User Manual for Link Version 2.3

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1 About This Manual

This manual is not intended to provide details on configuring a PowerShield battery monitoring system, only the communications configuration to allow integration with Link software. For details on configuring a PowerShield System, please refer to the appropriate manual that was supplied with the product.

This manual does assume a level of familiarity with the PowerShield System and a basic understanding of TCP/IP networking. Please refer to your IT Department in regards to issues with LAN (Local Area Network) configuration.

6300-017B

2 Typographical Conventions

Before you start using this guide, it is important to understand the terms and typographical conventions used in the documentation.

For more information on specialised terms used in the documentation, see the Glossary at the end of this document.

The following kinds of formatting in the text identify special information.

Formatting convention	Type of Information
Bold	Used for clarity, or other emphasis.
Special Bold	Items you must select, such as menu options, command buttons, or items in a list.
Italics	Used for screen names, and for referenced documents or to emphasise the importance of a point.

Note: The terms monoblock and jar are interchangeable. For this manual the term has been standardised as monoblock to avoid using the somewhat unwieldy convention of "monoblock/jar" throughout.

3 Introduction

Link is a comprehensive software tool for managing your standby batteries in conjunction with B1000, B2000 or Sentinel Battery Monitors.

Link consists of two parts:

- LinkServer - manages the Battery monitors
- LinkClient - the Graphical User Interface (GUI) that interacts with the Link Server

Both parts are installed with a single installer package. The computer running LinkServer may be a Desktop computer or a Server computer depending on the number of LinkClients and Powershield Battery Monitors managed. Please contact your supplier if you are unsure about your system configuration.

Link is best utilised when the battery monitors have a permanent connection with Link.

3.1 LinkClient

The LinkClient program is the user interface to Link and provides the following features:

- View, in real time, battery status and measurements
- Alarm status of all connected monitors
- Alarm history
- View battery history
- Initiate reports
- Manage reports

The LinkClient communicates with the LinkServer, to display events and execute user commands. LinkServer must be running for the LinkClient to operate. The LinkClient communicates with the LinkServer via TCP/IP. LinkServer software runs continuously in the background so closing the LinkClient does not stop the LinkServer.

The default TCP port number for Link is 14000.

3.2 LinkServer

The LinkServer software runs continuously in the background and is not a visual program. It is three Windows NT Services (PsMonitorServer, PsReportServer and PsEmailDispatcher). It performs the following tasks:

- Manages the monitors
- Stores the data recorded by the monitors
- Notifies alarms to users via email
- Generates reports as requested by LinkClients
- Server for the LinkClient(s)

Note: LinkServer MUST be running for events to be received and stored. Failure to have LinkServer running will compromise the functionality of the PowerShield Battery Monitoring, and thus compromise the reliability of your power backup systems.

4 Common functionality

4.1 Functional and Informational Icons

The table below describes the functional icons and buttons used in the Link software.

Icon	Click to...
	Log in to the software
	Add an item, object, or record.
	Delete an item, object, or record.
	Edit and item, object, or record.
	Cancel an action.
	Save a record.
	Delete an option from a drop-down list. Scroll or arrow down to the required option that you want to delete, then click this button to delete it from the list.
	Run the help system.

4.2 Navigational Icons

The table below describes the icons used to navigate to specific areas of the Link software.

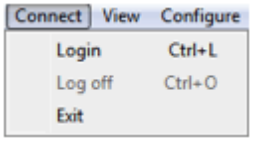
Note: Depending on permissions, some of the icons shown below may not be available to you.

Icon	Name	Click to...
	Alarm Status	View the Alarm Status of all connected battery monitors.
	History	View the Battery History. The History screen shows the stored data from the battery monitors. See the topic Battery History.
	Real-Time	View, in real time, string measurements, monoblock measurements and alarm status of battery monitor.
	Reports	Go to the Reports screen where you can generate reports on data collected by Link. See the topic Reports.
	Communications	View the status of the communication link(s) to the battery monitor(s). See the topic Communications.
	Downloads	View the current memory download activity. See the topic Memory Download. Note: Link automatically manages the data retrieval from the battery monitors.
	Configure Alarms	Manage alarm notification. See the topic Configure Alarms.
	Configure Sites	Set up users at the currently viewed site. See the topic Site Management.
	Configure Users	Configure user details at the currently viewed site. See the topic Configure Users.
	Battery Types	Add, edit, or delete battery types and models. See the topic Configure Battery Types.
	Server	Configure the server settings. See the topic Configure Server.

4.3 Menus

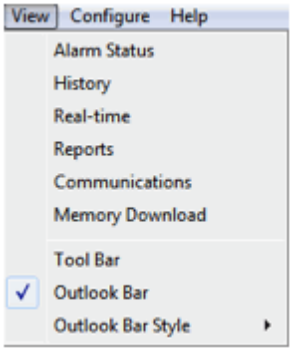
Connect Menu

The Connect menu provides the following options:



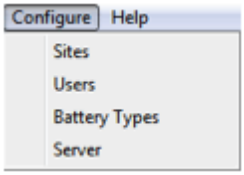
See the section Getting Started for information on logging in.

View Menu



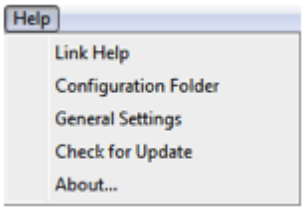
From this menu, in addition to the options for viewing data, you also have options regarding the visibility and style of tool bars.

Configure Menu



Administrators use this option to configure the items in LinkClient. The menu option may not be visible if you have insufficient permissions.

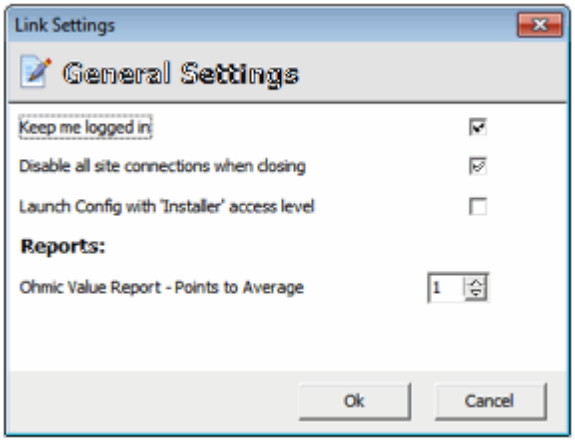
Help Menu



In addition to viewing this help system, there are general areas that can be configured if you have sufficient permissions. The Configuration Folder option takes you to the location where the LinkClient.ini file is stored.Some of the options listed here may not be visible if you do not have the necessary permissions.

4.4 General Settings

The *General Settings* screen (see sample screen below) provides the functionality to set options within LinkClient.



The table below describes the settings.

Setting	Description
Keep me logged in	Select this box to for the LinkClient to remember your username and password. The next time the LinkClient is run it will use those settings to login automatically. Note: This is not recommended unless you can be sure of security.
Disable all site connections when closing	Select this box so that when you log out of LinkClient will disable all site connections. Note: Recommended when Link is not permanently connected to the monitors. Example Link on a laptop computer of a service engineer that visits many sites.
Launch Config with "Installer" access level	Select this box if you want Config launched with ‘Installer’ security level.
Reports	
Ohmic Value Report - Points to Average	Number of points to average in Ohmic Value Report.

4.5 Check for Updates

From time to time updates become available for the Link software. Use this option from the Help menu to check if any updates are available for your version. The screen below displays when you click the option from the menu. Press the Start button and follow the on-screen instructions, or close the window by clicking the red 'x' at the top right.

5 Getting Started

This section describes installation procedures and gives an overview of security in Link, including how to log in to Link for the first time.

Recommended PC Requirements

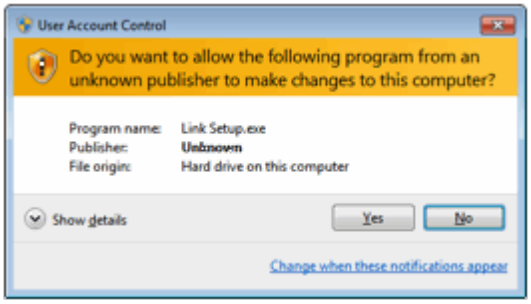
Before installing Link please check that the computer meets the minimum PC hardware requirements to run the Link software.

Processor:	Intel Dual Core E5400 or better
Operating System:	Windows XP SP3 Professional or later
RAM:	2GB
Monitor:	1024x768 or greater

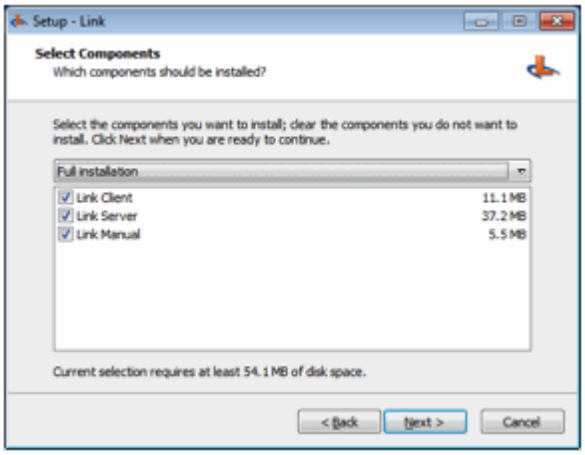
5.1 Installation

Follow these steps to install Link.

1. Run Link ***Setup.exe*** from the CD or from the file is stored on your computer if you downloaded the file from the internet.
2. For Windows 7 and Windows Vista you maybe prompted by the UAC as shown below, click ***Yes*** to continue.



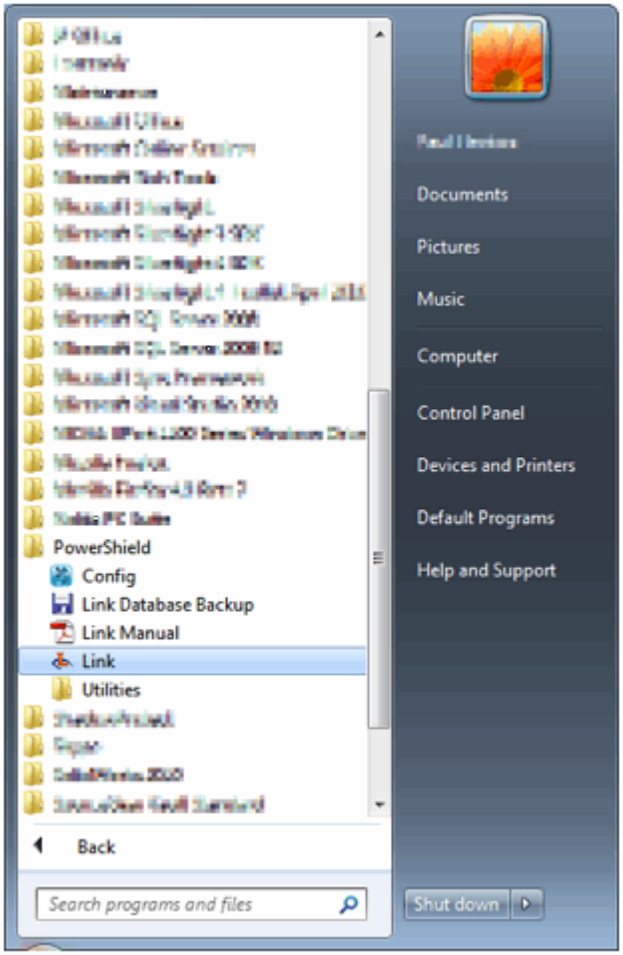
3. Follow the installer instructions until the *Select Components* stage
4. To install LinkClient only or LinkServer only deselect the component you do not want installed otherwise use the defaults below and click ***Next*** to continue through the rest of the installation process. For standard installations you must install both LinkServer and LinkClient.



5. Link is now installed on your computer.

5.2 Run Link

To run Link, use the Windows Start Menu functionality. Select Start | All Programs | PowerShield | Link. See sample below.



5.3 First-time Administrator Log In

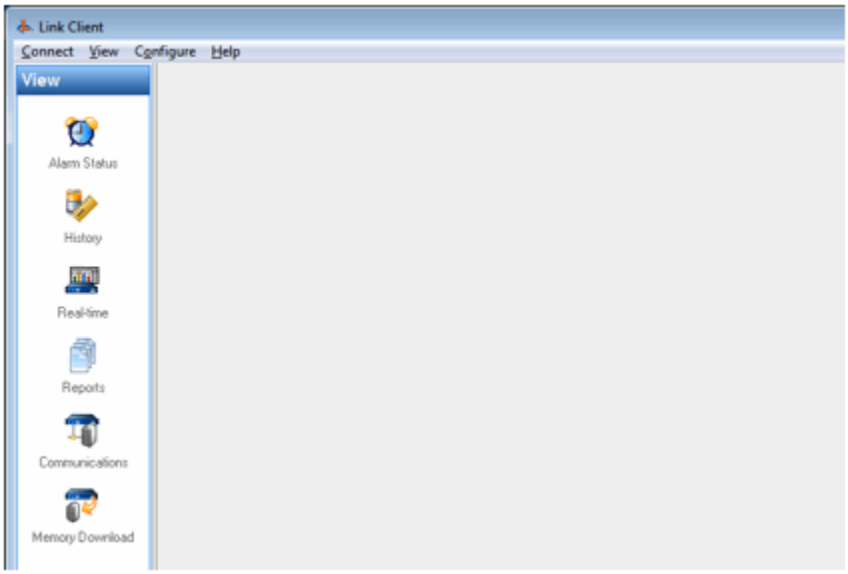
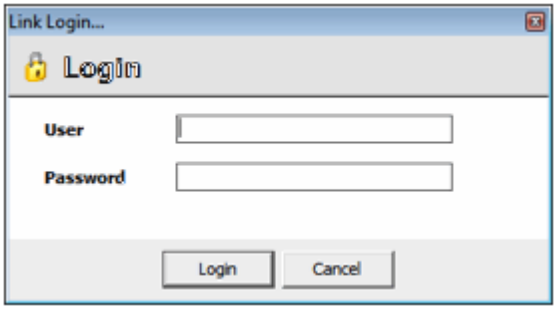
Access to the LinkServer is controlled by user accounts with passwords. This limits access for unauthorised people. User accounts and passwords are created by a user with Administrator Access in the *User Configuration* menu.

See the topic Configure Users.

Note: The *Help* menu is always available, even if not logged in to Link.

Follow these steps to log in for the first time.

Step	Action
1	After having successfully opened the LinkClient, you are presented with a blank form.

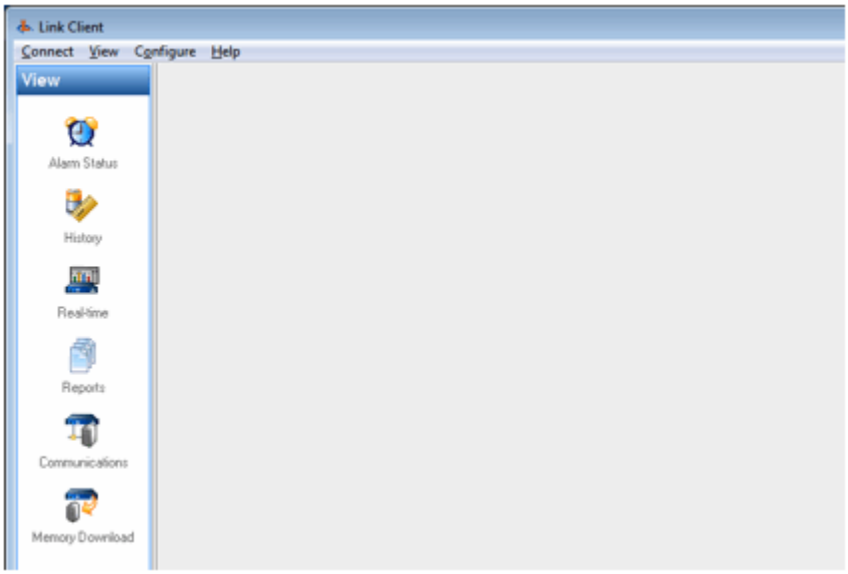
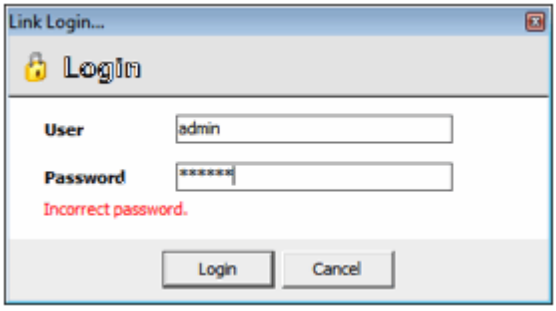
Step	Action
	
2	Use any one of these methods to access the Login screen: • From the *Connect* menu select Login from the drop-down list of options • Use the shortcut keys ***Ctrl+L*** The Login screen displays (see sample screen below). 
3	Enter ***admin*** as the User name. This is in lower case. Note: User names and passwords are case-sensitive.
4	Enter ***ADMIN*** as the password. This is in upper case. Note: User names and passwords are case-sensitive.
5	Click the ***Login*** button to log in, or the ***Cancel*** button if you want to abort the login process.

5.4 First-time User Log In

This login procedure is for users who have already been set up in Link by an administrator.

Note: The *Help* menu is always available, even if not logged in to Link.

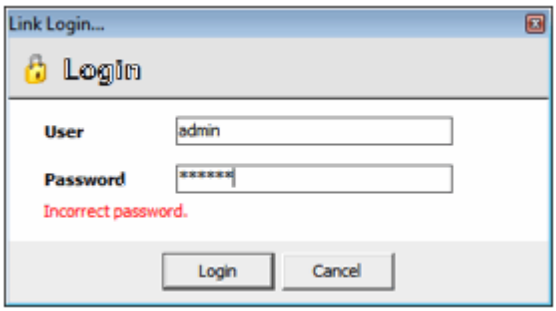
Follow these steps to log in for the first time.

Step	Action
1	After having successfully opened the LinkClient, you are presented with a blank form showing. 
2	Use any one of these methods to access the Login screen: • From the *Connect* menu select Login from the drop-down list of options • Use the shortcut keys ***Ctrl+L*** The Login screen displays (see sample screen below). 
3	Enter the User name that has been given to you by the Administrator. This is usually in lower case. Note: User names and passwords are case-sensitive.
4	For the first time login, your password will be the same as your user name, BUT this time it is in upper case. Note: User names and passwords are case-sensitive.
5	Click the ***Login*** button to log in, or the ***Cancel*** button if you want to abort the login process.

Note: You should now change your password. See the topic Change Password.

5.5 Login Failure Types

If your login is unsuccessful an error message displays on the *Login* screen (see sample screen below).



Reasons for an unsuccessful login are:

- Unknown user name
- Incorrect password
- Cannot connect to the Link server

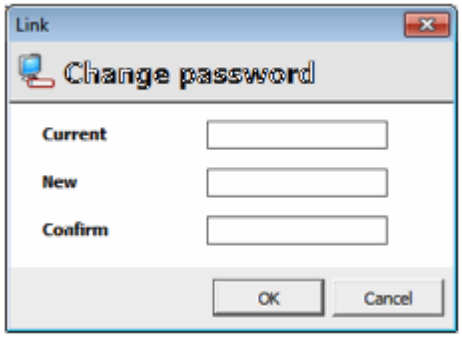
The table below describes the solutions.

Error message	Solution
Unknown user name	Log in as Admin and check the list of existing user names in the *User Management* screen.
Incorrect password	Either: • Log in again using the correct password including ensuring that the capitalisation is correct. • If you have lost your password, contact the Link Administrator who will need to create a new user account for you.
Cannot connect to the Link server	1. Check that PsMonitorServer Windows NT service is running on the computer by running the Windows services.msc program and viewing the PsMonitorServer status 2. Check the log file PsMonitorServer DDMMMYY.log in C:\Program Files\PowerShield\Link Server to verify that it has started. Example log statement "20/12/2010 11:17:31","Standard","0","Link Server","Server started: Version 2.3.0.51", 3. Check that the firewall is not blocking the TCP port that is used for communication between LinkClient and LinkServer. By default the port number is 14000

5.6 Change Password

Follow these steps to change your password.

Step	Action
1	From the Link menu select ***Configure*** | ***Users***.
2	Click the ***Password*** button. The *Change Password* screen displays, see sample screen below.

Step	Action
	
3	Type directly in the fields: ***Current*** - your initial password (usually your user name in capital letters) ***New*** - the password you want to use for Link ***Confirm*** - re-type the new password. Note: Passwords are case-sensitive. Strong passwords should be a minimum of 7 characters and no more than 10 characters.
4	Click the ***OK*** button to save the change, or click the ***Cancel*** button to abort the change of password.

5.7 Log Off

At the end of your session you should log out of LinkClient to ensure security is not compromised. Follow these steps to log off.

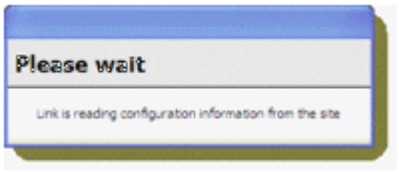
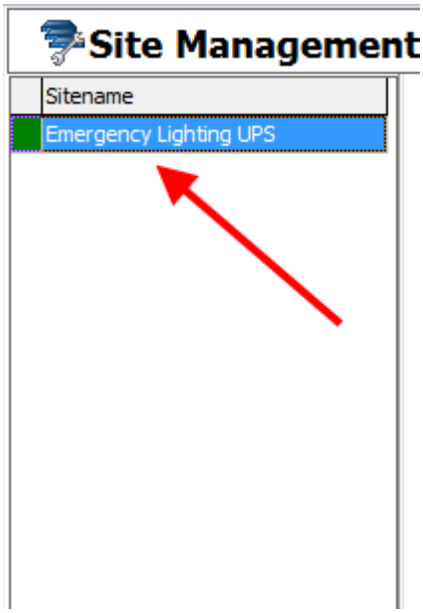
Step	Action
1	Use any one of these methods to log off the LinkClient software: • From the ***Connect*** menu select ***Log off*** from the drop-down list of options • Use the shortcut keys ***Ctrl+O***
	Note: This does not stop the LinkServer.

5.8 Add site

WARNING: To add a site to the Link database there must be a fully configured battery monitor with a valid communication link. The battery monitor(s) must be configured with software called *Config*. See the *Config* Manual.

Follow these steps to add a site.

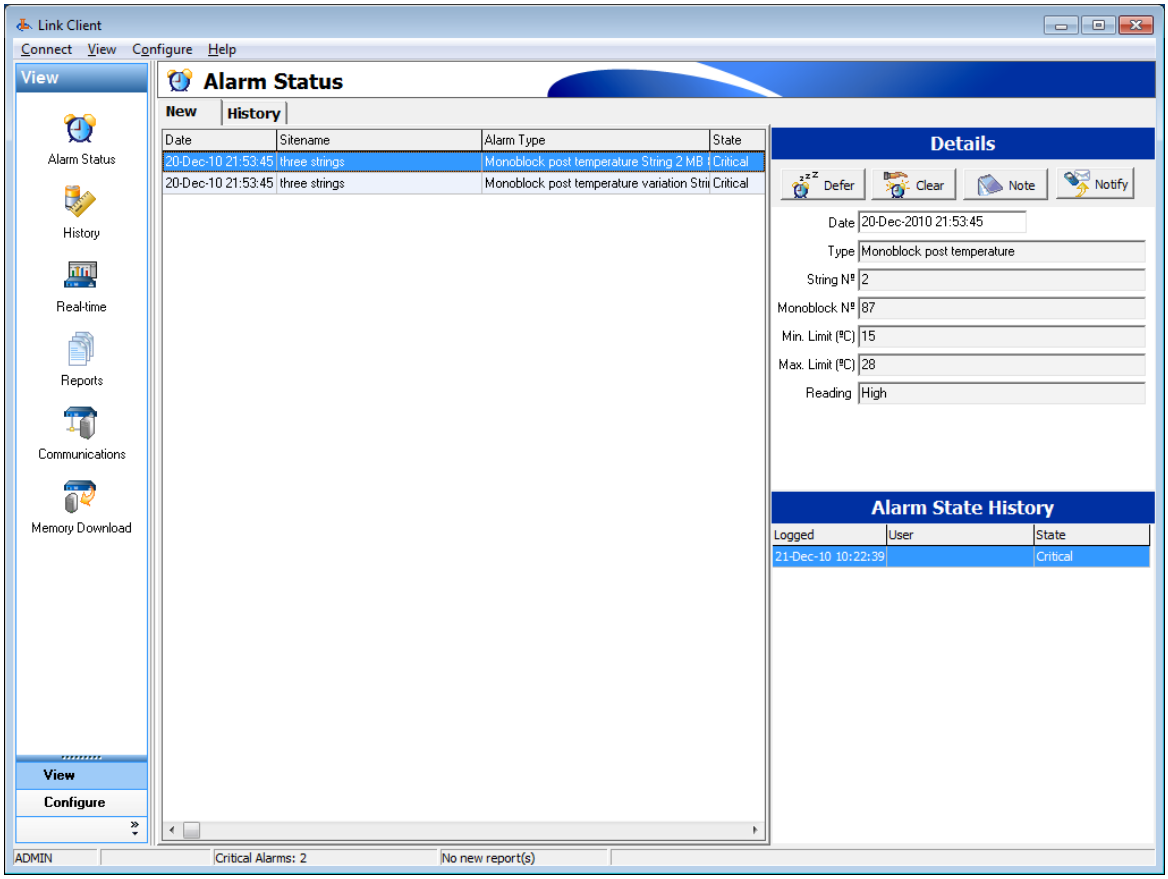
Step	Action
1	From the *Site Management* screen click the ***Add*** Site icon. In the *List* pane a new site called (New) is added to the list and the fields in the *Details* pane of all three tabs are enabled. Note that (New) is just a temporary name and you do not need to know the actual site name. Link manages this for you.
2	On the *Connection* tab enter the fields as described in the table below. The field on this tab must

Step	Action
	be completed before the site can successfully added to Link.
3	When all the information has been entered on the *Connection* tab click the Save icon. Link must be able to communicate with the Site before the site can be successfully added. You will see the following message displayed while Link checks configuration information from the site. 
4	When all the battery monitor configuration information is retrieved a new item will appear in the *Sitename* list as shown below. 

6 Alarm Status

The *Alarm Status* screen (see sample screen below) has two tabs:

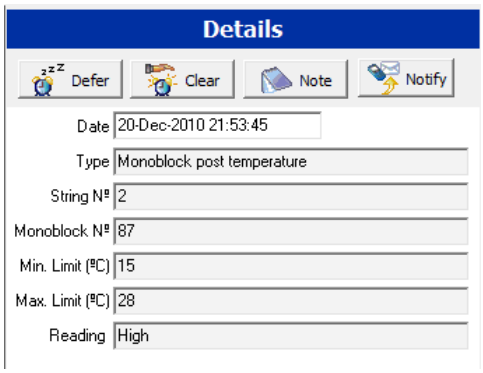
- ***New*** tab (default view) displays the current outstanding alarms.
- ***History*** tab - displays all alarms that have occurred during the specified time period.



Note: The Alarms screen includes non-alarm events such as string mode changes. Whilst these are not actually alarms, the events are considered worthy of user notification.

Alarm Details

The Alarm Details area of the screen (see sample screen above) is at the top right and shows the details for the currently selected alarm.



All of the relevant information for each alarm is shown. The information shown varies with the type of the alarm.

Note: The data shown cannot be edited and is as reported by the PowerShield site.

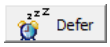
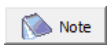
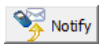
Timestamp differences

- The time stamp that displays in the Alarm Details pane shows the time the alarm was triggered at the site.

- The time stamp that displays in the Alarm History pane shows the time the alarm was received and stored in Link's database.

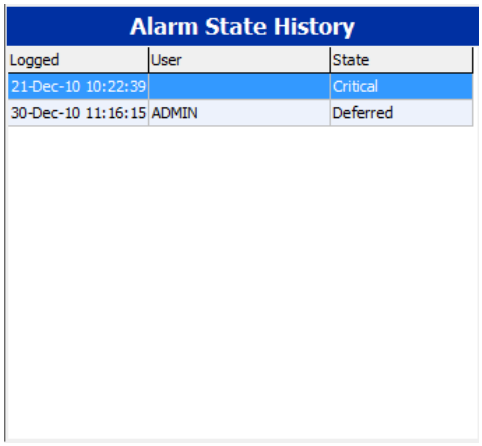
Actions you can take

On the menu bar of the Alarm Details pane the following options are available.

Option	See the topic...
	Defer an Alarm
	Clear, or Action an Alarm
	Add a Note to an Alarm
	Notify an Alarm

Alarm State History

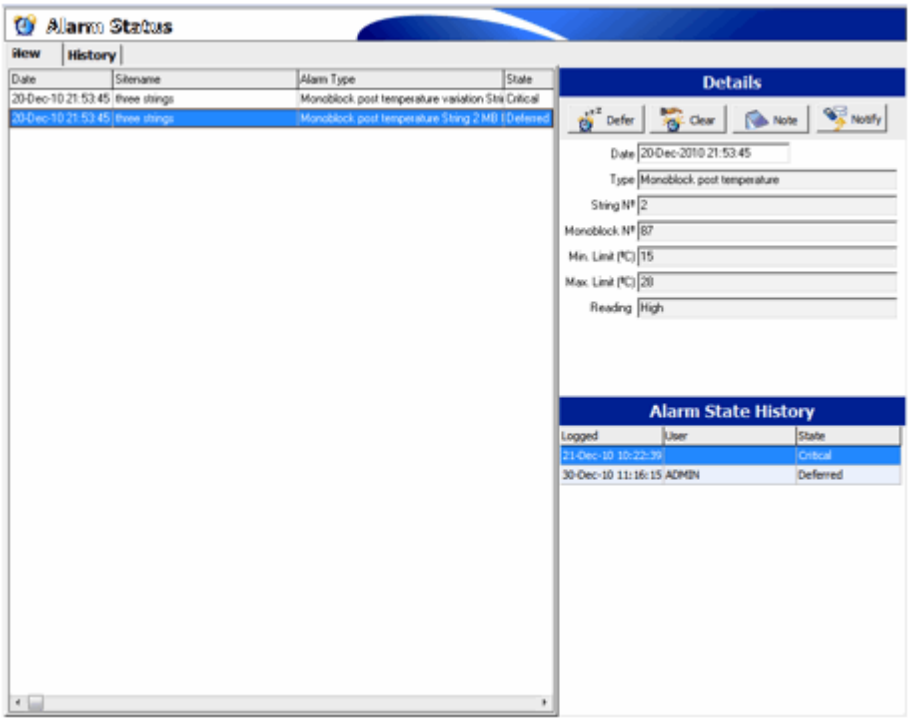
The Alarm History pane (see sample screen below), is located at the bottom right of the screen. This pane shows the history for the currently selected alarm. The list shows all events that have occurred in relation to that particular alarm.



This pane gives a record of who dealt with each alarm, when it was actioned, and the relevant state changes. Dates shown are as logged by Link. Details for the alarm are available in the Alarm Details pane. Additional information may be kept as Notes if required.

6.1 Alarms - New Tab

The New tab (see sample screen below) displays all events logged by Link that have not yet been action. These alarms are listed with date, site name, alarm type and alarm state information.



About the data

- The time and date shown refers to the time and date the alarm was triggered at the site.
- The site name and alarm type are taken directly from the site.
- An alarm can be in three possible states **Critical**, **Deferred**, **Actioned.**

Note: Once an alarm has been actioned it will not appear in the New Tab. It will appear only in the History tab.

Actions you can take

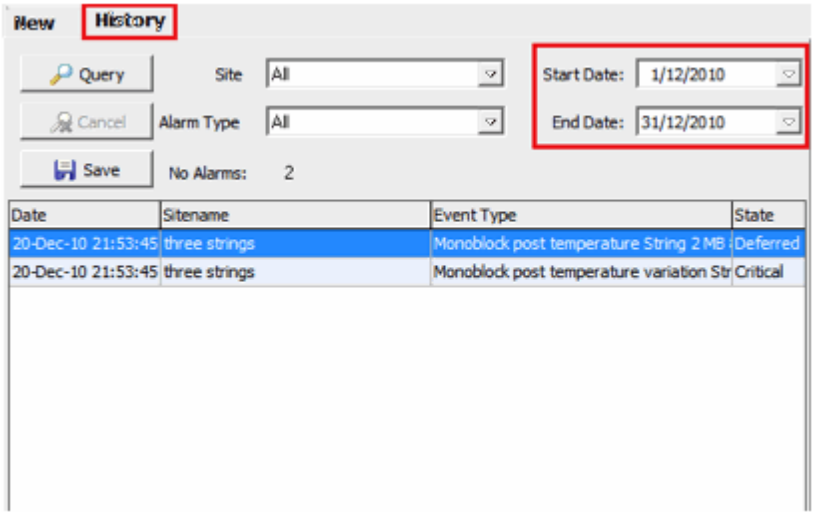
When alarms are first received by Link, they are displayed as Critical. The user can either

- Defer it for later action - see the topic Defer an Alarm.
- Action it immediately - see the topic Action an Alarm.
- Leave it as Critical

The user is also able to Notify other users of the alarm or add a Note to the alarm for future reference.

6.2 Alarms - History Tab

The History tab (see sample screen below) displays all alarms logged by Link and allows the alarms to be filtered. Alarms are listed with date, site name, alarm type, and alarm state information.
The time and date that displays refers to the time and date the alarm was triggered at the site. The site name and alarm type that displays are taken directly from that site.



Query Alarms

By default the filter is set to display all alarms that have occurred in the last week. The table below describes the various alarm filter options.

Filter by...	Description
Site	From the drop-down list select a particular site, or select All for all of the sites in your system.
Alarm Type	From the drop-down list select a specific Alarm Type or select All for all alarm types.
Start Date	From the drop-down calendar select a date for the start of the period you wish to display.
End Date	From the drop-down calendar select a date for the end of the period you wish to display.

Once you have configured the Filter parameters, click the Query button to display all alarms that meet the selected criteria. Link will then display the filtered list of alarms which are sorted by time, with the most recent at the top.

Note: If a large number of alarms are found you may wish to narrow your search. Click the Cancel Query button at any time to halt the search and display what has been found thus far.

Export Alarms

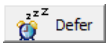
Click on the Save button to export the filtered alarm information that is displayed in the Alarm History screen to another application. A standard Save As... dialog displays and the default filename is Link Alarms.txt. The text file is formatted in CSV format and can be imported by CSV-aware applications such as Microsoft Excel or any text capable application.

6.3 Actions you can take

When alarms are first received by Link they are displayed as Critical. When you have first see the alarm you can either:

- Defer it for later action
- Clear the alarm
- Leave it as Critical
- Notify the alarm
- Add a note to an alarm

6.3.1 Defer an Alarm

Click the Defer 

button to defer an alarm for later actioning. In the New tab deferred alarms are listed below Critical alarms in the alarm list.

You may want to defer a non-urgent alarm for example, while more urgent issues are resolved, or defer an alarm where the originating fault state cannot be rectified at present.

Deferred alarms are displayed at the bottom of the alarm list. Link will record the user and time when alarms are deferred. This information is available in the Alarm History pane.

6.3.2 Clear the Alarm

Select the alarm you want to action and click the Clear 

button. This will action the alarm and move it from the New tab screen to the History tab screen.

Note: When you action the alarm, the Link system expects that you have followed the procedure that your company has defined for each alarm. Depending on the severity of the alarm, this may include alerting site personnel, service people, or Operations, depending on the backup power supply being monitored.

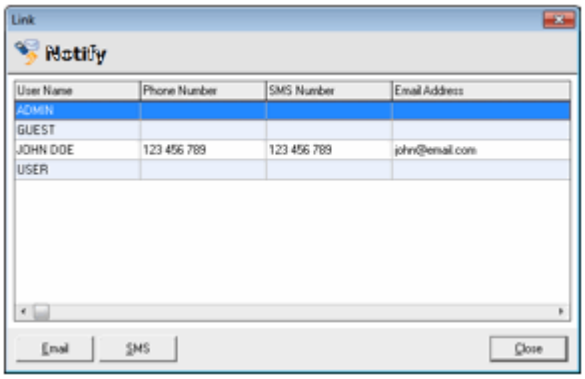
Actioned alarms are no longer displayed in the New tab, but they may be viewed in the History tab. This means that the new alarms display is cleared so that new alarms are easily seen. Link records the user and time when alarms are actioned. The information is available in the Alarm History pane.

Note: Failure to implement and execute appropriate systems for dealing with alarms will compromise the functionality of the Battery Monitoring system, and thus compromise the reliability of your power backup systems.

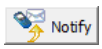
6.3.3 Notify an Alarm

Link provides two ways to notify alarms.

- Manually notify via the *Notify* screen (see sample screen below).
- Configure a user's account so that Link automatically sends a notification to the user



You can send detailed information on a particular alarm to selected personnel via email or SMS (text message to a mobile phone).

Select the alarm, and click the ***Notify*** 

button. The *Notify* screen (see above) displays and you can then select the user to whom the notification is to be sent.

Select either the ***Email*** button or the ***SMS*** button to notify the selected user via that method.

Multiple methods can be used for the same alarm. For example, you can send an SMS to a service person's mobile phone, and also send an email to their desk as confirmation. Multiple people may also be informed of the same alarm.

For example, you may alert a mobile service person, and also the site relying on the power supply.

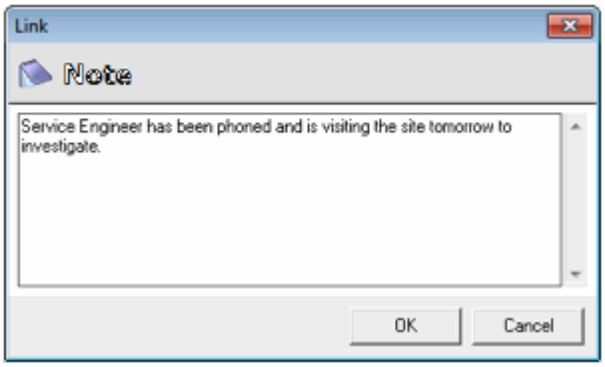
Note: SMS functionality is dependent on an email to SMS gateway.

6.3.4 Add a Note to an Alarm

The Notes functionality enables you to attach information to any alarm. For examples, an alarm occurs and upon investigation it is traced to faulty HVAC equipment on site. A note can be attached to the alarm, recording details of the fault and the fact that appropriate maintenance staff have been contacted. This allows other users of the system to know what has been done about the alarm. In the example given here, you would also want to defer the alarm so that it displays at the bottom of the list.

From either the ***New*** tab or the ***History*** tab,

- Select the alarm for which you want to add a Note.
- Click on the ***Note*** button to display the *Note* screen (see sample screen below).

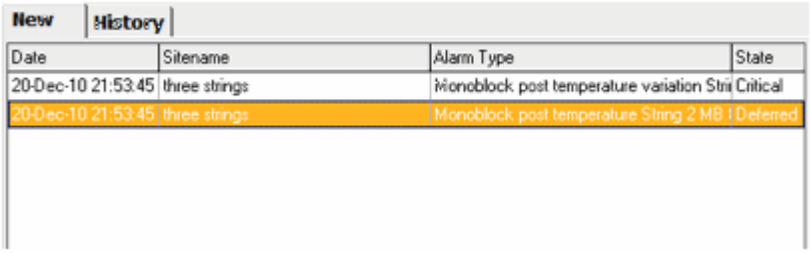


- Type your note directly in the screen and click the ***OK*** button to save it to the selected alarm.

Note: You can also add a note by double-clicking on an alarm.

Notes may be added to any alarm. Alarms that have a note attached are highlighted in orange in the list.

See sample screen below.



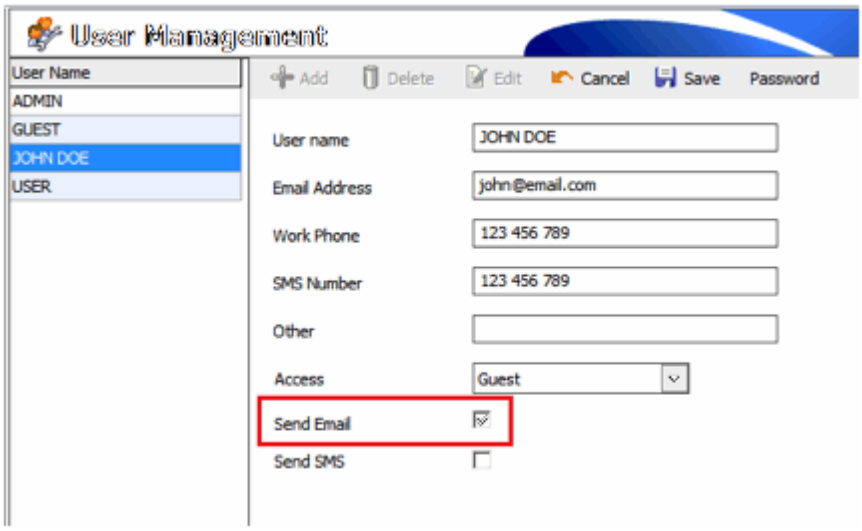
To open the Note, double-click on the highlighted alarm.

6.4 Automatic Alarm Notification

In order to have emails or SMS messages sent automatically by Link, one or more user accounts must have been configured for this.

- For email notification the user account requires a valid email address and the ***Send Email*** box

selected. See sample User Configuration screen below.



- For SMS notification the user account requires a valid mobile phone number, and the ***Send SMS*** box selected.

For details on user account settings see the topic User Management.

Note: For Link to be able to send email or SMS notifications, the Email Dispatcher and the Monitor Server must have a valid configuration. See the topic Server Settings for details.

7 Battery History

The Battery History screen allows you to view all of the time-based battery measurements stored by Link. At various times (or when various events occur) Link reads the history measurements from the battery monitors and saves the measurements in the database. The data is split into two separate groups:

- Event data - all measurements recorded during a Discharge or Charge event.
- Trend data - long-term measurements of all system readings.

Note: The Battery History screen relies on data logged at your sites. Each site therefore must be configured correctly to record this information. Link automatically saves the event data in the database when a string changes state to Discharge or Charge.

Link automatically saves the trend data in the database at regular intervals. Once the data is saved to the database, it is secure on the PC. It is then removed from the battery monitor.

Note: The Config software refers to the history measurements as Memories.

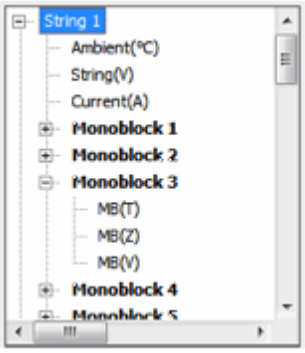
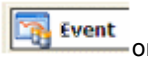
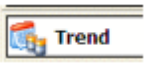
7.1 View Battery Data

The battery History screen shows the stored data from the battery monitors.

Note: The History screen relies on data logged at your sites. Each site must be configured correctly to record this information. Link automatically saves the event data in the database when a string changes state to Discharge or Charge. Link automatically saves the trend data in the database at regular intervals. Once the data is saved to the database, it is secure on the PC. It is then removed from the battery monitor at the site.

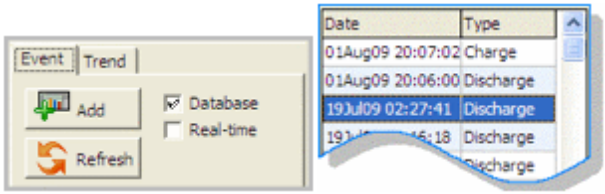
7.1.1 Display the Data

Follow these steps to display and view stored data.

Step	On-screen option	Action
1		From the drop-down site list select the Site whose data you wish to view. Once you have selected the Site, the system tree will update to reflect the configuration of the site you have selected.
2		All the measured parameters for the system are grouped and displayed in a tree format on a per string basis. Select the Data type to display by expanding the system tree and selecting the type of data you wish to graph. In the example here, the graph will display the String voltage for String 1. Note: When **Monoblock #** is in **bold** it has temperature readings.
3	 or 	Once you have selected the type of data to be graphed, you need to select either the ***Event*** tab to select data associated with Discharge or Charge events, or the ***Trend*** tab to select trended history data. See details below.

7.1.2 Event Data

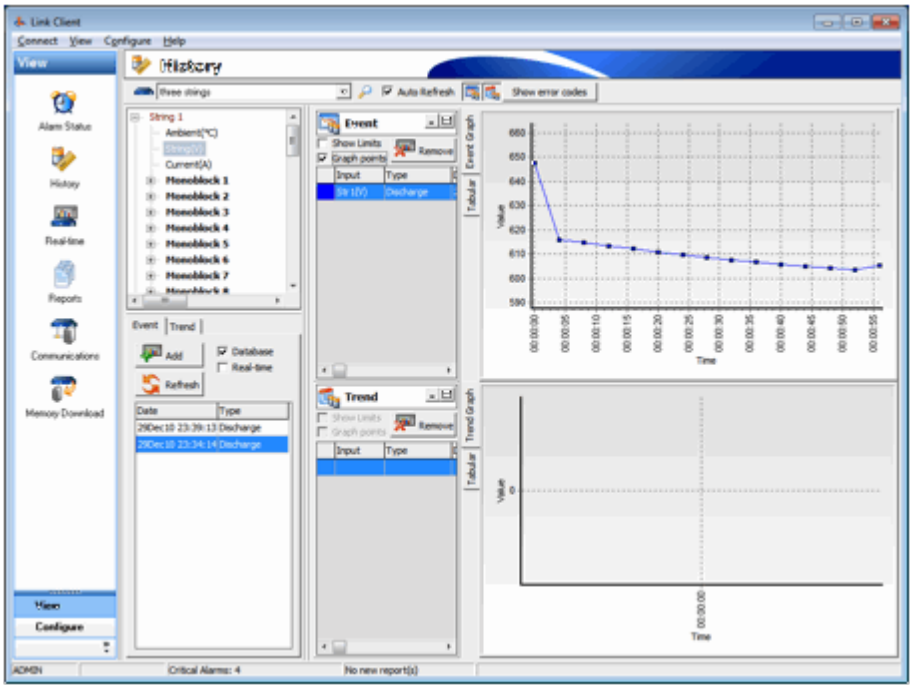
Event data shows all measurements recorded during a Discharge or Charge Event.



Select the Event tab and then click on the  button. If the String you have selected is currently in discharge or charge and you wish to look at the data as it is recorded, select the Real-time check box.

Select the event you wish to graph and click on the  button. The data will be graphed with time along the horizontal axis and values along the vertical axis.
Events that are still being actively logged on the Battery Monitor will be highlighted and appear as Discharging (rather than Discharge) and Charging (rather than Charge). When complete, they will be automatically downloaded by Link and added to the Link database.

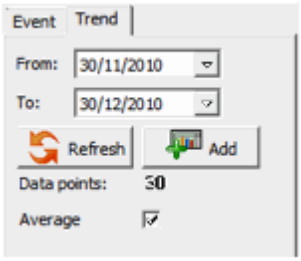
A sample screen below shows some typical results in the graph area.



Note: In the sample screen below Graph Points has been selected for the Event data.

7.1.3 Trend Data

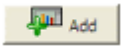
Trend data displays long-term measurements of all system readings.



Select the ***Trend*** tab. Select the period you wish to graph and then click on the 

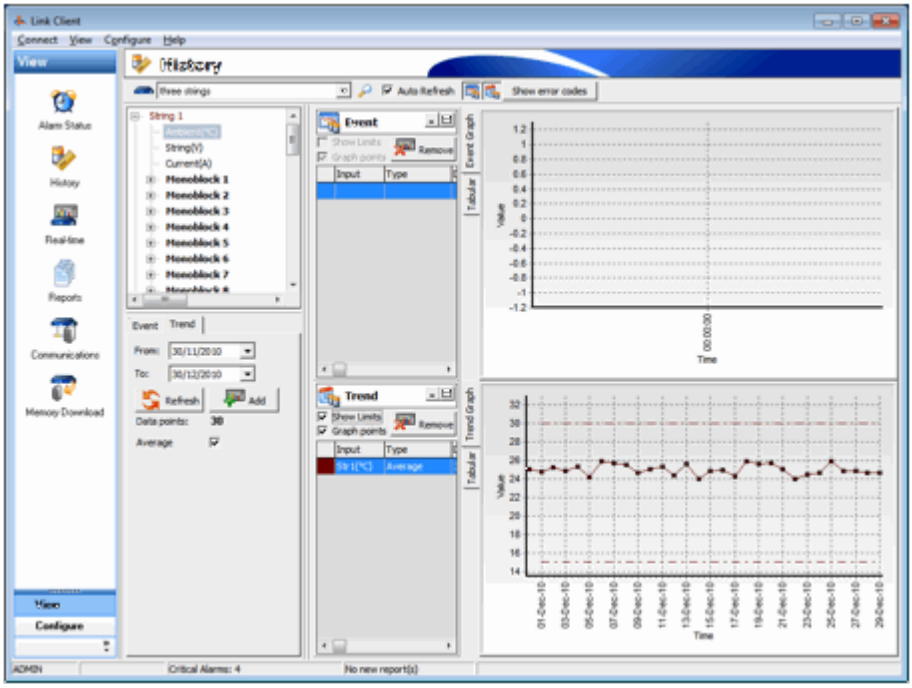
button. In the example shown there are 30 data points.

Note that the sample rate is user-defined using the Config software utility. The default interval is one day, so 30 data points equals 30 days, but this may not always be the case.

Click on the 

button to add the data to the graph. Select the Average box to display average values.

Below an example for String 1 Ambient temperature from 30-Nov-10 to 30-Dec-10.



7.1.4 View Data

There are two graph areas on the screen, Event data at the top, and Trend data at the bottom. A legend is displayed to the left of the graph to indicate the colour of each measurement that is graphed. You can hide (or show when hidden) either of these graphs. The icons act as toggles, i.e. click once to hide, click again to show.

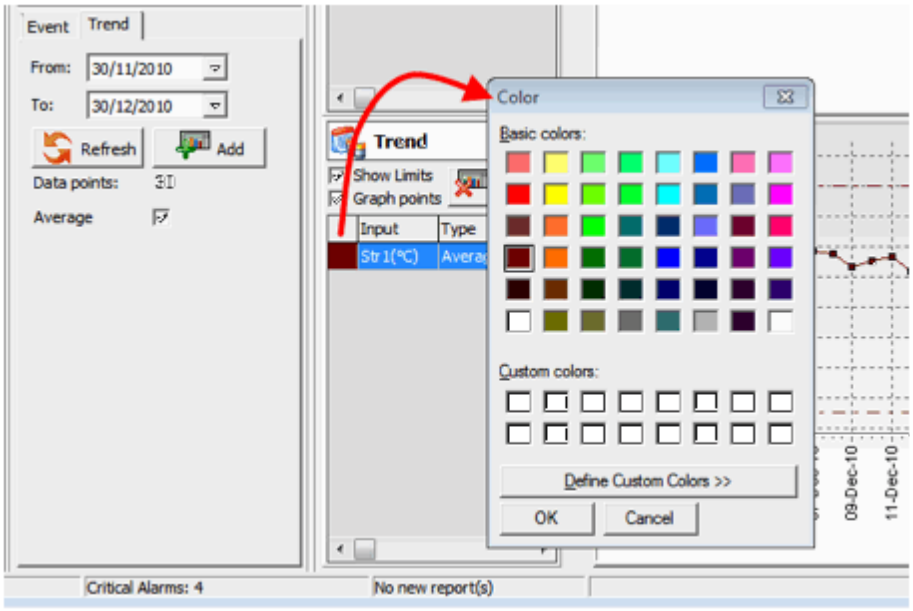
 - The Hide/Show Event icon

 - The Hide/Show Trend icon

In order to view more of the graph area, you can hide the legend if required by clicking on the ***Minimise***  icon in the header of the legend pane. To re-display the legend, click on the ***Maximise***  icon.

If desired, you can change the colour of the series on the graph as follows:

- In the Trend or Event Legend pane, you will see the colour for the selected event or trend displayed at the left of the item.
- Double-click the colour box to display the Color dialog as shown below.



- Select an alternative colour and click ***OK***. The colour of the series updates to the newly selected colour.

Note: When viewing real-time data (graphing data from a discharge that is currently in progress) the graph is normally updated regularly. You can pause this updating of the graph by de-selecting the ***Auto-Refresh*** box at the top of the screen.

7.2 Export Battery Data

You can export data directly from either of the graphs to a text file of CSV format. This is a format that can be read by any text editing program or program that accepts CSV (e.g. Microsoft Excel).

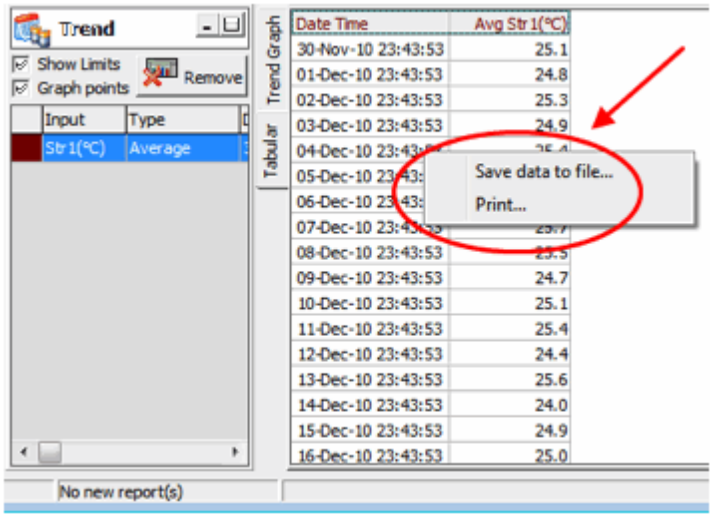
Follow these steps:

- Right-click on the graph to display the menu.
- Click ***Save Data to File***... to display the Save As window.
- Select the folder where the file is to be saved and enter a file name.

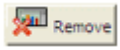
Note: The default file name for the event data is DischargeData.csv, and the default file name for the trend data is FloatData.csv.

- Click ***Save***.

The file lists the description of each measurement, followed by the individual data points. For each data point the time and data of the point and the value of the point is given. See sample file below.



7.3 Remove Data from Graph

To remove data from the graph, first select the measurement you wish to remove, and then click the 

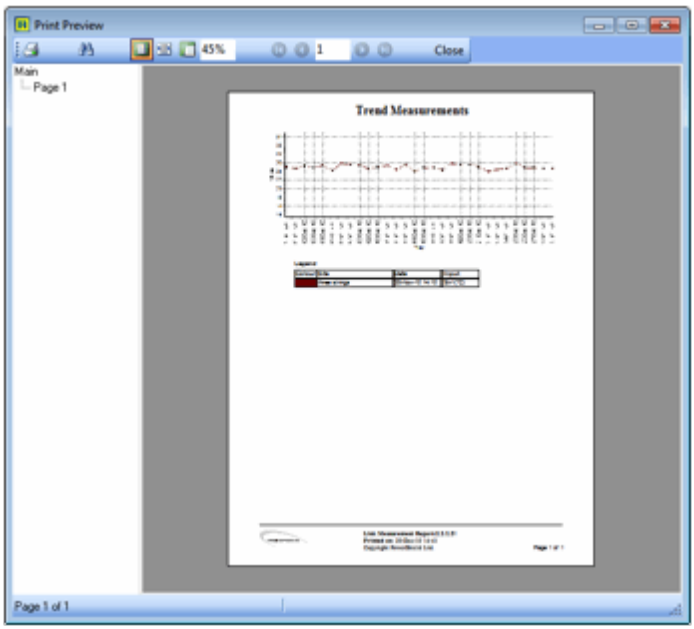
button.
The data is removed from the graph immediately.

7.4 Print Battery Data

You can print data directly from either of the graphs. Follow these steps after you have added the data to the graph as described above.

- Right-click on either the ***Trend*** or ***Event*** graph area. The following menu options display.

- Select ***Print...*** to display the Print Preview window. Click the ***Printer*** icon at the top left to print the file.



7.5 Display Real-time Event Data

It is possible to use the History window to watch the progress of a discharge or charge event as it is happening.

When you select the data to be graphed, ensure that the ***Real-time check box*** in the ***Event*** tab is selected. Data for events that are currently occurring at the Battery monitor will be highlighted and will appear as *Discharging* (rather than *Discharge*) and *Charging* (rather than *Charge*),

Select the event data that is marked as *Discharging* and the event graph will dynamically display a time series graph of the discharge data.

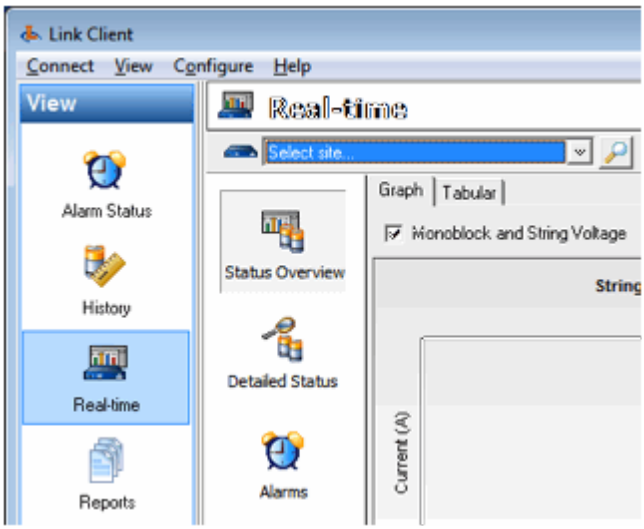
This graph is regularly updated every few seconds. You can pause the updating of the graph if required by de-selecting the ***Auto-Refresh box***.

8 Real-Time

The Real-time screen allows you to view the status of individual sites, with Link taking measurements from the monitor in real time.

Note: In order to view data in real time, site communications must be enabled. See Site Management.

To the right of the navigation pane, you will see the options available for real-time viewing.

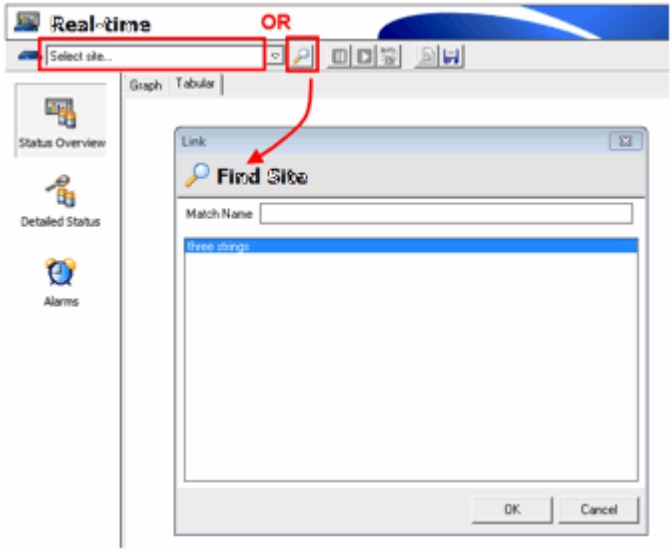


In all the real-time screens the data is updated from the battery monitor every few seconds.

8.1 Select a Site

In order to view live data from a site, you must first select it. There are two ways to select a site.

- From the drop-down list select the required site. However, if no sites are listed then check that communications are enabled. See the topic Site Management.
- Click the ***Search***  icon to display the Find Site screen (see sample screen below). From this screen you can either type the site name, or select it directly from the list pane. Click the ***OK*** button to display the data.



When you have selected a site the real-time screens will become active.

8.2 Status Overview

The Status Overview screen displays all measured parameters on a per string basis, for all the strings at the selected site.

For each string you can view:

- String voltage
- String current
- Ambient temperature
- Min/Max monoblock voltages
- Monoblock voltage variation
- Min/Max monoblock impedance
- Min/Max monoblock temperature

Note: The types of measurements displayed is dependent on the battery monitor hardware. For example a voltage only system does not have ohmic measurements.

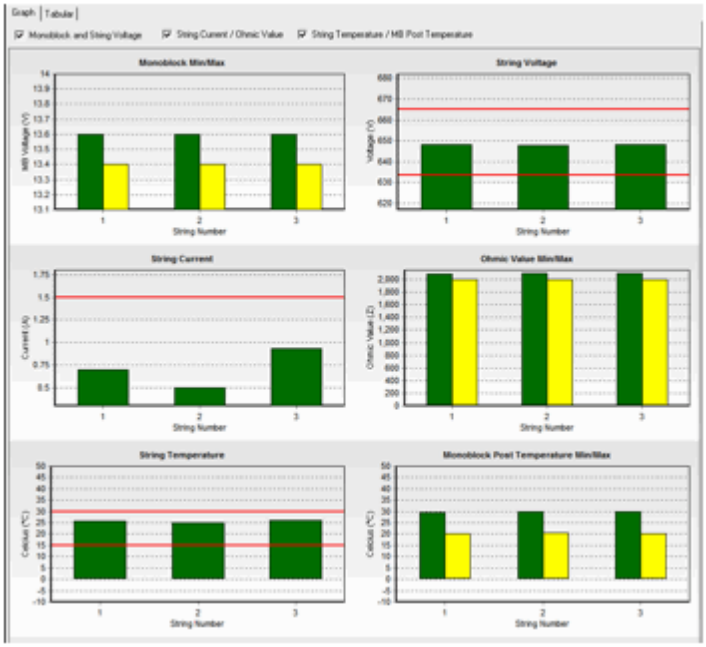
The Status Overview screen has two tabs, the ***Graph*** tab and the ***Tabular*** tab.

8.2.1 Graph tab

This option displays graphs of the data. At the top of the screen are some selection options to allow best visibility:

- Monoblock and String Voltage
- String Current/Ohmic Value
- String Temperature/MB Post Temperature

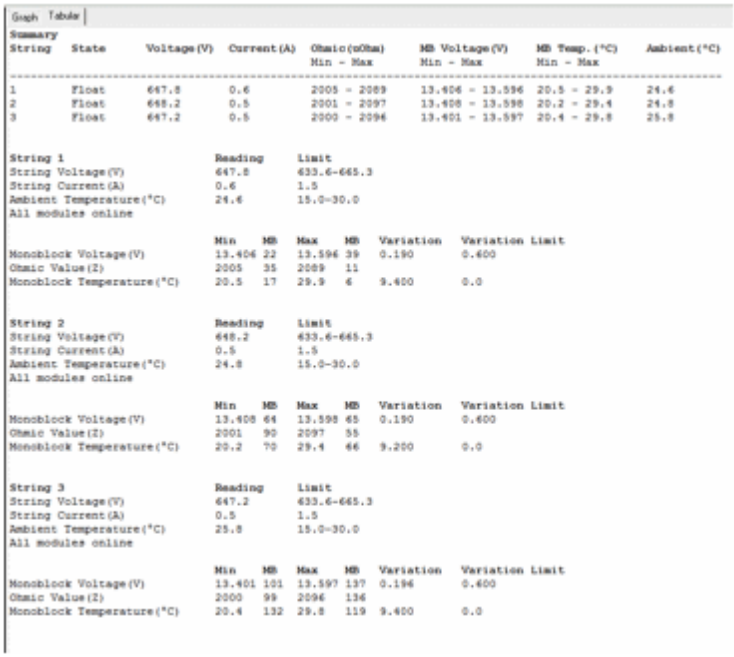
The screen sample below shows all selections.



8.2.2 Tabular tab

This option displays the data in a table.

See sample screen below.



Graph Tabular

Summary

String	State	Voltage(V)	Current(A)	Ohmic(mOhm) Min - Max	MB Voltage(V) Min - Max	MB Temp.(°C) Min - Max	Ambient(°C)
1	Float	647.8	0.6	2005 - 2089	13.406 - 13.596	20.5 - 29.9	24.6
2	Float	648.2	0.5	2001 - 2097	13.408 - 13.598	20.2 - 29.4	24.8
3	Float	647.2	0.5	2000 - 2096	13.401 - 13.597	20.4 - 29.8	25.8

String 1

	Reading	Limit
String Voltage(V)	647.8	633.6-665.3
String Current(A)	0.6	1.5
Ambient Temperature(°C)	24.6	15.0-30.0
All modules online		

	Min	MB	Max	MB	Variation	Variation Limit
Monoblock Voltage(V)	13.406	22	13.596	39	0.190	0.600
Ohmic Value(Z)	2005	35	2089	11		
Monoblock Temperature(°C)	20.5	17	29.9	6	9.400	0.0

String 2

	Reading	Limit
String Voltage(V)	648.2	633.6-665.3
String Current(A)	0.5	1.5
Ambient Temperature(°C)	24.8	15.0-30.0
All modules online		

	Min	MB	Max	MB	Variation	Variation Limit
Monoblock Voltage(V)	13.408	64	13.598	65	0.190	0.600
Ohmic Value(Z)	2001	90	2097	55		
Monoblock Temperature(°C)	20.2	70	29.4	66	9.200	0.0

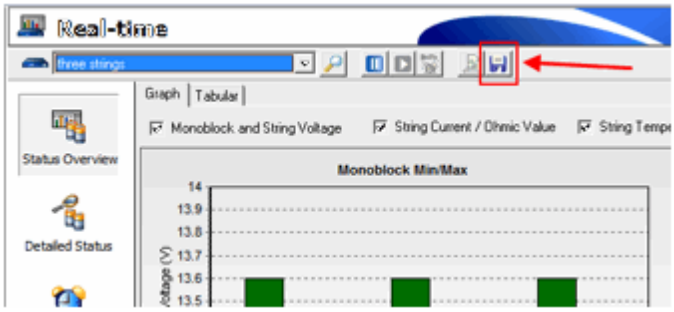
String 3

	Reading	Limit
String Voltage(V)	647.2	633.6-665.3
String Current(A)	0.5	1.5
Ambient Temperature(°C)	25.8	15.0-30.0
All modules online		

	Min	MB	Max	MB	Variation	Variation Limit
Monoblock Voltage(V)	13.401	101	13.597	137	0.196	0.600
Ohmic Value(Z)	2000	99	2096	136		
Monoblock Temperature(°C)	20.4	132	29.8	119	9.400	0.0

8.2.3 Overview CSV report

To take a snapshot of all the readings for the selected site click the ***Save*** button show below for a CSV format report.



8.3 Detailed Status

The Detailed Status screen displays all measured parameters for the selected string. The data is displayed live and in real time. It is refereshed regularly. Depending on the type of battery monitoring hardware installed, the screen displays:

- String voltage
- String current
- Ambient temperature
- Individual onoblock voltages
- Individual monoblock Ohmic values
- Individual monoblock temperature
- Monoblock statistics for the string

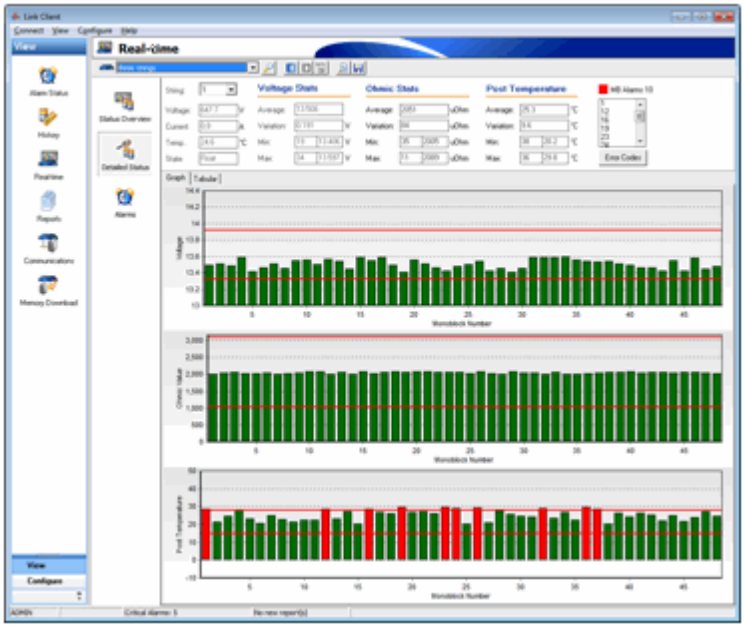
Note: The types of measurements displayed is dependent on the battery monitor hardware. For example a voltage only system does not have ohmic measurements.

The *Detailed Status* screen has two tabs, the *Graph* tab and the *Tabular* tab.

8.3.1 Graph tab

This option displays bar graphs of the monoblock Voltage, Ohmic value and temperature.

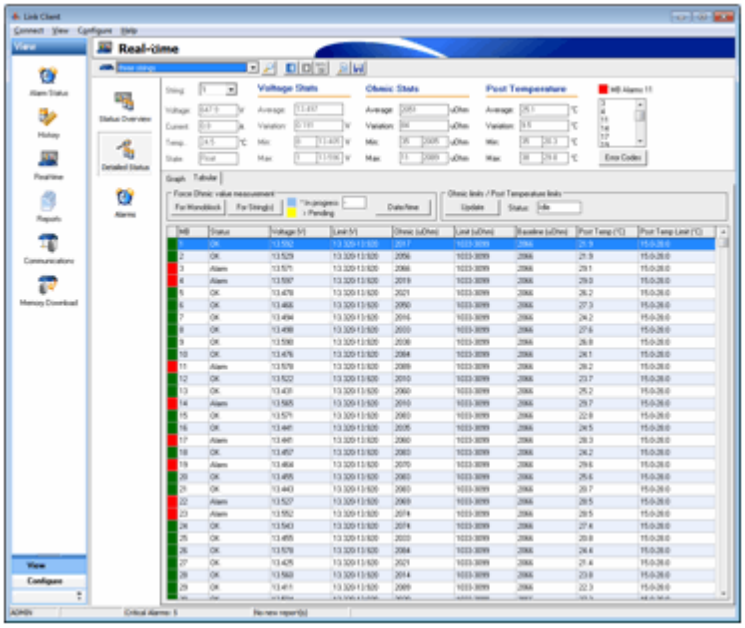
Below is a screen sample



8.3.2 Tabular tab

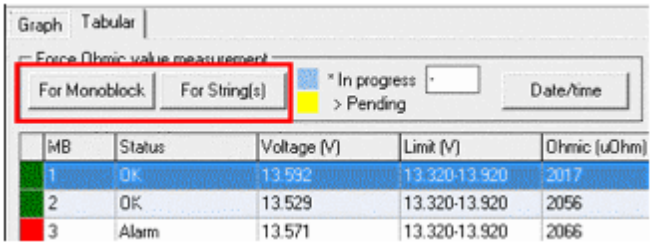
This option displays the data in a table.

See sample screen below.



8.3.3 Force Ohmic measurement

Ohmic measurements occur automatically, however a measurement can be forced if confirmation required. To force an Ohmic measurement for a monoblock, select the monoblock in the grid and click on the For Monoblock button. See screen sample below



To force an Ohmic measurement for a monoblock, click on the ***For Monoblock*** button.

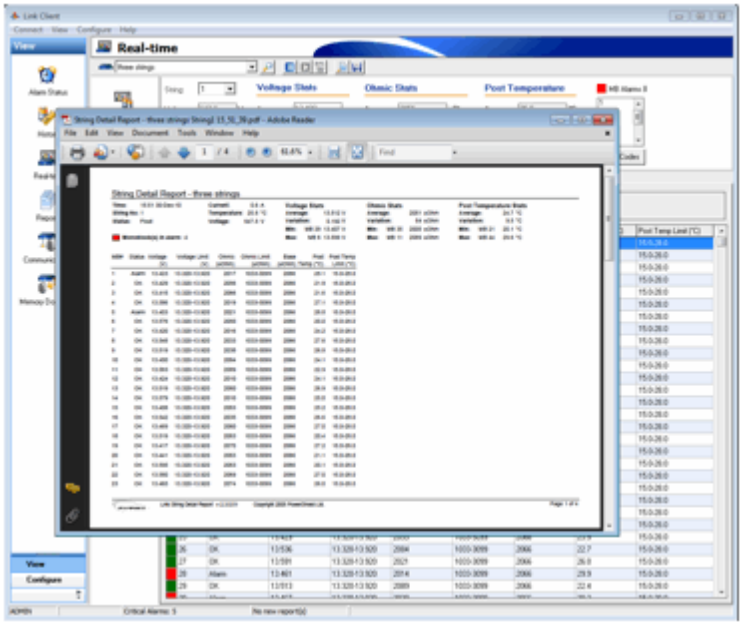
To force an Ohmic measurement for all the monoblocks of one or all strings, click on the ***For Strings(s)*** button and select ***String #*** or ***All strings***.

8.3.4 String Detail Report

A string detail report can be generated from the Detail Status screen in PDF or CSV format and to file or screen.

To create a String Detail Report to screen press the  button on the toolbar.

Below a screen sample



To create a PDF String Detail Report click the button on the tool bar and select the Save as type: to PDF.

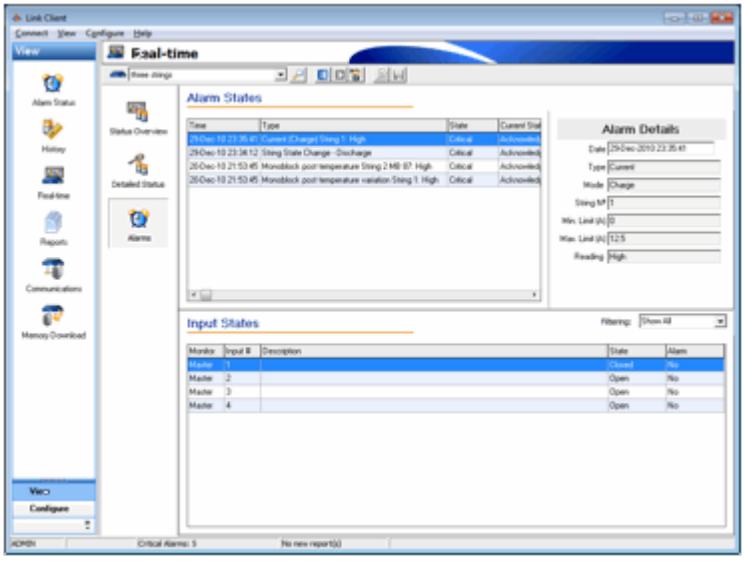
To create a CSV String Detail Report click the button on the tool bar and select the Save as type: to CSV.

Reports are saved to the location My Documents\PowerShield\Link.

8.4 Alarms (Real-time)

The Alarms screen (see sample screen below) shows all alarms and input states on the battery monitor at the selected site.

The information is read live, directly from the battery monitor, whereas the Alarm Status screen shows alarms that have been received and saved in the Link database.



8.5 Pause the screen updating

You can pause the display from updating by clicking on the Pause button.

8.6 Resume screen updating

You can resume the display updating by clicking on the Play button.

9 Reports

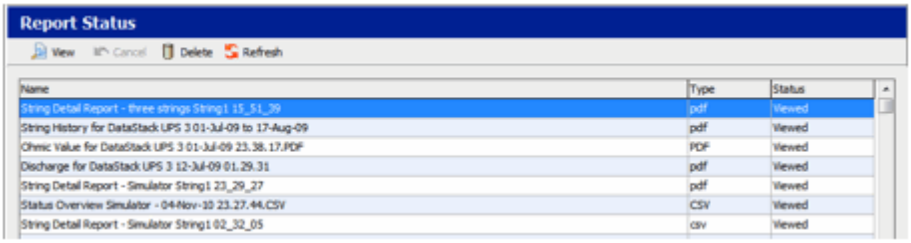
The Reports screen allows you to generate reports on data collected by Link. The table below describes the report types that are available.

Report Name	Icon	Provides a...
Discharge Report		Detailed analysis of one discharge event for a chosen site.
String History Report		Summary of monoblock float history a chosen period.
Discharge Summary Report		Summary of all discharge events for a chosen period.
Ohmic Value Report		Summary of the monoblock Ohmic value for a chosen period
Single Monoblock Report		Details for a single monoblock

9.1 Manage Reports

You can view the status of reports that are currently being generated, and view old reports by using the *Report Status* pane at the bottom of the *Reports* screen. The *Report Status* pane shows all reports that have been requested, or have already been generated.

See sample screen below.



The table below describes the statuses.

Status	Description
Requested	Upon clicking the Generate the Report button, the name of the report displays in the Report Status pane as Requested. If you want to cancel the report you can do this while the report's status is Requested by selecting the report in the Report Status pane and clicking ***Cancel***.
Processing and Generated	When Link starts processing the report the status changes to Processing. When Link has finished generating the report the status changes to Generated. At this point, if you are still logged on to the Link Client, the report will display in either Adobe Reader (for PDF reports) or Microsoft Excel (or whatever program you have configured for viewing CSV files). If you are not logged on, the report will display when you next log on, when you will be

Status	Description
	taken to the Reports screen.
Viewed	When the report has been viewed in the output program (e.g. Adobe Reader or Microsoft Excel) it will be marked as Viewed. Viewed reports are copied into a folder on the PC running the Link Client, as well as showing the report in the output program. By default, the folder on your Link Client PC where the reports are copied is: My Documents\PowerShield\Link
Failed	If an error occurs while generating a report, and Link cannot generate a report file, the report is marked as Failed.

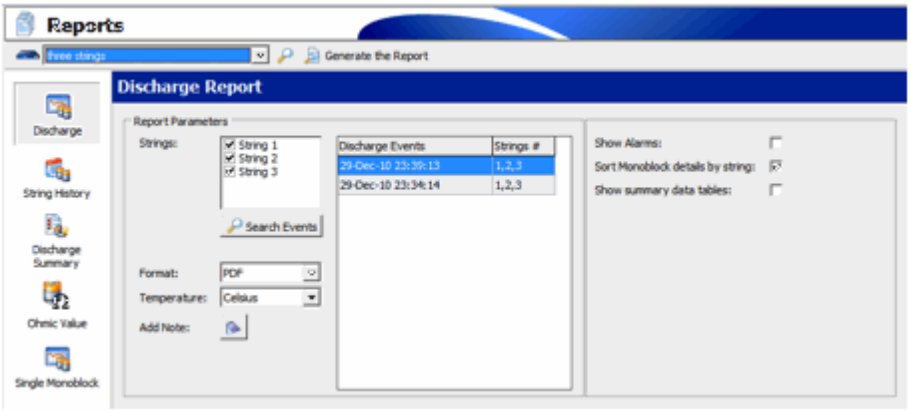
Note: You can delete a viewed report by selecting the report and clicking on the Delete button. This will remove the report file from your hard drive.

9.2 Discharge Report

The Discharge Report provides the information that is required to analyse a discharge and determine what (if any) problems occurred.

9.2.1 Discharge Report Settings

The sample screen below shows the options available for generating a Discharge Report.



The following options can be turned on or off for the report.

- Show Alarms
- Sort Monoblock data by string
- Show summary data tables

See Step 5 in the Generate the Discharge Report section below.

9.2.2 Generate the Discharge Report

Follow these steps to generate the Discharge Report.

Step	Action
1	From the Reports screen select the ***Discharge Report*** icon.
2	Select the *Site* for the report.
3	When a site is selected click the Search Events button to view the available data which is now listed under *Discharge Events*.

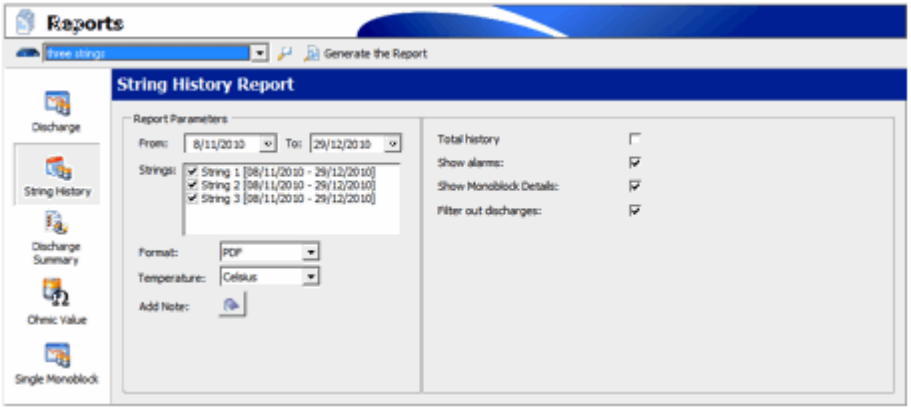
Step	Action
4	From the list of events, select the discharge event for which you want the report.
5	Select the box for any or all of the following options: • *Show Alarms* - to include a table listing any alarms that occurred during the discharge. • *Sort Monoblock details by string* - to include the individual monoblock performance data for each string and sorted by string number. If not selected, the monoblock performance data is report for all strings together. • *Show summary data tables* - to include tables summarising the String Voltage, String Current, and String Temperature in the Summary section of the report.
6	From the drop-down list, select the format for the report. Options are: • *PDF* - read by Acrobat Reader • *CSV* - read by text editor or application such as Microsoft Excel
7	From the drop-down list, select the temperature measurement format, i.e. *Celsius* or *Fahrenheit*.
8	If required, you can add a Note to the report by selecting the ***Note*** icon. A *Report Note* screen displays. Enter information by directly typing in the text pane. Click ***OK*** to save the *Note* with the report.
9	Click the Generate the Report button. The *Report Status* pane highlights the report name, and while generating shows a status firstly of **Requested**, then **Processing**. When the report has finished generating, it displays on screen and the status changes to **Viewed**.

9.3 String History Report

The String History report provides details on activity (discharges or alarms) and float behaviour for the selected strings on a selected site, over a specific period.

9.3.1 String History Report Settings

The sample screen below shows the options available for generating a String History Report.



The following options can be turned on or off for the report. See Step 3 in the Generate String History Report section below.

- Total history
- Show alarms
- Show Monoblock Details
- Filter out discharges

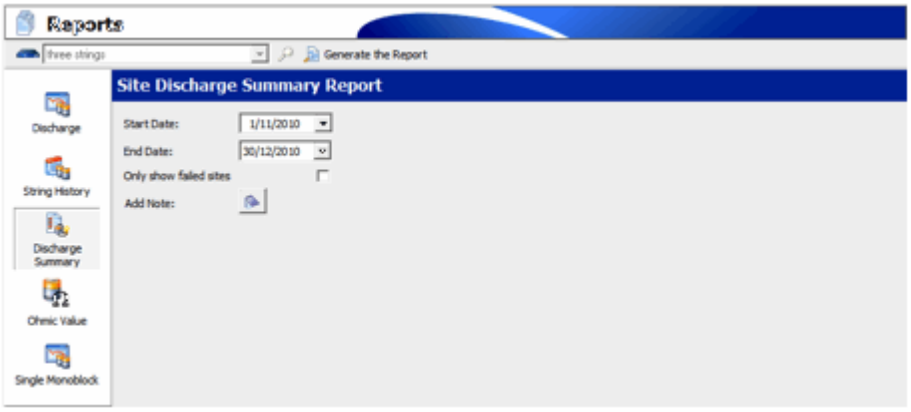
9.3.2 Generate the String History Report

Follow these steps to generate the String History Report.

Step	Action
1	From the Reports screen select the ***String History Report***  icon.
2	Select the site for which you wish to generate a report.
3	Select the report options: • *Total history* - Select this option if you want the report to cover the entire period that Link has data for this site. When you select this option the start date and end date selections are disabled. • *From and To* - The start and end dates for the period to be reported. • *Show alarms* - Select this option if you want the report to include a table showing all alarms for the selected site during the report period. • *Show Monoblock Details* - Select this option if you want the report to include a table showing the minimum, maximum and average voltage, over the report period, for each monoblock. • *Filter out discharges* - When this option is selected, Link will exclude daily minimum, maximum, and average data for days when a discharge occurred. Filtering out discharges will give more accurate figures for the minimum, maximum and average figures calculated from the float data.
4	From the drop-down list, select the format for the report. Options are: • *PDF* - read by Acrobat Reader • *CSV* - read by text editor or application such as Microsoft Excel
5	From the drop-down list, select the temperature measurement format, i.e. *Celsius* or *Fahrenheit*.
6	If required, you can add a Note to the report by selecting the ***Note***  button. A Report Note screen displays. Enter information by directly typing in the text pane. Click ***OK*** to save the Note with the report.
7	Click the  button. The *Report Status* pane highlights the report name, and while generating shows a status firstly of **Requested**, then **Processing**. When the report has finished generating, it displays on screen and the status changes to **Viewed**.

9.4 Site Discharge Summary Report

The Site Discharge Summary Report provides a summary of all the discharges that have occurred within the specified period.



9.4.1 Generate the Site Discharge Summary Report

Follow these steps to generate the Site Discharge Summary Report.

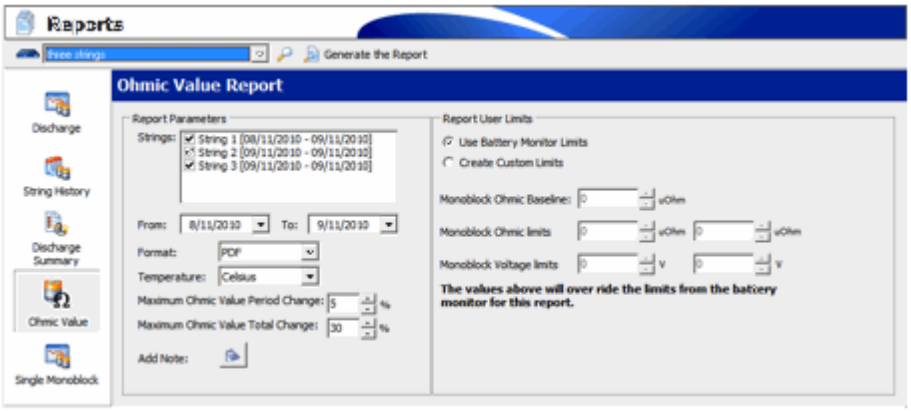
Step	Action
1	From the Reports screen select the ***Site Summary Report*** icon.
2	Select the ***start*** and ***end*** date.
3	Select the report option: • *Only show failed sites* - Select this option if you want the report to only list the discharges that failed.
4	If required, you can add a Note to the report by selecting the ***Note*** icon. A Report Note screen displays. Enter information by directly typing in the text pane. Click ***OK*** to save the Note with the report.
5	Click the Generate the Report button. The *Report Status* pane highlights the report name, and while generating shows a status firstly of **Requested**, then **Processing**. When the report has finished generating, it displays on screen and the status changes to **Viewed**.

9.5 Ohmic Value Report

The Ohmic Value Report provides details on fluctuations in monoblock ohmic value for a selected site, over a specific period.

9.5.1 Ohmic Value Report Settings

The sample screen below shows the options available for generating an *Ohmic Value Report*.



The following are options for the User Limits for the report. See Step 4 in the Generate the *Ohmic Value Report* section below.

- Use Battery Monitor Limits
- Create Custom Limits

9.5.2 Generate the Ohmic Value Report

Follow these steps to generate an Ohmic Value Report.

Step	Action
1	From the *Reports* screen select the ***Ohmic Value Report***  icon.
2	Select the ***Site*** for the report. Link automatically populates the ***Strings*** field with the data for that site. You can de-select any string to exclude it from the report.
3	From the drop-down calendars select a ***From*** and ***To*** *date* for the period to be covered by the report.
4	Select either of the options in the *Report User Limits* pane. • If you select *Use Battery Monitor Limits* then the remaining fields are disabled as Link will use the limits as set up in the configuration for the battery monitors at the selected site. • Select *Create Custom Limits* if you want to enter the limits manually in the fields that become enabled for this selection. Note that the values you enter will over-ride, for this report, the limits from the battery monitor. This allows you to experiment with tighter or wider ranges to search for anomalies.
5	From the drop-down list, select the format for the report. Options are: • *PDF* - read by Acrobat Reader • *CSV* - read by text editor or application such as Microsoft Excel
6	From the drop-down list, select the temperature measurement format, i.e. *Celsius* or *Fahrenheit* .
7	From the drop-down list select a percentage value for the *Maximum Ohmic Value Period Change* field. The default value is 5%.
8	From the drop-down list select a percentage value for the *Maximum Ohmic Value Total Change* field. The default value is 30%.
9	If required, you can add a Note to the report by selecting the ***Note***  icon. A Report *Note*

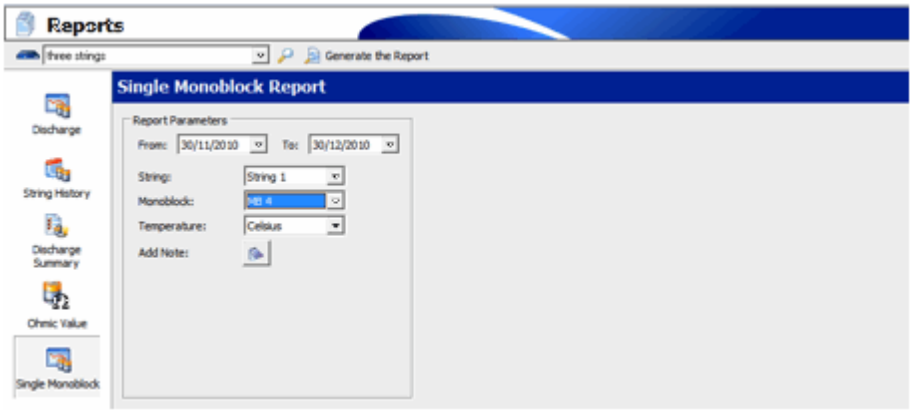
Step	Action
	screen displays. Enter information by directly typing in the text pane. Click ***OK*** to save the Note with the report.
10	Click the Generate the Report button. The *Report Status* pane highlights the report name, and while generating shows a status firstly of **Requested**, then **Processing**. When the report has finished generating, it displays on screen and the status changes to **Viewed**.

9.6 Single Monoblock Report

The *Single Monoblock Report* provides details for a selected Monoblock over a selected period.

9.6.1 Single Monoblock Report Settings

The sample screen below shows the options available for generating a *Single Monoblock Report*.



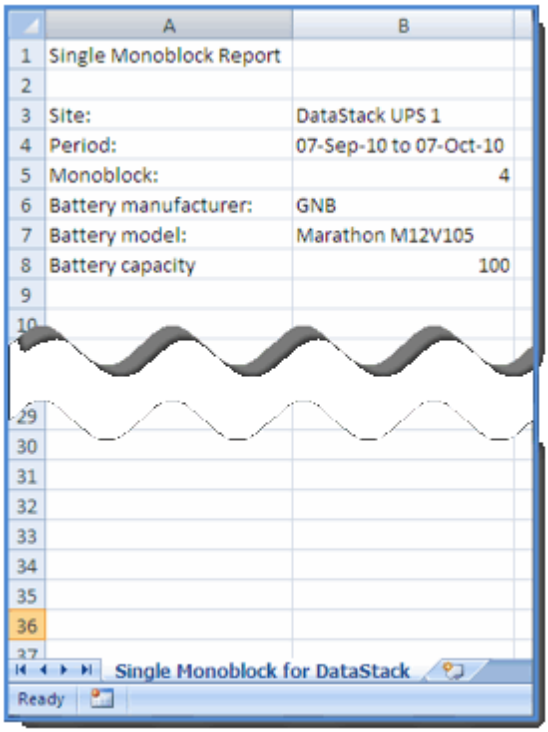
9.6.2 Generate the Single Monoblock Report

Follow these steps to generate the Single Monoblock Report.

Step	Action
1	From the Reports screen select the ***Single Monoblock Report*** icon.
2	From the drop-down calendars select the ***From*** and ***To*** *dates* for the report.
3	From the drop-down list select the *String*.
4	From the drop-down list select the *Monoblock*.
5	From the drop-down list, select the temperature measurement format, i.e. *Celsius* or *Fahrenheit*.
6	If required, you can add a Note to the report by selecting the ***Note*** icon. A Report *Note* screen displays. Enter information by directly typing in the text pane. Click ***OK*** to save the Note with the report.
7	Click the Generate the Report button. The *Report Status* pane highlights the report name, and while generating shows a status firstly of **Requested**, then **Processing**. When the report has finished generating, it displays on screen and the status changes to **Viewed**.

The report generates in CSV format and displays in Microsoft Excel (or an alternative program depending on your PC's file viewing configurations).

An example of a *Single Monoblock Report* is shown below.



	A	B
1	Single Monoblock Report	
2		
3	Site:	DataStack UPS 1
4	Period:	07-Sep-10 to 07-Oct-10
5	Monoblock:	4
6	Battery manufacturer:	GNB
7	Battery model:	Marathon M12V105
8	Battery capacity	100
9		
10		
29		
30		
31		
32		
33		
34		
35		
36		
37		

Single Monoblock for DataStack

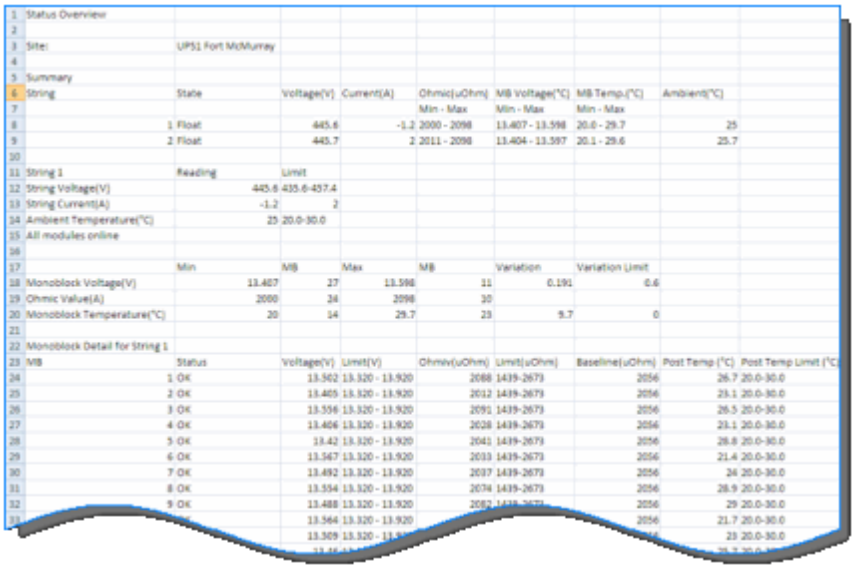
Ready

9.7 Status Overview Report

The *Status Overview report* is a report that is generated in real time. See also the topic *Overview Screen* in the *Real-Time* section.

While viewing the data on that screen you can click the ***Save*** icon and a snapshot of the string and monoblock measurements will generate. You will be prompted to save the report to either the default file area, or you can browse to a different folder.

A sample of the generated report is shown below.



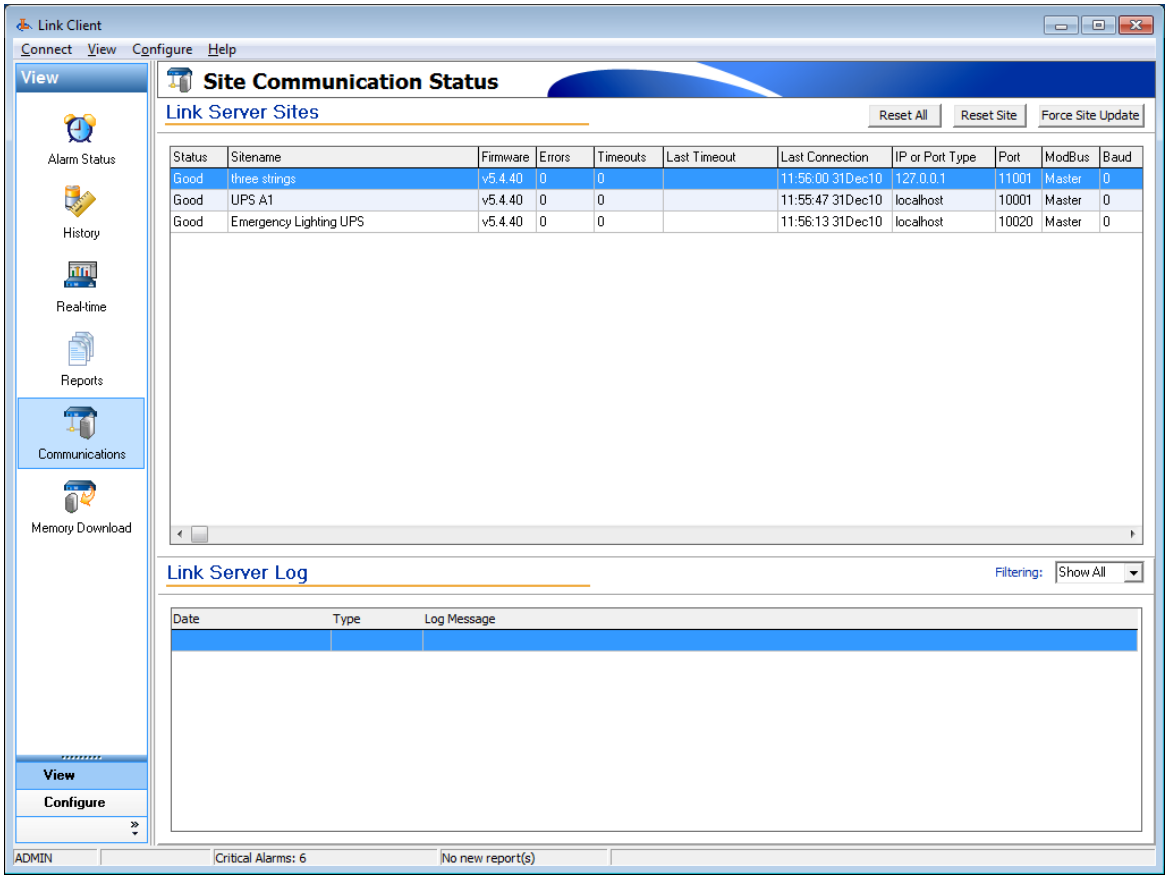
1	Status Overview							
2								
3	Site:	UPS1 Fort McMurray						
4								
5	Summary							
6	String	State	Voltage(V)	Current(A)	Ohmic(uOhm)	MB Voltage(°C)	MB Temp.(°C)	Ambient(°C)
7					Min - Max	Min - Max	Min - Max	
8		1 Float	445.6	-1.2	2000 - 2098	13.407 - 13.598	20.0 - 29.7	25
9		2 Float	445.7	2	2011 - 2098	13.404 - 13.597	20.1 - 29.6	25.7
10								
11	String 1	Reading	Limit					
12	String Voltage(V)		445.6	435.6-457.4				
13	String Current(A)		-1.2	2				
14	Ambient Temperature(°C)		25	20.0-30.0				
15	All modules online							
16								
17		Min	MB	Max	MB	Variation	Variation Limit	
18	Monoblock Voltage(V)	13.407	27	13.598	11	0.191	0.6	
19	Ohmic Value(A)	2000	34	2098	10			
20	Monoblock Temperature(°C)	20	14	29.7	23	9.7	0	
21								
22	Monoblock Detail for String 1							
23	MB	Status	Voltage(V)	Limit(V)	Ohmic(uOhm)	Limit(uOhm)	Baseline(uOhm)	Post Temp (°C)	Post Temp Limit (°C)
24	1	OK	13.502	13.320 - 13.920	2088	1439-2673	2056	26.7	20.0-30.0
25	2	OK	13.465	13.320 - 13.920	2012	1439-2673	2056	23.1	20.0-30.0
26	3	OK	13.556	13.320 - 13.920	2091	1439-2673	2056	26.5	20.0-30.0
27	4	OK	13.406	13.320 - 13.920	2028	1439-2673	2056	23.1	20.0-30.0
28	5	OK	13.42	13.320 - 13.920	2041	1439-2673	2056	28.8	20.0-30.0
29	6	OK	13.567	13.320 - 13.920	2033	1439-2673	2056	21.4	20.0-30.0
30	7	OK	13.492	13.320 - 13.920	2037	1439-2673	2056	24	20.0-30.0
31	8	OK	13.554	13.320 - 13.920	2074	1439-2673	2056	28.9	20.0-30.0
32	9	OK	13.488	13.320 - 13.920	2082	1439-2673	2056	29	20.0-30.0
33			13.564	13.320 - 13.920			2056	21.7	20.0-30.0
			13.369	13.320 - 13.920				23	20.0-30.0

10 Communications

10.1 Site Communication Status

The *Site Communication Status* screen gives you an overview of the state of the communications connections to all of the battery monitors that are being monitored by Link.

Note: This screen is particularly useful for verifying that the communication links to all of the sites are operating correctly.



For each site, the following columns are displayed.

Column	Description
Status	Shows the status of the communications connection to this site. The status options are: • Good • Bad • Disabled
Sitename	The name of the site.
Firmware	The version of firmware that the battery monitor is running. If this is blank, click on the ***Force Site Update*** button to make Link communicate with the site and read the firmware version.

Column	Description
Errors	The number of general communication errors while communicating with this site.
Timeouts	The number of timeouts while communicating with this site.
Last Timeout	When the last timeout occurred.
Last Connection	When Link last successfully communicated with this site.
IP or Port Type	Shows the **IP address** for TCP/IP connected sites or **COM** for sites connected to a serial port.
ModBus	The **Modbus address** of the battery monitor. This is usually **Master**.
Baud	The **Baud rate** used to communicate to the battery monitor.

10.1.1 Reset functionality

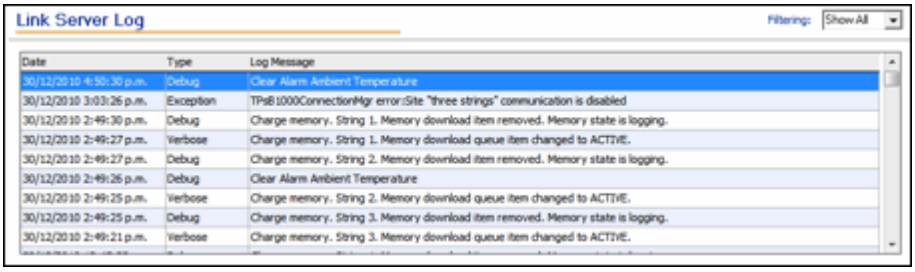
The *Site Communications Status* screen has the following options as described in the table below.

Note: These options are useful if you want to see how many errors you are getting over a period of time when diagnosing a problem connection.

Field	Click to...
Reset All	Reset the *Errors, Timeouts, Last Timeout*, and *Last Connection* fields for all sites.
Reset Site	Reset the *Errors, Timeouts, Last Timeout*, and *Last Connection* fields to the site currently selected in the Communication Status table.

10.2 Server Log

When you select a site in the *Communications Status* pane, the *Link Server Log* pane (see sample screen below) displays events from the Link Server Log that relate to that site.



Note: If the communications status for that site is Bad, you may be able to tell from the *Link Server Log* entries why the communications connection is not operating correctly.

The log messages are very low level therefore it is best to contact support with the log file for assistance.

10.2.1 Filter functionality

The types of events shown for the selected site can be filtered by selecting an option from the Filtering drop-down list.

The options are:

Option	Description
Show All (default)	Shows all event types at the selected site.
Exceptions	Shows only exceptions at the selected site.
Errors	Shows the errors recorded at the selected site.
Normal	Shows only normal events at the selected site.
Debug	Reserved for administrators
Verbose	Shows the full text of the message for logged messages at the selected site.

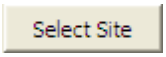
11 Memory download status

When you select Memory Download  from the navigation pane, the *Memory Download Status* screen displays.
This screen allows you to monitor any memory download activity. Link downloads memories from the Battery Monitors automatically based on various triggers such as time, or a change of string state from discharge to charge.

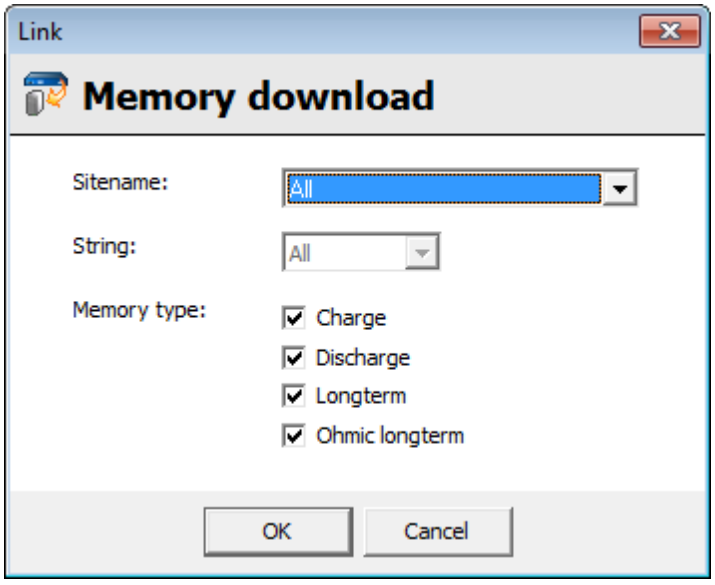
There are four types of memory that Link downloads from the Battery Monitors and these are described in the table below.

Memory Type	Description
Charge	Data logged during the charging of a string. This is downloaded after the string goes into float. The data is used when creating event-based graphs.
Discharge	Data logged during a discharge event. This is downloaded after a discharge event stops and the string goes into charge. The data is used when creating event-based graphs and Discharge Reports.
Float (long-term)	Long-term trend data. This is downloaded at regular intervals and provides a daily average value.
Ohmic (long-term)	Long-term voltage data for selected (or all) strings at the site(s). This is downloaded at regular intervals.

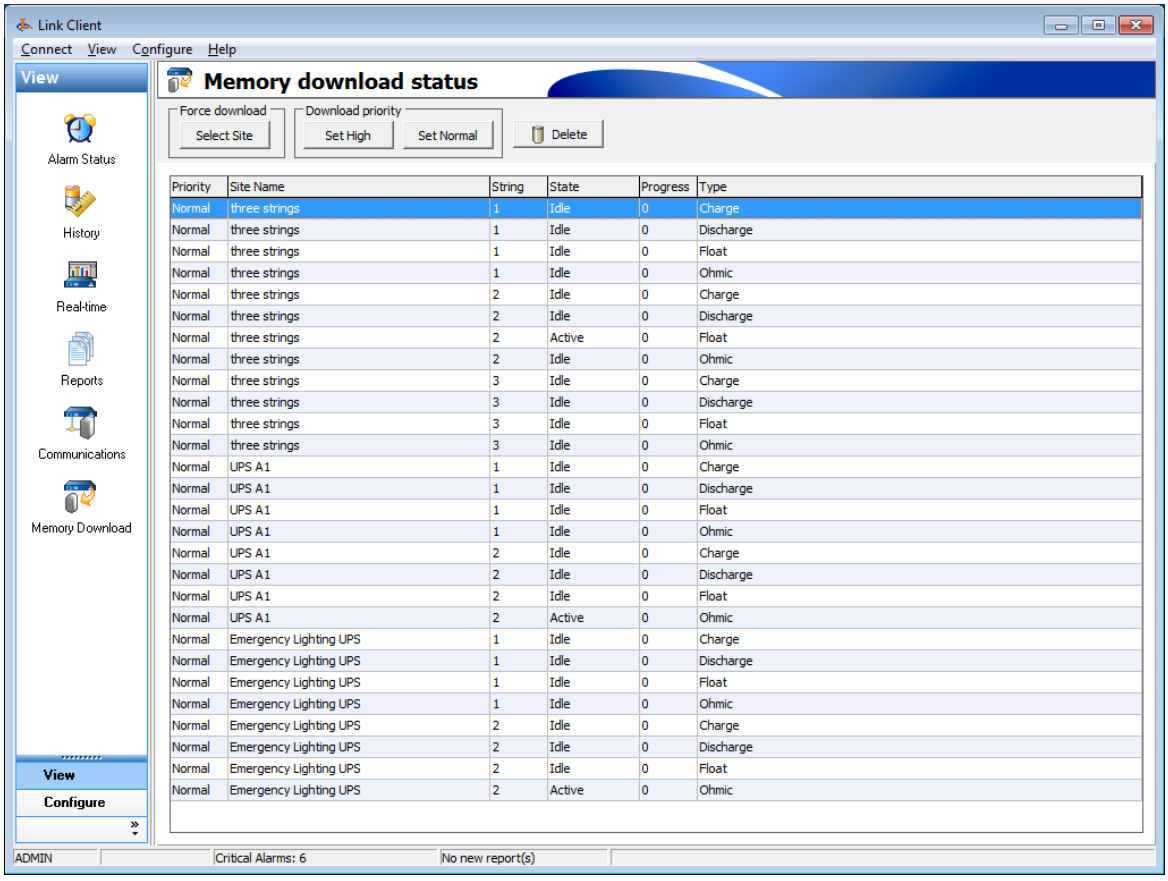
11.1 Select Site

When you click the 

button the *Memory Download* dialog opens with selectable options.



Select the required options to display the *Memory Download Status* screen (see sample screen below).



This screen shows all memories that are currently queued to be downloaded and lists the *priority, site name, string, state, progress*, and *memory type*. The state can be either **Idle** (the memory is waiting to be downloaded), or **Active** (the memory is currently being downloaded).

11.2 Downloads

You can force link to check the memories and download any data available and set priorities over the downloads as described in the table below.

Button	Click to...
Select Site	Select a site. Options are: • ***All Sites*** - Link will queue up a memory download for all memory types, on all strings, on all sites in the system. This is the default. • ***Selected site*** - Link will queue up a memory download for all memory types, on all strings, on the selected site.
Set High	Set the download as a high priority. Link will download in order of priority, i.e. **High** priority downloads in the queue will be downloaded ahead of **Normal** priority downloads
Set Normal	Change from a **High** priority download to a **Normal** priority download. Normal is the default.

Note: Depending on the communication link, the number of sites, and configuration of the sites, downloads may take minutes to tens of minutes. We recommend that single sites are forced until you are familiar with the time involved.

If a site has been recently added to Link, or there was a communications failure for a period of time, and the memories have not been downloaded from the site, this screen allows you to either force a memory check on all of the sites or for a chosen site.

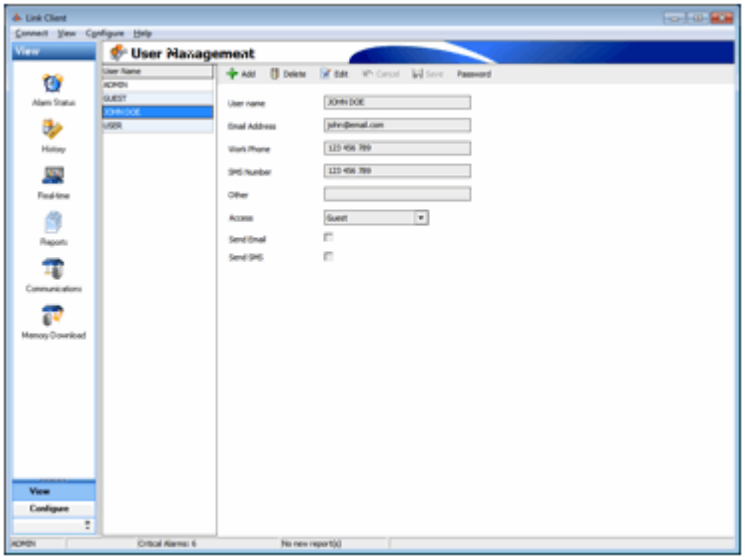
12 Configuration

This section describes the Configuration options available in Link. Configuration options can be viewed either by clicking the *Configure* tab at the bottom of the Navigation pane, or by selecting *Configure* from the menu bar at the top of the screen.

12.1 Configure Users

The *User Management* screen (see sample screen below) provides the functionality to manage users who have the necessary permissions to log in to the Link Server. The permission limits access for unauthorised people, and ensures appropriate records are kept for logged events.

The contact details for each user are also used for Alarm Notifications from the Link Server.



The screen has two panes:

- List of Users - a list of users who have been configured
- User Details - details for the currently selected user

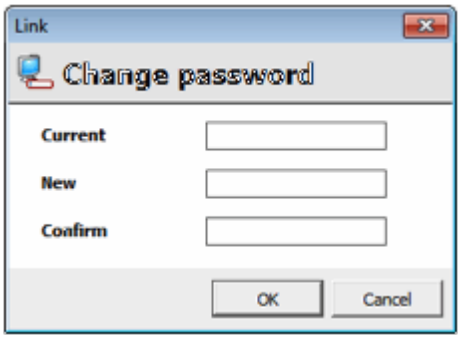
12.1.1 Create a User

To create a new User profile, click the Add icon. The fields in the User Details pane are enabled, and can be edited. Type the details for the new contact directly in the boxes, ensuring you enter the appropriate contact details so that the Link Server can notify the users.

Note: Ensure that the user name is not already in use.

When all the required details have been entered, click the ***Save*** icon.
Following the creation of a new user, you can change the password for the user. Click to select the new user in the *User List* pane, then click the Password button. The *Change Password* screen displays (see sample screen below).

Type the new password, and confirm it, then click ***OK***.



Note: If the user password is not changed, the password will default to the user name in capital letters.

The new user will now be able to log in, and the system will be able to send messages to the new user if the appropriate fields were completed.

12.1.2 Edit a User

User Details can be modified after the User has been added to Link. Follow these steps.

Step	Action
1	From the *User Management* screen, select the user in the *List* pane.
2	Click the ***Edit*** icon. You will see that the fields in the *Details* pane become active, i.e. they change from greyed-out to white.
3	Amend the fields as required and when complete click the ***Save*** icon to save the changed details.

12.1.3 User Communication Settings

The *Details* pane of the *User Management* screen is where you can enter information about communication with the user.

Send Email

Select this box to enable automatic email notification of alarms. This means that the user will be sent alarm information via email for all alarms received by Link that are auto-notify enabled.

A valid email address must be entered if you select the *Send Email* option.

Send SMS

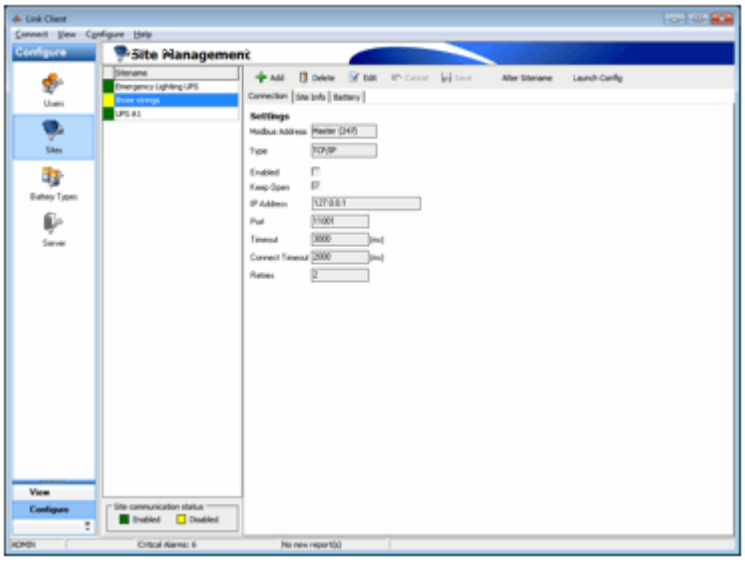
Select this box to enable automatic SMS notification of alarms. This means that the user will be sent alarm information via SMS text message for all alarms received by Link that are auto-notify enabled.

A mobile phone number must be entered if you select the *Send SMS* option and email server settings.

Note: Link Server requires an email to SMS gateway for the SMS functionality.

12.2 Site Management

The *Site Management* screen (see sample screen below) allows you to configure the Battery Monitor sites that you wish Link to manage.



The *Site Management* screen has two panes:

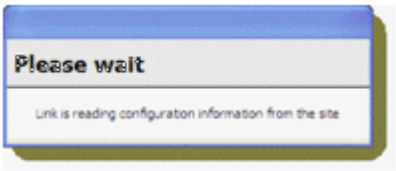
- List of Sites - shows all the battery monitoring sites that have been configured. If no sites have been configured this will be blank.
- Details - Three tabs, *Connection*, *Site Info*, and *Battery* - shows details for items on the currently selected site.

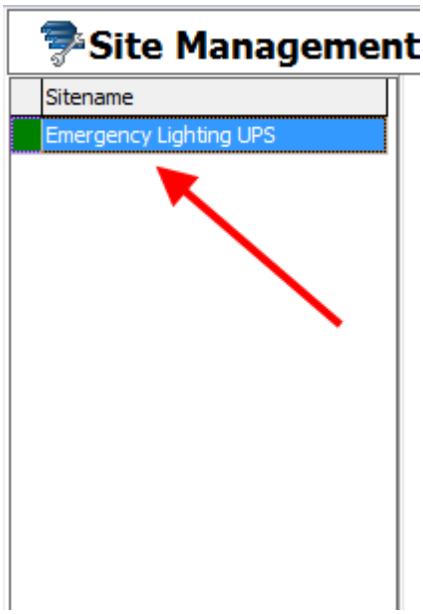
Note: Before Link can provide monitoring for a site, the site must be added to the Link database. See the topic **Add a Site**.

12.2.1 Add a Site

WARNING: To add a site to the Link database there must be a fully configured battery monitor with a valid communication link. The battery monitor(s) must be configured with software called Config. See the Config Manual.

Follow these steps to add a site.

Step	Action
1	From the Site Management screen click the Add Site icon. In the List pane a new site called **(New)** is added to the list and the fields in the *Details* pane of all three tabs are enabled. Note that **(New)** is just a temporary name and you do not need to know the actual site name. Link manages this for you.
2	On the *Connection* tab enter the fields as described in the table below. The field on this tab must be completed before the site can successfully added to Link.
3	When all the information has been entered on the *Connection* tab click the ***Save*** icon. Link must be able to communicate with the *Site* before the site can be successfully added. You will see the following message displayed while Link checks configuration information from the site. 
4	When all the battery monitor configuration information is retrieved a new item will appear in the *Sitename* list as show below.

Step	Action
	

12.2.1.1 Connection Tab Data Entry for a TCP/IP connection over a network

The table below describes the fields on the ***Connection*** tab of the *Site Management* screen that should be completed if your are connecting to the site via TCP/IP over a network.

Field	Description
Modbus Address	The field defaults to **Master (247)**. Leave this setting unless you are adding a site that is connected via a Gateway PowerShield battery monitor, in which case you need to set the **Modbus Address** to the ID of the site.
Type	Select *TCP/IP* to connect via the network.
Enabled	To temporarily disable a site, de-select this box.
Keep Open	Only de-select this option under the instruction of the battery monitor manufacturer.
Host	The *network address* or *host name* of the site you wish to add to Link. This should be either the IP address (4 number series separated by dots) of the computer name of the device server to which the Battery Monitor is connected.
Port	The *Port* of the site you wish to add to Link. Default port number is **10001**.
Timeout	The length of time Link will wait for a reply before it will re-send the data.
Connection Timeout	The length of time that Link will wait for a network connection to the site.
Retries	The number of times Link will re-send a message to the site before raising an alarm.

12.2.1.2 Connection Tab Data Entry for a serial port connection

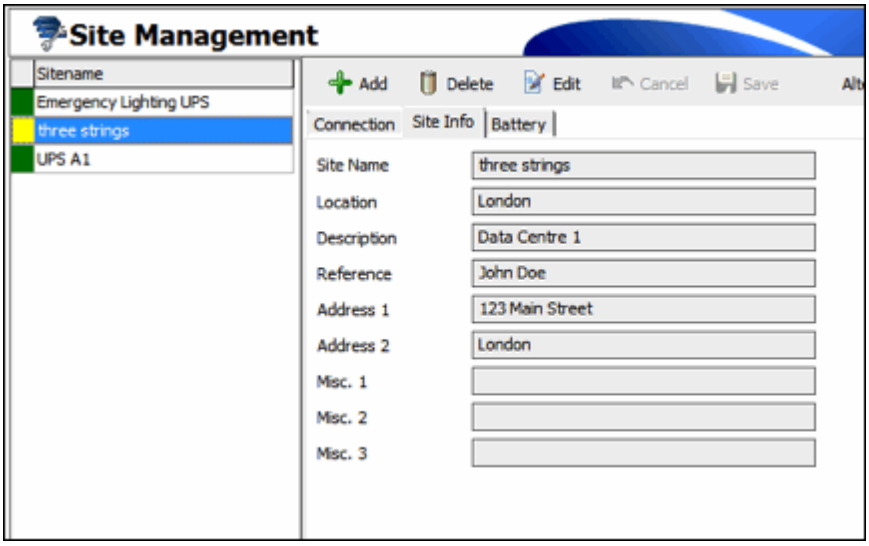
The table below describes the fields on the Connection tab of the Site Management screen that should be completed if your are connecting to the site via a serial port on the Link Server PC.

Field	Description
Modbus Address	The field defaults to ***Master (247)***. Leave this setting unless you are adding a site that is connected via a Gateway battery monitor, in which case you need to set the Modbus Address to the ID of the site.
Type	Select ***Serial Port*** to connect via a serial port on the Server PC.
Enabled	To temporarily disable a site, de-select this box.
COM	The number of the serial port on the Server PC to which the Battery monitor is connected.
Parity	Set this to ***None*** (the default setting). This is the parity setting to be used for the serial connection.
Timeout	The length of time Link will wait for a reply before it will re-send the data.
Baud Rate	From the drop-down list select the communication speed (Baud rate) at which the Link Server should communicate with the Powershield Battery Monitor.
Stop bits	Set this to ***1***. This is the number of stop bits to be used for the serial connection.
Retries	The number of times Link will re-send a message to the site before raising an alarm.

Note: Use the *Enabled* check box to disable a site whenever you wish to connect to the site with Config to verify or modify the site's configuration. This is necessary because only one program can communicate with the site at one time. Don't forget to re-select the ***Enabled*** box when you have finished using Config with the site.

12.2.2 Site Info tab

The Site Info tab of the *Site Management* screen (see sample fields below) allows you to store general information about the site.



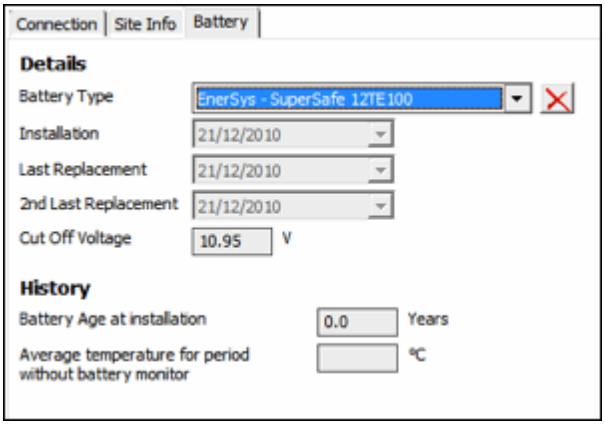
The table below describes the fields.

Field	Description
Site Name	The name of the site taken from the battery monitor's configuration. Note: You can only edit a site name using the button.
Location	A general purpose field for keeping track of where the battery monitor is. This field can contain up to 32 characters.
Description	A short description of what the site is monitoring, e.g. "emergency lighting batteries for building A".
reference	reference info.
Address 1	Address details
Address 2	Address details
Misc 1	This fields can contain any text up to 100 characters.
Misc 2	This fields can contain any text up to 100 characters.
Misc 3	This fields can contain any text up to 100 characters.

12.2.2.1 Battery tab

The Battery tab of the *Site Management* screen allows you to specify the type of batteries installed as wells as providing the functionality to keep track of their maintenance history. The tab has two sections:

- Details - Information about the batteries at the site.
- History - Details about the history of the batteries for the time before the batteries were monitored.



The fields are described in the table below.

Field	Description
Details	
Battery Type	From the drop-down list select the type of battery installed at this site. See the topic **Configure Battery Types** to modify the types listed here, or to add new battery types.
Installation	From the drop-down calendar, or type directly in the box the date the batteries were originally installed.
Last Replacement	From the drop-down calendar, or type directly in the box the date of the very last battery replacement.

Field	Description
2nd Last Replacement	From the drop-down calendar, or type directly in the box the date of the penultimate battery replacement.
Cut Off Voltage	Enter the voltage at which the batteries are fully discharged. This is the per monoblock voltage at which the site will stop operating.
History	
Battery Age at Installation	Enter the age of the batteries at the time of installation.
Average temperature	The average battery temperature for the period when the battery was not monitored.

Link uses the battery information when predicting battery performance. Configuring the battery type correctly will help Link provide more useful information in reports.

12.2.3 Modifying Sites

Site details and the site name can be modified, and sites can be deleted.

12.2.3.1 Modify Site Details

After the site has been added to Link the *Site Details* can be modified.

Follow these steps:

Step	Action
1	From the *Connection* tab of the *Site Management* screen select the site to be edited from the *list* pane.
2	Click the ***Edit***  icon and you will see that the field boxes become active, i.e. they change from greyed out to white.
3	Make the changes as required and click the ***Save***  icon to save the changed details.

At any time before you click the ***Save*** icon you can click the ***Cancel*** icon to revert to the settings as at the last saved configuration.

12.2.3.2 Modify the Site Name

The site name can be changed after it has been added to Link. This should only be done from withing Link, and not using other softare such as Config.

WARNING: Altering a site name may have serious consequences for long-term monitoring and site history. Ensure that you have correct approval and that relevant parties are notified.

Follow these steps to modify a site name:

Step	Action
1	From the *Connection* tab of the *Site Management* screen select the site to be edited from the list pane.

Step	Action
2	Click the Alter Sitename button. A screen displays allowing you to enter the new site name.
3	Enter the new site name and click ***OK*** to save the changed name, or click the ***Cancel*** icon to leave the site name unchanged.

12.2.3.3 Delete a Site

A site can be deleted. This means that the Link Server will no longer monitor the site once it has been deleted. The discharge data and associated alarms history will then not be accessible after the site has been deleted.

Follow these steps to delete a site:

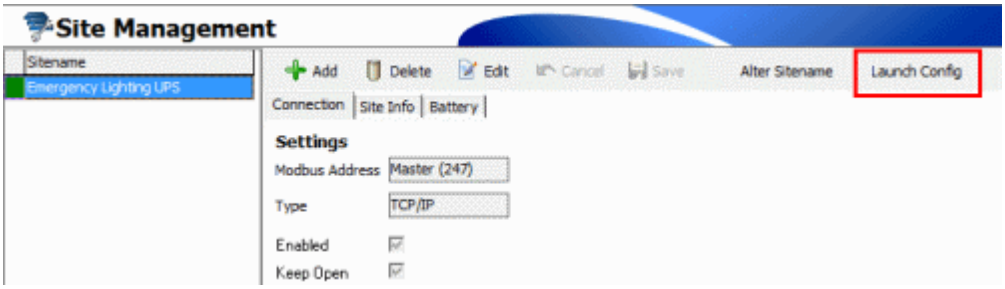
Step	Action
1	From the *Connection* tab of the *Site Management* screen select the site to be deleted.
2	Click the ***Delete*** icon. A confirmation screen displays.
3	On the Confirmation screen click ***Yes*** to delete the site, or ***Cancel*** to abort the deletion.

12.3 Launch Config

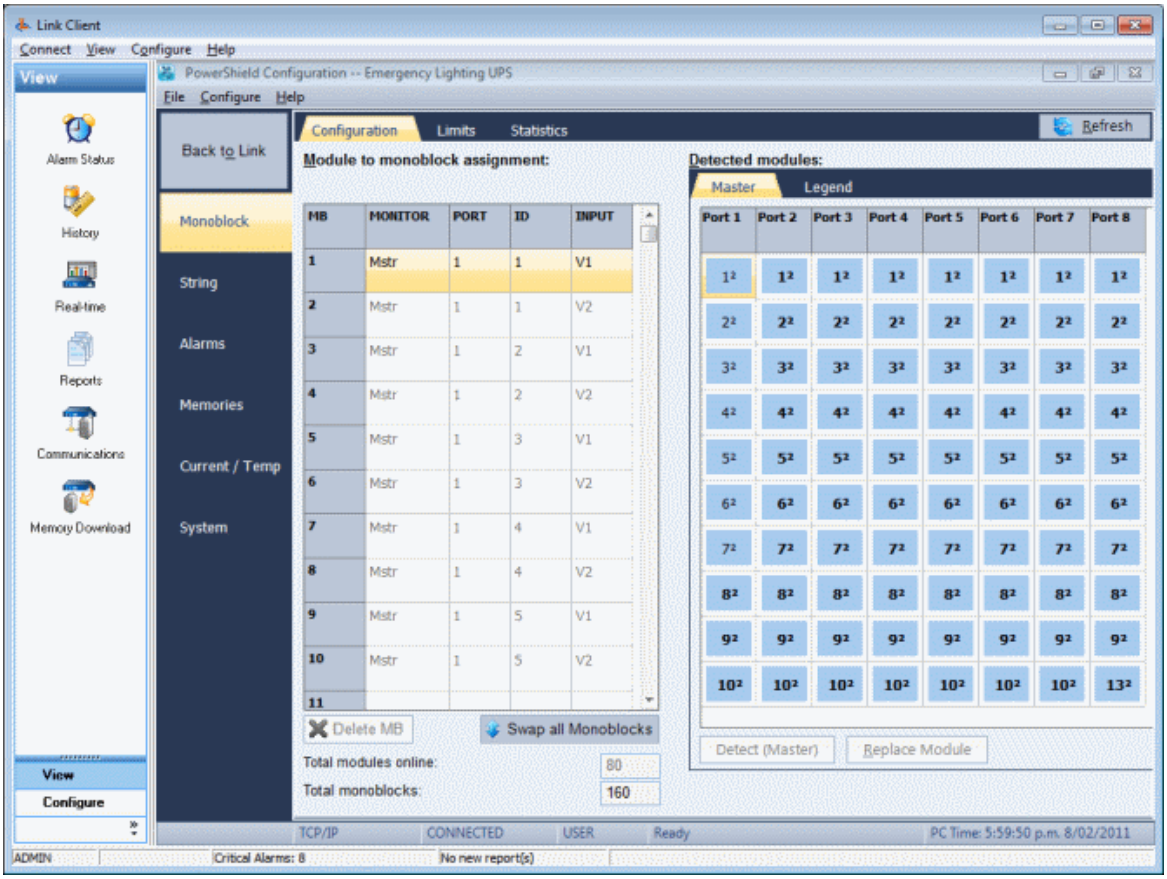
The LinkClient has the facility to launch the Config program and establish a connection so adjustments can be made to the battery monitor.

To launch the Config program from the LinkClient perform the following steps.

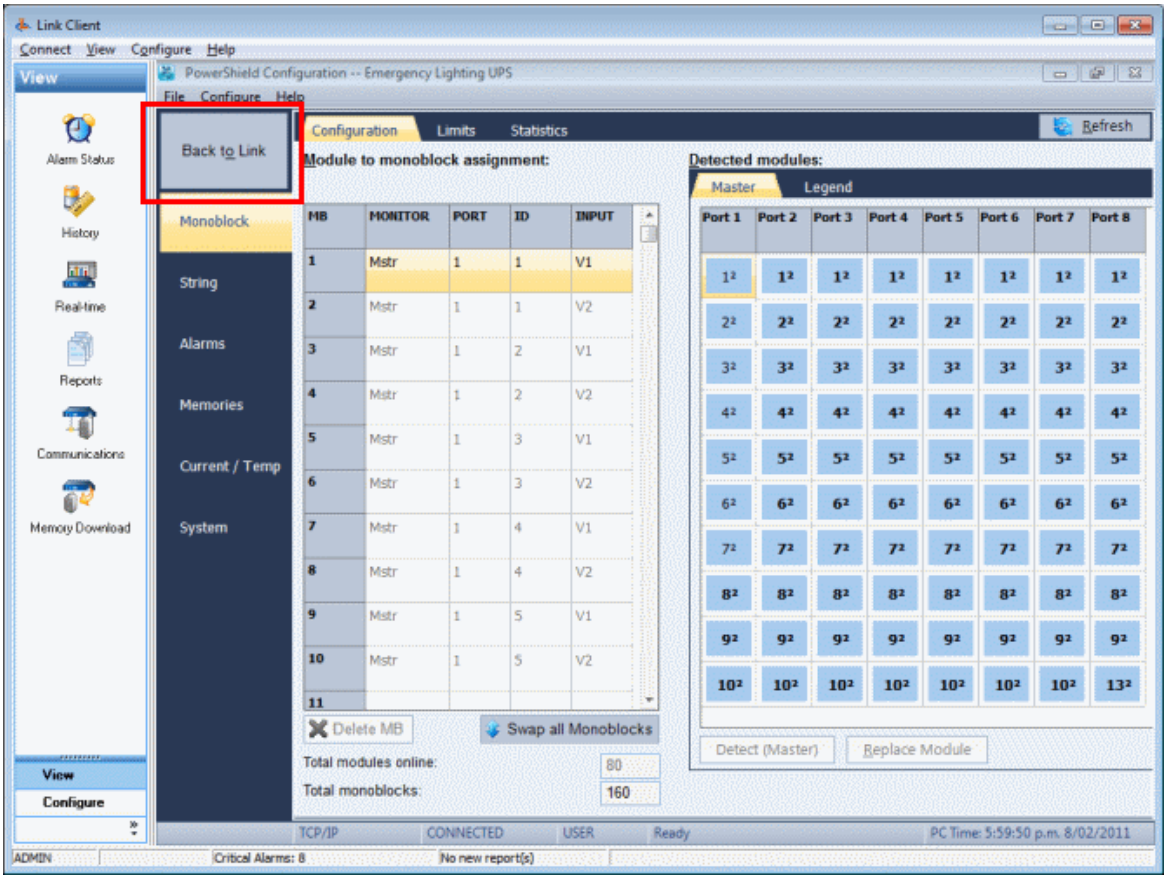
Step 1 click on the ***Launch Config*** button as show below.



Step 2 Use Config to make a change or changes to the battery monitor

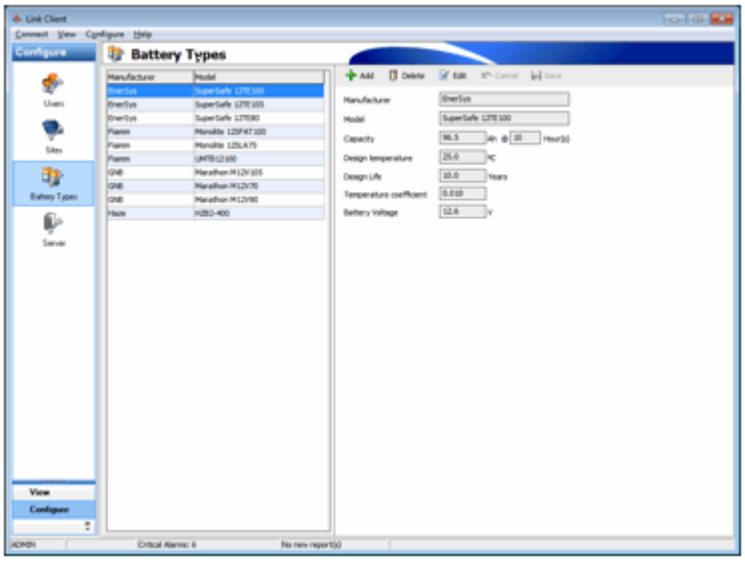


Step 3 click on ***Back to Link*** button in Config to close Config and return to Link



12.4 Configure Battery Types

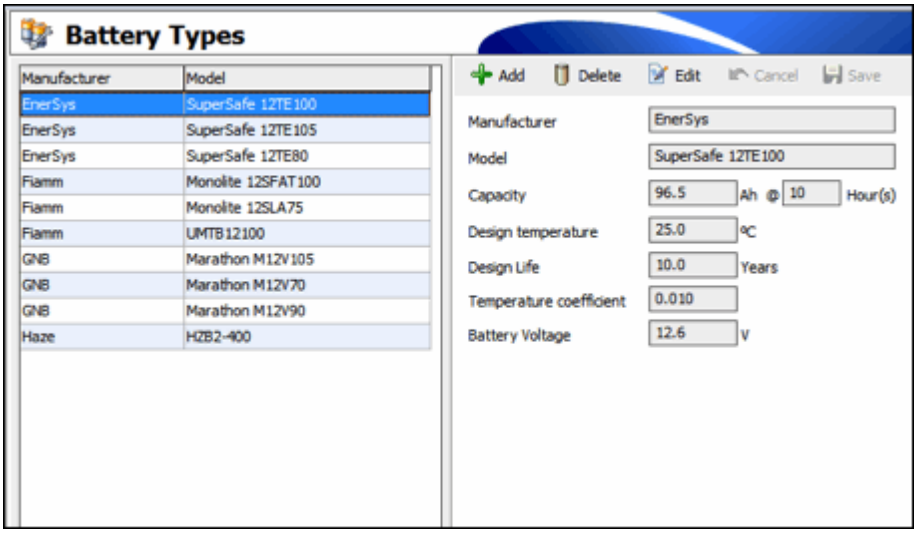
The *Battery Types* screen (see sample screen below) provides the functionality to manage the type of batteries in use at your sites. The battery type information is used for battery life prediction calculations.



12.4.1 Add a Battery Type

From the *Battery Types* screen you can add a battery type by clicking the ***Add*** icon.

You will notice that the fields become active, i.e. they change from being greyed-out to white.



The fields are described in the table below.

Field	Description
Manufacturer	The manufacturer of the battery.
Model	The battery model identifier.
Capacity	The Amp Hour (Ah) rating and the rate at which this is specified. Most batteries are rated at a 10-hour rate. In the example above the battery is rated to supply 9.65A for 10 hours before its voltage will drop to 10.5 Volts (fully discharged).
Design temperature	The design temperature of the battery as specified in the manufacturer's data sheet for the new battery type. This is the temperature at which the capacity and design life are specified.
Design Life	The design life of the battery as specified in the manufacturer's data sheet for the new battery type.
Temperature coefficient	This is the fraction of the design life by which the life of the battery is reduced for each degree Celsius (°C) increase in the average temperature of the battery. Use a value of 0.01 if you cannot obtain this figure from the manufacturer's data sheet for the new battery type.

12.4.2 Edit a Battery Type

WARNING: Making changes to a battery type will affect battery Life Prediction calculations for all sites that use this type of battery.

From the *Battery Types* screen, select the battery type from the *List* pane and click the ***Edit*** icon to enable the fields. Make the changes as required and click the ***Save*** icon to save the changed details.

At any time before you click the ***Save*** icon you can click the ***Cancel*** icon to revert to the settings as at the last saved configuration.

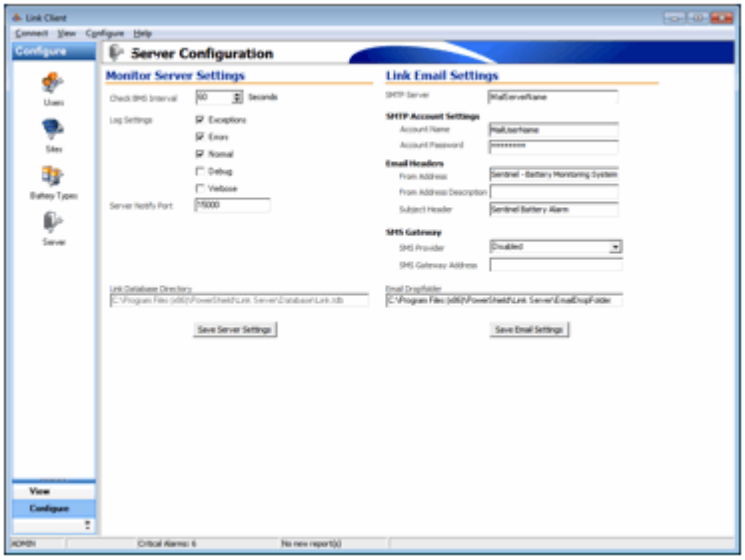
12.4.3 Delete a Battery Type

From the *Battery Types* screen you can delete a battery type by selecting the type from the *List* pane and then clicking the ***Delete*** icon.

Note: Only Battery Types that are not in use can be deleted.

12.5 Configure Server

The *Server Configuration* screen (see sample screen below) provides the functionality to configure the Link Server and the *Link Email settings*.



12.5.1 Monitor Server Settings

Field	Description
Check BMS interval	LinkServer polling of the monitor interval
Log Settings	Log options of the LinkServer
Server Notify Port	For legacy support only. LinkServer TCP Port number for listening for monitor notifications.
Link Database Directory	Link database location. The default location is *C:\Program Files\PowerShield\Link Server\Database*. The default database name is **Link.fdb**. Note Do not alter this parameter without making the same change in the ***Reports.INI*** file and restarting the *PsReportServer* Windows NT Service.

To save your changes click on Save Server Settings.

Note: For the changes to take affect the LinkServer needs to be restarted. The restart can be done by restarting the PsMonitorServer Windows NT service or rebooting the computer.

12.5.2 Link Email Settings

Field	Description
SMTP Server	IP address or host name of SMTP server
Account Name	SMTP server Link account name

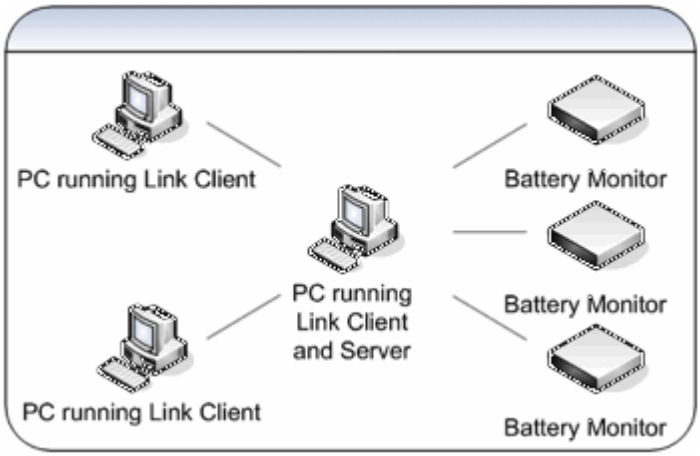
Field	Description
Account Password	SMTP server Link account password
From Address	Sender address of Link email
From Address Description	Sender description of Link email
Subject Header	Email subject header of Link email
SMS Provider	Email to SMS gateway option
SMS Gateway Address	SMS gateway IP address or host name
Email Dropfolder	Location of drop folder

To save your change click on Save Email Settings.

Note: For the changes to take affect the LinkServer needs to be restarted. The restart can be done by restarting the PsEmailDispatcher Windows NT service or rebooting the computer.

12.5.3 Configuring LinkClient to LinkServer on a different computer

The Link software is client server and so the LinkServer can support multiple LinkClient's. The only requirement is for the computers running LinkClient to be on the same LAN.
Below is an example topology



LinkClient uses two parameters from the *LinkClient.ini* file to determine how to connect to the LinkServer. The parameters are show below

[SERVER]
SERVER_HOST=<LinkServer address>
SERVER_PORT =<LinkServer TCP port number>

By default the parameters are *SERVER_HOST=localhost* and *SERVER_PORT=14000*

Steps for changing parameters in the *LinkClient.ini* file

Step	Action
1	The *LinkClient.ini* file location is dependent on the version of Windows. To easiest way to locate the file is to run the LinkClient and go to the *Help* menu and select ***Configuration folder***. This

Step	Action
	opens a file browser in the correct location.
2	Close LinkClient
3	Open *LinkClient.ini* with Notepad or another Text editor
4	Alter parameters and save *LinkClient.ini* file
5	Run LinkClient
NOTE The SERVER_PORT parameter of the LinkClient and LinkServer have to match	

The *LinkServer ini* file is location in *C:\Program Files\PowerShield\Link Server* and the filename is *PsMonitorServer.ini*.
For the changes in *PsMonitorServer.ini* to take affect the *PsMonitorServer* Windows NT Service has to be restarted which can be done via the *PSL Service Controller.exe* application, Windows Service Controller *services.msc* or by rebooting the computer.

12.6 Alarm details

Alarm	Description
Monoblock Voltage	The monoblock voltage is not within the monoblock voltage limits.
Temperature	The string temperature is not within the limits.
String Current	The string current is not within the limits.
Module Failure	A module has stopped responding.
Monitor Slave Offline	A slave battery monitor (in a Master/Slave system) has stopped responding to the Master.
String Voltage	The string voltage is not within the limits.
String State Change	A string has changed to status to either **Discharge, Charge** or **Float**.
Monoblock Variation	The maximum variation between monoblock voltages on a string has exceeded the limit.
Monitor Memory	The battery monitor memory alarm. It could be any one of these alarms: • Memory Format • Memory Low • Memory Full • Long Term Memory Low • Long Term Memory Full
Mains Failure	A mains failure alarm (main detect contact open).
Test not started	Legacy no longer supported
Test Overrun	Legacy no longer supported
Notify Failure	Legacy a battery monitor failed to send an alarm to Link.
No Comms Response	Link could not contact the specified battery monitor.
Download Error	One or more errors have occurred when trying to download a memory from

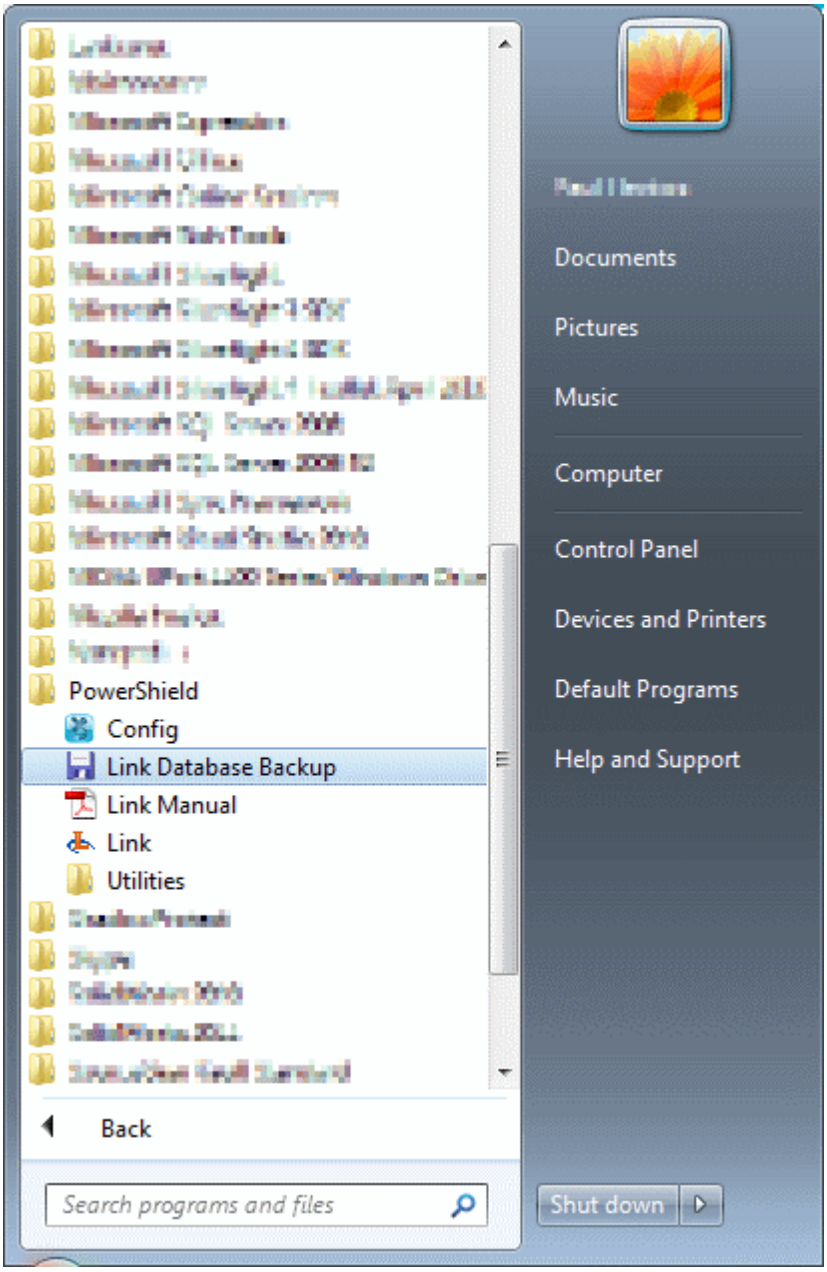
Alarm	Description
	a monitor
Site name difference	Site name in the Link database is different to the battery monitor sitename
Unknown Monitor Notification	An alarm notification has been received from a battery monitor that has not been configured in Link.
Discharge Test Initialise Fail	Legacy no longer supported
Discharge Test Overrun	Legacy no longer supported
Notification from disabled monitor	Disabled monitor has sent alarm notification.
Battery Capacity Low	Legacy no longer supported
Monitor Input Alarm	Battery monitor input alarm
Monoblock base Ohmic	Monoblock Ohmic alarm. The Ohmic value of a monoblock has gone outside its limits
String median Ohmic	Monoblock Ohmic values for one or more strings have exceeded the maximum variation
Monoblock post temperature	Monoblock Ohmic alarm. The post temperature of a monoblock has gone outside its limits
Monoblock post temperature varation	Monoblock post temperatures for one or more strings have exceeded the maximum variation
Email Transmission Failure	Link failed to send an email for an alarm.
SMS Transmission Failure	Link failed to send an email to the SMS gateway for an alarm.
Mail Server Error	Link Email Dispatcher has an error see PsEmailDispatcher.log file for further details.

13 Database Backup

LinkServer stores the data collected in a database. This database should be backed up regularly and the backup stored in a safe location. Link comes with a database backup utility and can be run from the Windows program menu.

The database is backed up by running the Link Database Backup program from the Windows program menu.

To back the database click on Windows menu ***Start | All Programs | PowerShield | Link Database Backup*** item as shown in the screen shot below.



The time it takes to backup depends on the size of the database and may take 10-20 minutes.
The result file from the back will be located in **C:\PROGRAM FILES\POWERSHIELD\LINK SERVER\BACKUP** with the file extension **fbk**.

13.1 Scheduling the Link database backup

The *Link Database Backup* program can be scheduled by the *Windows Task Scheduler* depending on the version of Windows can be found under the *Control Panel* or *Adminstrative Tools*.

Please consult the **Windows Task Scheduler** documentation for creating a task. The *Link Database backup* program is located in **C:\PROGRAM FILES\POWERSHIELD\LINK SERVER** and the program name is **DBBackup.EXE**.