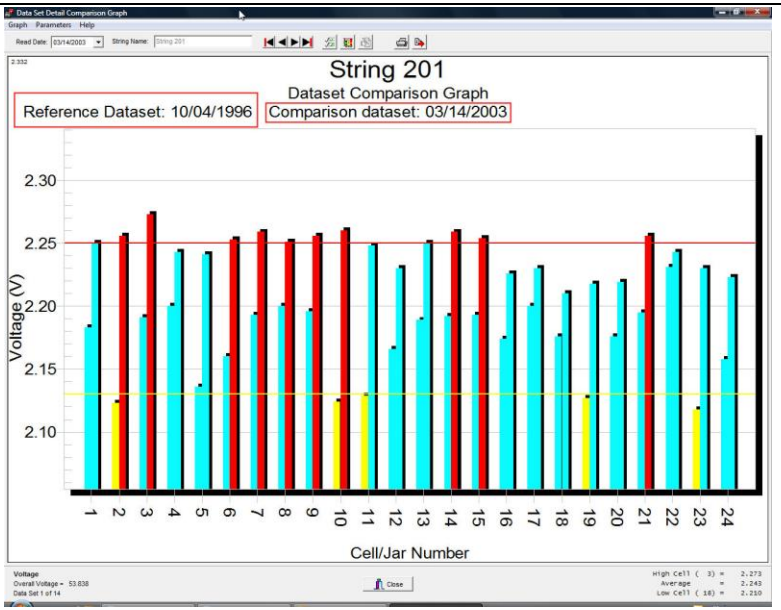


Figure 270. Comparison Graph Example

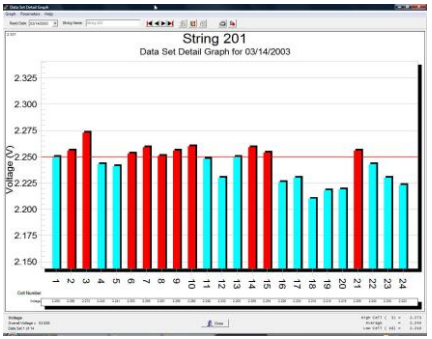


Figure 271. Comparison Data Set Graph Example 3/14/2003

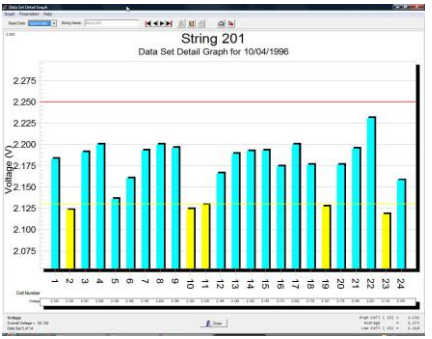


Figure 272. Reference Data Set Example 10/04/1996

At any time, the user may select a new Data Set as a reference. From the Read Date list, select a date, and then choose Graph|Set as Reference. When using multiple strings, a Select Strings button appears at the top of the window.

Trending a Parameter Over Time

Trending a specific cell parameter can help identify a potential problem. For example, a rising internal resistance can be readily identified when compared to previous readings.

As an example, trend internal resistance for a cell by opening a file with at least two Data Sets.

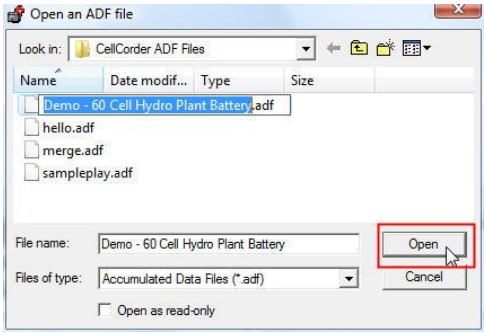


Figure 273. Open File With Multiple Data Sets

Click the **View Battery Data Set Graphs** button.

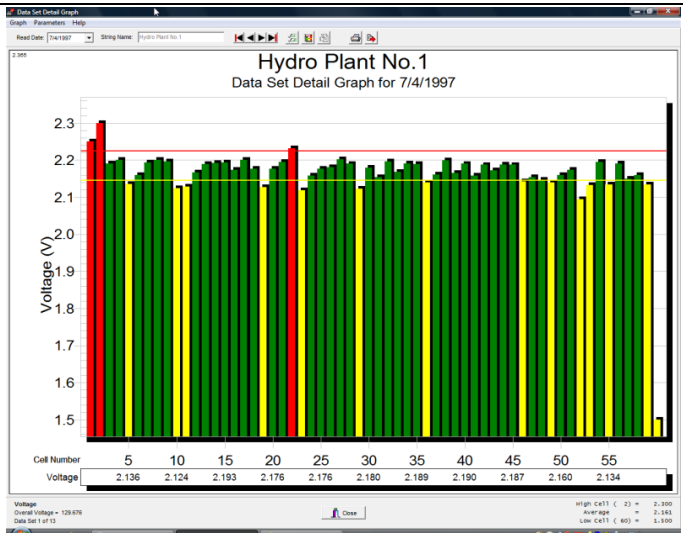


Figure 274. View Graph

Click a cell in the graph.

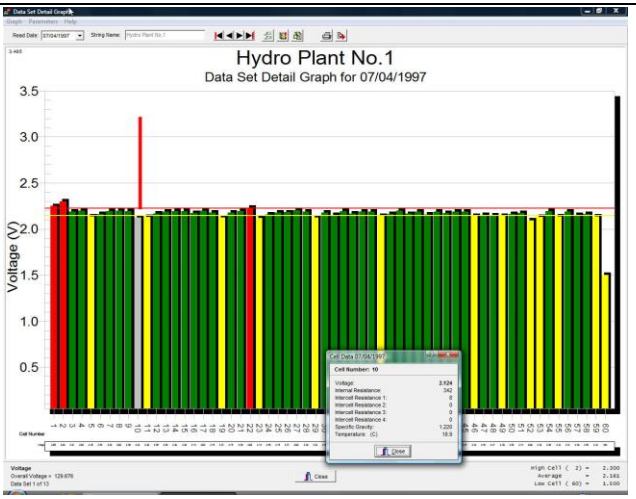


Figure 275. Click Cell In Graph

NOTE:
Refer to cell where red line is above grey bar.

Then click Parameters|Trend|Cells.

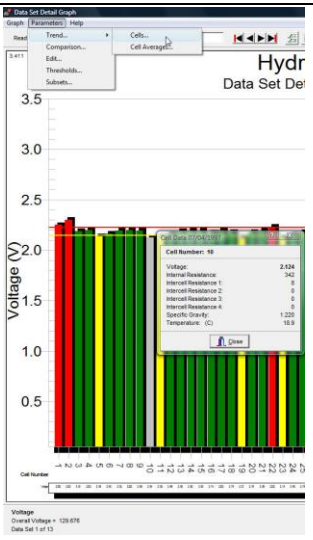


Figure 276. Parameters|Trend|Cells

Click the **Select Which Parameters Appear in Graph** button.

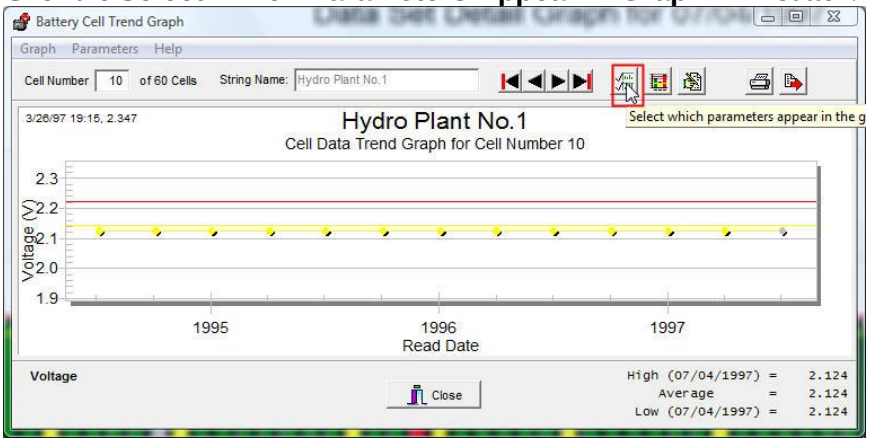


Figure 277. Select Parameters

In the Data Subsets window, select Internal Resistance only, then click OK.

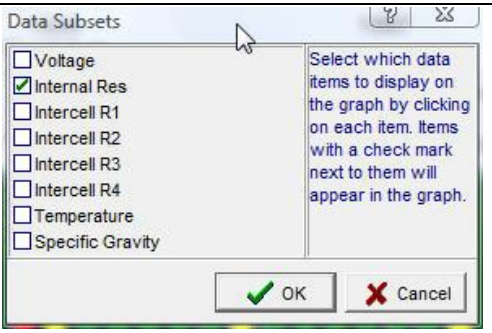


Figure 278. Data Subset Internal Resistance Only

A Battery Analysis window appears to explain that previously chosen subsets are being cleared.

Select OK.

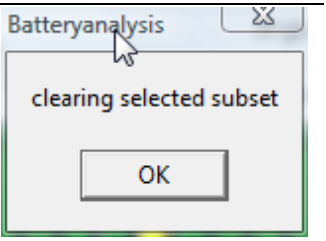


Figure 279. Clearing Selected Subsets

A Battery Cell Trend Graph displays the cell values over time. Click a data point or date to display details in the Cell Data box. If the box does not appear, enable it under File|Preferences. The following is a graph of Cell 52 from the sample file **Demo–60 Cell Hydro Plant Battery**.

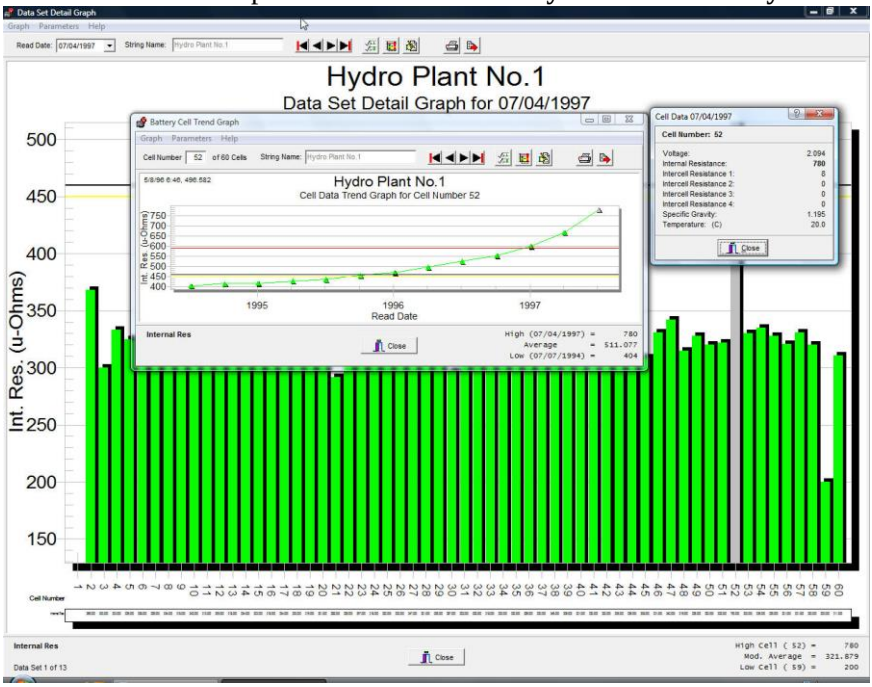


Figure 280. Cell 52 From The Sample File Demo–60 Cell Hydro Plant Battery

NOTE:

Intertier cells are specially indicated on the Cell Trend graphs. The graph subtitle is appended with Intertier on intertier cells.

Trending a Parameter Average Over Time

Trending a parameter average helps identify inconsistencies in a battery system, and trending internal resistance averages helps determine when the battery is approaching end of life.

To perform an average trend on a resistance parameter, for example, do the following.

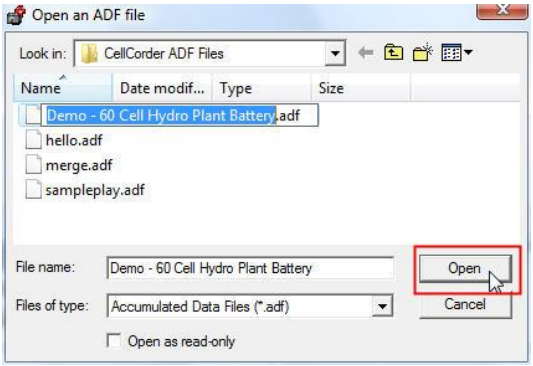


Figure 281. Open File With Multiple Data Sets

Click the **View Battery Data Set Graphs** button.

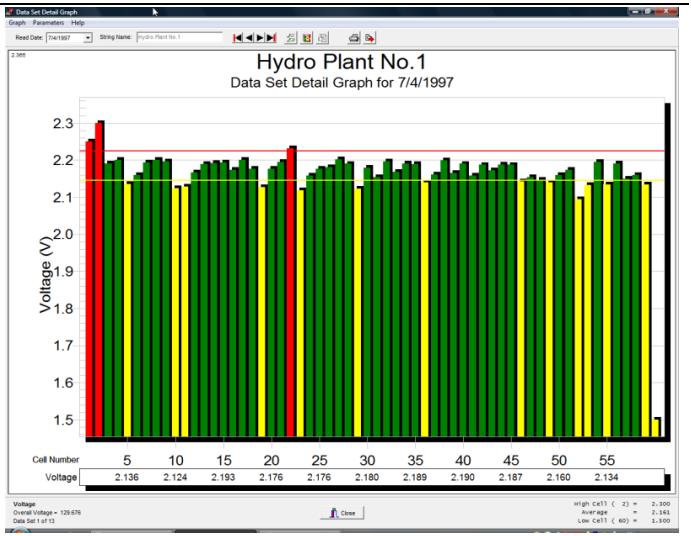


Figure 282. View Graph

Click a cell in the graph.

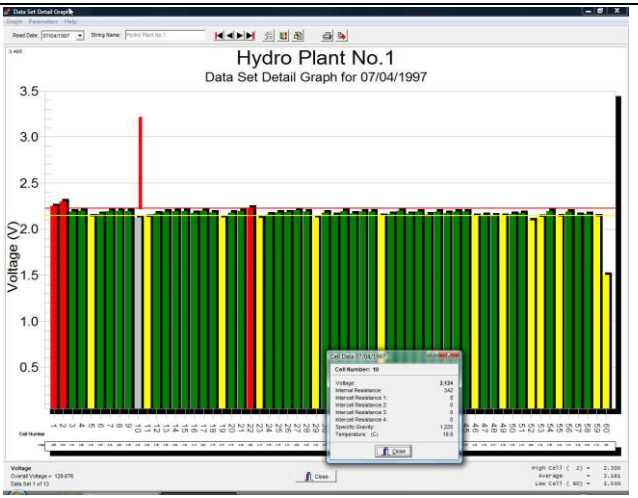


Figure 283. Click Cell In Graph

NOTE:
Refer to cell where red line is above grey bar.

Then click Parameters|Trend|Cell Averages.

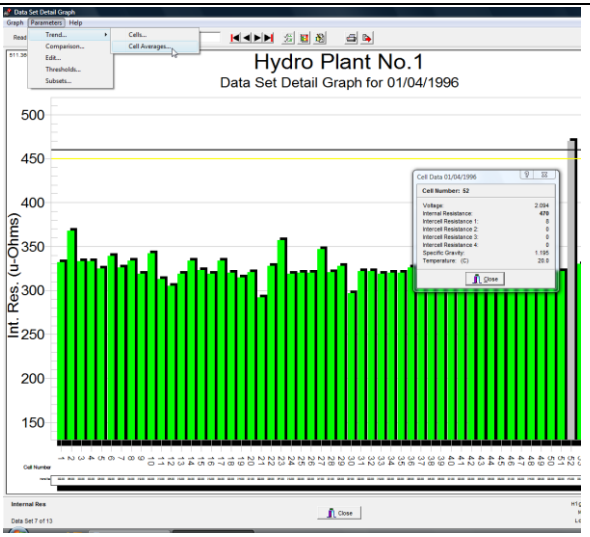


Figure 284. Parameters|Trend|Cell Averages

Click the **Select Which Parameters Appear in Graph** button.

In the Data Subsets box, select Internal Resistance only, then click OK.

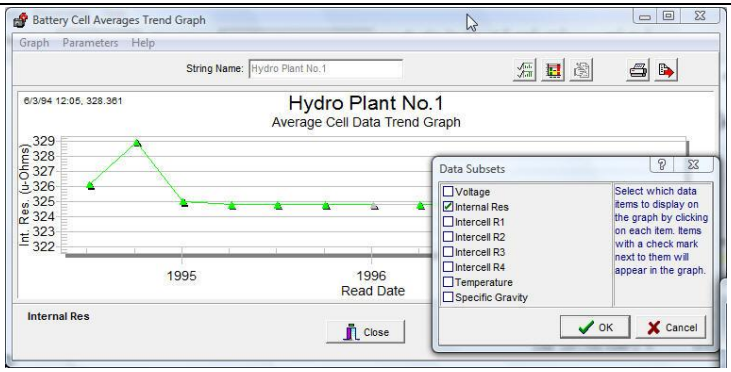


Figure 285. Battery Cell Averages Trend Graph

A Battery Cell Averages Trend Graph displays internal resistance over time. Click a data point or date to display details in the Cell Data box. This detail box shows the averages of all parameters on a given date.

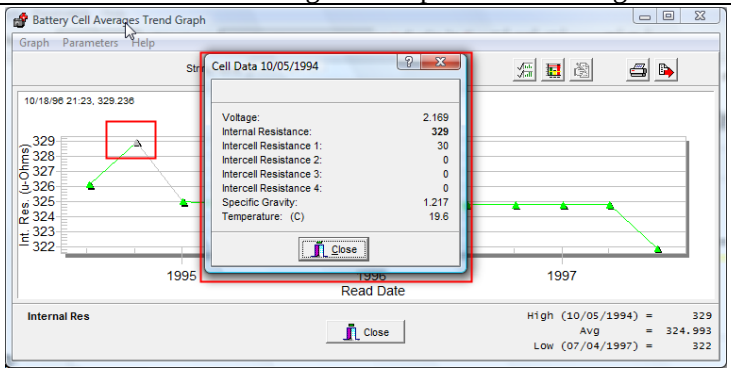


Figure 286. Cell Average Trend Data

NOTE:
If the box does not appear, enable it under File|Preferences.

The average summaries on the internal resistance window are a calculated modified average. This eliminates extremely bad cells that would give a false average. The calculation eliminates any cells that are above or below the true average by 25%, and then recalculates a new average called Modified Average.

11 Generating Reports: Five Report Types

The BAS program can create five types of reports:

- Detail Report,
- Comparison Report,
- Threshold Deviation Report,
- Cells Trend Report, and
- Cell Averages Trend Report.

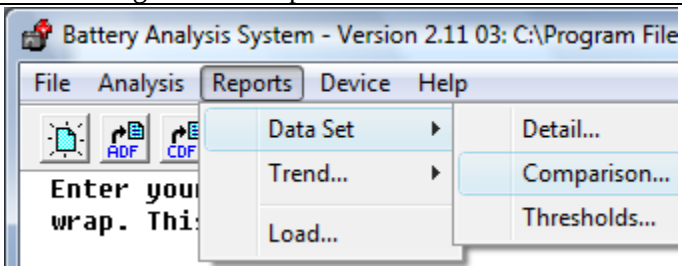


Figure 287. Main Menu|Reports|Data Set

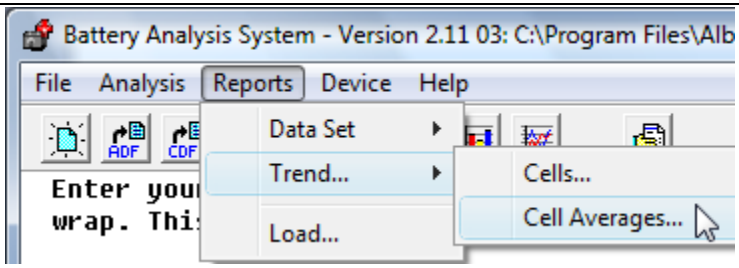


Figure 288. Main Menu|Trend

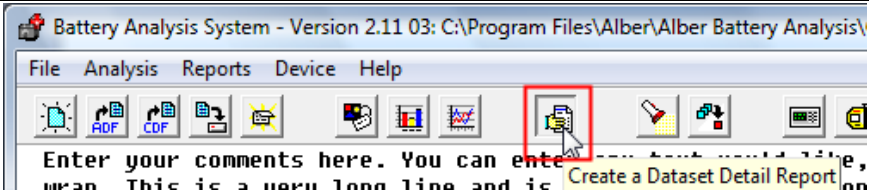


Figure 289. Main Toolbar|Create a Dataset Detail Report

The user can create a report with tabular lists, graphs or both make footer with user–defined text and a date stamp, and page number.

When a report displays, buttons at the top allow the user to change page view size, view other report pages, print the report, and save as a ZRF file.

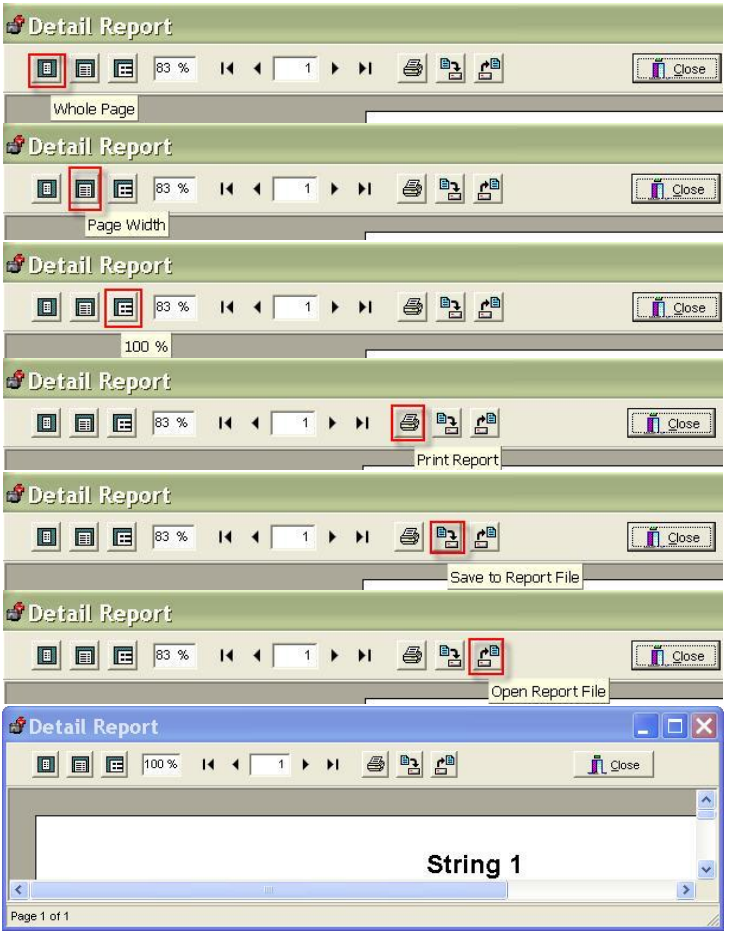


Figure 290. Buttons At Top Of Reports

The user can:

- Open a ZRF file later by selecting Reports|Load or by using the Archive Reader.

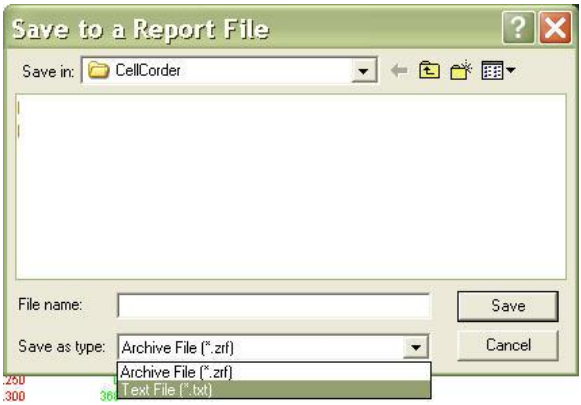


Figure 291. Save Report As Text

- Save the text portion of the report as a text file by clicking the Save to Report File button and then selecting TXT in the **Save as type** box.

Each Report Type Has Five Setup Tabs

To create a report, open an ADF or CDF to be converted into an ADF, then select the desired report type and then select all the appropriate tabs and edit accordingly to complete the report.

Figure 292. Reports And Report Setup Tabs

There are five Report Setup tabs within each Report Setup:

1. Data Sets,
2. Strings| Cells,
3. Graphs and Tables,
4. User Defined, and
5. Other Options.

View a tab by clicking the top of the desired tab.

NOTE:
The Report Setup tabs have options that the user can edit depending upon the type of report being generated. Complete the five Report Setup tabs, then click the Create Report  *button that is located at the bottom of the Reports Setup window.*

11.1.1 Data Sets Tab

There are three types of Data Sets Tabs, the Detail and Threshold report are similar where multiple dates can be chosen to include in the report chosen. The trend cell and cell averages are similar in that they include the newest read date chosen, all dates in between to the last read date chosen. Data Sets in the Comparison Report Setup asks the user for a reference date and several other read dates may be chosen to compare with the reference data.

11.1.2 Strings|Cells Tab

If the user wishes to present multiple string information within reports, then go to File|Properties and click to check the box next to Multi Strings.

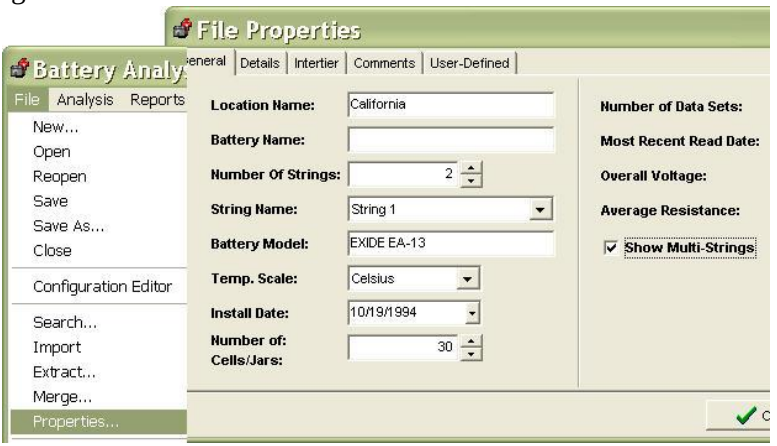


Figure 293. File|Properties

11.1.3 Graphs And Tables Tab For All Reports But Threshold

Reports can print tables and graphs that show selected parameters. Select **Use single graph** to display all parameters on one graph. Select **Use large graph** for a larger graph in the report. These report types create reports that show absolute values but not percentage change.

11.1.4 Reports|Data Set|Thresholds Graphs And Tables Tab

With this report type, the **Values instead of percentages** check box appears. Not selecting this box creates a report that shows deviations as percentage threshold change instead of absolute values.

11.1.5 User Defined Tab

This tab allows the user to display previously defined fields on reports.

11.1.6 Other Options Tab All Reports

All report types can have a user–defined header and footer. Use this Options tab to edit the text, choose page orientation, and print the page number and the date and time the report was created. If **User Text** is not checked, the footer will not print. The user may also choose to print a company logo or any BMP file image on the first page of the report.

> *NOTE:*
> *Make sure the BMP file is not larger than 150 x 150 pixels.*

Detail Report

This report type allows the user to select the data sets (sets of readings) to be included in the generated Detail report. The Detail Report creates a tabular list and graphs of selected Data Sets.

Create a data set detail report by clicking  or from the Main Menu click Reports|Data Set|Detail.

Figure 294. Reports|Data Set|Detail

The Data Set Detail Report creates a tabular list and graphs of selected Data Sets.

The Setup window opens to the first tab, Data Sets. Check into boxes provided to include desired dates in the report.

All can be used to select all dates easily.

Close exits the Report Setup window.

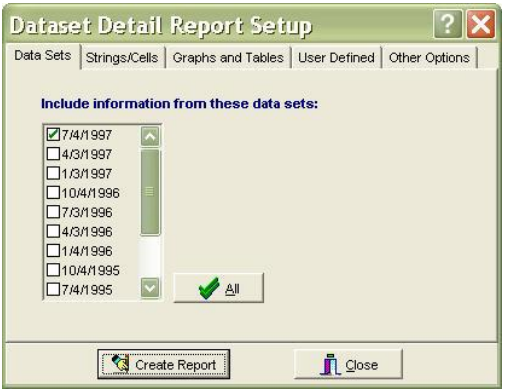


Figure 295. Data Sets Tab

If the open ADF contains only one string then the user can skip the Strings/Cells Tab.

If the open ADF contains multiple strings then the user can choose to create the reports with one or more strings by pressing Select String(s).

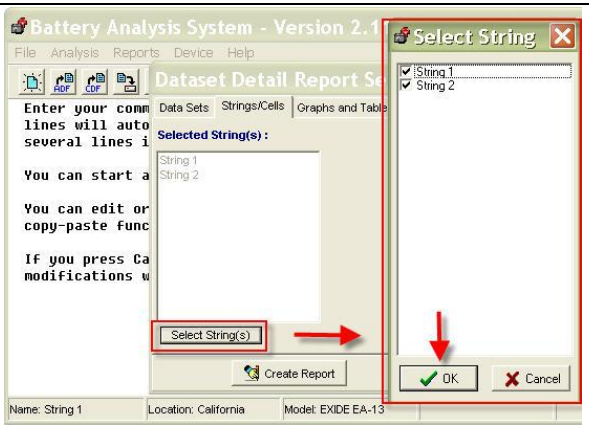


Figure 296. Strings/Cells Tab

NOTE:
The default is to include all strings in the report.

Next, the user can choose which information needs to appear in the Detail Report by using the mouse to click into the boxes provided.

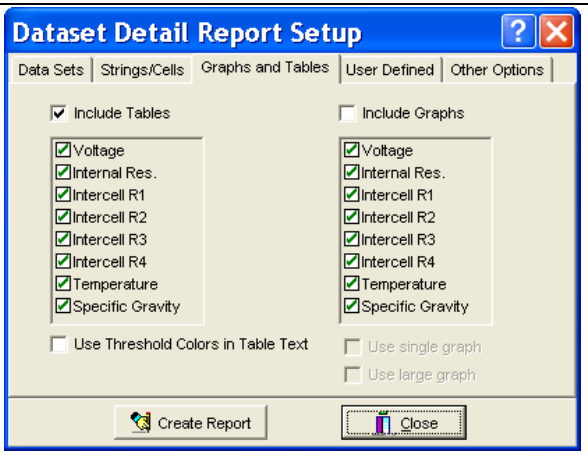


Figure 297. Graphs And Tables Tab

NOTE:
The user's preferred threshold colors may also be displayed in the report by checking into the box provided.

If the user had defined specific fields under File| Properties|User Defined Fields and would like to include these into the report, click into the boxes provided.

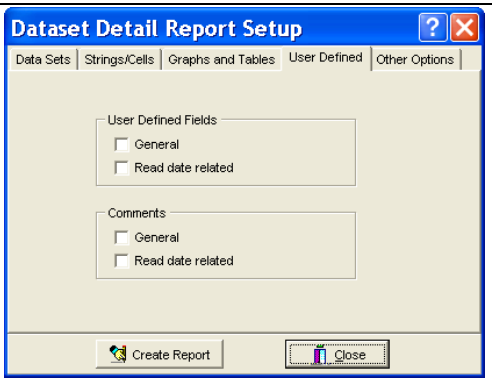


Figure 298. User Defined Fields To Be Included

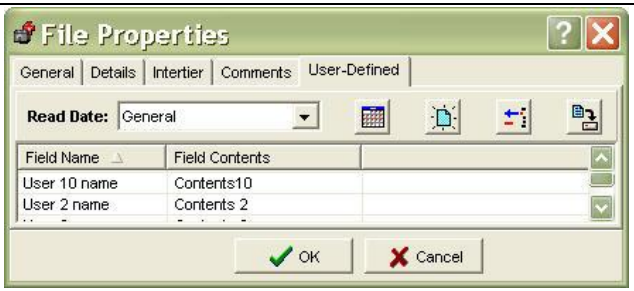


Figure 299. File| Properties|User Defined Tab/Field Name/Contents

Report titles, orientation, footer, etc. can be edited in the Other Options tab.

NOTE:
An optional logo may be placed on the top of the report.

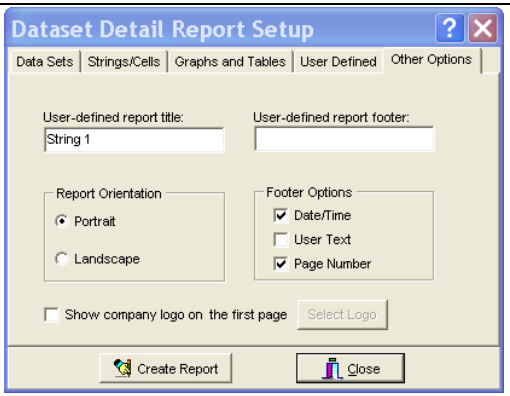


Figure 300. Other Options Tab

Figure 301. Data Set Detail Report Examples

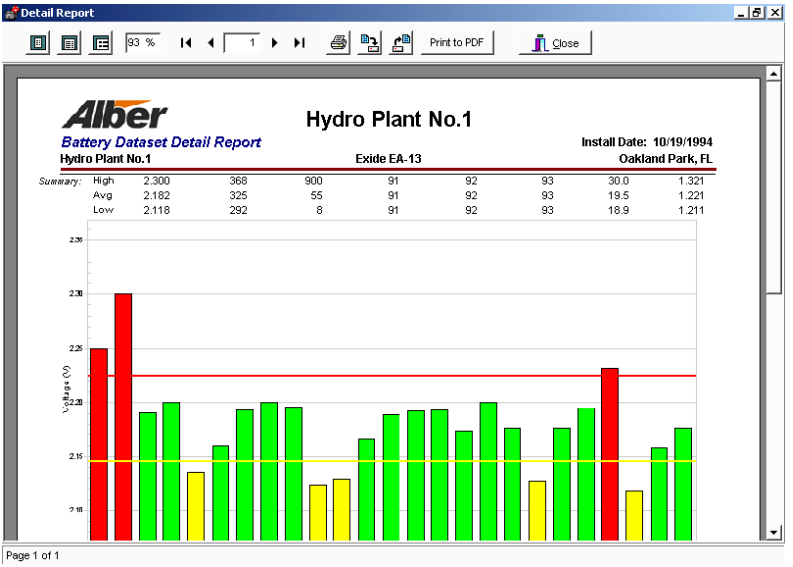


Figure 302. Data Set Graph On Detail Report

Comparison Report

This report type selects a reference data set date that is compared to the other data sets selected.

> *NOTE:*
> *The user cannot compare the same data set date to itself.*
>
> *All data sets except the reference can be in one report.*
>
> *If the user selects this report type, **Report Orientation** is not selectable and is fixed at **Landscape**. This prints a wide page for Comparison reports.*

The Data Set Comparison Report creates a comparison table of selected Data Sets referenced to one Data Set.

To start the Data Set Comparison Report Setup, click Reports|Data Set|Comparison.

Figure 303. Reports|Data Set|Comparison

Choose a reference data set and comparison data set(s) to be included in the comparison report.

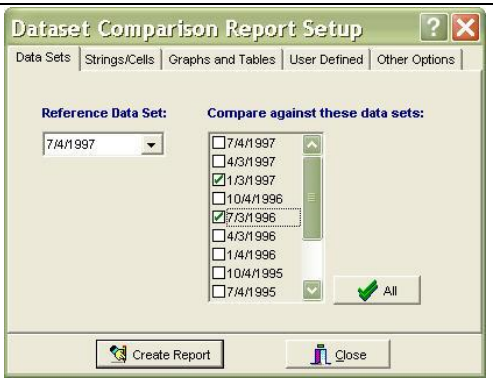


Figure 304. Select Reference Data Set And Comparison Data Sets

If there is one string only, the user may skip this tab.

NOTE:
In multi-string files, the user will need to select/deselect strings as needed.

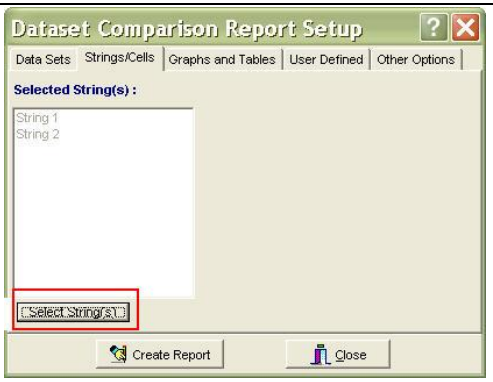


Figure 305. Select Strings For The Comparison Report

Choose the graphs and tables tab and make selections.

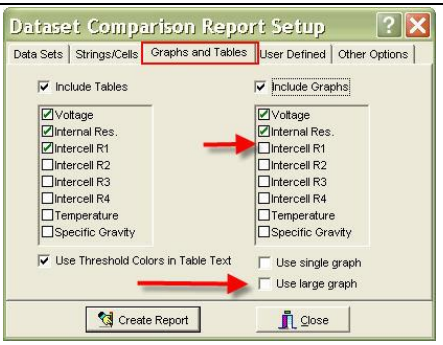


Figure 306. Comparison Report Setup Graphs And Tables Tab

If User Defined Fields need to be displayed on the Comparison Report, click into the boxes provided for the desired information.

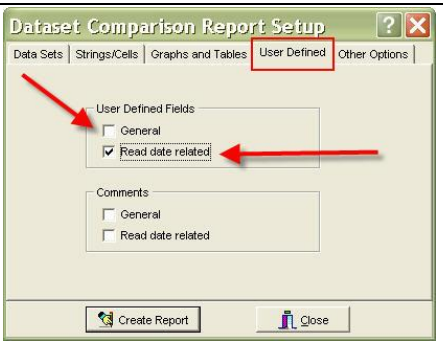


Figure 307. User Defined Tab In Comparison Report Setup

Last, change all other options by selecting the Options Tab

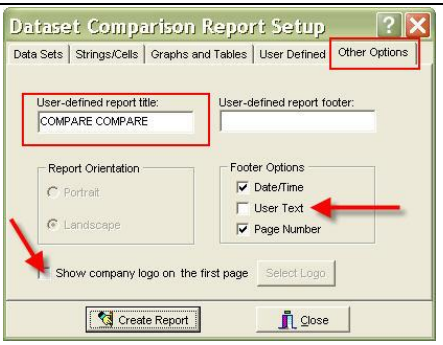


Figure 308. Other Options Tab Comparison Report Setup Window

Lastly, click 

to generate the Comparison Report.

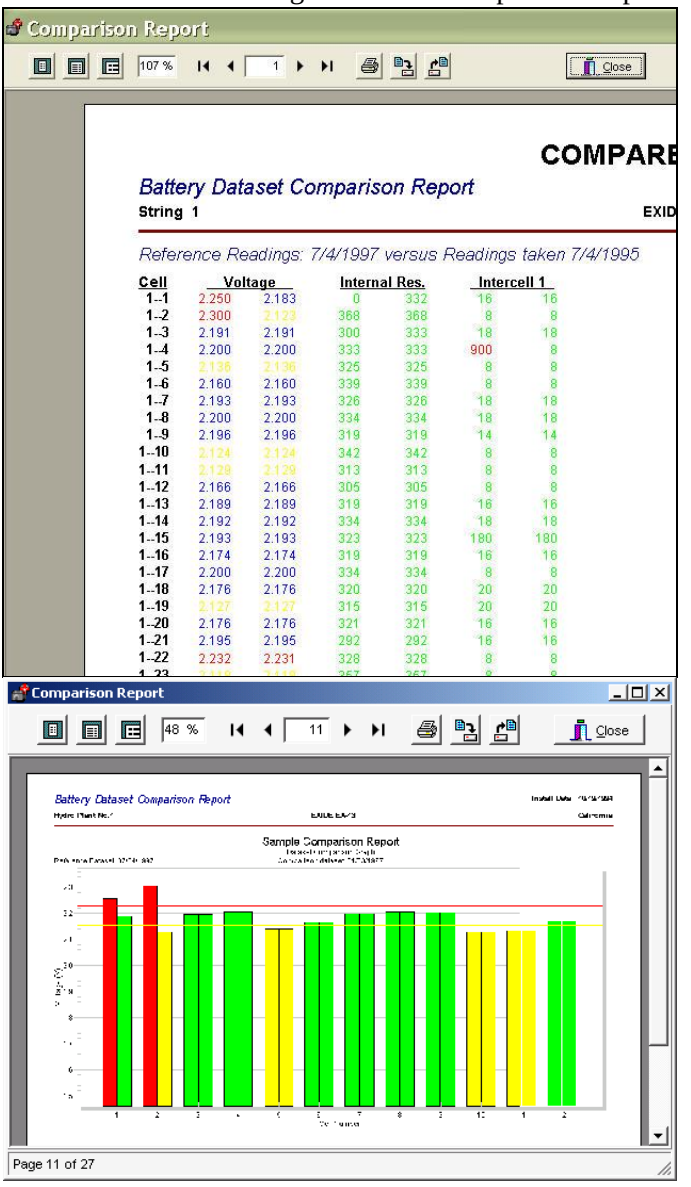


Figure 309. Data Set Comparison Report/Graph Examples

Threshold Deviation Report

The Data Set Threshold Report creates a deviation list that shows threshold violations of selected Data Sets.

To start the Threshold Report Setup, click Reports|Data Set|Thresholds.

Figure 310. Other Options Tab Comparison Report Setup Window

Choose Data Sets by clicking into the boxes provided.

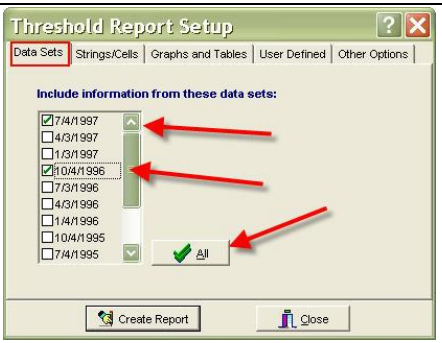


Figure 311. Threshold Report Setup Choose Data Sets

If necessary, select strings to be displayed in the threshold report.

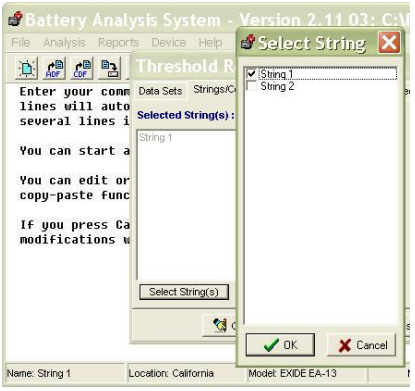


Figure 312. Select Strings For Threshold Report

Select Graphs and Tables tab and choose parameters to be included in the report.

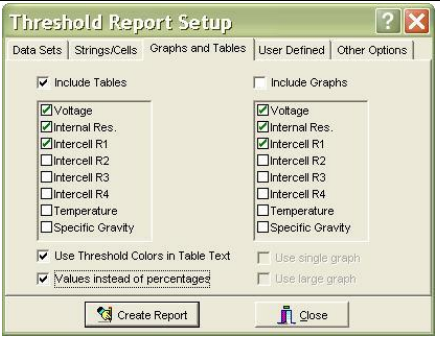


Figure 313. Threshold Report Graphs And Tables Tab

If desired, the user may select previously defined user fields to be included in the report.

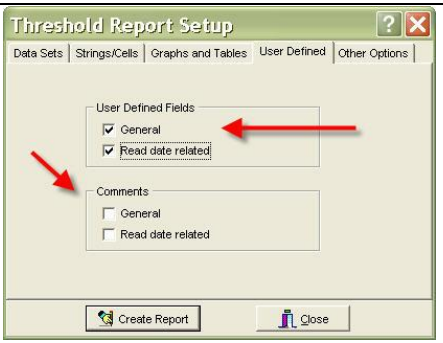


Figure 314. User Defined Fields

Choose comments or a new title and change the report orientation in the Others Tab.

Click  to create the Threshold Report.

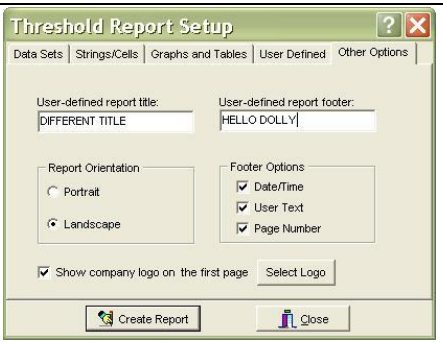


Figure 315. Other Options Tab For The Threshold Report

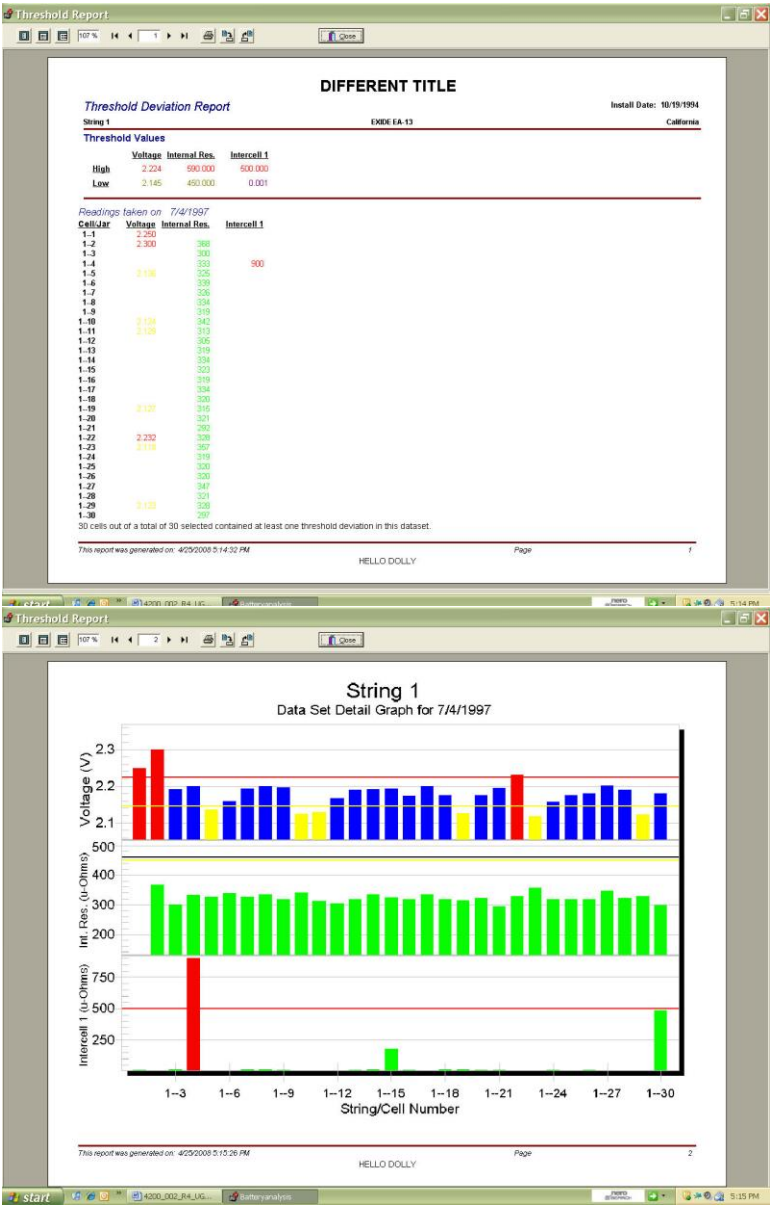


Figure 316. Threshold Report With Graphs Example

Cell Trend Report

The Cell Trend Report creates a list and graph of selected Data Sets with respect to time. To start the Cell Trend Report Setup, click Reports|Trend|Cells.

Figure 317. Reports|Trend|Cells

Select the dates to be included in the Cell Trend Report.

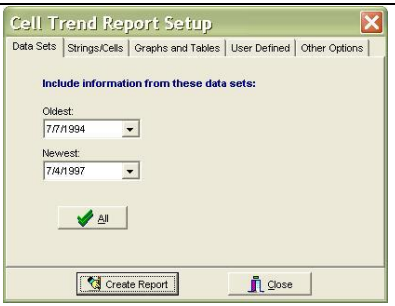


Figure 318. Reports|Trend|Cells|Data Sets Tab

Choose the Strings/Cells to be included in the Cell Trend Report.

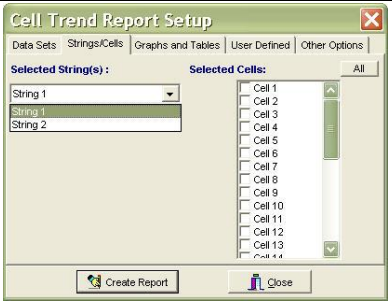


Figure 319. Reports|Trend|Cells |String/Cells Tab = Multi String Left Unselected In Properties

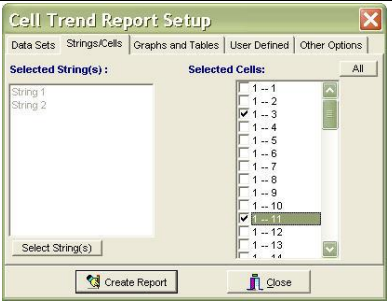


Figure 320. Reports|Trend|Cells |String/Cells Tab = Multi String Selected In Properties

Select the parameters to be included under Graphs and Tables.

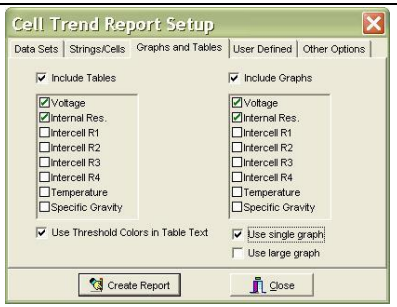


Figure 321. Reports|Trend|Cells |Graphs And Tables Tab

If User Defined general information needs to be included in the report, click into the check boxes provided.

NOTE:
If the user selects these report types, ***Read date related*** *is not selectable because Trend examines cells and not a particular data set.*

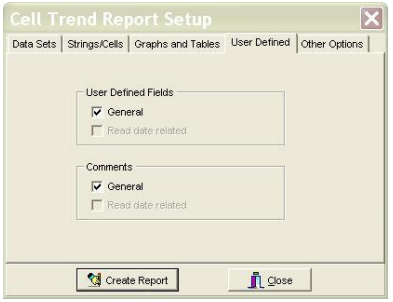


Figure 322. Reports|Trend| Cells|User Defined

Choose comments or a new title and change the report orientation in the Others Tab.

Click 

to create the Cell Trend Report.

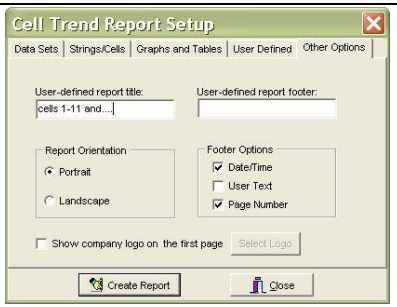


Figure 323. Reports|Trend|Cells|Other Options Tab

The following figure shows resistance parameter Cell 52 as a graph.

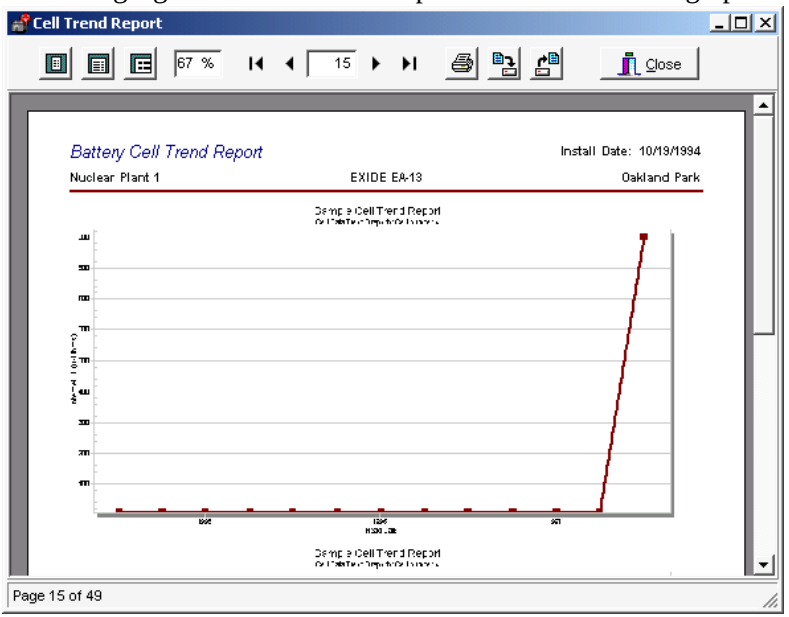


Figure 324. Battery Cell Trend Graph

Cell Averages Trend Report

The Cell Average Trend Report creates a tabular list of selected Data Sets averages with respect to time. To start the Cell Average Trend Report Setup, click Reports|Trend|Cell Averages.

Figure 325. Reports|Trend|Cell Averages

NOTE:
If the user selects this report type, choosing the oldest and newest data sets also includes all the data sets between these dates in the Trend report.

Choose the data sets to be included in the Cell Averages Trend Report.

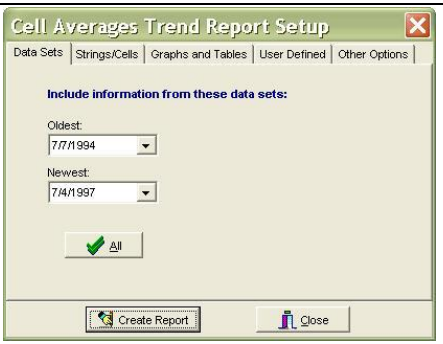


Figure 326. Reports|Trend|Cell Averages|Data Sets Tab

Choose the string or strings to be included in the Cell Averages Trend Report.

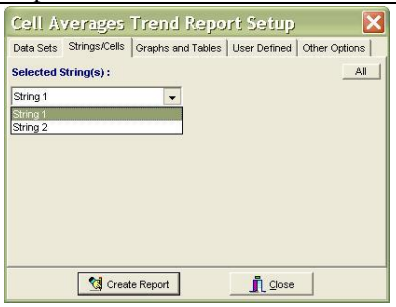


Figure 327. Reports|Trend|Cell Averages|Strings/Cells Tab = Multi String In Properties Left UnSelected

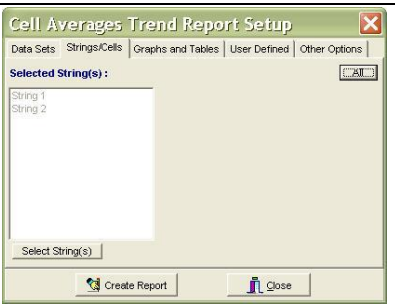


Figure 328. Reports|Trend|Cell Averages|Strings/Cells Tab = Multi String In Properties Selected

Choose to include Intercell, Temperature and other parameters as well as to include tables or graphs.

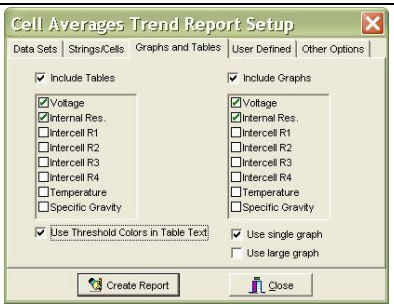


Figure 329. Reports|Trend|Cell Averages|Graphs And Tables Tab

If User Defined general information needs to be included in the report, click into the check boxes provided.

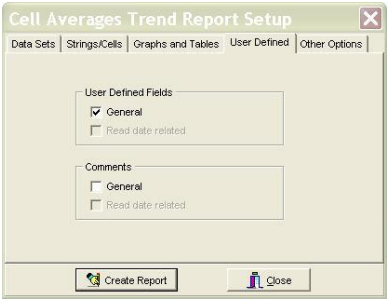


Figure 330. Reports|Trend|Cell Averages|User Defined Tab

NOTE:
*If the user selects these report types, **Read date related** is not selectable because Trend examines cells and not a particular data set.*

Choose comments or a new title and change the report orientation in the Others Tab.

Click  to create the Cell Trend Report.

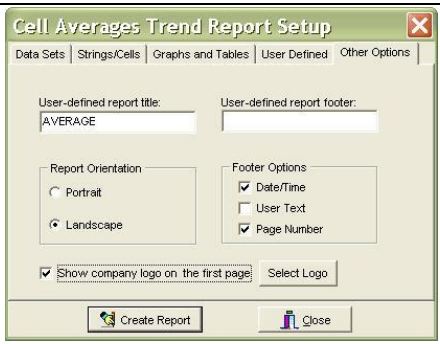


Figure 331. Reports|Trend|Cell Averages|Other Options Tab

The following figures show parameters tabulated from the first to last Data Set with respect to time, and resistance parameter averages as a graph.

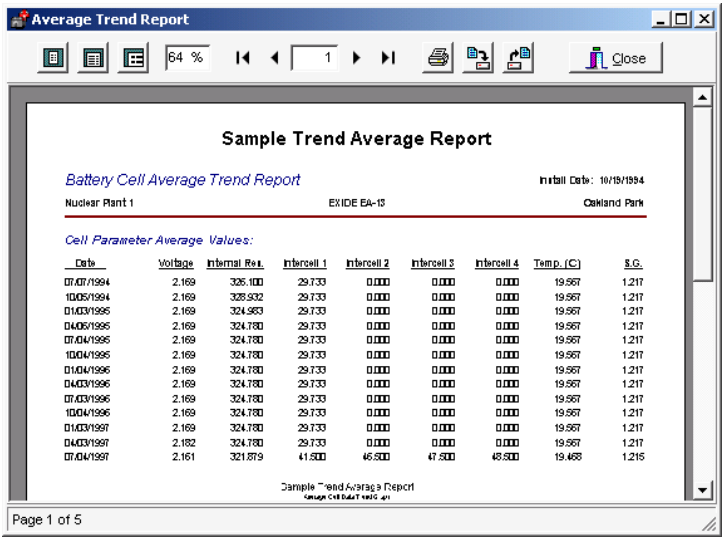


Figure 332. Cell Average Trend Report

Figure 333. Cell Average Trend Graph

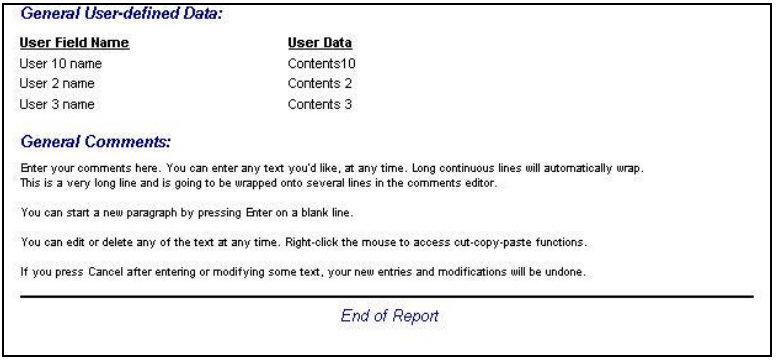


Figure 334. User Defined Data And Other Options Information Can Be Found At The End Of The Report

Print to PDF

A trial version of a PDF file generating program is available at installation. If the user does not have a program that creates PDF files, install this program if the user wants to create reports in PDF format for use and distribution. After 15 trial uses, the user may purchase the full program from Docudesk.

The Print to PDF button appears on report windows if the PDF program is installed. The user may save the report as a PDF file by clicking the Print to PDF button.

Archive Reader

The Archive Reader displays and prints reports saved as ZRF files.

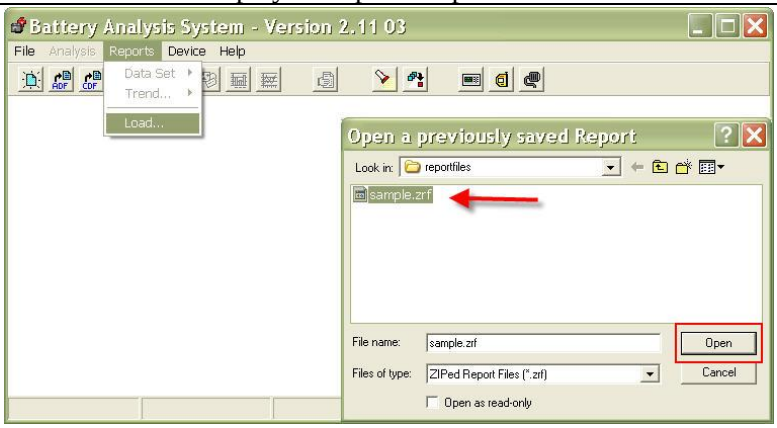


Figure 335. Main Menu Reports|Load

To start the Archive Reader click Reports|Load and open a ZRF report file.

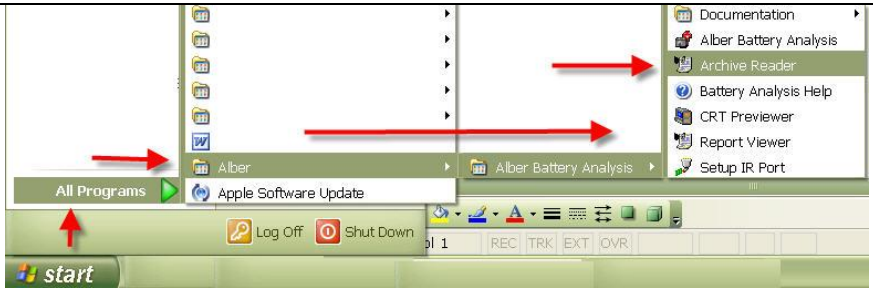


Figure 336. Start|Programs|Alber|Alber Battery Analysis| Archive Reader

The user may also start the reader using the Windows desktop by clicking Start|Programs|Alber|Alber Battery Analysis|Archive Reader.

NOTE:

The Archive Reader opens CRT ZRF report files. To open CLC–200 QRP report files, use the CLC–compatible Report Viewer.

The user may load a previously saved report any time the Archive Reader is open. For example, the user might create a new report, review and save it using the Archive Reader, and then immediately load in a different saved report.

12 Exporting Graph Data: Options

Graphed data can be exported in various formats. An ADF must be open and graphs can be accessed via the main menu under Analysis. For this example, Analysis|Data Set|Detail graph is open.

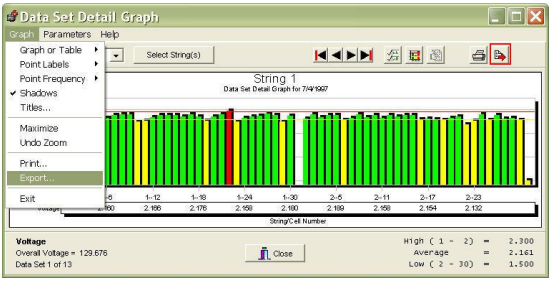


Figure 337. Graph Export Data

To open the Export Option window, on any Graph window, click Graph|Export or  .

The Export Option window opens.

Figure 338. Excel Export Option

Microsoft Excel

Click to export as an Excel file, select the Excel version, then click OK.

Type a file name and click Save.

Data on the File|Properties|Details tab is saved in XLS format.

DOS DB File

Figure 339. DOS DB Export Option

The **DOS DB File** exports data in a format used by the DOS–based BAS program.

NOTE:
Not used for the Windows version.

Others; Metafile, BMP, Text/Data Only

Click to export as MetaFile, BMP, or text format.

Figure 340. Other Graph Export Options

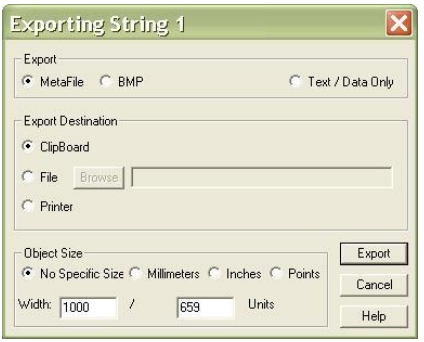


Figure 341. Exporting String 1

The Export File Options box opens.

Exported Data's Destination

The **Export Destination** area has three selections, clipboard, file, and printer.

12.1.1 Clipboard

Sends to the clipboard, so the file can be copied into another program. After selecting, click Export and use the destination program's Paste|Place function to place the image.

12.1.2 File

Saves as a file. Click Browse. In the File Save As box, type a file name, then click Save. On the Exporting box, click Export.

> *NOTE:*
> *The file is not saved until the user clicks Export.*

12.1.3 Print Metafile Only Pr

Click into the radial button next to Printer, select the Metafile's (Object) Size; full page, millimeters, inches and/or points and then click Print. Choose a Printer and then click OK.

How Selecting a File Type Influences Output		
Export File Type Options	Export Destination Options	Output Exported
12.1.4 Metafile	Clipboard, File and Printer	Export the Graph window image
12.1.5 BMP	Clipboard and File	
12.1.6 Text|Data		Export data in a column

Figure 342. File Type Export Outputs

Figure 343. Graph Export Text/Data Only

If Text|Data Only is selected in the Export area, after the user clicks Export, the following window appears:

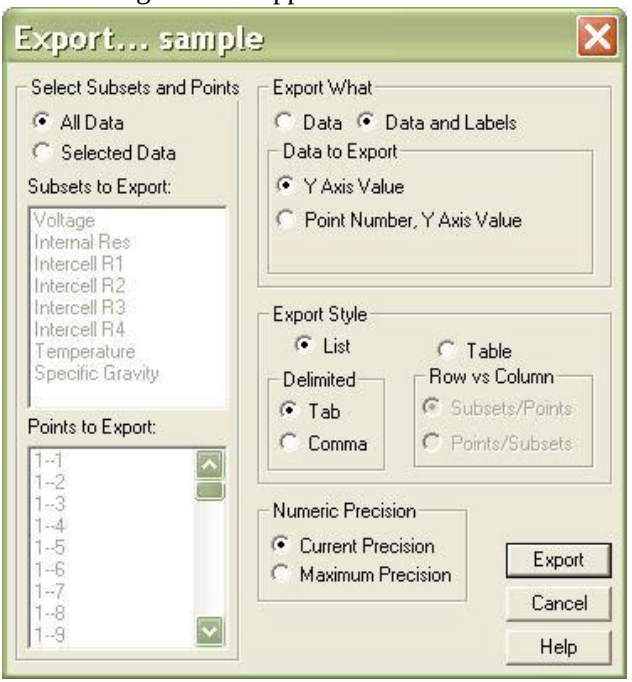


Figure 344. Export Text|Data Options

12.1.6.1 Select Subsets And Points

Select Subsets and Points has two selections; All Data and Selected Data.

All Data	Exports data from all the parameters in the Subsets to Export and Points to Export boxes.
Selected Data	Exports data selected in the Subsets to Export and Points to Export boxes. To choose data, click Selected Data, and then highlight items in the lists. To select multiple items, hold the Shift or Ctrl key down while clicking items.

NOTE:
Leaving all items unselected exports all data.

12.1.6.2 Export What

Export What selects whether data is exported with or without parameter labels. The following examples have one parameter; Voltage, and five cells.

2.183	2.123	2.191	2.200	2.136

Figure 345. Graph's Text Data Without Labels

	1	2	3	4	5
Voltage	2.183	2.123	2.191	2.200	2.136

Figure 346. Graph's Text Data And Labels With Y Axis Value Selected

	1	2	3	4	5
Voltage	1, 2.183	2, 2.123	3, 2.191	4, 2.200	5, 2.136

Figure 347. Graph's Data And Labels With Point Number, Y Axis Value Selected

12.1.6.3 Export Style

Click **List** or **Table** to select data export style. **List** exports the data one record per line.

NOTE:
Data fields can be separated by tabs or commas.

Voltage 1	2.183
Voltage 2	2.123
Voltage 3	2.191
Voltage 4	2.200
Voltage 5	2.136

Figure 348. Tab Format

Voltage,1,2.183
Voltage,2,2.123
Voltage,3,2.191
Voltage,4,2.200
Voltage,5,2.136

Figure 349. Column Format

Table exports the data in grid fashion in Subset by Point or Point by Subset style.

	1	2	3	4	5
Voltage	2.183	2.123	2.191	2.200	2.136

Figure 350. Table Subset By Point Format

Point by Subset:

Voltage		
	1	2.183
	2	2.123
	3	2.191
	4	2.200
	5	2.136

Figure 351. Table Point By Subset Format

In the **Numeric Precision** area, click **Current Precision** to export data with three decimal places. Click **Maximum Precision** to export more than three decimal places if available.

NOTE:
Data results are exported as computed, not as displayed.

13 CRT Data Backup

- Backing up battery data from the CRT to the computer via USB device/Smart Media memory card copies cell voltage and resistance data;the CDF, and location names, dates, and thresholds. To back up, first save the data from the CRT to the USB/memory card.
- Follow all instructions packaged with the USB/memory card reader.

NOTE:
Install the memory card reader software and connect the reader to the computer USB port. Use Windows Explorer to confirm the reader drive is active.

- To back up, insert the memory card into the reader on the computer or insert the USB into a free USB port.
- Using Windows Explorer, navigate to the USB/memory card drive. Select the drive, highlight the CDF name, and click Edit|Copy on the Explorer toolbar.
- Choose a subdirectory for the file (usually Program Files\Alber\Alber Battery Analysis\Cellcorder CDFs) and click Edit|Paste to copy the file into the subdirectory.

Memory Card Note

 WINDOWS 2000 CAUTION:

Removal of the memory card, used with CRT–300 from some manufacturer's reader|writers when using Windows 2000 may require the following steps:

- Double–click the My Computer icon on the Windows desktop.
- Right click the reader|writer drive icon and click Eject from the pop–up menu.
- After the message It is now safe to remove the media from the drive appears, the user may remove the memory card.

Failure to follow this procedure could result in lost data. Consult the manual for the reader|writer to see if this or other procedures apply.

14 Upgrading CRT Firmware

Download the upgrade UPG file from the website: www.alber.com/softwareupdates.htm.

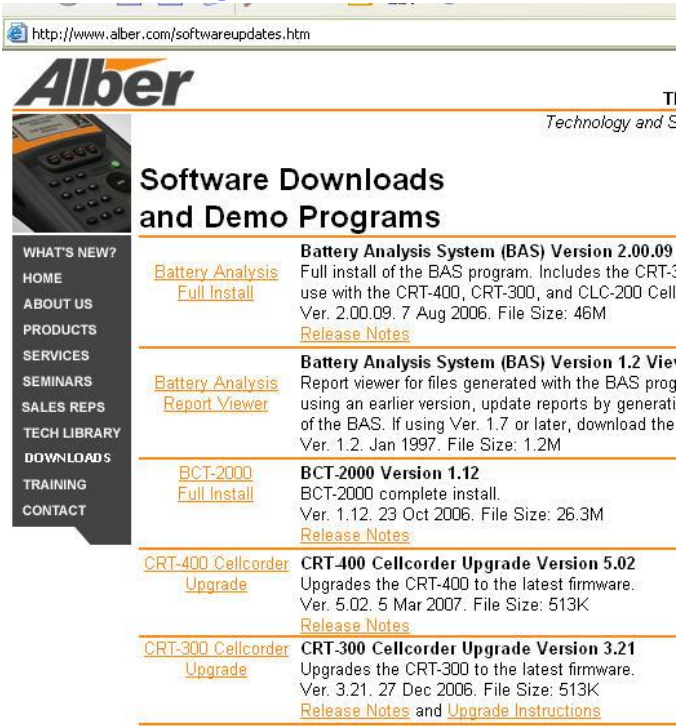


Figure 352. www.alber.com/softwareupdates.htm

Or, copy the file from a CD to Program Files\Alber\Alber Battery Analysis.

To start in upgrade mode, press 

and the green POWER button 

at the same time.

The CRT displays this message;

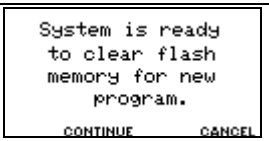


Figure 353. System Is Ready

NOTE:
Using the USB/memory card to upgrade is much faster than IR.

If using Windows 2000, refer to the Memory Card Note in the previous section.

WARNING:
Do not continue until the user has the UPG upgrade file ready. Clearing the current firmware makes the Cellcorder unusable until new firmware is loaded.

Upgrade Via USB Device/CRT-400s

At the message System is ready to clear Flash memory for new program, press CONTINUE/F2.

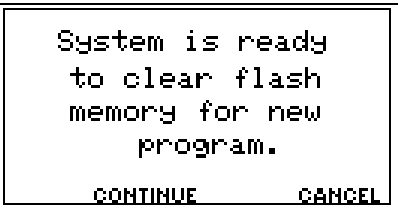


Figure 354. System Is Ready

At System ready to receive upgrade file. Select file transfer method, press USB/F2.

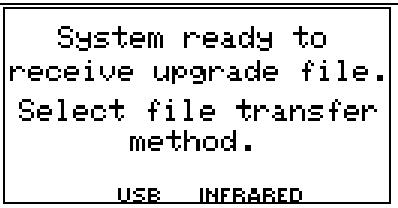


Figure 355. Sytem Ready For Upgrade

The CRT LCD lets you know that it is being prepared for the Memory Upgrade.

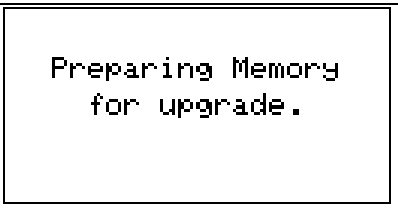


Figure 356. Preparing Memory For Memory

File transfer in progress appears and the frame number counts down.

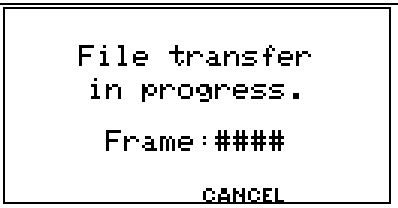


Figure 357. File Transfer in Process

When Upgrade successful. System is running Version nn.nnnnn appears, press CONTINUE/F3.

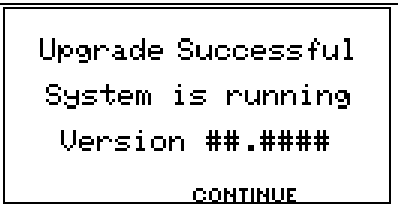


Figure 358. Upgrade Successful

Upgrade Using The IR Port

Download the upgrade UPG file from the Albér Web site; www.alber.com/softwareupdates.htm.

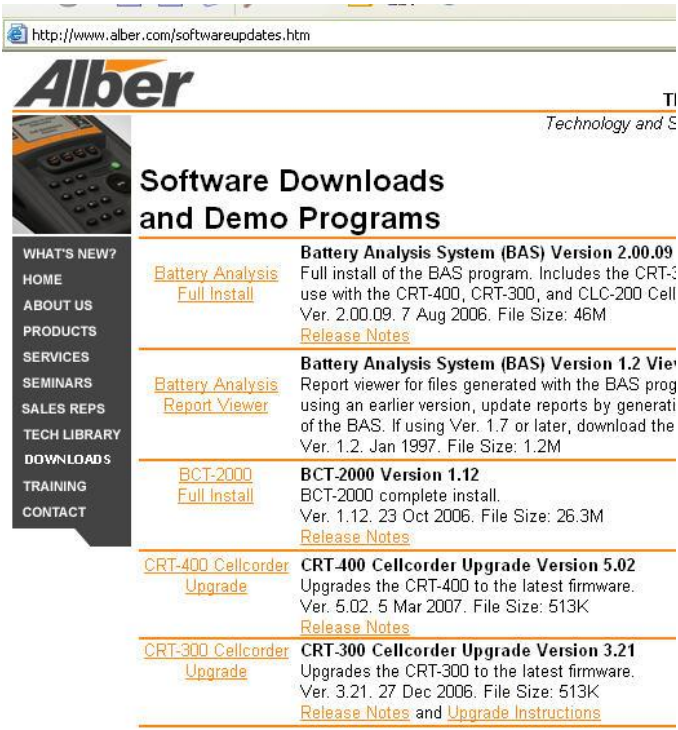


Figure 359. www.alber.com/softwareupdates.htm

Or, copy the file from a CD to Program Files\Alber\Alber Battery Analysis.

To start in upgrade mode, press 

and

the green POWER button at the same time.

The CRT displays this message;

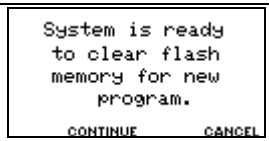


Figure 360. System Is Ready

At the message System is ready to clear Flash memory for new program, press CONTINUE/ F2.

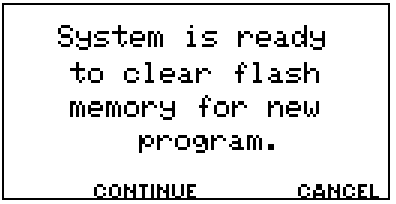


Figure 361. System Is Ready

At System ready to receive upgrade file. Select file transfer method, press INFRARED/F 3.

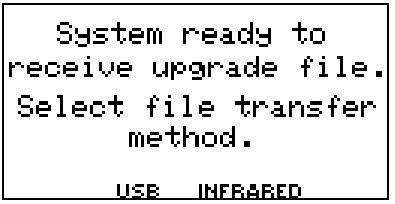


Figure 362. Sytem Ready For Upgrade

The CRT LCD lets you know that it is being prepared for the Memory Upgrade.

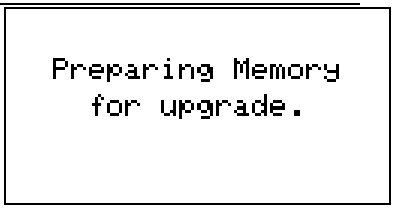


Figure 363. Preparing Memory For Memory

File transfer in progress appears.

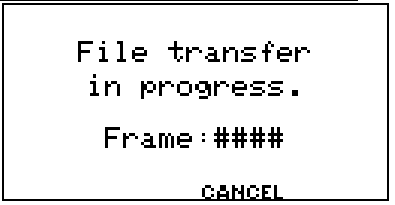


Figure 364. File Transfer in Process

NOTE:
The Frame: #### does not count down at this time.

Start the BAS program 

on the laptop/pc.
Check or choose the COM port that enables the IR interface.

Select  from the BAS software toolbar.

To change the port click on the ▼down arrow to select a highlight and select a port, then click OK.

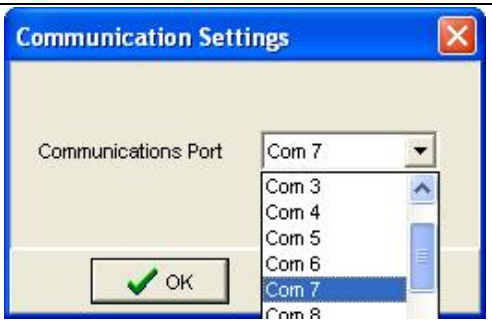


Figure 365. Communications Settings Com Port BAS Software

Then click the Start the Cellcorder Interface button  .
On the next box, select CRT and click OK.

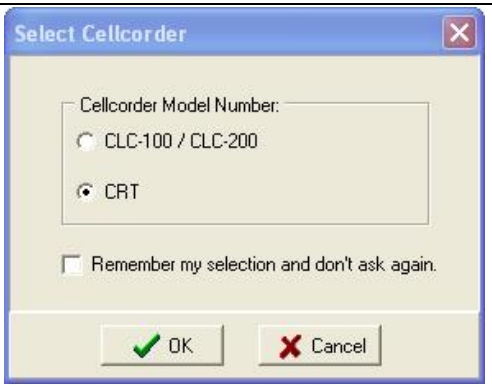


Figure 366. BAS Software Program Select Cellcorder

On the BAS Instructions for CRT screen, click Continue.

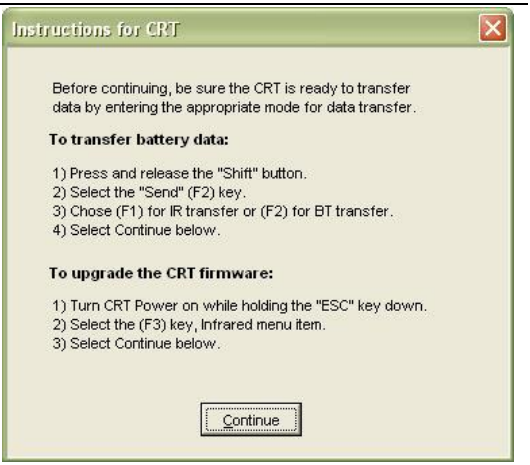


Figure 367. BAS/Instructions

Align the computer and CRT–400 IR ports.

Figure 368. Align IR Ports

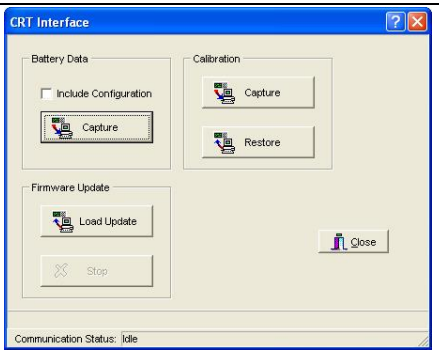


Figure 369. BAS/CRT Interface Window

On the BAS CRT Interface window, click Load Update under Firmware Update.

Select the .UPG file, then click Open.

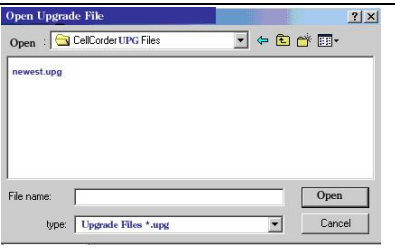


Figure 370. Open *.UPG File

File transfer in progress begins to count down on the CRT.

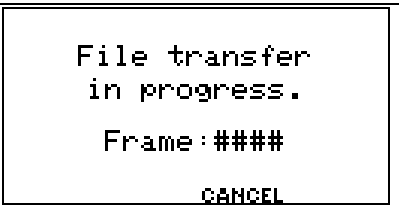


Figure 371. File Transfer in Process

NOTE:
The Frame: #### counts down at this time.

When Upgrade successful. System is running Version nn.nnnnn appears, press CONTINUE/F3.

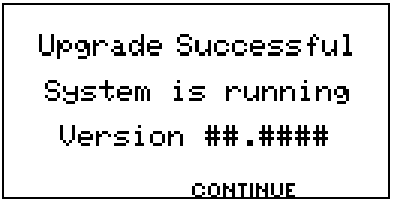


Figure 372. Upgrade Successful

Click Close.

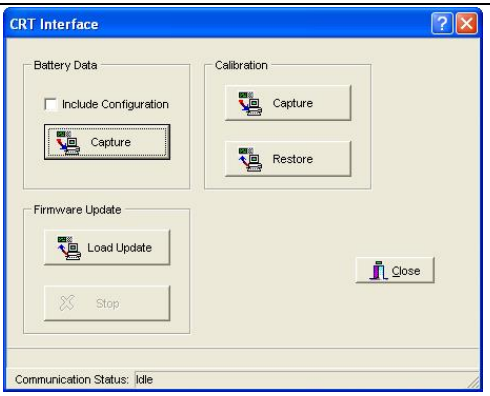


Figure 373. BAS/CRT Interface Window

Upgrade Via Memory Card/CRT-300s

Complete this section to upgrade CRT firmware using the memory card.

- Download the upgrade UPG file from the website or a CD to Program Files\Alber\Alber Battery Analysis.
- Using Windows Explorer, copy the file to the memory card.
- With the CRT power off, insert the memory card into the Cellcorder. To start in upgrade mode, press Esc+Power On.
- At the message, System is ready to clear Flash memory for new program, to upgrade press Continue. (To cancel upgrade, press Cancel.)
- At the message System ready to receive upgrade file; select file transfer method, press Smart Media. The message File transfer in progress appears and frame numbers count down.
- When Upgrade successful; system is running Version *nn.nnnnn* appears, press Continue to display the Main Menu.

15 CLC-200

Capturing CLC–200 Battery Data

This chapter describes how to capture data from the CLC–200 to the computer via RS–232 serial cable. This captures battery cell voltage, resistance data, SG and temperature.

> *NOTE:*
> *If both the Cellcorder and hydrometer have data for the*

same parameters, it is important which data the user capture first, because the data captured last overwrites data captured first. For example, if the user captures SG and temperature data from the Cellcorder and then the hydrometer, the hydrometer data will overwrite the Cellcorder data.

15.1.1 A New ADF for CLC–200 Data

Create a new data file  *or* Main Menu > File|New

Before the user can capture Cellcorder data, an ADF battery file must exist. If none exists, complete this section. Refer to *Overview: Creating ADFs* for help with windows.

To create an ADF for CLC–200 data, do the following.

- On the BAS main menu, click File|New.
- On the New ADF box, click Download a new Data Set from a Cellcorder.
- On the General Battery Information box, type Location, Battery and String Names, Model, Install Date, and the Number of Cells measured in the string.
- On the Select Cellcorder box, choose CLC–200, and then click OK. The Cellcorder Interface box appears. To capture data, continue with the next section.

15.1.2 Capturing CLC–200 Data

This section describes CLC–200 to computer battery data capture via RS–232 serial cable, which captures cell voltage and resistance data, and site setup data, including location names, dates, and thresholds.

- Connect the Cellcorder to the computer via RS–232 serial cable.
- Power up the Cellcorder.
- If *not* creating a new ADF from the above section, do these steps:
    - If an ADF is not open, click File|Open (or File|Reopen). Choose a file name, and then click Open.
    - Click Device|Cellcorder. On the Select Cellcorder box. choose CLC–200 then click OK. The CLC–200 Interface box

appears.

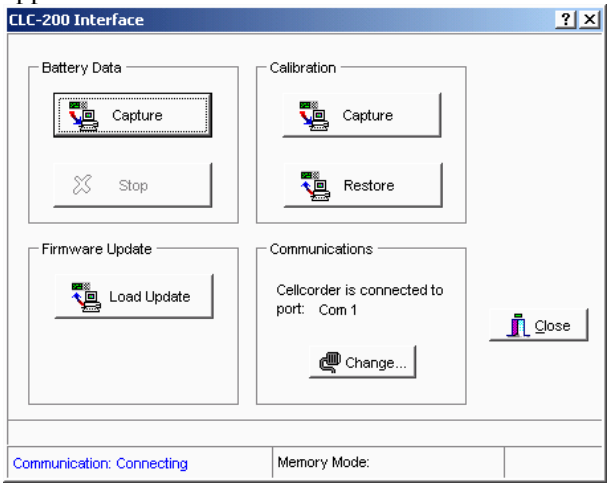


Figure 374. CLC–200 Interface

- Verify Communication Status on the Interface box indicates Connected. If necessary, change the COM port to enable the Cellcorder. To change the port, click Change, select a COM port, and then click OK.

  Communication Status indicates connection status. At first, this box indicates Connecting; after communication is verified, Connected appears. If communication cannot be established, Failed appears, with Retry or Cancel options.

  After communication is established, if Memory Mode at the bottom indicates a Cellcorder status of Unknown, confirm Cellcorder firmware is Version 2.00 or later. The version number displays at CLC–200 power up. Memory Mode displays Unknown until the BAS communicates with the CLC–200.
- In the Battery Data area, click Capture. The Cellcorder Battery Data Capture box appears.

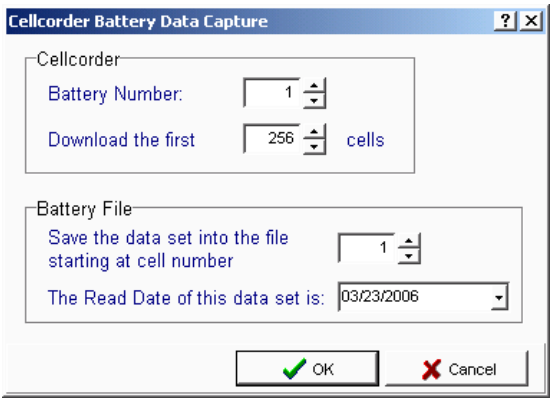


Figure 375. Cellcorder CLC–200 Data Capture

- In the **Battery Number** box, select which battery data to download from the Cellcorder. If the Memory Mode is 7 x 256, the selection is from one to seven. If 28 x 64, the selection is from one to 28.
- **Download the First *nn* Cells** defaults to the Number of Cells on the File|Properties|General tab. It is the maximum number of cells from which data will be captured and usually matches the number of cells in the battery.
- Set **... at Cell Number *nn*** to the cell number the CLC should start downloading data to, typically one. Thus, Cellcorder Cell 1 data is recorded in the file under Cell 1, and so on.

NOTE:
Change the starting cell number when more than one Cellcorder records data from the same battery. For example, on a 256–cell battery, one Cellcorder tests cells 1 to 128 and stores the data in Cellcorder locations 1 to 128. The other Cellcorder tests cells 129 to 256 and stores in 1 to 128 as well. Capture the first Cellcorder with the starting cell number set to one and capture the second into the same file with the starting number set to 129.

- Set the **Read Date for this Data Set**. Type a date or click the drop–down button and use the calendar.
- To start capturing data, click OK. A bar on the Interface box indicates progress. When finished, status shows Download 100% completed (*nn* Cells). Click OK.

NOTE:
If capture fails, verify the correct COM port and Number of Cells is selected.

- After capture, close the Cellcorder Interface box.
- To save the captured data in the ADF, click File|Save.

CLC–200 Calibration Backup

This chapter describes how to back up CLC–200 calibration data and restore calibration to the unit. The user should back up when the user first receive the unit and after calibrations.

Important note for BAS Version 1.2 or later.
Starting with Version 1.2, calibration file code helps prevent uploading invalid calibration data to the Cellcorder. Ver. 1.1 or earlier and DOS files do not have this code and are not compatible. For this reason, back up calibration data immediately after upgrading from Ver. 1.1 or earlier so the user will have a valid calibration file.

15.1.3 Backup Via Serial Cable

Complete this section to back up CLC–200 calibration to a file.

- Connect the Cellcorder to the serial port selected in the Communications Settings box and power on the Cellcorder.
- On the main menu, click Device|Cellcorder.
- On the Cellcorder Interface box, if required, to change the COM port that communicates with the CLC, click Change, select a port, and then click OK.
- In the Calibration area, click Capture.
- On the Saving Cellcorder Calibration Data box, go to a subdirectory and choose an existing calibration data file name or type the new backup file name, then click Save.

NOTE:
Use the Cellcorder serial number for the file name.

If the user selects an existing file, the file is verified and the window prompts the user to confirm the user's intent to overwrite the file.

- On the Cellcorder Calibration Data box, type the Cellcorder serial number. This writes the serial number to the file for extra security.
- In the Display Format area, click Decimal.
- To save the data, click OK.
- After successful data transfer, a message appears.

15.1.4 Restore Via Serial Cable

Complete this section to restore CLC–200 calibration from a file.

- Connect the Cellcorder to the serial port selected in the Communications Settings box and power on the Cellcorder.
- On the main menu, click Device|Cellcorder.
- On the Cellcorder Interface box, if required, to change the COM port that communicates with the CLC, click Change, select a port, and then click OK.
- In the Calibration area, click Restore.
- On the File Open box, go to a subdirectory, choose a calibration data file, and click Open.
- The selected file is verified and, if valid, the Cellcorder Calibration Data box appears. Verify the Cellcorder serial number in the serial number box.
- To restore the data to the Cellcorder, click OK, or click Cancel.
- If data transfer is successful, a message appears.

Upgrading CLC–200 Firmware

The user can upgrade CLC–200 firmware using a serial cable connected to the computer and Cellcorder. Upgrades are available at www.alber.com.

WARNING:
Do not continue until the user has the PRG upgrade file ready. Clearing the current firmware makes the Cellcorder unusable until new firmware is loaded.

15.1.5 Upgrade Via Serial Cable

BAS Version 1.2 and later software can upload new firmware to the CLC–200. Complete this section to upgrade CLC–200 firmware.

- Download the upgrade PRG file from the website or a CD to Program Files\Alber\Alber Battery Analysis.

- Connect the Cellcorder to the serial port selected in the Communications Settings box and power on the Cellcorder.
- If upgrading a previously upgraded Cellcorder (that is, not running original factory firmware), reset the Cellcorder to original firmware before continuing the upgrade process. To determine firmware level: At power up, a Cellcorder running original firmware displays Boot at the bottom of the display, then Initializing and the Main Menu. A Cellcorder running updated firmware displays the revision number then the Main Menu. To reset the Cellcorder firmware, go to Step 4 or, if the Cellcorder is running original firmware, go to Step 5. If the user is unsure of firmware status, it will do no harm to reset it.
- To reset the firmware, if required:
    - Power on the Cellcorder.
    - Press the Cellcorder <F1> key four times in quick succession.
    - At the prompt: **Erase RAM program? <Enter> Clear <Esc> Quit** press <Enter> and wait for the Cellcorder to re–initialize.
    - Refer to step three and verify the Cellcorder is reset to original factory firmware.
- If the Cellcorder is running original firmware, on the computer click the BAS icon to start the program.
- On the **Main Menu**, click Device|Cellcorder.
- On the Select Cellcorder box, click CLC–200.
- Verify Communication at the bottom of the Cellcorder Interface box indicates Connected. On the Cellcorder Interface box, if required, to change the COM port that communicates with the CLC, click Change, select a port, then click OK
- In the Firmware Update area, click Load Update.
- On the Upload New Cellcorder Firmware box, go to the subdirectory with the update file, choose the file, and then click Open.
- When a valid file is selected, the firmware version prompts for confirmation before upgrading. For example, Click OK to begin uploading Version 2.15. To proceed, click OK. Uploading may take ten minutes. The Cellcorder Interface box estimates time remaining and displays a message when complete.

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