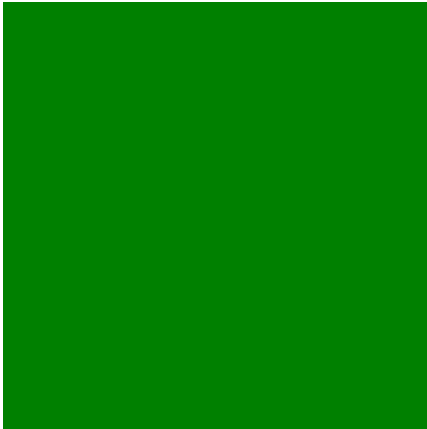




# WELSoft™

## Companion Software for the Interrogator™ Battery Analyzer



Interrogator Device Configuration

Interrogator Site Configurations: Name: Site Config File 1

Site Configuration | String Configuration

Add Remove Copy Insert Reset

Site No.	Site Name	Site ID	No. of Str
1	Hawthorne North	HAWV_N	4
2	Hawthorne Central	HAWV_C	4
3	Hawthorne South	HAWV_S	4
4	Hawthorne HQ Main UPS	HAWV_HQ_UPS	4
5	Torrance HQ Main UPS	TORR_HQ_UPS	6
6	Torrance Substation 1	TORR_SUB_1	2
7	Torrance Substation 2	TORR_SUB_2	2
8	Torrance Substation 3	TORR_SUB_3	2
9	Torrance Substation 4	TORR_SUB_4	2
10	LA Offices Main UPS	LA_OFF_UPS	4
11	LA Offices Backup Lighting 1	LA_OFF_LIGHT_1	1
12	LA Offices Backup Lighting 2	LA_OFF_LIGHT_2	1
13	LA Offices Backup Lighting 3	LA_OFF_LIGHT_3	1
14	LA Offices Backup Lighting 4	LA_OFF_LIGHT_4	1
15	LA Substation 01	LA_SUB_01	4
16	LA Substation 02	LA_SUB_02	4
17	LA Substation 03	LA_SUB_03	4
18	LA Substation 04	LA_SUB_04	4
19	LA Substation 05	LA_SUB_05	4

## WELSoft™ The Interrogator™ Companion Software

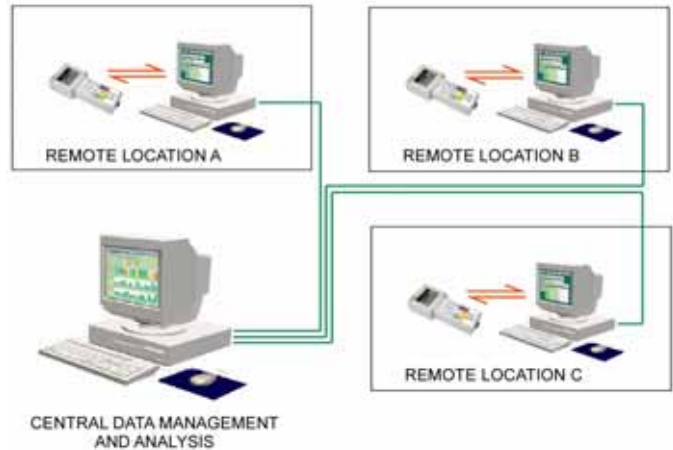
WELSoft™ is the companion software for the Interrogator™ handheld battery analyzer. This software has been specifically written for those users that have to monitor critical, large or widespread battery inventories.

### Main Software Features

- > Capture and store battery State-of-Health (SOH) test data, site configuration data, and other information entered by the end user into the Interrogator™ for later analysis, review and filing.
- > Review and analyze battery test data using the built-in data viewing functions and pre-configured reporting options.
- > Gain an immediate one-glance overview of battery inventory SOH with the Inventory Overview™ screen, or access greater detail with the string specific or individual cell level reports.
- > Export all data to text, PDF® or Excel® format for hardcopy filing and full data manipulation for additional user defined analysis.
- > Pre-configure the Interrogator with site and string information to maximize efficiency of maintenance personnel at battery test sites.
- > Install new software (analysis modules) to the Interrogator™ to expand the measurement and analysis capabilities of the handheld device.

### Capture and Manage Data - Company Wide

WELSoft™ enables the user to upload all data collected by one or many Interrogator™ units for easy viewing, printout or export to other applications for further analysis. Each copy of WELSoft™ can communicate with an unlimited number of Interrogator units and the WELSoft™ standard user license allows the installation of as many copies as required within the users organization.



*Data collected locally and managed centrally...*

Data can be collected locally and then held centrally within the IT network. WELSoft™ can be installed locally on any PC to allow direct data collection at the end of each maintenance day. This data can then be transferred via the network to the central data storage location or sent as e-mail attachments. As each copy of WELSoft™ is identical, the location of central data storage can be freely chosen by the user - or if preferred data can be managed and analysed by local staff.

### Site Data and Test Data Review

The user can review the test data as well as site configuration information and any additional notes entered by the maintenance crew using the built-in data viewing options.

CONFIGURATION FIELD	VALUE
Number of Batteries in String:	20
Number of Cells per Battery:	3
Cell Voltage:	2.00 Volts
Impedance Reference Value:	3600 Siemens/Mhos
Battery Manufacturer:	DEKA
Battery Type:	Flooded
Battery Model:	30C-5
Amp Hour Rating:	150 Amp-Hours
Battery Run Time:	70 Minutes
String Installation Date:	September 12, 2000
String Run Time:	45 Minutes
String Load Current:	115.0 Amps
String Float Current:	5.0 Amps
String Voltage:	135.00 Volts
Charger Manufacturer:	SAFT
Charger Type:	SLR1200
Supervisor:	John Miller

*View / review site & test result data with the Site Information window...*

## Pre-Configured Reports

WELSoft™ comes complete with a set of built-in pre-configured reports and analysis tools to allow the user to quickly review the SOH of the users' battery inventory. The Inventory Overview report allows a rapid one-glance method to quickly assess the overall readiness of the battery inventory and allows the user to identify which cells and monoblocks will soon need to be replaced.



The Inventory Overview screen allows the user an "at-a-glance" view of the state of health of the entire battery inventory

The Inventory Overview report is a custom data review window that allows the user to view the progression of each individual advanced state of health parameter (SOHP) as well as the impedance, voltage and overall State-of-Health of each cell or monoblock. In addition WELSoft™ also provides the user with the ability to view detailed result information at the string level with the String Overview report.



The string level report window gives the user full flexibility

The user can decide the amount of data that is to be presented at this level. This can be limited to a single parameter such as Overall SOH or it can be extended to include all advanced State-of-Health parameters. The user can elect to view this data as a chart or as a colour coded data table.

## Flexible Trended Data at the Cell Level

Fully trended information at the cell level can be viewed for any individual cell (or the smallest unit tested) to show temporal changes in the test results. The Cell Level report allows the user to select which parameters are trended, how many readings are included in the trend, and to blend in and out the respective warning and fail alarm levels.

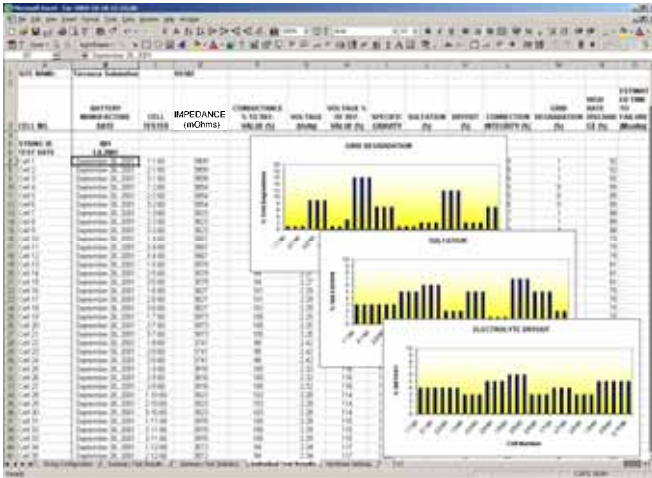


The cell level report window - accessible directly from the inventory overview or the string level report - provides the user with trended profiles for any of the recorded test data for any cell or monoblock

## Capability to Export all Data

At WEL we appreciate that users may have their own preferred data analysis techniques and preferred software. WELSoft™ has been designed to provide the user full export capabilities of all Interrogator™ captured data to TEXT, PDF® or Excel® file formats.

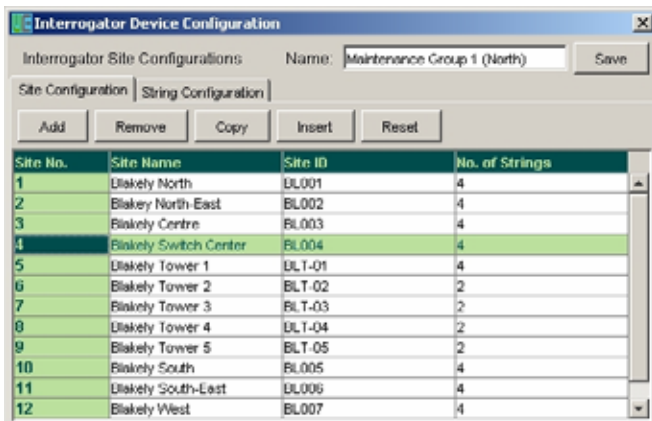
When data is exported then all data is exported – there are no data that the user can only view using WELSoft™.



Export and analyse data using third party software...

### Site and String Pre-Configuration of the Interrogator™ via WELSoft™

The Interrogator™ battery analyzer can be pre-configured with site and string data such that the actual testing procedure becomes as easy as pulling up the required site data and commencing the testing sequence. WELSoft™ allows the user to pre-configure the Interrogator™ quickly and easily using a PC. Each Interrogator™ can be pre-configured for up to 50 different sites each with up to 50 strings. There are no limitations or restrictions on the number of cells per string, and these can be configured differently for each and every site. The configurations can be saved as configuration files and distributed to maintenance teams. Saved configurations can also be re-used so the user can create a library of test configuration files for the complete battery inventory.

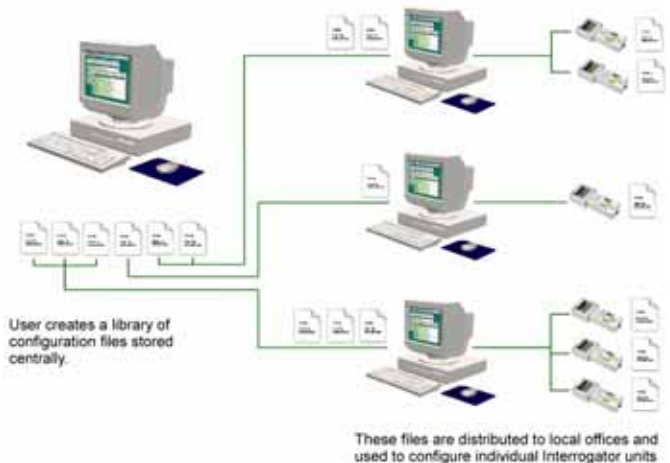


Site No.	Site Name	Site ID	No. of Strings
1	Blakely North	BL001	4
2	Blakely North-East	BL002	4
3	Blakely Centre	BL003	4
4	Blakely Switch Center	BL004	4
5	Blakely Tower 1	BLT-01	4
6	Blakely Tower 2	BLT-02	2
7	Blakely Tower 3	BLT-03	2
8	Blakely Tower 4	BLT-04	2
9	Blakely Tower 5	BLT-05	2
10	Blakely South	BL005	4
11	Blakely South-East	BL006	4
12	Blakely West	BL007	4

The site and string configuration utility...

The 64MB of built in FLASH RAM allows the storage of sufficient site and string configuration data to cover multiple days of testing. Configuration files can also be created centrally and then sent to remote maintenance crews, who can then use a locally installed copy of WELSoft™ to upload the configuration data into their Interrogator™ handheld units. The same crews can then send their test results back to the battery management centre at the end of each day and collect the configuration files for the next day's operations. Naturally any installed copy of WELSoft™ can be used to create configuration files ensuring that all remote sites have autonomy in the use of WELSoft™ if required.

### Central Library of Configuration Files



Configuration files can be created and managed centrally and then distributed to remote sites...

The Interrogator™ configuration utility within WELSoft™ allows the user to pre-program an Interrogator™ handheld with the following information and settings:

- > Names and I.D.'s of all sites and strings that are to be tested.
- > String configuration details for all strings. (number of batteries (cells/ monoblocks) per string, number of cells per monoblock, float voltage etc.).
- > The cell types to be tested (VRLA, Flooded, AGM, GEL)

- > Amp-hour rating per cell / monoblock
- > Specific gravity logging (enable/disable)
- > Cell / monoblock manufacture date logging (enable / disable)
- > Cell / monoblock manufacturer and type (name)
- > Names of the maintenance crew
- > Name of Supervisor
- > Special/individual instructions to the maintenance crew

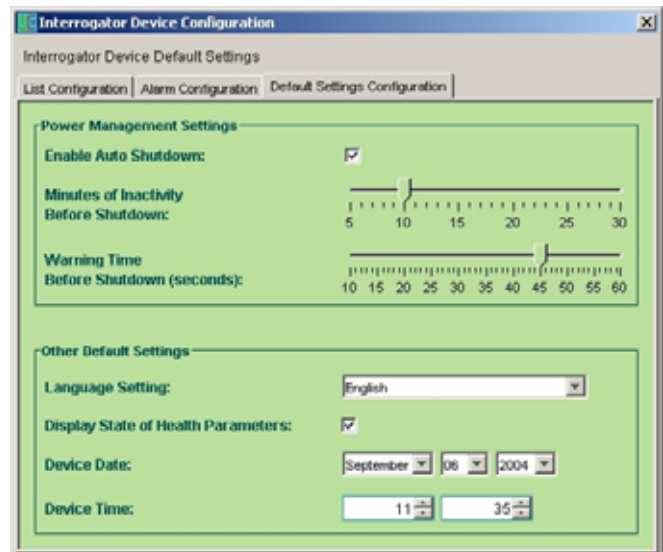
(The above is only a partial list of the data that can be pre-configured in the Interrogator™)

### Interrogator™ Device Configuration Utility

The alarm levels settings within each Interrogator™ unit determine whether each battery tested receives a pass, warning, or fail result. WELSoft™ provides the user with a configuration utility to set the alarm levels that are distributed with each site and string configuration file. In this way the manager responsible for the

maintenance of the battery inventory is assured that the warning and fail alarm levels are applied consistently throughout the organisation. The alarm levels on the Interrogator™ unit, as well as the ability to change the alarm levels with WELSoft™ are password protected.

The configuration utility also allows the user of WELSoft™ to set all other preferences on the Interrogator™ units such as the onboard power management features, language settings etc..

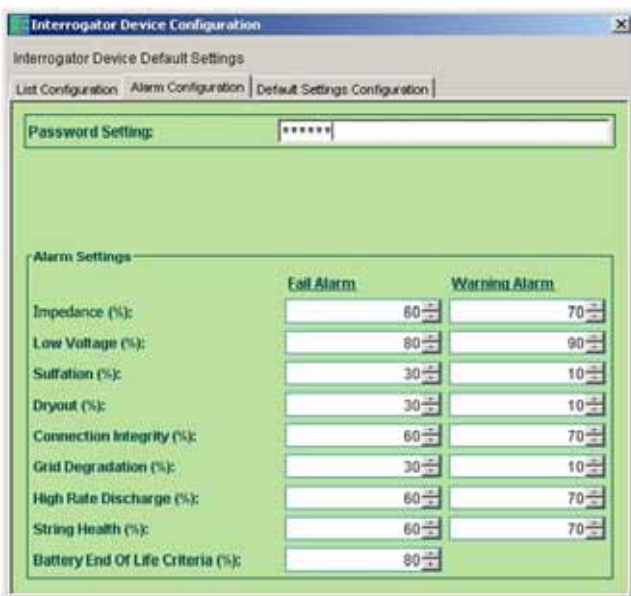


...it also allows the user to set all the other Interrogator™ on board preferences...

### Expand the analysis capabilities of the Interrogator™ by installing new software modules into each handheld unit.

WELSoft™ is not just the accompanying software for the Interrogator™. It is the key that unlocks the users ability to upgrade the Interrogator™ with new and better functionality and extended testing features. The Interrogator™ handheld device has been developed to be modular and thus continuously expandable.

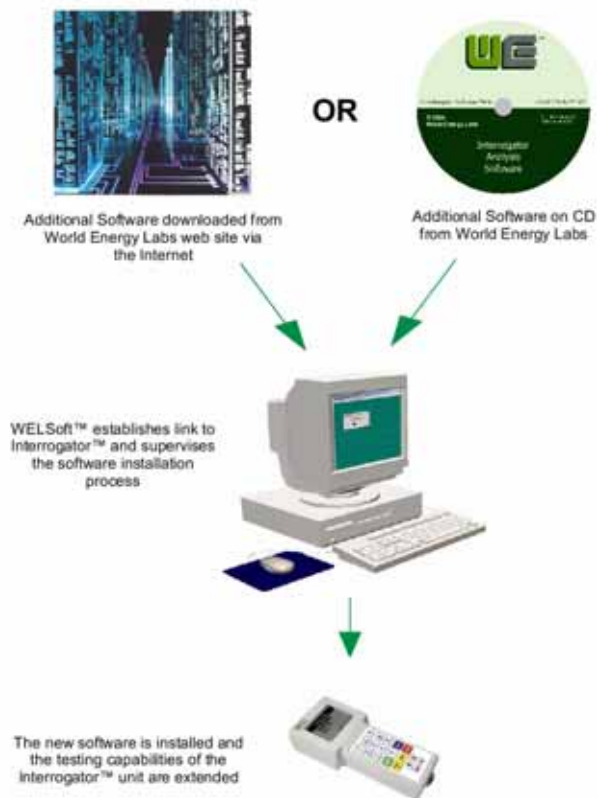
During testing, the Interrogator™ is not physically limited to capture signal response waveforms at fixed frequencies. Instead it captures the whole waveform response from each cell tested. As new failure modes are identified and new State-of-Health (SOH) analysis modules are developed, World Energy Labs will be



The Interrogator™ device configuration facility allows the user to easily set the various State-of-Health alarm levels...

releasing upgrades to the analysis software held within the Interrogator™. These upgrades are installed into the Interrogator™ using WELSoft™. The software to extend the capabilities of the Interrogator™ will be made available either on CD or as a web based download.

**Interrogator™ Software Installation Process**



*New analysis software can be installed in the Interrogator™ handheld units using WELSoft™*

**System Requirements**

- > **Processor**  
350MHz Pentium II or better
- > **Operating System**  
Windows XP (Recommended)  
Windows 2000  
Windows ME  
Windows 98 SE  
Windows NT 4.0 (SP5 required)

- > **Software**  
Sun Microsystems Java Run Time Environment. This will be automatically installed on the target machine if it is not already installed. For further information regarding the Java Runtime Environment visit [www.sun.com](http://www.sun.com)
- > **System Memory**  
64 MB of RAM minimum (above the operating system requirements) 128 MB recommended
- > **Hard Drive Space**  
50 MB of hard disk space for the installation files
- > **Optical Drive**  
CD or DVD drive for installation purposes only.
- > **Communication Port**  
1 free serial communication port (only needed when communicating with an Interrogator™ unit). Alternatively a USB port can be used with suitable USB/Serial adapter.
- > **Display**  
800 x 600 resolution (minimum), true color.
- > **Internet Connection**  
For downloading new analysis software for the Interrogator™ (not essential).
- > **Further Information**  
For Information on the latest release of WELSoft™ and the hardware requirements please contact us at the address below.

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