

Files Used by the CRT-400 Cellcorder and Battery Analysis System (BAS) Program

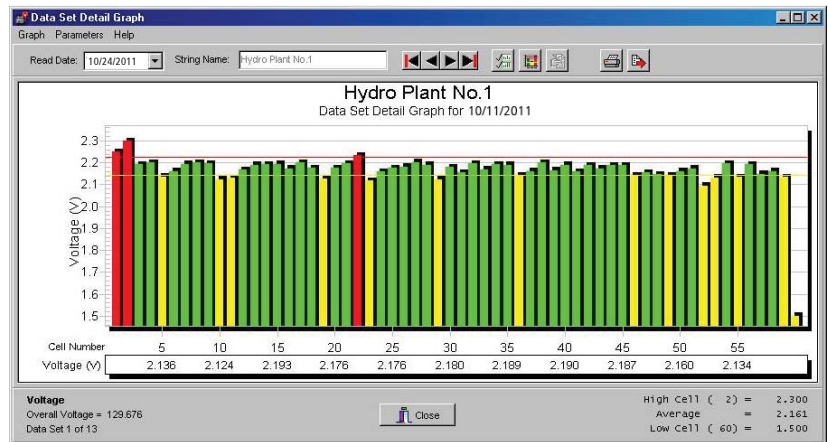
There are many file types used with the Cellcorder and BAS program, and they are fully described in the user's guides. This section describes the two most common file types.

.CDF Cell Data File -

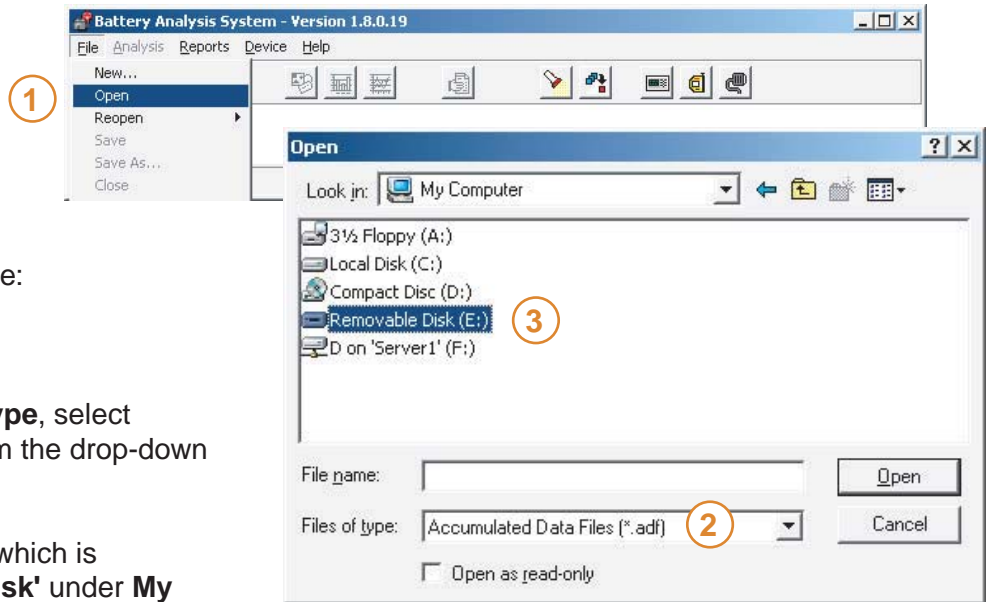
Created by the CRT-400 when saving readings to the USB flash drive. It is the transport file that gets data from the CRT-400 to the computer. This file contains one set or multiple sets (if in multi-string mode) of readings for a complete string of batteries. The Battery Analysis System (BAS) program imports this file into an ADF file.

.ADF Accumulated Data File -

Contains sets of readings that were imported from CDF files. One ADF file can contain many CDF files from the same string. This gives the BAS program the ability to trend over many sets (different dates) of data. Create one ADF file for each string or one battery with parallel strings. Every time readings are taken for that string, import the data in the CDF file into the ADF file.



Importing a CDF File into an ADF File



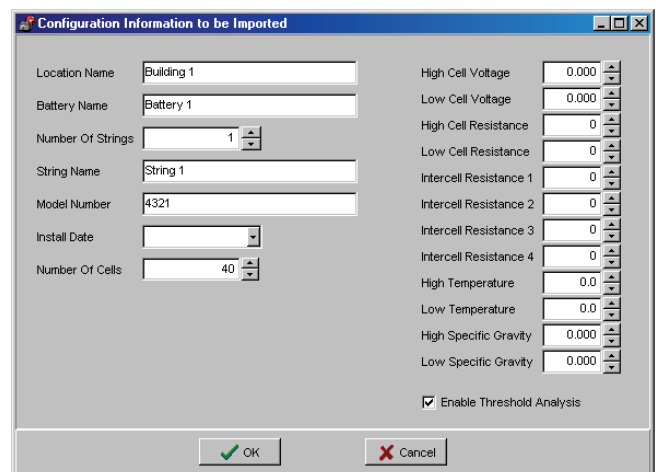
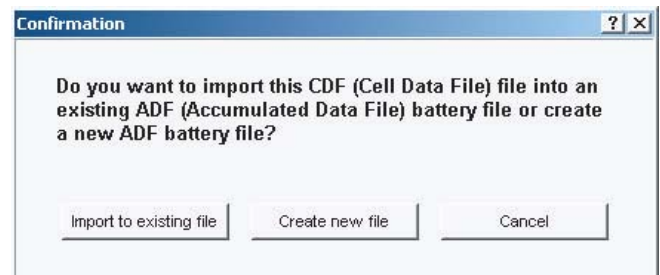
To import a **CDF** file into an **ADF** file:

1. Select **File** then **Open**.
2. In the **Open** dialog box at **File Type**, select **Cellcorder Data File (*.cdf)** from the drop-down list.
3. Navigate to the USB flash drive which is normally labeled '**Removable Disk**' under **My Computer**.
4. In the **Confirmation** dialog box, click **Import to Existing File** or **Create New File**. Both buttons refer to an **ADF** file.

Note: If this is the first time importing, click **Create New File** and then, each time you take additional readings for that string, click **Import to Existing File** and select the appropriate previously-created ADF file.

If **Import to Existing File** is selected, navigate to the desired **ADF** file and select it. The new data will be added to the existing data as a new read date when viewing the readings.

If **Create New File** is selected, the **Configuration Information** dialog box appears. This box can be configured using the **CRT-400 template** setup or with the configurator in the program. You can change or add information by using **File** then **Properties**.



Viewing Battery File Properties

This page describes the five **File Properties** pages, which you may use to edit battery data. Open a file, click **File** then **Properties**. You must click **File** then **Save** to save changes.

The **General** page shows details and allows editing of these details, such as location name, battery name, number of strings, string name, battery model, temperature scale, installation date and number of cells/jars. The temperature scale and number of cells will affect the battery data file. The number of data sets, most recent read date, overall voltage, and average resistance are also shown on the general page.

Note: Do not use identical battery names in the same location name or identical string names in the same battery name.

The **Details** page displays a table of values for all cells with data. Columns display cell number, cell voltage, internal resistance, intercell R1 to R4 resistance, specific gravity, and temperature. This list view can display cell data in colors based on threshold values, and intertier cell data in bold.

Cell #	Voltage	Internal Res.	Intercell R1	Intercell R2	Intercell R3	Intercell R4	Spec. Gravity	Temp (C)
1	2.250	0	18	0	0	0	1.210	10.9
2	2.300	368	8	0	0	0	1.214	18.9
3	2.191	300	18	0	0	0	1.212	10.9
4	2.200	333	900	0	0	0	1.215	18.9

The **Intertier** page manually or automatically marks cells in a battery 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 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.

The **Comments** page has a text editor for typing comments, such as the date and type of readings taken or when connectors were cleaned. The **Select a New Read Date** dialog box lets you associate comments with a read date. To save a **Comments** page as a template, click the **Save As New Comment Template** button.

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

Field Name	Field Contents
User 10 name	Contents10
User 3 name	Contents 3
User 2 name	Contents 2

Viewing Battery Readings

To show a graph of an **ADF Battery File**: Click **File** then **Open** on the main menu and select a file name, then click **Analysis**, **Data Set** then **Detail**. To enlarge a graph area, drag a rectangle across it. To return to normal size, right-click the graph and click **Undo Zoom**.

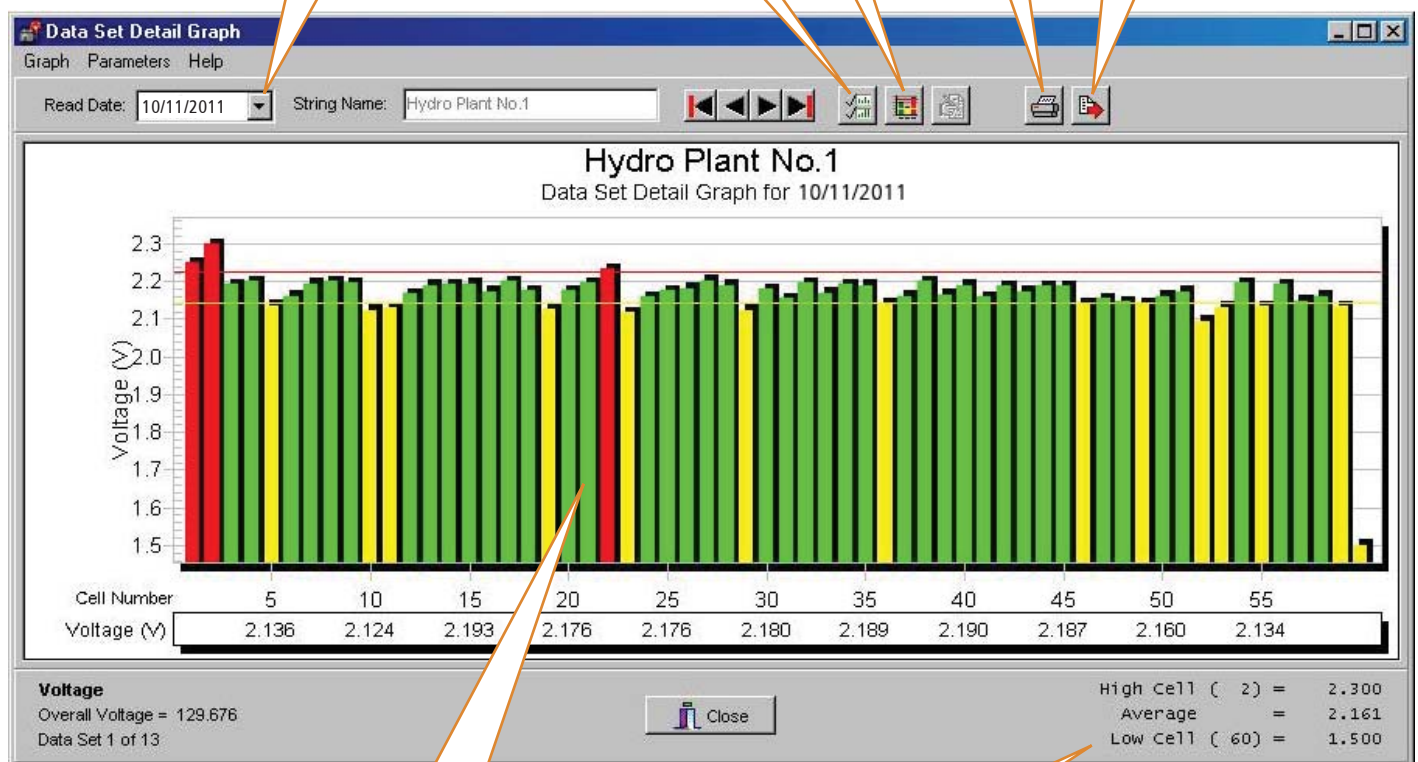
View voltage, resistance, intercell resistance, temperature or SG.

Set threshold display properties and the graph scale.

View different data sets by selecting a date from the list.

Print the graph.

Export to a file or the clipboard.



Cell Data 10/14/2011

Cell Number: 32

Voltage:	2.196
Internal Resistance:	322
Intercell Resistance 1:	20
Intercell Resistance 2:	0
Intercell Resistance 3:	0
Intercell Resistance 4:	0
Specific Gravity:	1.214
Temperature: (C)	20.0

Close

Shows the minimum, maximum and average values of the readings.

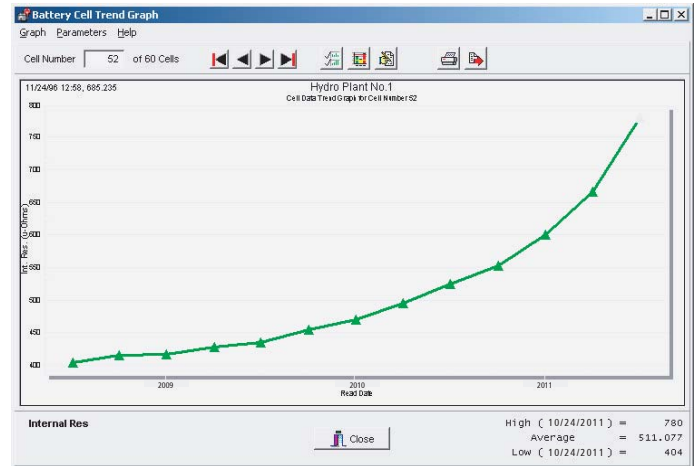
Bar Graph Cell Data

To display text data for a cell, click on a bar. The **Cell Data** box shows **Cell Number**, **Cell Voltage**, **Internal Resistance**, **Intercell Resistance**, **Specific Gravity** and **Temperature** when available.

Trending a Parameter Over Time

Trending a specific parameter can help identify a problem:

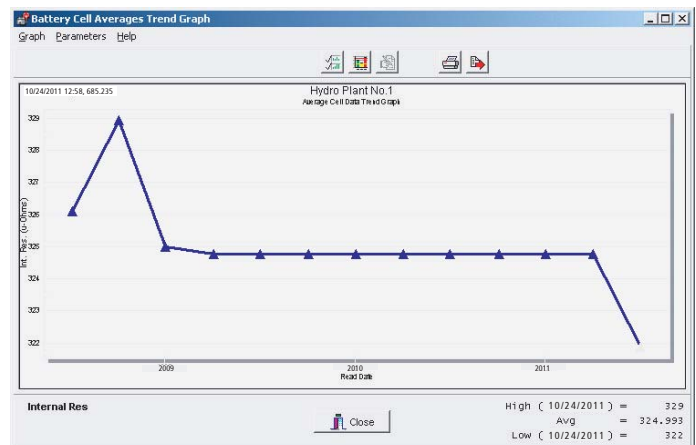
1. Open a file with at least two data sets and click the **View Battery Data Set Graphs** button.
2. Click a cell in the graph, then click **Parameters, Trend then Cells**.
3. Click the **Select Which Parameters Appear in Graph** button.
4. On the **Data Subsets** box, select **Internal Resistance** only. A **Battery Cell Trend Graph** displays the cell values over time.
5. Click a data point or date to display details in the **Cell Data** box. If the box does not appear, enable it under **File then Preferences**.



Trending a Parameter Average Over Time

Trending a parameter average helps identify inconsistencies in a battery system, and trending internal resistance averages helps determine a battery's end of life. The average summaries on the internal resistance screen are calculated to reduce false averages. The calculation eliminates cells above or below the true average by 25%, and then recalculates a new Modified Average.

1. Open a file with at least two Data Sets and click the **View Battery Data Set Graphs** button.
2. Click a cell in the graph, then click **Parameters, Trend then Cell Averages**.
3. Click the **Select Which Parameters Appear in Graph** button.
4. On the **Data Subsets** box, select **Internal Resistance** only. A **Battery Cell Averages Trend Graph** displays internal resistance over time.
5. Click a data point or date to display details in the **Cell Data** box.



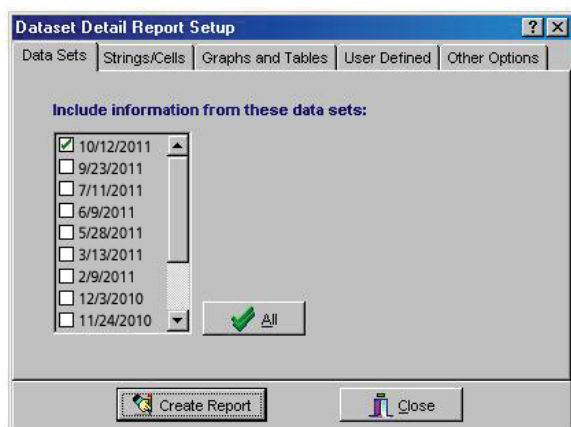
Generating Reports

The **BAS Report Generator** creates five reports: a **Detail**, **Comparison**, **Threshold Deviation**, **Cell Trend**, and **Cell Average Trend Report** with lists, graphs or both.

Click **Create Report** after setup. View saved reports using the **Archive Reader**. Buttons on report pages change view size, print, and save as a **ZRF** archive file. To save the text portion as a text file, select **TXT** in the **Save As Type** field.

Data Set Detail

This report creates lists and graphs of selected Data Sets. Clicking **Reports**, **Data Set** then **Detail** opens five setup pages: **Data Sets** selects sets of readings to include. **Strings/Cells** identifies cell range. **Graphs and Tables** includes tabular or graph information. **User Defined** defines user fields and comments. **Other Options** offers title, date, time, page number, size and footer.



Data Set Comparison Report

This report compares selected data sets referenced to one data set.

Click **Reports**, **Data Set** then **Comparison**. All data set dates except the reference can be in one report.

Cell Trend Report

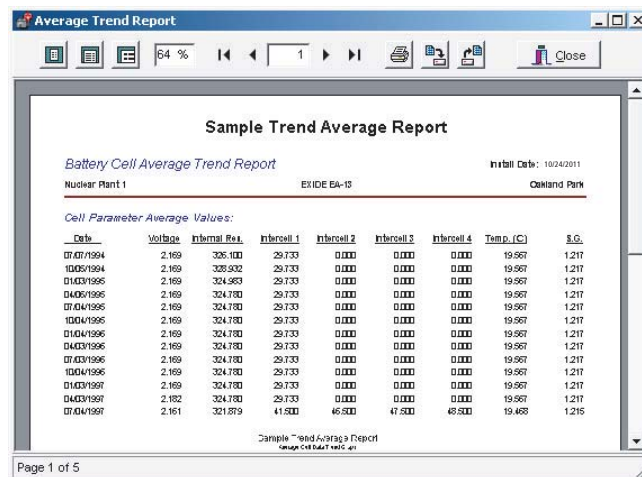
This report creates a tabular list of selected data sets with respect to time.

Click **Reports**, **Trend** then **Cells**.

Cell Average Trend Report

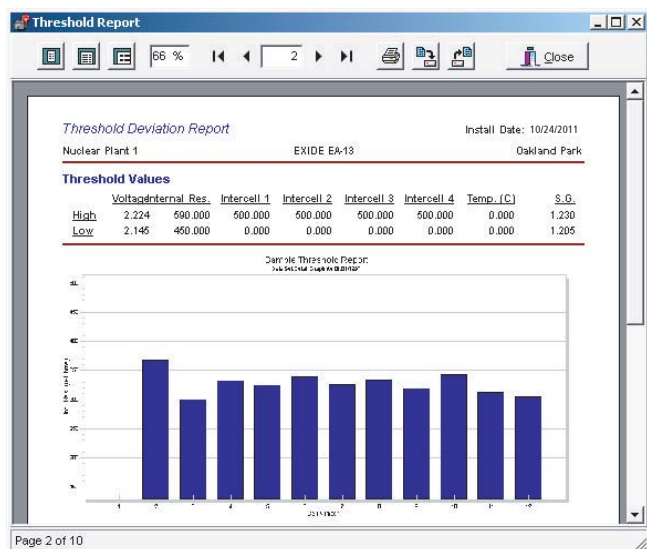
This report creates a tabular list of selected data sets averages with respect to time.

Click **Reports**, **Trend** then **Cell Averages**.



Threshold Deviation Report

The **Data Set Threshold Report** creates a list that shows threshold violations of selected data sets.



Archive Reader

The **Archive Reader** displays and prints reports that were generated and saved with the **Report Generator**. To start the reader:

Click **Reports** then **Load** and open a report file. You may open a previously saved report any time the **Archive Reader** is on screen. The reader opens **CRT-400 ZRF** report files and may be downloaded from the Albér Web site: www.alber.com.