

Cellcorder[®] CRT Previewer User's Guide

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590-2091-501A/SL-29406/4200-040 R3

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Table of Contents

1	GENERAL PRODUCT DESCRIPTION.....	1
1.1	Safety Information	1
1.1.1	<i>If Questions Come Up.....</i>	<i>1</i>
1.2	System Requirements	1
1.3	Helpful Reading	2
2	BAS SOFTWARE INSTALLATION WITH CRT PREVIEWER.....	2
2.1	Insert BAS/Previewer Installation CD Into PC	3
2.2	PDF File Program.....	3
2.3	Infrared IR Communication Driver BAS USAGE ONLY	4
2.3.1	<i>Determine COM Port For IR BAS USAGE ONLY.....</i>	<i>5</i>
3	START PREVIEWER SOFTWARE.....	7
3.1	Explanation Of File Types.....	7
3.2	Make Backup Copy Of Sample Data	8
3.3	Understanding The Main Menu Functions	8
3.3.1	<i>File.....</i>	<i>10</i>
3.3.2	<i>Graph.....</i>	<i>11</i>
3.3.3	<i>Help.....</i>	<i>12</i>
3.4	Toolbar.....	13
3.5	Previewer Tabs	13
3.5.1	<i>General.....</i>	<i>13</i>
3.5.2	<i>Tabular Data.....</i>	<i>15</i>
3.5.3	<i>Graph.....</i>	<i>18</i>
3.5.4	<i>Intertier</i>	<i>20</i>
3.5.5	<i>Comments</i>	<i>23</i>
4	THE IMPORTANT CONFIGURATION FILE EDITOR: CCF.....	23
4.1	Multiple Sites – IMPORTANT	24
4.2	General Tab – Configuration File Editor CFE	25
4.2.1	<i>Model Number/Browse/Battery List Editor Window</i>	<i>28</i>
4.3	Threshold Tab – Configuration Editor	35
4.4	Test Mode Tab – Configuration Editor	36
4.4.1	<i>Amp Hour Rating.....</i>	<i>36</i>
4.4.2	<i>Single Testing.....</i>	<i>36</i>

4.4.3	Dual Testing	37
4.4.4	Triple Testing.....	37
4.4.5	Quad Testing.....	37
4.4.6	Combined Testing	37
4.4.7	Computed Testing	37
5	BEGIN – OPEN A *.CDF OR VIEW CRT BATTERY DATA.....	38
5.1	To Save Readings/Files (From CRT Manual)	39
5.2	Memory Card Note.....	41
6	GENERATING REPORTS.....	42
6.1	Setting Report Options	42
7	EXPORTING DATA.....	43
7.1	Export File Type.....	44
7.2	Export Destination.....	44
8	CREATING A DATA SET.....	47
9	CRT CALIBRATION BACKUP	47
10	CRT CALIBRATION BACKUP.....	48
11	UPGRADE CRT FIRMWARE	49

Table of Figures

Figure 1. Insert CD	3
Figure 2. Start Run	3
Figure 3. Installing When CD Does Not Auto start	3
Figure 4. Previewer Icon.....	3
Figure 5. Installing the PDF Writer	4
Figure 6. Postscript Interpreter Installation.....	4
Figure 7. IR Driver Install Window	5
Figure 8. Select COM Port For IR Communication BAS USAGE ONLY.....	5
Figure 9. Install IR Driver/BAS USAGE ONLY.....	6
Figure 10. Install IR Driver Later/BAS USAGE ONLY	7
Figure 11. Start Programs Vertivco Vertivco Battery Analysis CRT Previewer.....	7
Figure 12. Main Menu; File, Graph & Help	8
Figure 13. Main Menu File	9
Figure 14. Main Menu Help.....	9
Figure 15. Main Menu Graph	9
Figure 16. File Menu.....	10
Figure 17. Main Menu Graph	11
Figure 18. Return To Previous Graph View Esc Key	11
Figure 19. Main Menu Help.....	12
Figure 20. Help On Help Window And Explanation	12
Figure 21. Help About	12
Figure 22. Toolbar	13
Figure 23. General tab.....	14
Figure 24. Tabular Data Tab.....	16
Figure 25. Tabular Data Sort Ascending.....	17
Figure 26. Tabular Data Sort Descending	17
Figure 27. Cell Data Editor	18
Figure 28. Graph Tab	19
Figure 29. Select Parameter	20
Figure 30. Cell Data Box	20
Figure 31. Intertier Tab	21
Figure 32. Comments Tab.....	23
Figure 33. Previewer Icon.....	24
Figure 34. File Configuration Editor.....	24
Figure 35. Configuration Editor.....	25
Figure 36. Configuration Editor File New Save Import Exit	27
Figure 37. Error Message.....	27
Figure 38. Configuration Editor Edit Delete Sort.....	27
Figure 39. Configuration File Editor.....	28
Figure 40. Battery List Editor	29

Figure 41. Import From Another Battery List File..... 29

Figure 42. Helpful Battlist.blf 30

Figure 43. www.vertivco.com Baseline Resistance Data/Battlist.blf..... 30

Figure 44. BLF On The Website..... 31

Figure 45. File Download BLF 32

Figure 46. C:\Program Files\vertivco\Vertivco Battery Analysis
..... 32

Figure 47. Imported Battlist.blf..... 33

Figure 48. File| New Battery 33

Figure 49. Battery List Editor New Battery 34

Figure 50. Threshold Tab Configuration File Editor 35

Figure 51. Configuration Editor Test Mode Tab..... 36

Figure 52. Saving The CCF 38

Figure 53. Enter File Name 39

Figure 54. Select File/F3..... 39

Figure 55. WARNING Data Will Be Lost..... 39

Figure 56. File Exists Overwrite WARNING 40

Figure 57. File|Open 40

Figure 58. Open *.CDF in C:\Program Files\Vertivco\Vertivco Battery
Analysis\CellCorder CDF Files 41

Figure 59. Open CDF On USB Flash Hard Drive Or Smart Media Card 41

Figure 60. Report Option 42

Figure 61. Export Options..... 43

Figure 62. Export File Options 44

Figure 63. Export Text 45

Figure 64. Select Configuration 47

1 General Product Description

The Vertiv CRT Previewer software program allows the user to view the data file, .CDF, created by the CRT and stored on the USB device and/or the Smart Media memory card. Unlike the Battery Analysis System BAS program, where the user can continually build battery files by appending new sets of readings, Previewer only allows the user to view one set of readings at a time and print them.

Previewer can do the following:

- ◆ Display data in bar graph and tabular formats.
- ◆ Modify data and save the file.
- ◆ Manually create a battery file by entering data from another source and saving the file.
- ◆ Create site setup information for the CRT.
- ◆ Update Cellcorder CRT firmware.

Previewer interfaces with the CRT Cellcorders only.

The key differences are:

- ◆ The CRT-300 has Smart Media memory card capability and
- ◆ The CRT-400 has a USB port.

1.1 Safety Information

It is extremely important to read and to understand the safety precautions outlined in the Legal Safety section of the CRT User's Guides and those printed elsewhere in this manual and/or corresponding manuals before using the Cellcorder and the 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 Vertiv CRT Previewer software program or Cellcorder assistance.

1.2 System Requirements

The following are the minimum system requirements for the CRT Previewer software operation.

- ◆ Version 2.01A01 or later firmware for the CRT-400 Cellcorder,
- ◆ Version 1.00A25 or later firmware for the CRT-300 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.

- φ CD/DVD drive.
- φ USB port on computer for transferring data via USB flash drive.

1.3 Helpful Reading

It is a good idea to read through the following manuals before using the CRT and Vertiv CRT Previewer software program.

- ◆ Cellcorder CRT Previewer User's Guide, pn 4200–040
- ◆ Battery Analysis System User's Guide, pn 4200–002
- ◆ Cellcorder CRT User's Guide, pn 4200–038, pn 4200–070
- ◆ USB device manufacturer's instructions. Belkin Components, Smart Media or other instructions.
- ◆ Uninterruptible Power Supply UPS manufacturer's instruction manual, if a UPS is used.

2 BAS Software Installation With CRT PREVIEWER

The Vertiv CRT Previewer software program is compatible with CRTs, Version 1.00A25 or later, and is distributed on one CD. Before installation, close all other programs.

To install the program, insert the CD into the computer and select Start|Run from the Windows desktop. From the Run window, type d:\setup (or other drive) to start the installation, then follow the on–screen instructions. After installation, an icon shortcut appears on the desktop.

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

- ◆ a PDF writer,

NOTE:

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

- ◆ an IR driver, and

NOTE:

IR communication is done with the BAS software only.

- ◆ a sample database.

2.1 Insert BAS/Previewer Installation CD Into PC

Before BAS software 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. Previewer Icon

2.2 PDF File Program

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

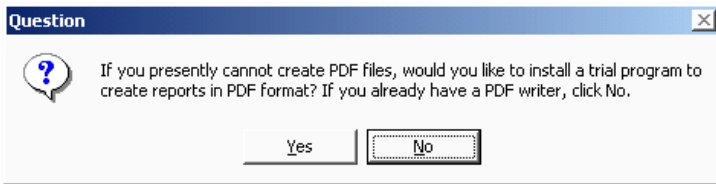


Figure 5. Installing the PDF Writer

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.

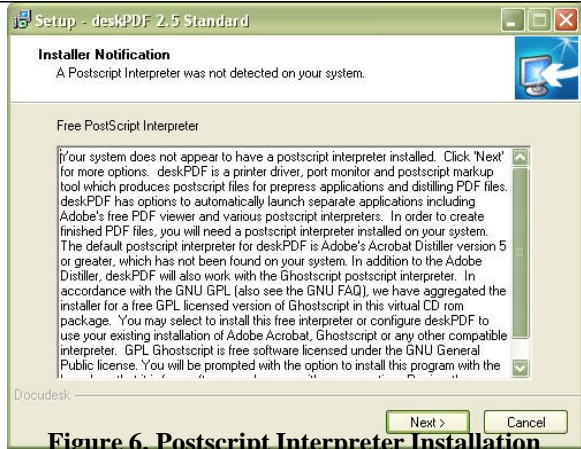


Figure 6. Postscript Interpreter Installation

NOTE:

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

2.3 Infrared IR Communication Driver BAS USAGE ONLY

NOTE:

Only the BAS communicates via IR.

INSTALLATION STEPS ARE PROVIDED HERE IN CASE THE PREVIEWER MANUAL IS FOLLOWED FIRST.

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

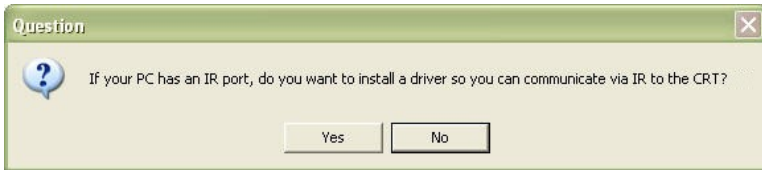


Figure 7. IR Driver Install Window

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 with the BAS program.

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.

2.3.1 Determine COM Port For IR BAS USAGE ONLY

During IR installation, select a COM port for IR Communication Driver.

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

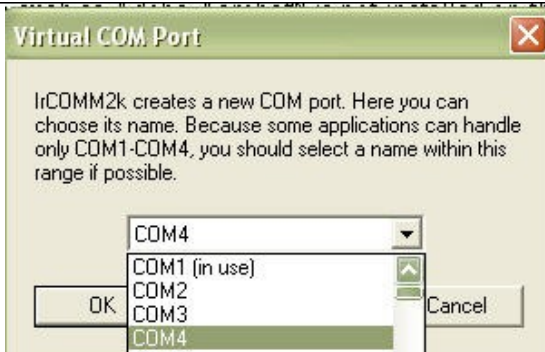
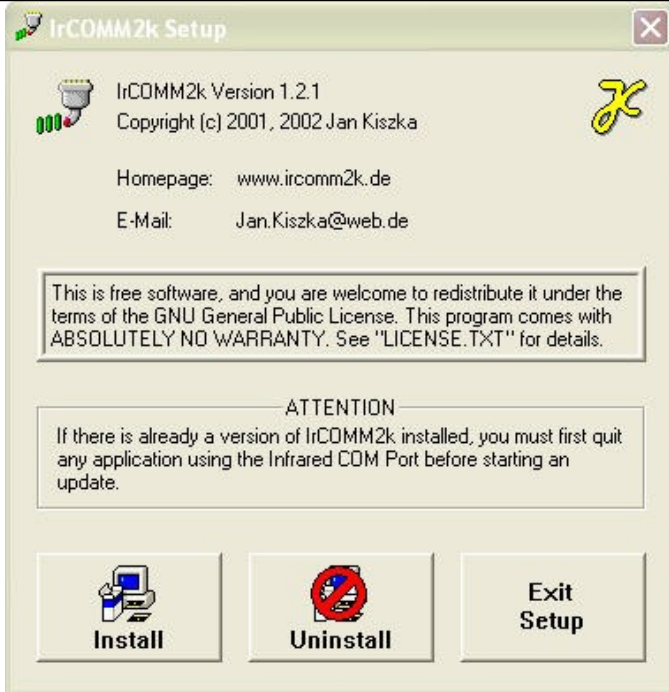


Figure 8. Select COM Port For IR Communication BAS USAGE ONLY



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 program

Figure 9. Install IR Driver/BAS USAGE ONLY

NOTE:

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

The Program Files are kept on the C: drive.

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

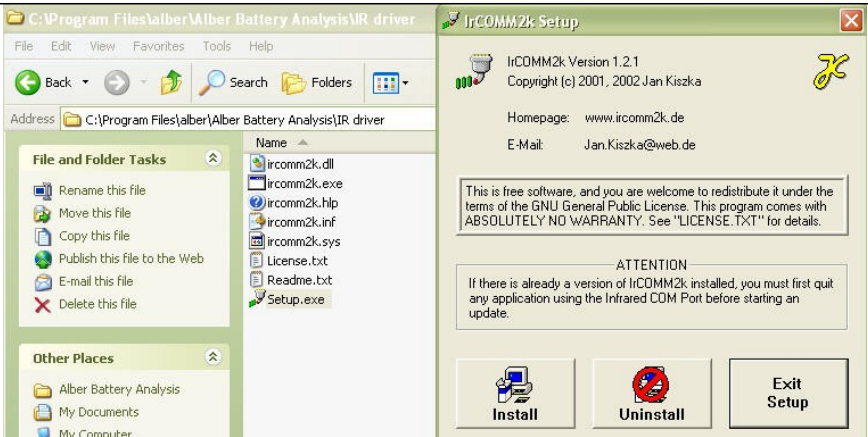


Figure 10. Install IR Driver Later/BAS USAGE ONLY

3 Start Previewer Software

To start the Previewer software program, double-click the Previewer icon on the desktop or select Start|Programs|Vertivco|Vertivco Battery Analysis|CRT Previewer from the Task bar. Previewer opens and the General tab appears. Each toolbar button along the top of the program window displays a hint when the cursor is over it.

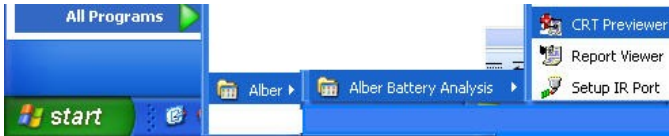


Figure 11. Start|Programs|Vertivco|Vertivco Battery Analysis|CRT Previewer

3.1 Explanation Of File Types

Several file extensions are used in the Cellcorder BAS and Previewer programs. These extensions are associated as follows: types

Extension	Explanation
ADF	Accumulated Data File
	Used primarily within the BAS software. 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.

Extension	Explanation
CAL	Calibration file One file for <i>each</i> Cellcorder in use.
CCF	CRT Configuration file Contains site setup information. One file for <i>all</i> Cellcorders in use.
CDF	CRT Cell Data File. One file for each battery string.

3.2 ***Make Backup Copy Of Sample Data***

Previewer program contains the sample file sample.cdf. Use this file to try features described in this manual. When saving a modified sample file, use a different file name so the original sample data does not get changed.

Use the sample file sample.cdf 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.

3.3 ***Understanding The Main Menu Functions***

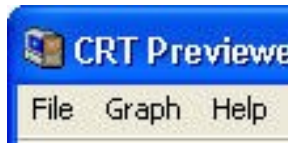


Figure 12. Main Menu; File, Graph & Help

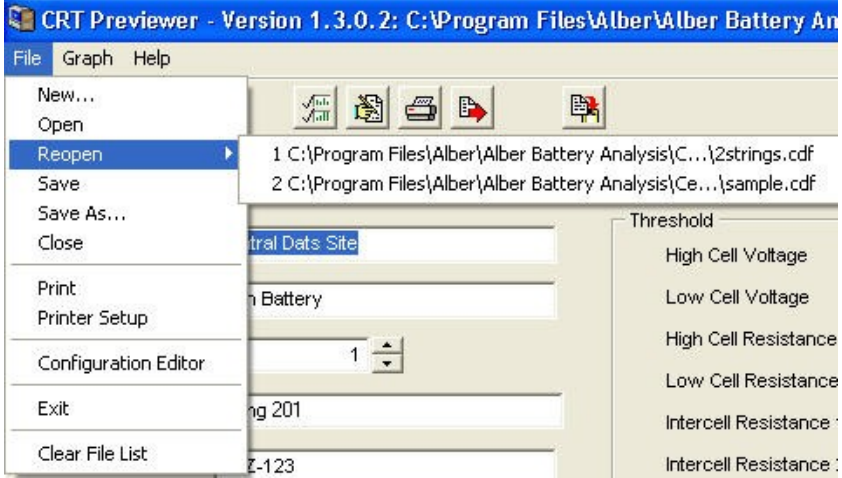


Figure 13. Main Menu File

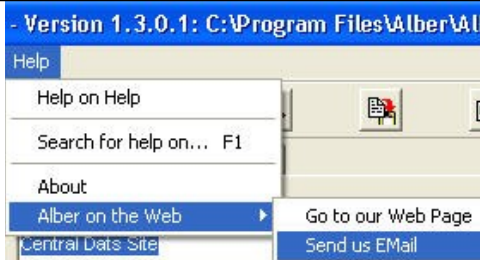


Figure 14. Main Menu Help

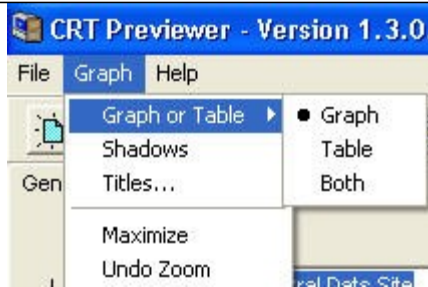


Figure 15. Main Menu Graph

3.3.1 File

NOTE:

A few File Menu options have no toolbar button equivalents.

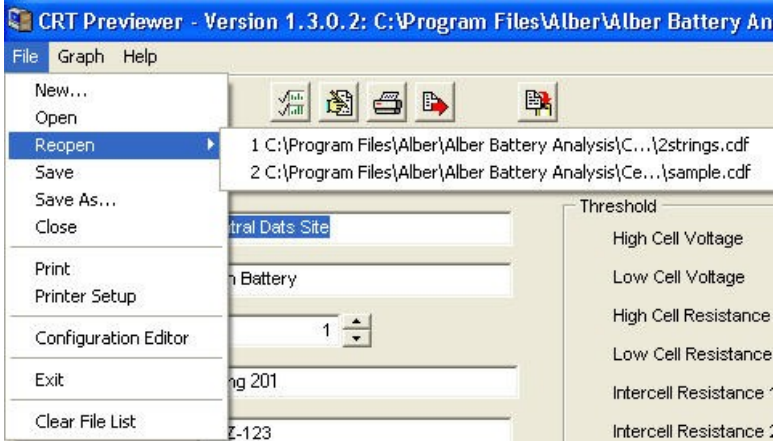


Figure 16. File Menu

File New	Opens the Select Configuration window. Use to manually create a battery file. Refer to Creating a Data Set.
File Open	Opens a list of Cellcorder .CDF data files in the Cellcorder .CDFs subdirectory. Refer to Main Menu.
File Reopen	Displays a list of recently opened files. Click a file name to open it.
File Save As	Displays a list of .CDFs in the .CDFs subdirectory. Save the file as a .CDF with an existing or new name.
File Close	Closes the currently open file.
File Print	Opens the Report Option window and then the Print Preview before printing. Refer to Setting Report Options.
File Printer Setup	Selects the printer and paper orientation.
File Configuration Editor	Displays the Configuration File Editor pages. Refer to Configuration File Editor.
File Exit	Closes Previewer program.
File Clear File List	Clears the list of recently opened files that appears when File Reopen is selected.

3.3.2 Graph

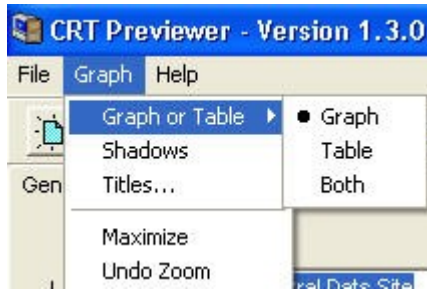


Figure 17. Main Menu Graph

Graph Graph or Table	The user may choose to view only the graph of the data, or the table populated with cell data or Both.
Graph Shadows	Adds/removes shadows to the bars in the graph.
Graph Titles	Adds and/or changes the Graph's Title. Customizes the graph title and stores it in the .CDF. When found in a configuration file during report generation, the customized title appears on each graph in the report. Otherwise, the user-defined report title appears.
Graph Maximize	Select to maximize the graph for better viewing. Use the Esc key on the keyboard or click in the upper left corner to return to regular viewing.
Undo Zoom	To zoom in on an area in the graph, select the Ctrl key on the keyboard and hold down the button on the mouse and move over the area to be enlarged. Use Undo Zoom to go back to the previous view. Another way to zoom in on a portion of the bar graph, place the mouse and program cursor on the graph, hold the left mouse button down, and drag across the cells of interest. The cursor changes to a magnifying glass when selecting a valid region. Release the mouse button to complete the zooming. Select Undo Zoom on the Graph menu to return to original size.

Figure 18. Return To Previous Graph View Esc Key

NOTE:
The Maximize function is not the same as maximizing the window.

3.3.3 Help



Figure 19. Main Menu Help

Help|Help
 on Help

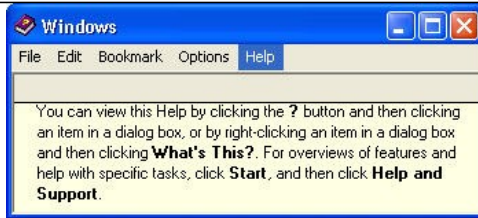


Figure 20. Help On Help Window And Explanation

Help|Search
 for Help
 on...F1

Press F1 on the keyboard to access and/or search for information.

Displays the version of Previewer.

Help|About

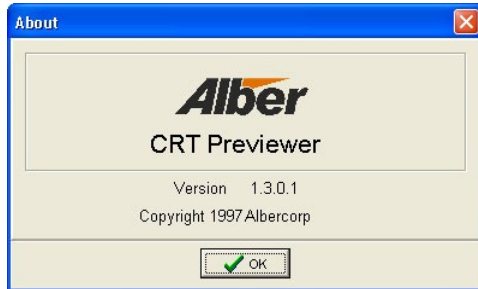


Figure 21. Help About

Help|
Vertiv on
the web










The user can send an email to Vertiv or go to the website for more information.

3.4 Toolbar



Figure 22. Toolbar

The Toolbar provides access to all program features. Some toolbar buttons are not active until certain actions occur, such as opening a battery data file.

	Create new data file		Open a file
	Save current file		Close .CDF
	Select parameters		Edit values of cell
	Print		Export graph
			Transfer data to BAS Import CDF into ADF

3.5 Previewer Tabs

When Previewer starts, the General tab appears. To open a file, click the Open

File Open button  or select File|Open from the Main Menu.

Previewer opens Cellcorder CRT .CDFs. The Cellcorder CLC–200 data files may be uploaded and saved as a .CDF.

Battery data can be edited on the General, Intertier, and Comments Tabs. After opening a file, click a tab to display. Changes are not saved to the battery file until a Save is performed. Usually save files to the default Cellcorder .CDFs subdirectory.

3.5.1 General

Use the General tab to edit site information such as location, battery, and string names, model number, and dates, and set temperature, frequency, and date format. Changing the number of cells, thresholds, temperature units, charger frequency, and date format changes the battery data file contents.

Figure 23. General tab

The bottom left of the page displays Overall Voltage OV and Average Cell Voltage, Resistance, Temperature, Specific Gravity SG, and Intercell Resistance. This data cannot be changed. These values are not read from the .CDF, but are calculated from the data.

Location Name, Battery Name, String Name	Edit location name, battery name, and string name in these boxes.
--	---

Model Number	Edit the model number of the battery.
--------------	---------------------------------------

Number of Cells	This setting normally is set to the number of cells in the battery, but may be used to limit or expand the number of cells shown on charts or graphs. Change the Number of Cells setting with caution.
-----------------	--



CAUTION:

The Number of Cells setting affects most displays of battery data, including graphs, reports, and calculations. However, changes to this setting do not affect the actual cell data in the file. No data is lost by reducing the number of cells; the excess cell values simply become unavailable to the program until the Number of Cells is changed to its original value.

Install Date	Edit the date the battery was installed.
Read Date	Indicates the date of the data being displayed. To change, type a new date or click the date field drop-down button and click on the calendar.
Thresholds	Threshold values for voltage, resistance, temperature and SG may be changed in this area. The Graph Tab bar graph colors change when thresholds are changed. The colors indicate cells are within or exceeding minimum or maximum limits.
Temperature Units	Changing the Temperature Units from Fahrenheit to Celsius converts temperatures to Celsius throughout the program. Changing the temperature scale does not affect the values of data in the file, but only the way the values are indicated.
Charger Frequency	Select 50Hz or 60Hz to filter the ripple frequency.
Date Format	Select U.S. (mm/dd/yyyy), Europe (dd/mm/yyyy) or China (yyyy/mm/dd) date format.

3.5.2 Tabular Data

The Tabular Data Tab displays values for all cells with data. When data is available, columns display cell number, cell voltage, internal resistance, intercell R1 to R4 resistance, temperature, and specific gravity.

The screenshot shows the 'CRT Previewer - Version 1.3.0.2' application window. The 'Tabular Data' tab is active, displaying a table with the following data:

Cell #	Voltage	Internal Res. /	Intercell R1	Intercell R2	Intercell R3	Intercell R4	Temp. (F)	Spec. Gravt
6	2.253	190	21	25	0	0	75.0	1.248
2	2.256	189	20	20	0	0	75.0	1.250
3	2.273	185	22	19	0	0	75.0	1.249
5	2.241	183	22	20	0	0	75.0	1.250
1	2.250	180	22	21	0	0	75.0	1.251
7	2.259	178	19	22	0	0	75.1	1.249
8	2.251	177	22	18	0	0	75.3	1.253
4	2.243	175	23	23	0	14	75.0	1.250
9	0.000	0	0	0	0	0	0.0	0.000
10	0.000	0	0	0	0	0	0.0	0.000
11	0.000	0	0	0	0	0	0.0	0.000
12	0.000	0	0	0	0	0	0.0	0.000
13	0.000	0	0	0	0	0	0.0	0.000
14	0.000	0	0	0	0	0	0.0	0.000
15	0.000	0	0	0	0	0	0.0	0.000
16	0.000	0	0	0	0	0	0.0	0.000
17	0.000	0	0	0	0	0	0.0	0.000
18	0.000	0	0	0	0	0	0.0	0.000
19	0.000	0	0	0	0	0	0.0	0.000
20	0.000	0	0	0	0	0	0.0	0.000
21	0.000	0	0	0	0	0	0.0	0.000
22	0.000	0	0	0	0	0	0.0	0.000
23	0.000	0	0	0	0	0	0.0	0.000
24	0.000	0	0	0	0	0	0.0	0.000

Figure 24. Tabular Data Tab

Data is arranged in a list view, which displays record oriented data in rows and columns. Each column represents a field of a record, and each row represents one record.

Click a column header to sort on that column. Click the same header again to reverse the order. A triangle in the header of the selected column points up when sorted in ascending order or down for descending.

CRT Previewer - Versi... File Graph Help

General Tabular Data Graph Intertier

Cell #	Voltage	Internal Res.
4	2.243	175
16	2.226	175
8	2.251	177
7	2.259	178
15	2.254	178
1	2.250	180
20	2.219	180
10	2.260	181
18	2.210	181
5	2.241	183
24	2.223	183
3	2.273	185

Figure 25. Tabular Data Sort Ascending

CRT Previewer - Versi... File Graph Help

General Tabular Data Graph Intertier


Cell #	Voltage	Internal Res.
22	2.243	195
12	2.230	194
14	2.259	192
19	2.218	192
6	2.253	190
23	2.230	190
2	2.256	189
11	2.248	189
9	2.256	188
21	2.256	188
17	2.230	187
3	2.273	185

Figure 26. Tabular Data Sort Descending

To re-arrange column order, click a column header and hold the mouse button down, then drag the header onto another column header. Release the mouse button to place the column at that position. To change column width, drag the dividing line between two column headers left or right.

3.5.2.1 Editing Cell Data

To open the Cell Data Editor to change data on the Tabular Data Tab, click the

Edit Values button , or double-click a cell number or row on the Tabular Data Tab. The editor indexes to the cell number or row clicked. Use the mouse, Tab or Arrow keys to highlight data to be changed. When editing is complete, click OK to save the changes.

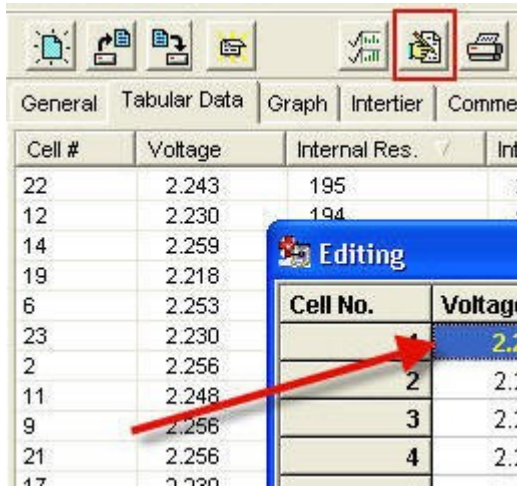


Figure 27. Cell Data Editor

3.5.3 Graph

The Graph Tab displays battery file data in graph and/or table format. The graph can be customized, printed and exported for report generation. Menu items are described below.

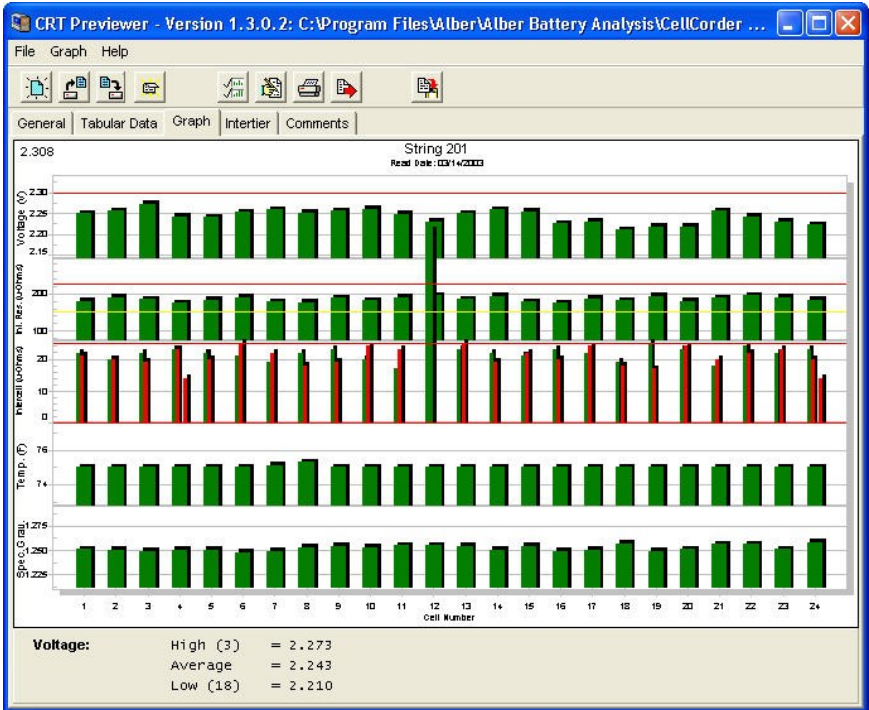


Figure 28. Graph Tab

3.5.3.1 Graph Parameters

The Select Parameters window allows the user to select which parameters appear on the Tabular Data and Graph Tabs.

To display, click the Select Parameters button .

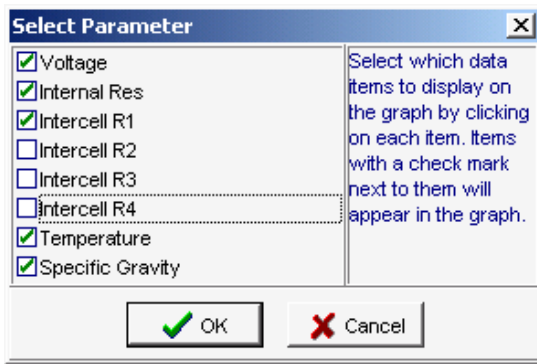


Figure 29. Select Parameter

Check the boxes to cause parameters to display on the Tabular Data or Graph Tabs, then click OK.

3.5.3.2 Bar Graph Cell Data

To display text data for a particular cell in the bar graph, enlarge the area of interest on the graph, then click on a bar graph. The Cell Data window appears.

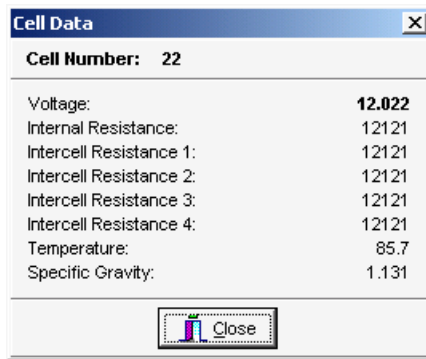


Figure 30. Cell Data Box

The Cell Data window displays the cell number clicked and the cell voltage, internal resistance, intercell resistance, temperature and gravity when data is available. The bold value indicates the portion of the bar graph clicked. For example, if the Intercell Resistance 3 bar was clicked, the value for Intercell Resistance 3 is bold.

3.5.4 Intertier

The Intertier Tab lets the user set locations of intertiers, either manually or automatically.

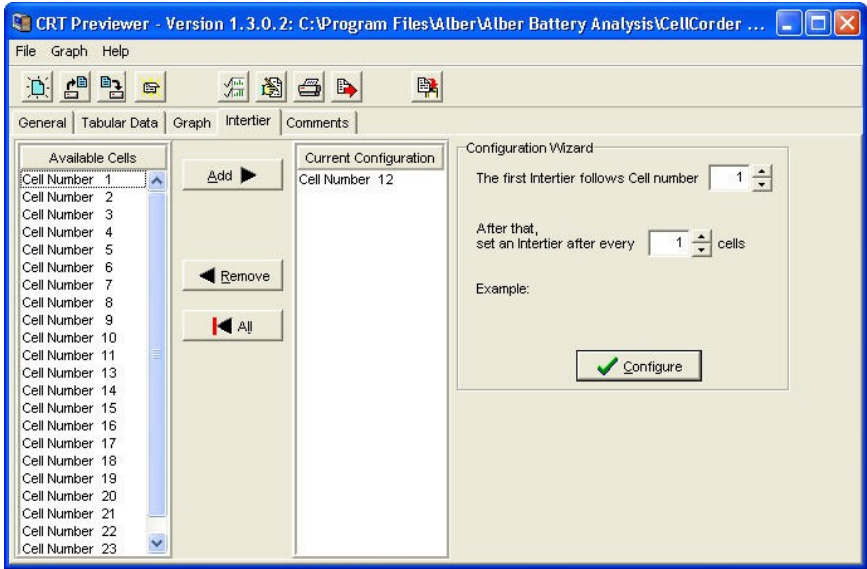


Figure 31. Intertier Tab

3.5.4.1 Intertier Configuration

The user may mark battery cells as intertier cells to indicate they are on the boundary of an intertier connection. By convention, only the cell with the lower cell number is marked. For example, if Cell 10, the last cell of one row of cells, is connected to Cell 11, the first cell of the next row of cells, only mark Cell 10 as an intertier cell.

Intertier configuration affects how intercell resistances are calculated. The program ignores intertier cells when calculating high, average, and low intercell resistances for a series of cells because intertier cells have much higher intercell resistances than other cells.

To configure intertier cells, open the battery file. Verify the battery has been configured with the correct number of cells on the General 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 Intertier Configuration Wizard is to the right.

There are three ways to create an intertier configuration:

- | | |
|----------|---|
| Method 1 | Select one or more cells in either list, then click the Add, Remove or All button. 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 each cell. To select a group of cells, click the first cell in the group, hold Shift down, then click the last cell in the group. |
| Method 2 | Select one or more cells in either list, then drag the selection onto the other list. |
| Method 3 | Use the Configuration Wizard to automatically create an intertier configuration. First, click All, if necessary, to clear the current configuration. On the Wizard, fill in the box next to the First intertier follows cell number and the Set an intertier after every nn cells box. The Example area shows the start of the sequence. Click Configure to display the results in the Current Configuration list. The list may be edited, if needed, by using the Add or Remove buttons. |
-

As an example, if a 24 cell battery has intertier cells at 6, 12 and 18, enter 6 in both edit boxes to indicate an intertier every six cells, beginning with cell number 6.

3.5.5 Comments

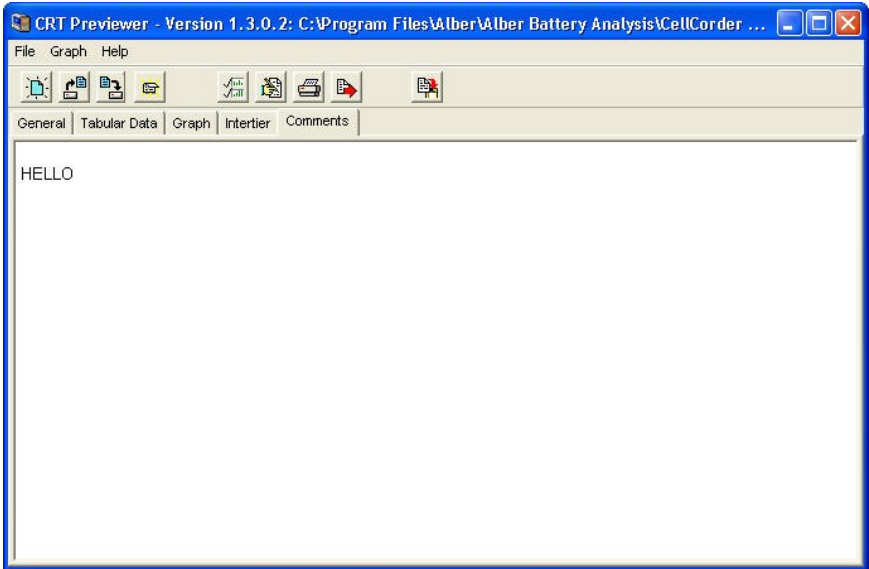


Figure 32. Comments Tab

Use the Comments Tab text editor for typing comments. For example, a battery maintenance log might show the date and type of readings taken, or when a cell was replaced or connectors cleaned. The user can copy text on this page to the clipboard; right click the comments area to open the edit menu.

4 The IMPORTANT Configuration File Editor: CCF

This section describes how to create and edit the configuration file using the Configuration Editor in Previewer. To use the Cellcorder to create the file, refer to Setting Up and Editing a Site in the Cellcorder manual.

NOTE:

Previewer has a General tab with a Threshold area displayed in the bottom left; the Configuration Editor has a General tab and a Threshold tab.

To edit or create a .CCF/configuration file, click File|Configuration Editor. The editor opens the CCF or, if none exists, indicates Site 0 of 0. To edit a site, select the Location, Battery and String Names from drop down lists or, to add a new site or create a CCF if none exists, click New and type data.

If a configuration site is opened in Previewer, changes made and saved to the General tab or Threshold area are reflected in the CCF on the Configuration Editor General tab and Threshold Page.

NOTE:

It is highly recommended to set up configurations/sites prior to using the CRT/BAS/Previewer 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 Previewer Configuration Editor to create and edit the configuration file, CCF.

Start Previewer by double-clicking the icon on the desktop.



Figure 33. Previewer Icon

Select File|Configuration Editor from the Main Menu.

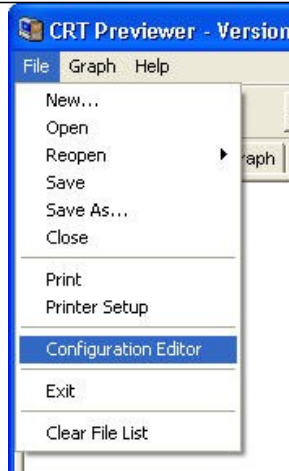


Figure 34. File|Configuration Editor

4.1 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 must originate and be maintained using the Configuration Editor. This avoids having a different CCF 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 when the Previewer/BAS program opens the CDF.

4.2 General Tab – Configuration File Editor CFE

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

To create a CCF 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.

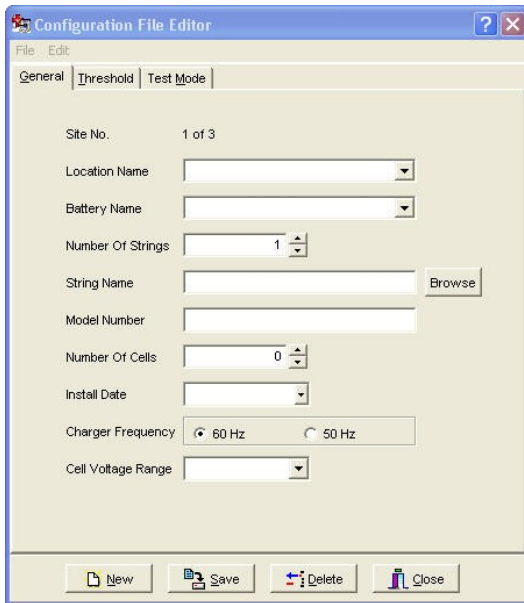



Figure 35. Configuration Editor

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.

The user cannot have two identical battery names under the same location name. Selecting different batteries changes the available strings on the String window.

The user cannot have two identical string names under the same battery name.



Figure 36. Configuration Editor|File|New| Save|Import|Exit

File|New begins a NEW CCF.

File|Save saves the CCF.

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


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



Figure 37. Error Message



Figure 38. Configuration Editor|Edit|Delete|Sort

Edit|Delete will delete the entire Site No#.

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

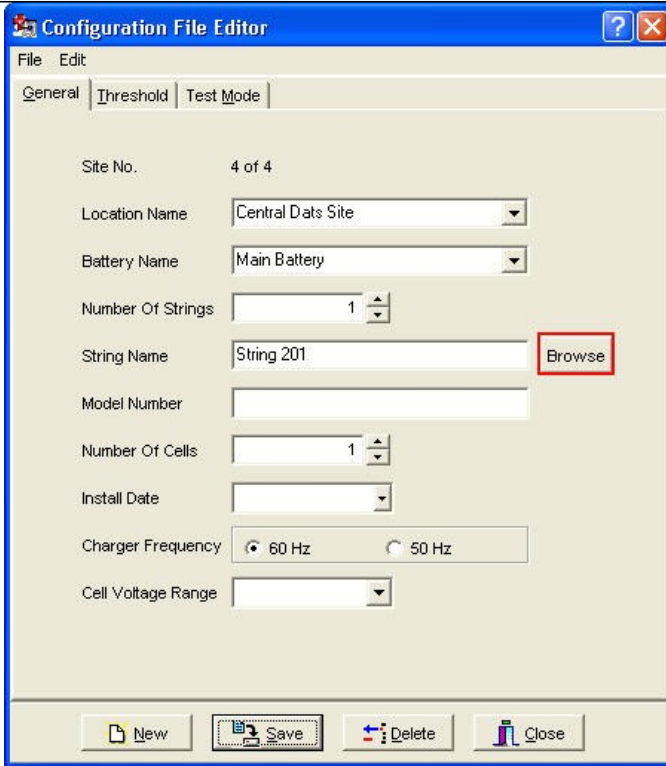



Figure 39. Configuration File Editor



4.2.1 Model Number/Browse/Battery List Editor Window


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  then .
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  has been selected, the Battery List Editor window appears.

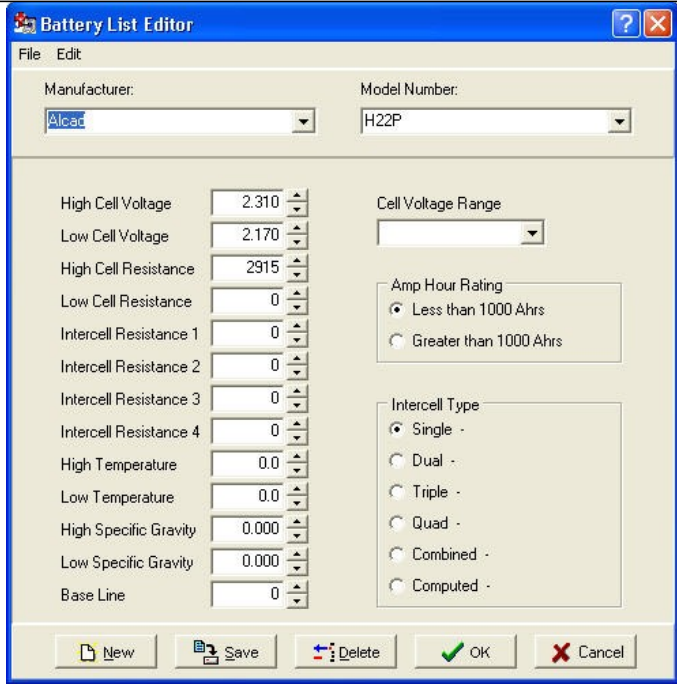


Figure 40. Battery List Editor

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.

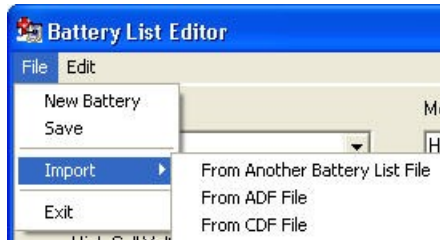


Figure 41. Import From Another Battery List File

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

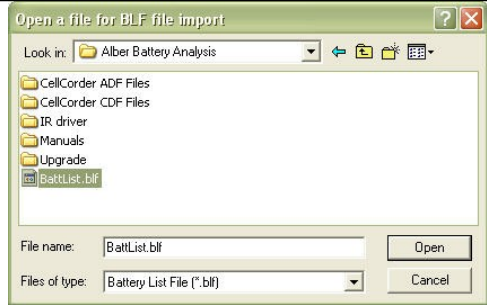
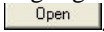


Figure 42. Helpful Battlist.blf

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.vertivco.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 for typical batteries used in the field.



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Figure 43. www.vertivco.com Baseline Resistance Data/Battlist.blf



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Internal Resistance Baseline Guide

These internal resistance baseline values from Vertivco research, battery manufacturers, and our customers will help determine the health of your batteries.

The average values in micro-ohms, taken on known-good batteries at 100% capacity, are to be used as guidelines only. Vertivco recommends you maintain baseline readings for your batteries based on manufacturers' data.

Taking Readings

When you take readings, you should record Internal cell resistance; measuring instrument used, such as the Cellcorder; battery manufacturer, model and size (Ah); battery age; install date; date of test and room temperature.

The batteries you measure should be either on-line or on-charge for at least 90 days. Connect the measuring instrument to the battery according to the equipment manufacturer's instructions, and observe the [safety precautions](#) below.

Listed readings are based on tests done at room temperature, typically 77F. Vertivco has observed that only extreme temperature variations affect cell resistance readings.

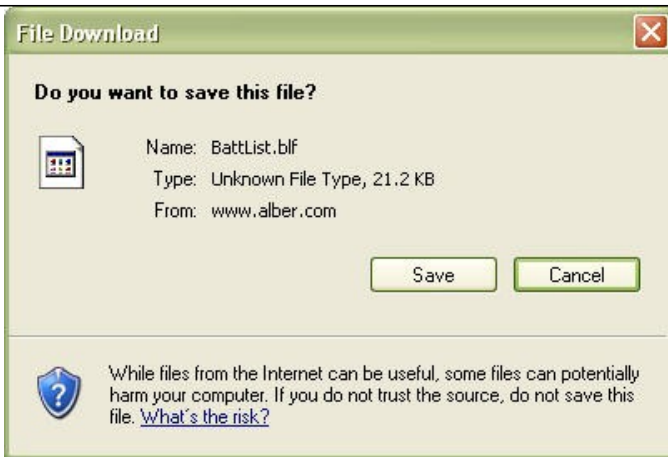
Contributing Your Readings

We would be pleased to add your resistance readings on 20 or more healthy batteries to our database. Your data should show: Internal cell resistance, measuring instrument used, battery manufacturer, model and size (Ah); battery age; install date; date of test, and room temperature. Or, if you have a Battery Analysis System ADF file, we can extract the data. To contribute your readings, contact our Engineering department or [e-mail](#) the ADF file.

Downloading a BLF File

You may download a file [a;of](#) resistance reference values for your CRT-300 [_____](#) list file for the

Figure 44. BLF On The Website

**Figure 45. File Download BLF****Figure 46. C:\Program Files\vertivco\Vertivco Battery Analysis**

Select and navigate to C:\Program Files\vertivco\Vertivco Battery Analysis or where the user may have program files stored to save the BattList.blf for importing into the software program 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.

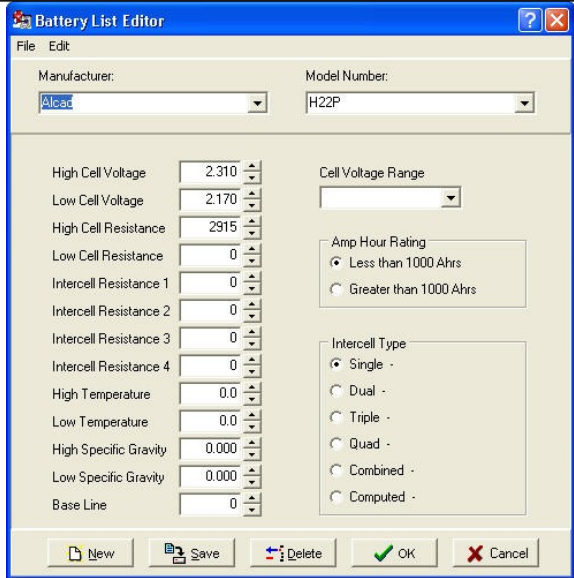


Figure 47. Imported Battlist.blf


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




Figure 48. 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.

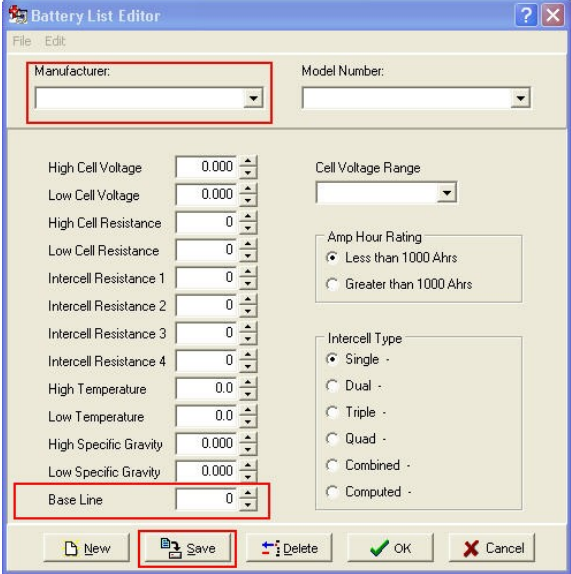





Figure 49. Battery List Editor New Battery

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 .*

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

4.3 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.

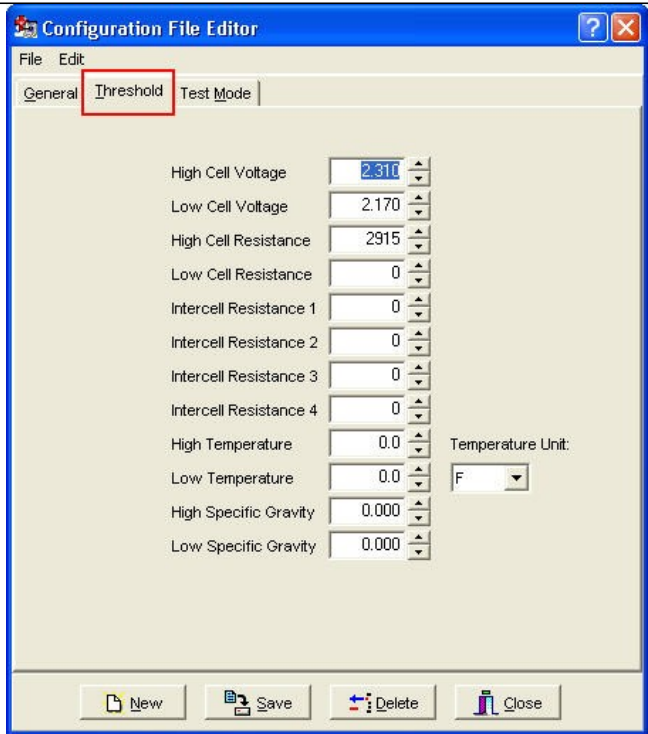


Figure 50. Threshold Tab Configuration File Editor

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.

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.

4.4 Test Mode Tab – Configuration Editor

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

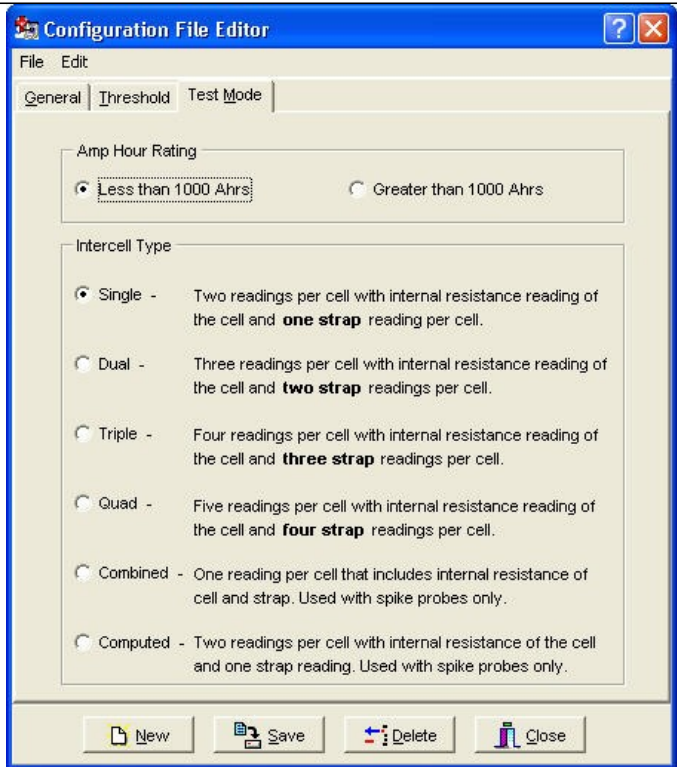


Figure 51. Configuration Editor Test Mode Tab

4.4.1 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**.

4.4.2 Single Testing

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

4.4.3 Dual Testing

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

4.4.4 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 three negatives are connected together.

4.4.5 Quad Testing

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

4.4.6 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 ∞ 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.

4.4.7 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: <http://www.vertivco.com>

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 Test Mode tabs of the Configuration Editor, click .

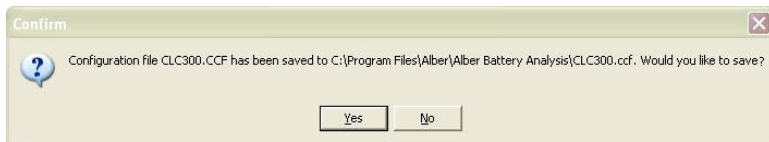



Figure 52. Saving The CCF

When this window appears, click  or  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 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/smart media card and the PC or a network drive within a backup folder and the local drive of the pc.

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

5 BEGIN – Open A *.CDF Or View CRT Battery Data

The user may view data from the CRT via the file saved on the USB device or Smart Media memory card or open/view the data file *.CDF on the PC.

This function captures battery cell voltage and resistance data and location names, dates, and thresholds.

NOTE:

Before using the memory card, refer to the Memory Card Note section.

Before using USB device, refer to paperwork included with the device.

To transfer data from the CRT to the computer, first save the data from the CRT to the memory card/USB device.

5.1 To Save Readings/Files (From CRT Manual)

Insert the USB flash hard drive/Smart Media Card into the CRT and POWER on.



To save readings, press

At Enter File Name, type a name, up to eight characters, no spaces

or

press SELECT NAMES/F3 to select an existing file name.

Press SELECT/F2.

To save to the USB flash hard drive, press SAVE/F2.



Figure 53. Enter File Name

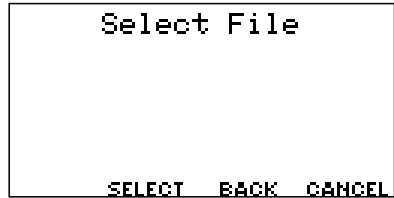


Figure 54. Select File/F3

Press F3/CONTINUE.

Press F1/CANCEL when the user wish to cancel saving the readings to the file chosen.

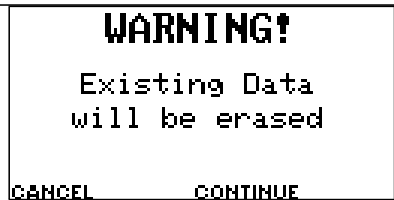


Figure 55. WARNING Data Will Be Lost

If the file exists, another warning will alert the user and ask to confirm saving the file name typed or chosen. For YES press F1, for NO press F2.

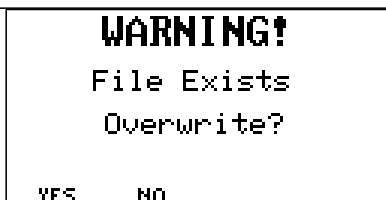


Figure 56. File Exists Overwrite WARNING

NOTE:

A space cannot be inserted in a file name.

Saving readings to the USB flash hard drive/Smart Media Card does not delete them from the CRT's temporary storage.

After saving cell readings to the USB flash hard drive/Smart Media card, the user may clear the CRT's temporary storage and take readings on another battery.

The user may also use Microsoft Explorer to transfer files from the USB device/Smart Media Card to a computer.

Following the instructions packaged with the memory card reader, install the memory card driver.

Confirm the drive is active by locating it under Windows Explorer.

Insert the USB device into the USB port on the PC or insert the Smart Media card into the card reader on the computer. To load the .CDF, start Previewer program, then click the Open File button or select File|Open.



Figure 57. File|Open

In the Open File window, click the Look in: drop-down menu and navigate to the drive that indicates the location of either the Smart Media card or the USB device. Highlight the desired .CDF, and click Open. The data appears in Previewer program.

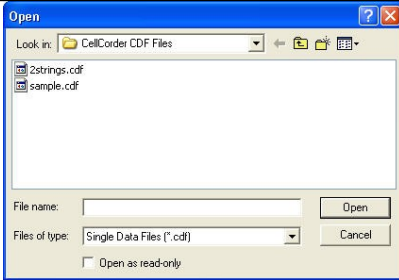


Figure 58. Open *.CDF in C:\Program Files\Vertivco\Vertivco Battery Analysis\CellCorder CDF Files

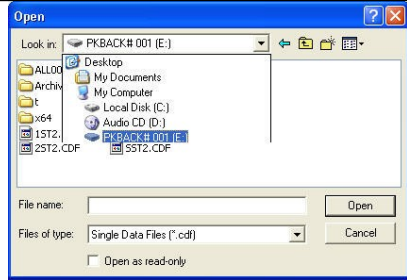


Figure 59. Open CDF On USB Flash Hard Drive Or Smart Media Card

NOTE:
*If no site information was linked to the readings in the CRT prior to saving the file, the number of cells within the file will not be defined. The user must enter the correct number of cells within the string on the General tab; otherwise, the bar graphs will default to 256 cells.
To transfer the file to the computer, save to the .CDFs subdirectory on the computer. To transfer to the Cellcorder, save to the memory card/USB device.*

Data can be edited on the General, Intertier, and Comments Tabs. Changes are not saved to the battery file until File|Save is selected. To transfer the file to the computer, save to the .CDFs subdirectory on the computer. To transfer to the Cellcorder, save to the memory card/USB device and then transfer the file to the CRT.

5.2 Memory Card Note



WINDOWS 2000 CAUTION:

Removal of the memory card from some manufacturer's reader/writers when using Windows 2000 may require the user doing the following:

Double-click the My Computer icon on the Windows desktop.

Right click the reader/writer drive icon and select 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.

6 Generating Reports

Previewer can print reports with user-specified parameters. A complete report contains cell data tables and graphs. After a report is defined, it can be reviewed in Print Preview before printing.

6.1 Setting Report Options

Open a file, then click the Print button  or select File|Print to display the Report Option window.

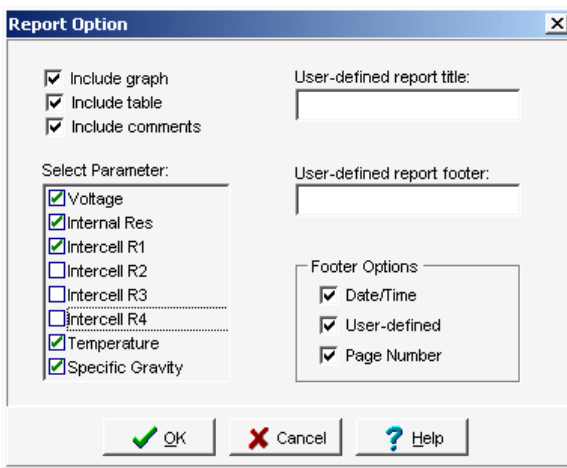


Figure 60. Report Option

The report creates a tabular list of all data or specific data in the battery file. A bar graph report can be created with or without tabular data. The Report Options window has the following items.

Include Graph, Include Table	Click to include a graph and/or table in the report.
Include Comments	If the Comments Tab has notes, select this option to print them in the report.
Select Parameter	Selects the voltage, resistance, temperature and SG parameters included in the report.

User Defined Report Title and Report Footer	Type a title and footer that will appear on every page of the report.
Footer Options: Date/Time, User Defined, and Page Number	Check these boxes to print on each page the date and time the report was printed, the user defined footer text, and the page number.

After making selections, click OK to display the Print Preview window. To view other report pages, click the toolbar arrows to step to first, previous, next or last page. Use toolbar buttons to increase or decrease page size, print the report, or close the window.

7 Exporting Data

Previewer can export graphed data in multiple formats. To open the Export

Option window, click the Export Graph button .



Figure 61. Export Options

To export a file: select the type of export; select the export destination; if available, select the size of the image to export; and click the Export or Print button. Following sections explain this sequence.

To export data as an Excel file, click into the radial button next to Microsoft Excel in the Export Option window, select the Excel version, then click OK. Type a file name, choose a location to save the file, then click Save. The Tabular Data Tab is saved in Excel spreadsheet format.

To export in Other formats, click into the radial button next to Others in the Export Option window, then OK. The Export File Options window opens.

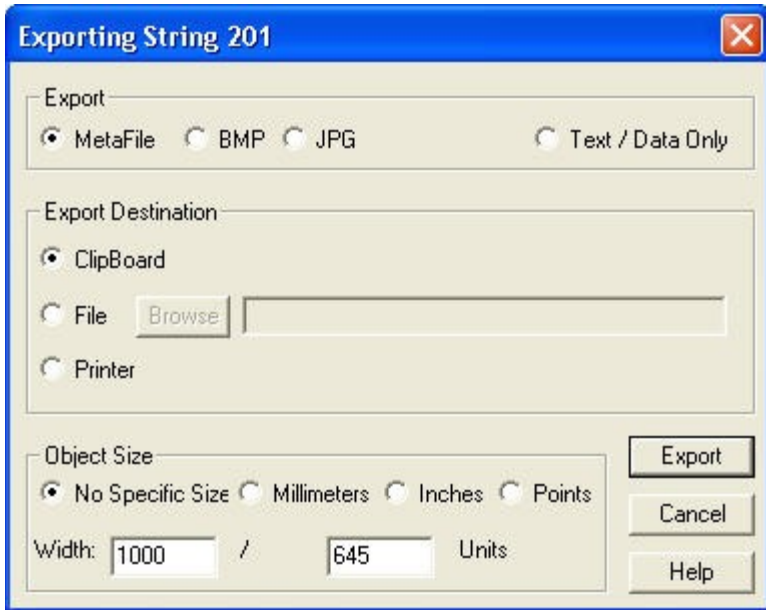


Figure 62. Export File Options

7.1 Export File Type

Click a file type button to enable options in the Export Destination and Object Size areas. The following list defines file formats, Metafile, BMP, JPG, Text/Data Only.

7.2 Export Destination

Select Clipboard to send a file to the clipboard so it may be copied/pasted into a document.

Select File to export as a file. Click Browse to open the File Save As window, type a file name, then click OK. On the Exporting window, click Export.

If Text/Data Only is selected, after the user clicks Export, the Text/Data Export window appears.

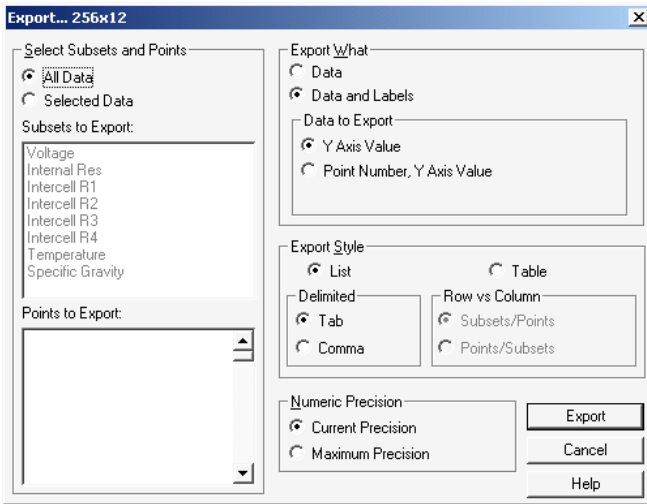


Figure 63. Export Text

Click All Data or Selected Data to export data from all the parameters or only data selected in the Subsets to Export and Points to Export boxes. To choose export data, click Selected Data, then highlight the item in the list. To select multiple items, hold the Shift or Ctrl key while clicking items. Leaving all list box items unselected exports all data.

Under Export What, select whether data is exported with or without parameter labels. The following examples are illustrated with one parameter (voltage) and five cells.

- ◆ Data without labels.

	2.183	2.123	2.191	2.200	2.136
--	-------	-------	-------	-------	-------

- ◆ Data and Labels with Y Axis Value selected.

	1	2	3	4	5
Voltage	2.183	2.123	2.191	2.200	2.136

- ◆ Data and labels with Point Number, 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

Export Style	Allows for selection of two styles in which data may be exported: list format and table format.
List	Exports the data one record per line. The data fields can either be separated by tabs or commas.

◆ Tab Format:

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

◆ Comma Format:

Voltage,1,2.183

Voltage,2,2.123

Voltage,3,2.191

Voltage,4,2.200

Voltage,5,2.136

Table	Exports the data in a grid fashion in either a Subset by Point or Point by Subset style.
-------	--

◆ Subset by Point:

	1	2	3	4	5
Voltage	2.183	2.123	2.191	2.200	2.136

◆ Point by Subset:

	Voltage
1	2.183
2	2.123
3	2.191
4	2.200
5	2.136


Numeric Precision	With Current Precision, data is exported with three decimal places. Maximum Precision exports more than three decimal places when data can support this option. Data results are exported as computed, not as displayed.
-------------------	--

Object Size	Select the unit of measure and the dimensions for the object, so it will have usable height and width.
-------------	--

Export Destination (continued)	If exporting a Metafile to the printer, click Printer then click Print to open the Print window, select the printer and options, then click OK.
--------------------------------	---

8 Creating A Data Set

This section describes how to create a battery file by typing the data. The user may maintain the file manually or transfer data from the Cellcorder via Smart Media Card or USB device at a later time.

To manually create a battery file, click the Create New button  or select File|New. The Select Configuration window appears.

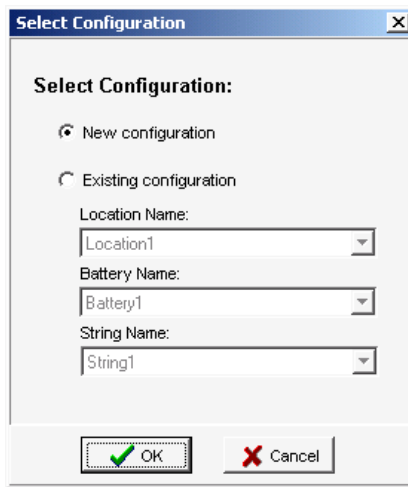


Figure 64. Select Configuration

To copy existing setup data to the new file, click Existing Configuration, select the Location, Battery and String Names, then click OK.

To create the file with no setup data, click New Configuration then OK. If an existing configuration was selected, the General and Intertier Tabs display battery information. If a new configuration was selected, begin by editing the General tab.

The Tabular Data Tab has all values set to 0 (blank). To edit data on this page, double-click on the grid to open the Cell Data Editor. After values are edited, continue with the Intertier Tab if needed.

To save the file, click the Save button or select File|Save. In the Save window, type a file name, then save to the pc's Cellcorder .CDFs subdirectory.

9 CRT Calibration Backup

If the Cellcorder loses calibration data, calibration can be restored instead of sending the unit back to the factory. Factory calibration is backed-up to the memory card/USB device in the file calk.cal.

NOTE:

If the user changes the calibration, the user must back up the new edited calk.cal.

If using a memory card, refer to the Memory Card Note section.

- ◆ Insert a memory card into the CRT-300 card drive or a USB device into the
- ◆ CRT-400 USB drive , then power up the Cellcorder.
- ◆ To display the Service Menu, at the Main Menu, press Shift+Serv. The password window appears.
- ◆ Type the password, then press Enter. Default is 1234.
- ◆ Select Calibration to display the Calibration Menu.
- ◆ Press Cal-K to display the calibration constants.
- ◆ To back up calibration data to the memory card/USB device, press Backup.
- ◆ At Enter File Name, type a name, eight characters maximum for the calibration file. Vertiv suggests using the Cellcorder serial number. After typing the file name, press the F2 Save.
- ◆ The CRT displays Saving Cal-K, then Closing File. When Calibration
- ◆ Constants appear, press Cancel three times to return to the Main Menu
- ◆ After the CAL file is saved, copy it from the memory card to the computer under Programs/Vertivco/Vertivco Battery Analysis. After copying the file, the user may delete it from the memory card if the user wish.

10 CRT Calibration Backup

- ◆ Copy the .CAL calibration file from the computer to a memory card/USB
- ◆ device.
- ◆ Insert the memory card/USB device into the Cellcorder card drive/USB
- ◆ port, then power up the Cellcorder.
- ◆ To display the Service Menu, at the Main Menu, press Shift+Serv. The password window appears.
- ◆ Type the password, then press Enter.
- ◆ Select Calibration to display the Calibration Menu.
- ◆ Press Cal-K to display the calibration constants.
- ◆ To restore calibration K-constants to the Cellcorder, press Restore.
- ◆ Select: Restore from Smart Media (memory card)/USB Device.
- ◆ Highlight the calibration CAL file using the Arrow keys then press Restore.
- ◆ When Calibration Constants appear, press Cancel three times to return to the Main Menu.

11 Upgrade CRT Firmware

The user can upgrade CRT Cellcorder firmware using the memory card or USB flash hard drive. Vertiv publishes upgrades to the web at www.vertivco.com.

NOTE:

If using a memory card, refer to the Memory Card Note section.



WARNING:

Do not continue until the user has the .UPG upgrade file ready. The user will be clearing the current firmware, which makes the Cellcorder unusable until new firmware is loaded.

Download the UPG upgrade file from the Vertiv Web site or an Vertiv CD to Program Files/Vertivco/Vertivco Battery Analysis.

Using Windows Explorer, copy the file to the memory card/USB flash hard drive.

With the CRT powered off, insert the memory card/USB device 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 or to go to the Main Menu without upgrading, press Cancel.

After pressing Continue, at the message System ready to receive upgrade file; select file transfer method, press Smart Media. The message File transfer in progress appears and the frame number counts down.

When Upgrade successful; system is running Version *nn.nnnnn* appears, press Continue to display the Main Menu.

Index

- Add button 23
- ADF
 - defined BAS..... 7
- All button 23
- arrow keys..... 43
- available cells column 22
- backup
 - sample data file 8
- base line 36
- battery name..... 15
- BattList.blf 32
- BLF 7, 32, 37
- browse 28
- button
 - Add 23
 - All 23
 - Browse 28
 - Create New 53
 - Current Precision 52
 - Data 50
 - Edit Values..... 13, 18
 - Existing Configuration 54
 - Export 50
 - Export Graph..... 13
 - Export Graph..... 48
 - File Close 13
 - File New..... 13
 - File Open 13, 14
 - File Save 13
 - List Format..... 51
 - Max Precision 52
 - New Configuration 54
 - Other Formats 49
 - Point Number 50
 - Print Report..... 13, 47
 - radial Excel 49
 - Remove 23
 - Select Parameters 13, 20
 - Toolbar 7
 - Transfer Data 13
 - Y-axis 50
- CAL file..... 8
- calibration CRT-300 55
- CAUTION 41
- CCF 8, 24, 25
- CD
 - software 2
- CDF 8, 44
 - to ADF..... 13
- cell
 - voltage range 29
- cell data 21
- cell data editor 18
- celsius 38
- centigrade 16
- charger frequency 16, 29
- clear file list menu item 11
- column
 - order 18
 - sort list view 17
 - width..... 18
- COM port
 - IR BAS ONLY 5
- comma format..... 52
- Comments Tab 24
- configuration
 - file editor 25, 28
- Configuration
 - Editor 25
- configuration file
 - # of strings 28
 - battery name 28
 - cell voltage range..... 29
 - charger freq..... 29
 - install date..... 28
 - location 28

model number	28	save	13
number of cells	28	types	7
site no.	28	file types	7
string name	28	firmware upgrade CRT-300.....	56
configuration wizard	22, 23	footer options.....	48
current configuration column.....	22	general	
current precision	52	config file editor	28
Data button.....	50	General tab	14
data editor	18	Ghostscript	
date		program	4
format.....	16	graph	
install.....	16	maximize	11
read	16	return previous.....	11
date format	16	shadows	11
demo file	8	title.....	11
DocuDesk		undo zoom	11
PDF program.....	3	help	12
dual intercell setting	40	include	
edit configuration file.....	25	comments check box	48
export	49, 50, 51, 53	graph check.....	47
graph	13, 48	table check	47
fahrenheit	16, 38	install	
file	3	BAS	2
ADF for BAS	7	date	16, 28
BattList.blf	7, 32, 35	Previewer.....	2
BLF	7, 32	software	2
CAL	8	intercell	
calibration	8	combined	40
CCF.....	8, 24	computed	40
CDF.....	8	dual	40
clear list.....	11	quad	40
close	10, 13	single	40
configuration editor.....	10	triple	40
exit	10	intertier configuration	22
menu	10	Intertier tab	21
new.....	10	IR	
open.....	10	BAS ONLY	1, 4, 5
PDF:	3	list view	17
print.....	10	location name	15
print setup	10	maximum precision	52
program	6	memory card.....	1, 42
reopen	10	caution	47

Index

- meta file 53
- model number 15
 - config editor 28
- multiple sites 25, 38
- New button 53
- NOTE..... 2, 5, 6, 25, 26, 32, 36, 37, 38, 39, 40
- number of cells..... 15, 28
- number of strings 28
- numeric precision..... 52
- object size 49, 53
- open file
 - battery data via memory card.. 42
- PDF
 - DocuDesk 3
- point by subset 52
- points..... 50
- print..... 53
 - report..... 10, 13
- Print button 47
- program
 - BAS..... 2
 - CRT Previewer 2
 - DocuDesk 4
 - Ghostscript 4
- quad intercell setting 40
- read date..... 16
- Remove button..... 23
- reopen menu item..... 10
- report..... 47
 - user defined footer 48
 - user defined title..... 48
- report generation 47
- safety 1
- sample data 8
- select
 - configuration 10, 53, 54
- select parameters 20
 - report option..... 48
- setting
 - combined intercell..... 40
 - computed intercell..... 41
 - dual intercell 40
 - quad intercell 40
 - single intercell 40
 - triple intercell 40
- single intercell setting 40
- Smart Media .see also memory card
 - caution 47
- software 2
 - CD 2
 - version 13
- software install 2
- string name 15, 28
- subset by point..... 52
- subsets 50
- system
 - requirements 1, 2
- tab
 - CFE General 31
 - CFE Test Mode 39
 - CFE Threshold 38
 - Comments..... 14, 24, 46
 - General 7, 14, 27, 46
 - Graph..... 19
 - Intertier 14, 21, 22, 46
 - Tabular Data 16
- tab format 52
- table format button 52
- Tabular Data tab 16
- temperature units 16
- test mode/F1 43
- testing
 - combined 40
 - computed 40
 - dual 40
 - quad 40
 - single 40
 - triple 40
- the Print button 53
- threshold 38
 - config file editor 39
- threshold values 16
- toolbar buttons 7

triple intercell setting40
type
 config editor 39
 config file editor..... 39
 intercell39

UPG file..... 56
USB
 device 1
 www.vertivco.com
 32