AKER WADE™

Motive Power Management Systems

Motive Power Manager™

for Express Fast Chargers and DC Power Loggers

User's Manual

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Note

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware or software, nor to provide for every possible contingency in connection with installation, operation, or maintenance. Features may be described herein which are not present in all systems.

Note

This manual is based on Motive Power Manager version 2.4.0.0.

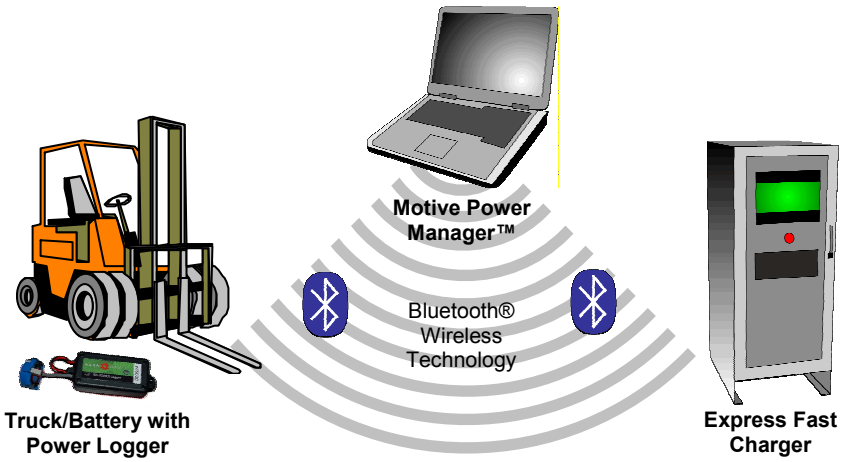
Contents

Chapter 1: Introduction

What is Motive Power Manager™?

Motive Power Manager (MPM) is a comprehensive electric-vehicle fleet energy-management system designed for use with Express fast chargers or Power Logger battery modules. MPM software collects battery data using Bluetooth, wireless technology then merges and analyzes this data to paint a complete picture of vehicle energy usage and battery performance.

MPM can be purchased preloaded on an MPM Netbook computer with software and Bluetooth® wireless capability installed and ready to go out of the box, but MPM software can also be purchased separately for use with a personal computer.



® Bluetooth is a registered trademark of Bluetooth SIG, Inc.
™Motive Power Manager is a trademark of Aker Wade Power Technologies, LLC.

Features

Motive Power Manager is a powerful, energy-management system designed for all types of charging applications including conventional, opportunity, and fast charging.

Communications

- Charger and battery data automatically aggregated using wireless technology.
- Information distributed by PC, local network, or through the Internet.

User-Defined Exceptions

- Exceptions defined either for an entire fleet or per battery/truck.
- All important battery variables monitored: voltage, temperature, electrolyte level, energy throughput, and charging compliance.

Powerful Reporting Tools

- Over 30 reports predefined for big-picture fleet monitoring.
- Powerful graphical reports for quick analysis.
- Relative workload reported by battery, truck, or the fleet as a whole.
- Reports scalable, for all dates or a range of dates, by battery, truck, or fleet.
- Works with DC Power Logger wireless battery monitoring devices and Express fast chargers.

Getting Started

Note: See "Appendix A. Installing Motive Power Manager on a User-Supplied Computer" if you did not purchase MPM on an MPM Netbook from Aker Wade Power Technologies.

Starting-Up Motive Power Manager

If you purchased a Motive Power Manager Netbook, all necessary software will be installed ready to run out of the box. The MPM Netbook is also shipped with a Bluetooth adapter ready to plug in and start communicating with Express Fast Chargers and DC Power Logger battery modules.

MPM Netbook

Bluetooth Adapter

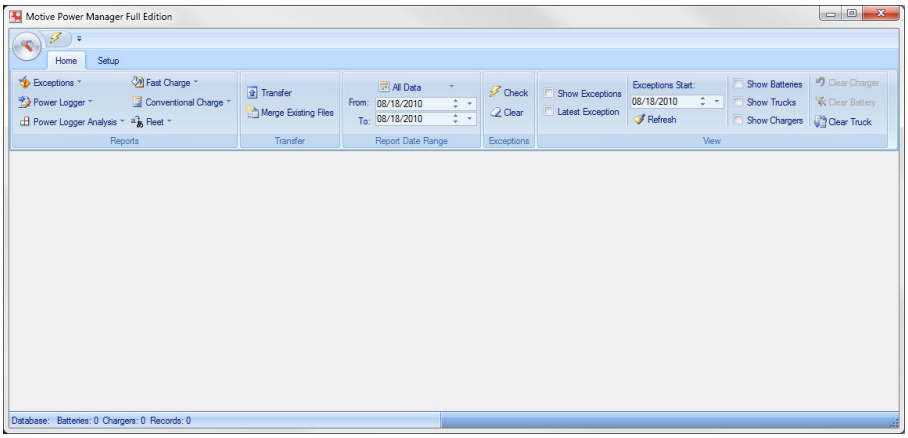
Note: See "Chapter 2. Setting-Up Your Fleet Management System" for details on creating and managing an MPM Database and configuring exception parameters.

To startup Motive Power Manager:

1. Remove the MPM Netbook, power cord, and Bluetooth adapter from the box.
2. Connect the power cable to the MPM Netbook and power it up
3. Once Windows® has started, insert the Bluetooth adapter into one of the USB ports. The LED on the adapter should illuminate indicating it is ready to communicate.

4. Start up Motive Power Manager by double-clicking the icon on the Windows Desktop. The MPM software will open as shown below.

Note: Motive Power Manager with a blank database showing no charger, battery, or exception data.



Quick Tour of the MPM User Interface

The MPM user interface is similar in appearance and operation to the most recent Microsoft Office programs.

Quick Start Button

Usually, the first task you perform when beginning a session with Motive Power Manager is to create or open a database. The MPM Quick Start button provides quick access to available databases in your system and is the starting point for creating, opening, and importing databases. Transferring data from chargers and battery modules can also be initiated here.

Note: To add an MPM command to the toolbar: Right-click the desired command residing on the **Home**, or **Setup** tab and choose **Add to Quick Access Toolbar** from the pop-up menu.

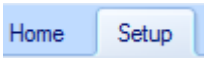
Quick Access Toolbar

The Quick Access toolbar is a user-configurable collection of MPM commands for often-performed tasks. Most MPM commands can be added to the toolbar giving you the flexibility to work the way that is most convenient for you. The toolbar can also be placed above or below the tab area.

Note: To move the toolbar above or below the ribbon: Right-click on the text of one of the tabs and choose **Show Quick Access Toolbar Below (Above) the Ribbon** from the pop-up menu.

To minimize the ribbon tab area: Right-click on the text of one of the tabs and choose **Minimize the Ribbon** from the pop-up menu.

Setup and Home Tabs



The full collection of MPM commands are divided into two categories and grouped onto the tabs: **Setup** and **Home**. The tab area, referred to as the ribbon, can be minimized to allow for more viewing area in the **Exceptions**, **Batteries**, **Chargers**, and **Trucks** panes.

The **Setup** tab is where you configure exceptions, program Power Logger battery modules, and perform database and system tasks.

The **Home** tab contains a complete set of options for often-used tasks such as "discovering" chargers and battery modules through the Bluetooth wireless system, transferring data from them, and merging the data into a database. In addition, the **Home** tab provides a comprehensive suite of reports and graphs that can be printed

Note: See "Chapter 3. Transferring and Merging Data" to learn how to collect data from Express Fast Chargers and DC Power Logger modules and merge it into an MPM Database.

or exported. Also, there is a set of controls for viewing the data that is displayed in the viewing panes for **Exceptions** , **Batteries**, **Chargers**, and **Trucks** below the tabs.

Custom Program Settings

Note: See "Chapter 2. Setting-Up Your Fleet Management System" to learn how to customize MPM software for your particular charging and monitoring operation.

MPM software allows you to select only the features of the program that are needed for your particular charging and monitoring operation. MPM software is designed to work with all types of battery charging and monitoring applications (fast charging, opportunity charging, and conventional charging) and to collect data from both Express fast chargers and Power Logger battery modules. Because of this power and flexibility some of the screens and reports and other functionality of the software might not be needed for your application and can be hidden from view if desired.

The **Settings** command on the **Home** tab allows you to configure MPM software to show only the features and information you need for transfer operations; for viewing battery, charger, exception, or truck data in the viewing panes; and for reports.

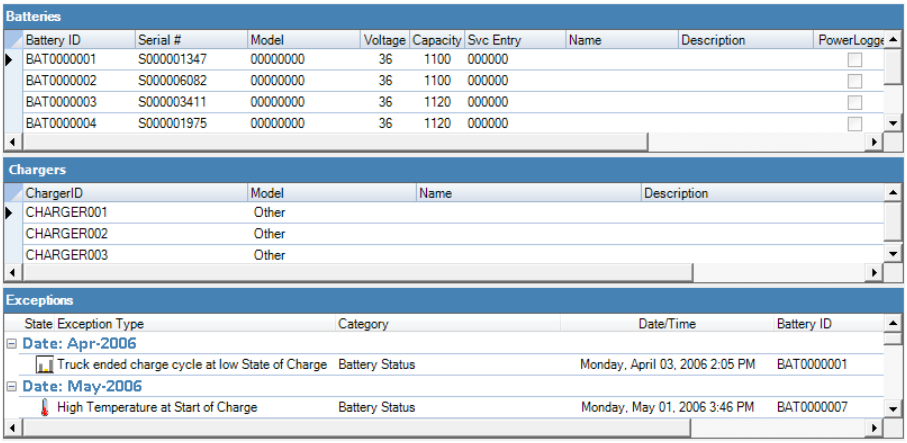
Chargers, Batteries, and Exceptions Viewing Panes

If your operation uses Express Fast Chargers, a list of chargers and batteries will appear in their respective panes once you have transferred and merged log files from the chargers. If your operation uses Power Logger modules to collect battery data, a list of these batteries will appear in the **Batteries** pane once you have transferred and merged log files from those modules.

The exceptions that appear in the **Exceptions** pane are controlled in three ways:

1. The setting of exception parameters in the **Setup** tab.
2. The setting of the date parameters in the **Setup** or **Reports** tab. This establishes a time window for which exceptions are displayed.
3. The selection of a specific charger and/or battery in the **Chargers** and **Batteries** panes (or multiple chargers and/or batteries). This limits the exceptions displayed to only those specific chargers and batteries.

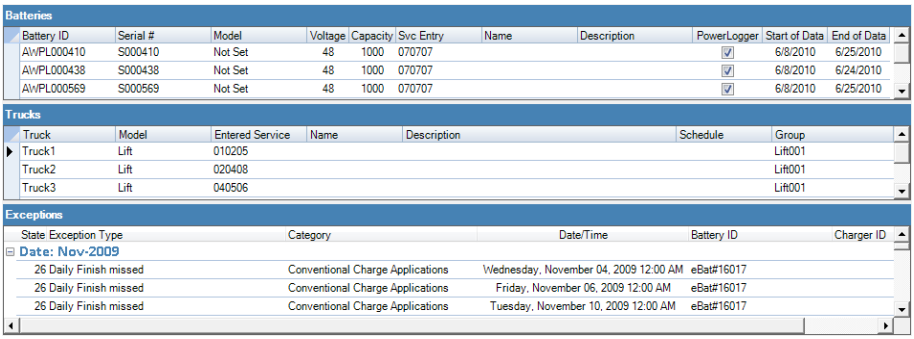
Note: See "Chapter 4. Viewing Exceptions and Generating Reports" for complete instructions on controlling the view of the **Chargers**, **Batteries**, and **Exceptions** panes.



Trucks Viewing Pane

If your operation uses Power Loggers for battery monitoring, the addition of a Truck ID module mounted on the electric vehicle allows you to monitor truck utilization. From the **Trucks** viewing pane in the MPM software you can enter descriptive information about your trucks and also assign trucks to a truck group and shift schedule for greater flexibility in monitoring truck utilization through the **Fleet** reports.

Note: Batteries are listed in the **Batteries** pane whether battery data is collected through Express fast chargers or Power Logger modules. Those listed from Power Loggers are distinguished by a checked box in the Power Logger column.



Batteries

Battery ID	Serial #	Model	Voltage	Capacity	Svc Entry	Name	Description	PowerLogger	Start of Data	End of Data
AWPL000410	S000410	Not Set	48	1000	070707			☑	6/8/2010	6/25/2010
AWPL000438	S000438	Not Set	48	1000	070707			☑	6/8/2010	6/24/2010
AWPL000569	S000569	Not Set	48	1000	070707			☑	6/8/2010	6/25/2010

Trucks

Truck	Model	Entered Service	Name	Description	Schedule	Group
Truck1	Lift	010205				Lift001
Truck2	Lift	020408				Lift001
Truck3	Lift	040506				Lift001

Exceptions

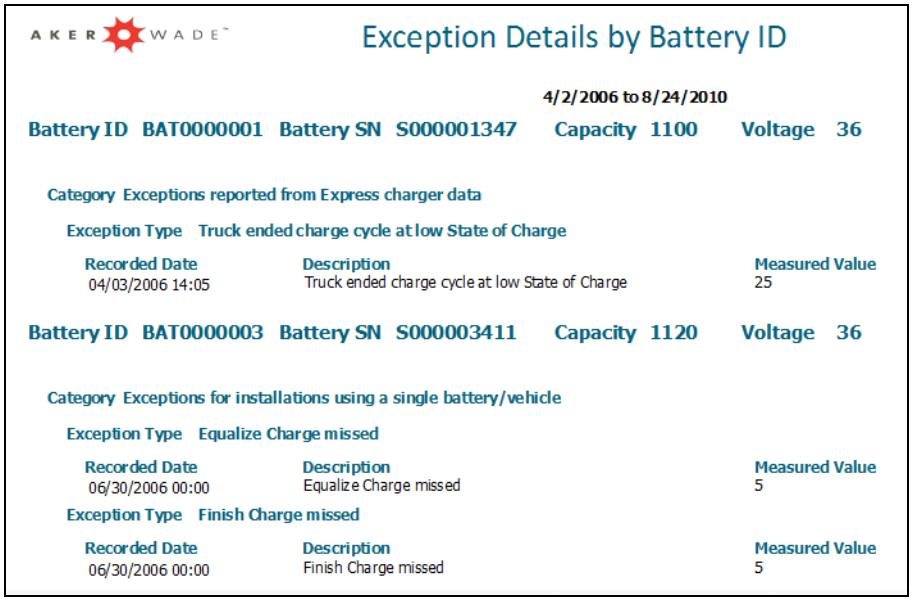
State	Exception Type	Category	Date/Time	Battery ID	Charger ID
Date: Nov-2009					
	26 Daily Finish missed	Conventional Charge Applications	Wednesday, November 04, 2009 12:00 AM	eBat#16017	
	26 Daily Finish missed	Conventional Charge Applications	Friday, November 06, 2009 12:00 AM	eBat#16017	
	26 Daily Finish missed	Conventional Charge Applications	Tuesday, November 10, 2009 12:00 AM	eBat#16017	

Note: See "Chapter 4. Viewing Exceptions and Generating Reports" and "Chapter 5. Power Logger Analysis Tools" for more information.

Reports, Graphs, and Power Logger Data Analysis

The viewing panes allow you to keep track of exceptions as soon as data from chargers or Power Logger battery modules have been transferred and merged. If you want to create a permanent record of battery data or perform more in depth analysis, you can choose one of the many formats for generating a report or graph. For in-depth power discharge analysis of your operation you can use the Power Logger Analysis tools.

Sample Exception Report



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Exception Details by Battery ID

4/2/2006 to 8/24/2010

Battery ID BAT0000001 Battery SN S000001347 Capacity 1100 Voltage 36

Category Exceptions reported from Express charger data

Exception Type Truck ended charge cycle at low State of Charge

Recorded Date	Description	Measured Value
04/03/2006 14:05	Truck ended charge cycle at low State of Charge	25

Battery ID BAT0000003 Battery SN S000003411 Capacity 1120 Voltage 36

Category Exceptions for installations using a single battery/vehicle

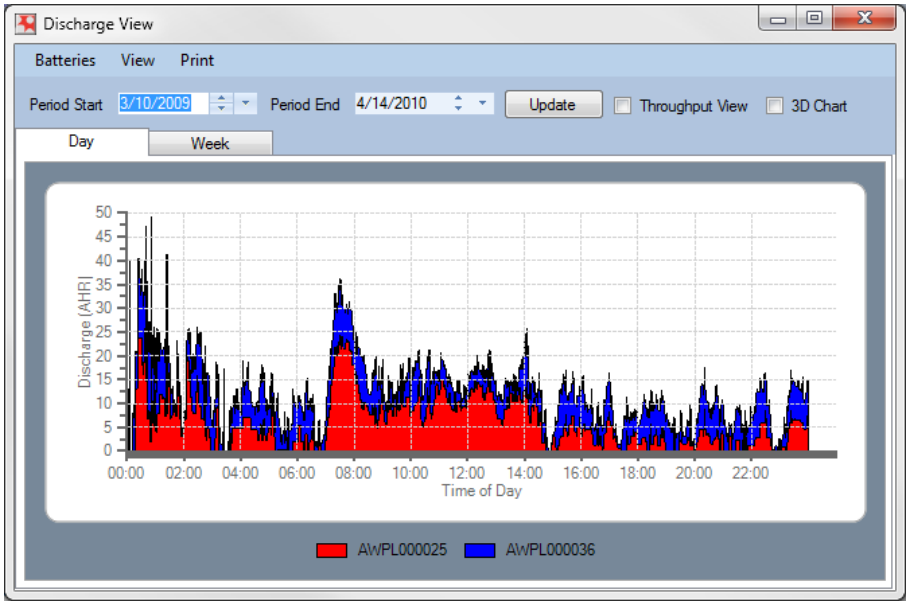
Exception Type Equalize Charge missed

Recorded Date	Description	Measured Value
06/30/2006 00:00	Equalize Charge missed	5

Exception Type Finish Charge missed

Recorded Date	Description	Measured Value
06/30/2006 00:00	Finish Charge missed	5

Discharge comparison of Two Batteries Using the Power Logger Analysis Tools



Chapter 2: Setting-Up Your Fleet Management System

Setting-up a fleet management system using Motive Power Manager is done essentially the same way whether your operation uses Express Fast Chargers or DC Power Logger battery modules as the source for battery data.

The basic steps described in this chapter for setting-up your management system are:

Step 1. Starting Motive Power Manager

Step 2. Obtaining a License

Step 3. Customizing MPM Software for your Operation

Step 4. Creating an MPM Database

Step 5. Configuring Power Logger Battery Modules (Power Logger applications only)

Step 6. Performing an Initial Transfer and Merge from Express Fast Chargers or Power Logger Battery Modules

Step 7. Editing Charger and Battery Details

Step 8. Configuring Exception Parameters

Step 9. Creating Shift Schedules and Truck Groups (Conventional charging applications only)

Other Setup operations described in this chapter include:

- Setting Exception View Parameters
- Performing Database Tasks
- Transferring MPM Software to a Different Computer or Recovering from Corrupted Software
- MPM Software Version and Resetting the Software

Step 1. Starting Motive Power Manager

To get started you must first start Motive Power Manager and get a license from Aker Wade.

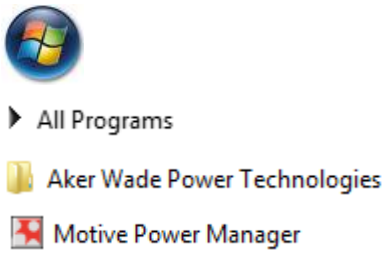
To start Motive Power Manager:

Start Motive Power Manager by double-clicking the icon  on the Windows Desktop.

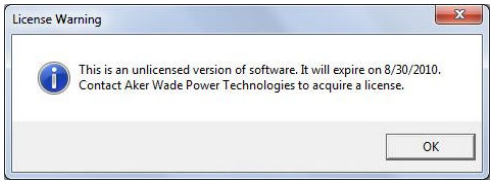
NOTE: Any time you intend to transfer data from a Fast Charger or Power Logger you must insert the Bluetooth adapter securely into one of the USB ports before starting Motive Power Manager. The LED on the adapter should illuminate indicating it is ready to communicate.

Or,

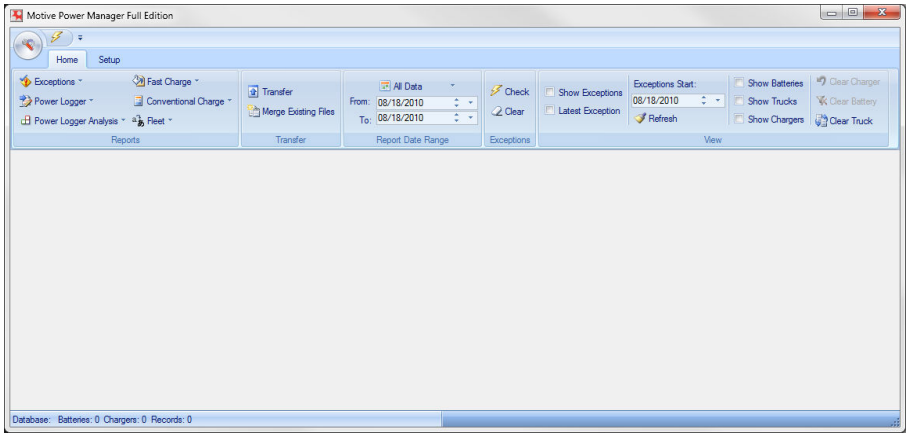
Click the **Windows Start** button and navigate to the Motive Power Manager program as shown below.



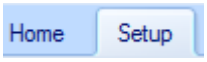
The Motive Power Manager program will open with a reminder that this is an unlicensed version and that you need to contact Aker Wade for a license.



Upon clicking **OK** a blank database will open.



Step 2. Obtaining a License

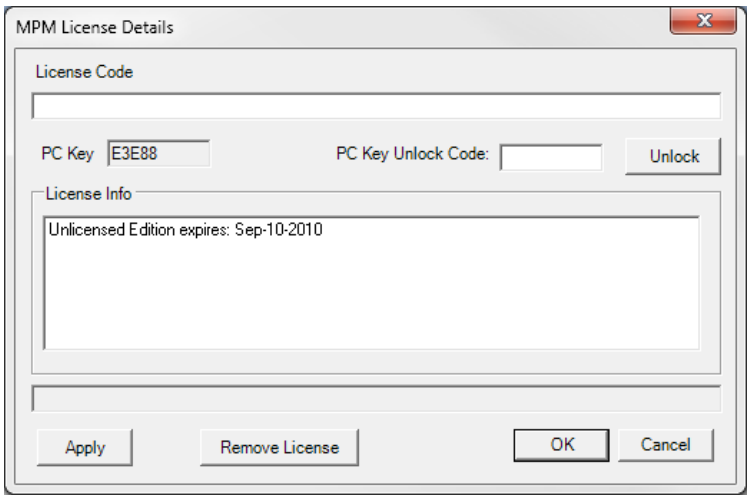


Basic and Full license versions of MPM software are available. Unlicensed software has the same functionality as the Basic license version but will operate only 5 days. The Basic Edition, which is free, supports the most recent 60 days of Fast Charge data, the most recent 7 days of fixed-install Power Logger data, and unlimited split-core Power Logger data. The Full Edition, which must be purchased initially and renewed annually, supports unlimited days on all Fast Charger and Power Logger data.

See Appendix B. MPM Features List, for a complete list of features available in MPM software.

To obtain a license for the Basic or Full Edition of MPM:

1. From the **Setup** tab click License. The **MPM License Details** dialog box opens.



2. Email the following information to service@akerwade.com :
   - The 5-digit **PC Key** located on the **MPM License Details** screen.
   - Your first and last name.
   - Reference number (found on the envelope for the CD containing MPM software). This is for those who have purchase the software on CD-ROM only.
   - Your email address.
   - Your phone number.
   - Your company name.

   A License Code good for one year will be generated and e-mailed to you. The start date begins on the day your license code was sent to you.
3. Copy and paste the code into the **License Code** box
4. Verify that the code matches exactly and click **Apply** then **OK**.

NOTE: After clicking **Apply** you should see either Basic Edition or Full Edition in the description text box along with the features included.

Step 3. Customizing MPM Software for your Operation

MPM software provides a comprehensive set of features for all types of charging applications: fast, opportunity, and conventional. In order to tailor the software to your particular application's requirements, however, you can select and display only the features of the program that are needed for your particular charging and monitoring operation.

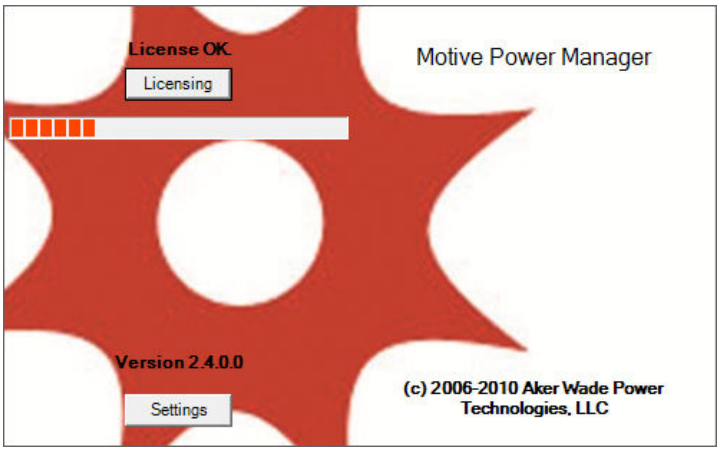
To configure program settings:

1. Once the MPM program is running, from the **Setup** tab click the Info command Settings. The **Program Settings** screen will open.

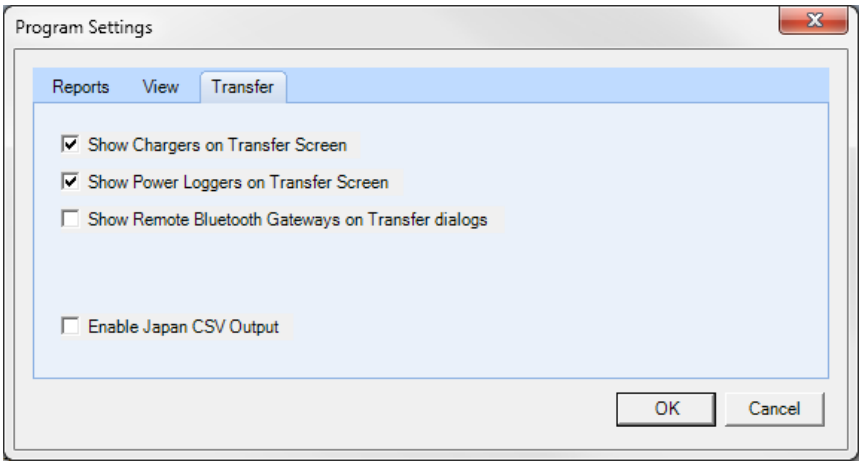
Or,

Immediately after initiating the startup of the MPM software, click the **Settings** button on the MPM startup screen. In this case the **Program Settings** screen will open before the MPM program starts running.

MPM Startup Screen



Program Settings Screen



NOTE: The **Program Settings** option, **Enable Japan CSV Output,** is for special applications only and should not be checked unless authorized by Aker Wade.

2. Check or uncheck the boxes on each of the tabs of the **Program Settings** screen: **Transfer**, **View**, and **Reports**. See the table below for typical settings for different charging operations.
3. Click **OK**.
4. If you accessed the **Program Settings** screen from the **Setup** tab, close and restart Motive Power Manager.

Typical Program Settings for MPM Software by Application Type

Program Setting	Express Fast Charging	Opportunity Charging with Power Loggers	Conventional Charging with Power Loggers	Gateway
Transfer Tab				
Show Chargers on Transfer Screen	☑	☐	☐	☐
Show Power Loggers on Transfer Screen	☐ or ☑	☑	☑	☐
Show Remote Bluetooth Gateways[1] on Transfer dialogs	☐	☐	☐	☐
View Tab				
Hide Batteries	☐	☐ or ☑	☐ or ☑	☑
Hide Chargers	☐	☑	☑	☑
Hide Exceptions	☐	☐	☐	☑
Hide Trucks	☑	☑	☐ or ☑[2]	☑
Reports Tab				
Hide Fast Charge Reports	☐	☑	☑	☑
Hide Conventional Charge Reports	☑	☑	☐	☑
Hide Power Logger Reports	☑	☐	☐	☑
Hide Power Logger Analysis	☑	☑	☑	☑
Hide Fleet Management Reports	☑	☑	☐ or ☑[2]	☑

[1]Remote Bluetooth Gateways is a term used for a legacy product and is not used in any current installation.
[2] Viewing data by truck in the Trucks viewing pane and viewing Fleet Management Reports require the installation of an Aker Wade Truck ID module to identify the electric vehicle to the Power Logger.

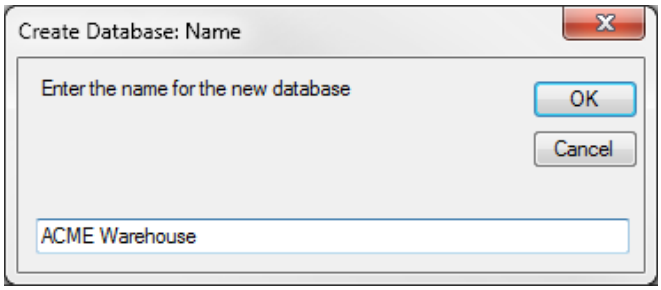
Step 4. Creating an MPM Database for the First Time

To create a new Motive Power Manager database:

1. With MPM Software running, click the Motive Power Manager **Quick Start** button

And choose 

. The **Create Database** box opens.



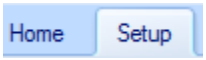
2. Type the name of the database in the name box.

3. Click **OK**. Motive Power Manager will create and open a new database. The name of the database will appear in the lower, left corner of the MPM window.

NOTE: The following characters are not permitted as part of a database name: ' " : < > ? [ ] | *

Also, a name that includes a number within parentheses, such as (1), is not permitted.

Step 5. Configuring Power Logger Battery Modules



Note: Skip this step if you are not using Power Logger Battery Modules.

Note: For instructions on installing the Bluetooth adapter and software on your computer, see "Appendix A. Installing Motive Power Manager to a User-Provided Computer. "

NOTE: Any time you intend to transfer data from a Fast Charger or Power Logger you must insert the Bluetooth adapter securely into one of the USB ports before starting Motive Power Manager. The LED on the adapter should illuminate indicating it is ready to communicate.

This step is for Power Logger users only.

Configuring Power Logger battery modules requires Bluetooth communications capability on the computer used to run Motive Power Manager. The Motive Power Manager Netbook is shipped ready to go out of the box with all needed software installed and the Bluetooth adapter included. The Bluetooth adapter shipped with the product is the only adapter that is currently supported by Motive Power Manager. If you are running Motive Power Manager on a user-supplied computer, you will need to purchase the adapter from your supplier separately from the Motive Power Manager software itself.

The Power Logger battery module collects important battery data including voltage, temperature, electrolyte level, energy throughput, and charging compliance. To ensure the data retrieved from the Power Logger modules is accurate, it is important to perform a basic setup for the modules and synchronize the clock of the modules with the PC running Motive Power Manager.

Before configuring Power Logger modules you must first verify that Bluetooth communications is operating and then "discover" the modules.

To verify Bluetooth communications is operating:

In order for the Bluetooth adapter to operate properly with Motive Power Manager, you must install the Bluetooth adapter while the Motive Power Manager program is closed.

1. Before starting up Motive Power Manager, insert the Bluetooth adapter into a USB port on your computer. In a few seconds a Bluetooth icon will appear in the Windows System tray.

   And, the LED on the adapter will be ON.

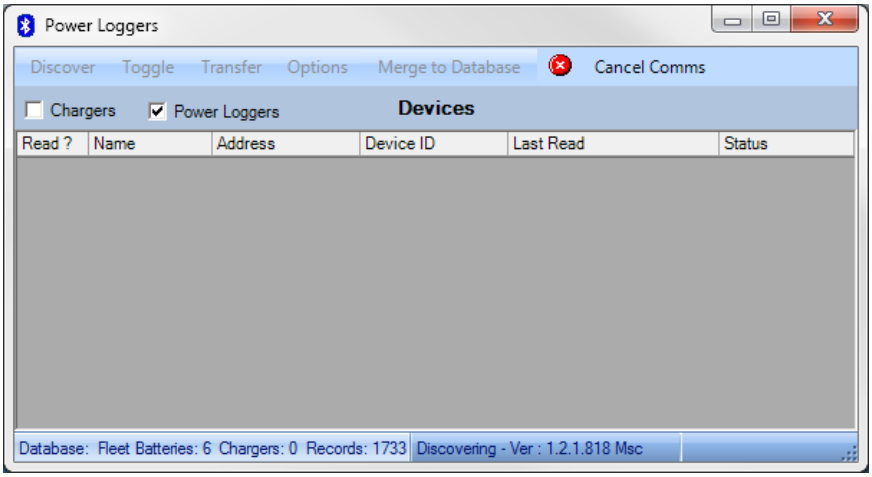
2. Start Motive Power Manager.

To "Discover" Power Logger Battery Modules:

1. From the **Setup** tab click the Configure command 

. The **Power Loggers** setup screen will open.

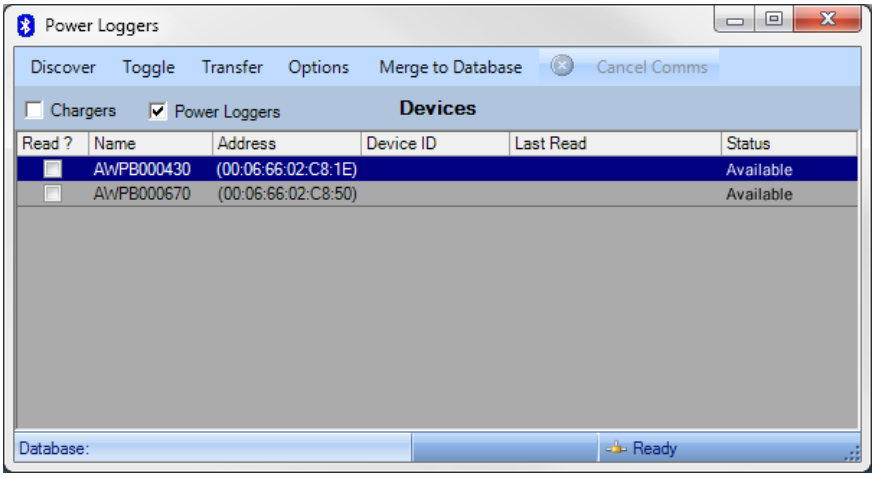
Note: To set the Transfer screen to display Power Loggers only, make sure Chargers is not checked.



Note: The "Discover" operation will take several seconds or longer in a noisy environment where there is a lot of electromagnetic interference, either from plant operations or other wireless devices.

You may need to initiate the "Discover" operation more than once in a noisy environment to make sure all devices are discovered.

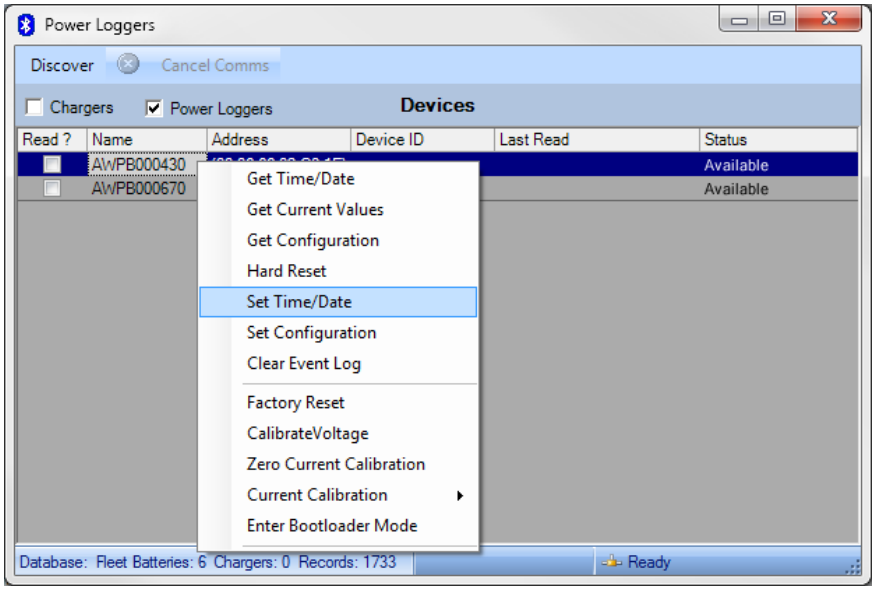
2. Click **Discover**. After a few seconds all battery modules within Bluetooth range will appear in a list similar to that shown below.



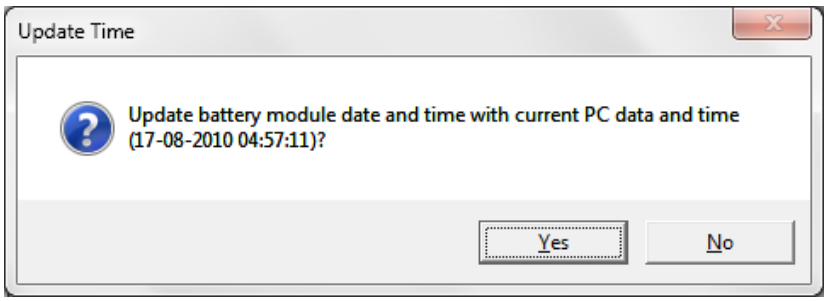
Note: For a description of all Power Logger battery module commands, see Aker Wade publication, "DC Power Logger Installation and Operation Manual, 3-3005-20".

To synchronize date/time with the PC:

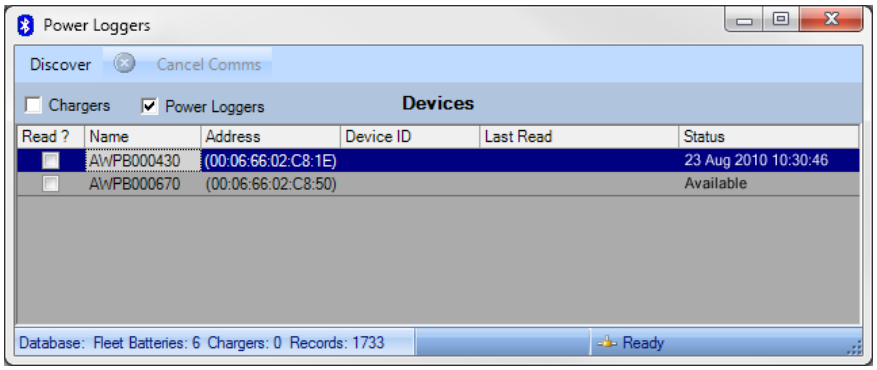
1. Right-click the name of a Power Logger and choose **Set Time/Date**.



The **Update Time** dialog box will appear.

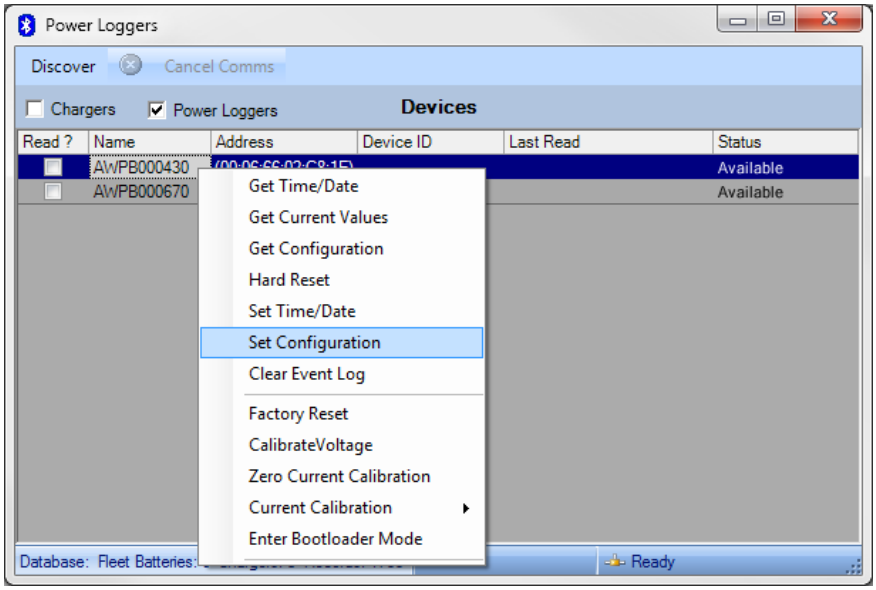


2. Click **Yes**. The synchronized time and date will appear in the status field for the updated Power Logger.

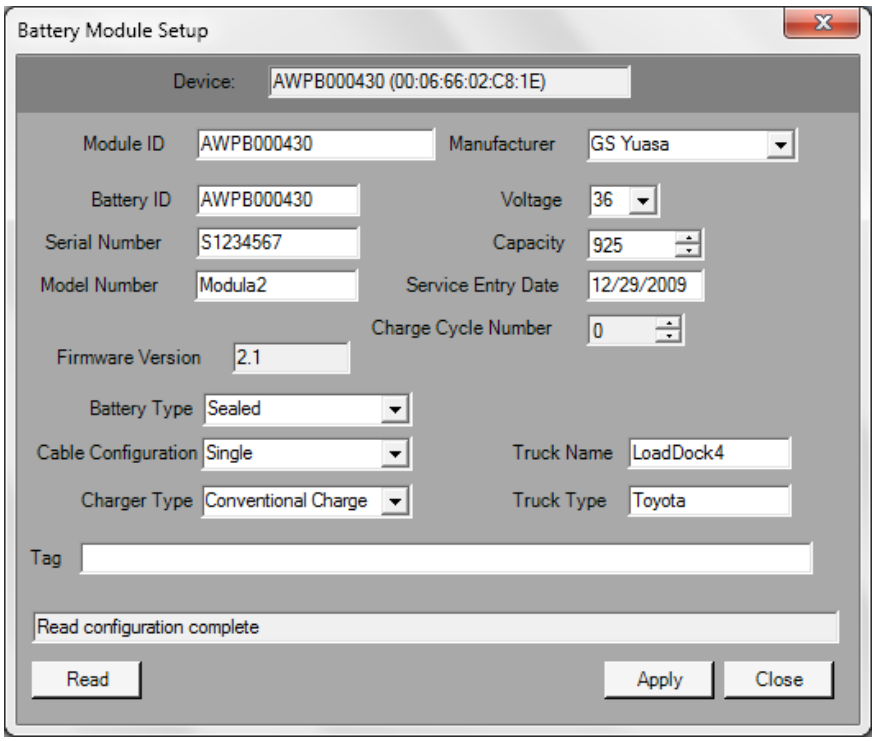


To set the basic configuration:

1. Right-click the name of a Power Logger and choose **Set Configuration**.

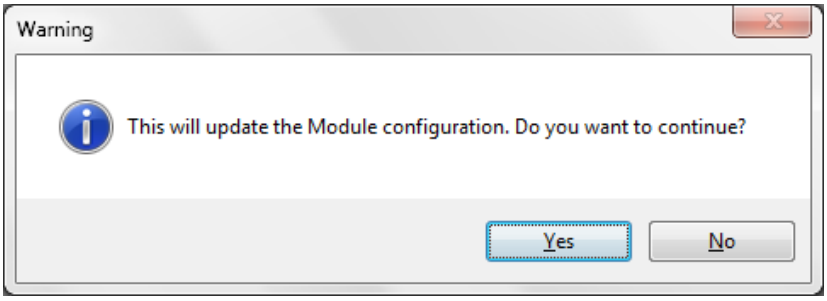


The **Battery Module Setup** dialog box opens.



Note: Synchronize the clocks and perform basic setup for each Power Logger battery module in your operation.

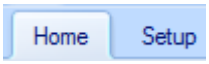
2. Type in the correct configuration information for the battery and click **Apply**. The **Warning** dialog box then opens.



3. Click **Yes**. Then click **Close** on the **Battery Module Setup** dialog box.

   Synchronize the clocks and perform basic setup for each Power Logger battery module in your operation.

Step 6. Performing an Initial Transfer and Merge from Express Fast Chargers or Power Logger Battery Modules

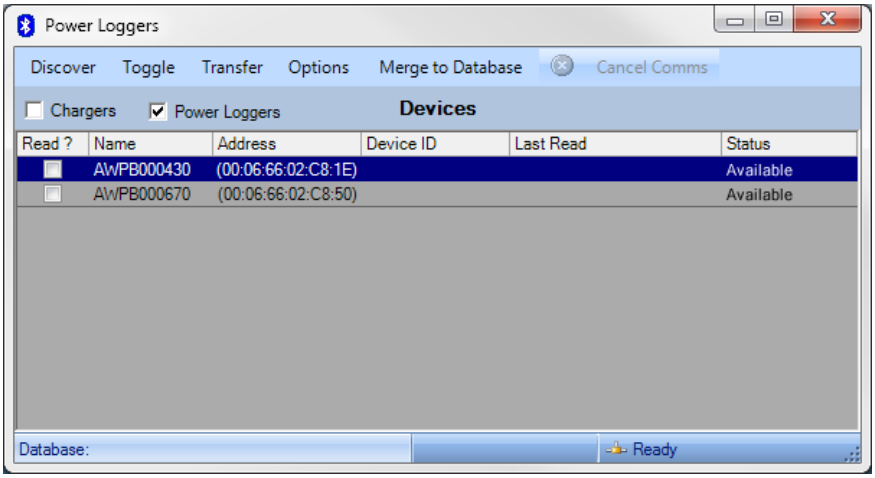


In order to add descriptive information into the database for each fast charger or battery in your operation, you must first perform an initial transfer and merge from the Express Fast Chargers or Power Logger battery modules. This transfer and merge will automatically identify each of the devices in your operation, within Bluetooth communications range (~300ft), and each will be listed in the **Batteries** and/or **Chargers** panes.

To transfer data from Power Logger battery modules:

If you have performed Step 5. "Configuring Power Logger Battery Modules" you will have already discovered the Power Loggers and will only need to perform an initial transfer and merge.

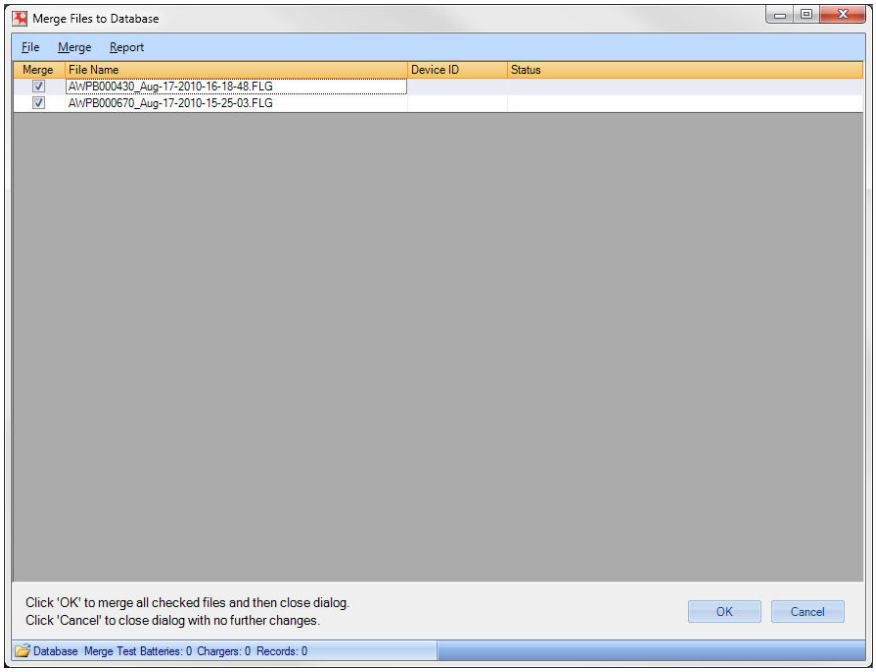
1. From the **Home** tab click Transfer. The Power Loggers transfer screen will open with the previously discovered modules appearing in the list.



2. Check the Power Logger(s) you want to include in the transfer from the list of discovered Power Loggers and click **Transfer**. The status of each transfer is indicated in the **Status** field for each device.

Note: To set the Transfer screen to display Power Loggers only, make sure Chargers is not checked.

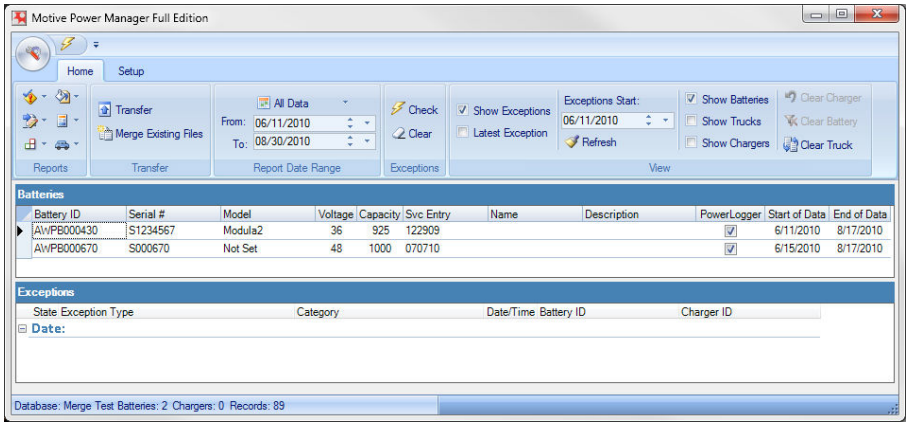
3. Once the transfer for all modules is complete, click **Merge to Database**. The **Merge to Database** screen opens.



4. Check the Power Logger(s) you want to include in the merge and click **Merge**. The status will be updated for each checked Power Logger until the merge is complete.

5. Click **OK** to close the **Merge to Database** screen.

Successful completion of the initial transfer results in a list of batteries appearing in the **Batteries** pane as shown below.



To transfer data from Fast Chargers:

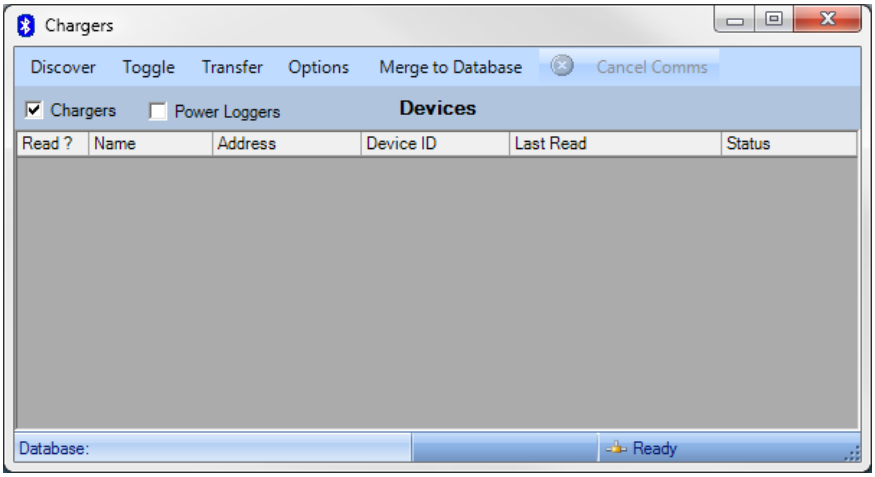
1. From the **Home** tab click Transfer. The **Chargers** transfer screen will open with previously discovered modules appearing in the list or blank if no chargers have been discovered.

Note: To set the Transfer screen to display Fast Chargers only, make sure ☐ Power Loggers is not checked.

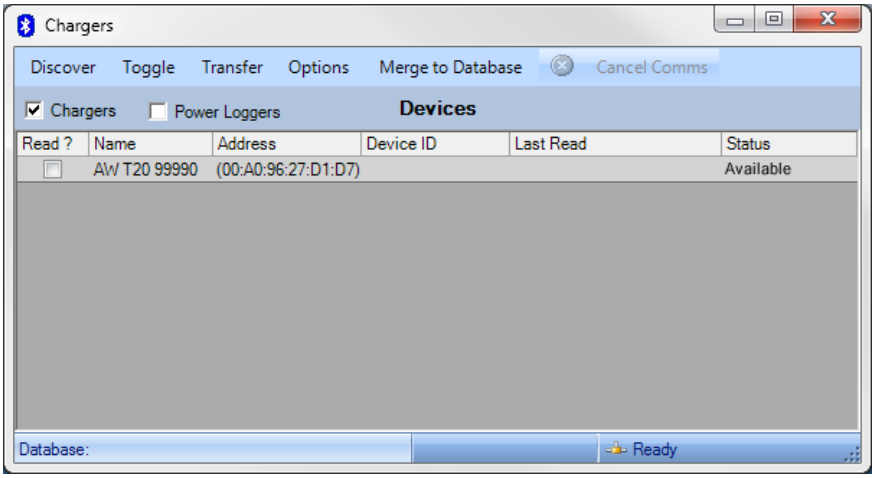
NOTE: Any time you intend to transfer data from a Fast Charger or Power Logger you must insert the Bluetooth adapter securely into one of the USB ports before starting Motive Power Manager. The LED on the adapter should illuminate indicating it is ready to communicate.

Note: The "Discover" operation will take several seconds or longer in a noisy environment where there is a lot of electromagnetic interference, either from plant operations or other wireless devices.

You may need to initiate the "Discover" operation more than once in a noisy environment to make sure all devices are discovered.

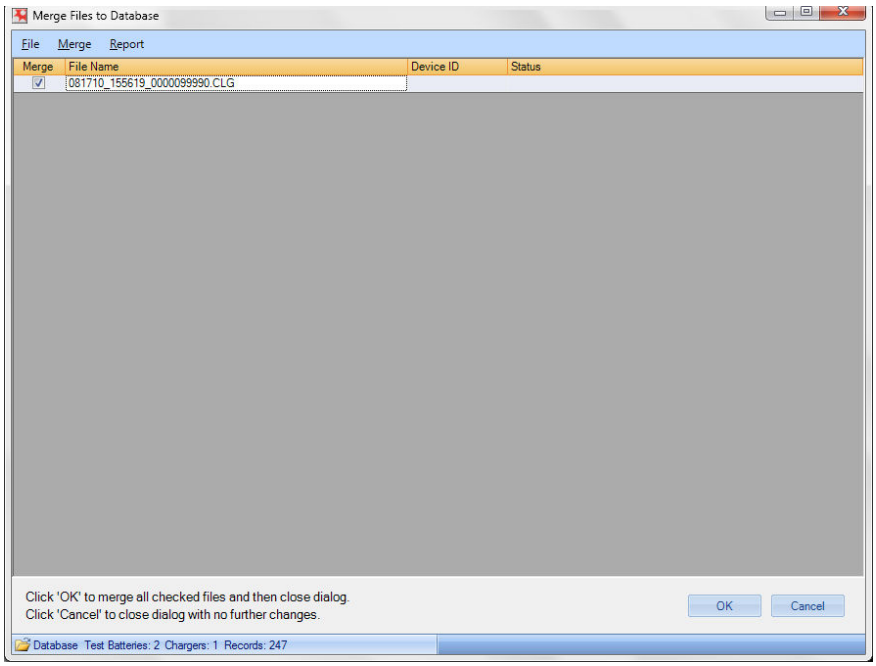


2. From the **Chargers** transfer screen click **Discover**. After a few moments any discovered chargers will appear in the **Chargers** transfer screen as shown below.



3. Check the charger(s) you want to include in the transfer from the list of discovered chargers and click **Transfer**. The status of each transfer is indicated in the **Status** field for each device.

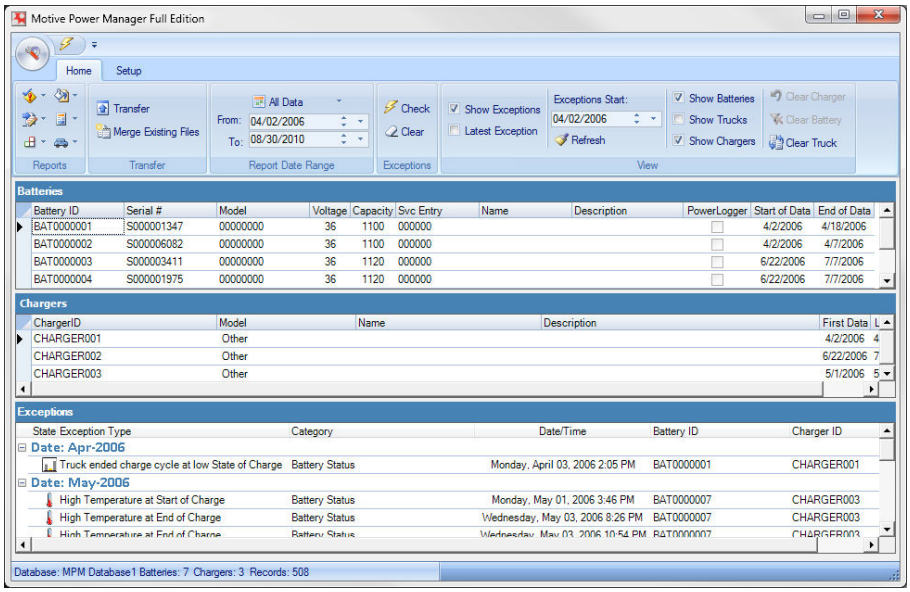
4. Once the transfer for all modules is complete, click **Merge to Database**. The **Merge to Database** screen opens.



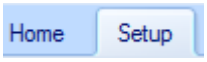
6. Check the charger(s) you want to include in the merge and click **Merge**. The status will be updated for each checked charger until the merge is complete.

7. Click **OK** to close the **Merge to Database** screen.

Successful completion of the initial transfer results in a list of chargers and batteries appearing in their respective viewing panes similar to that shown below.



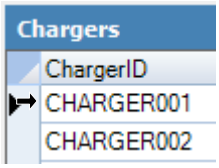
Step 7. Configuring Charger or Battery Details



Once the initial transfer and merge has been performed you can add descriptive information referred to as charger and battery details. This descriptive information makes it easier to identify the elements of your operation in MPM reports and when viewing exceptions.

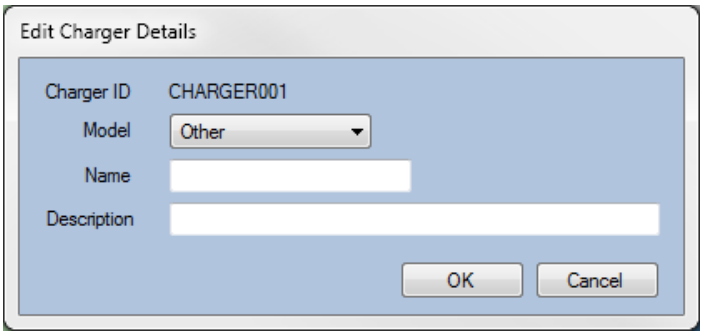
To edit charger details:

1. From the **Setup** tab select a charger from the list in the **Chargers** pane. To do this move the cursor into the vertical band next to the charger you want to select. Once the cursor changes into a horizontal arrow, click the mouse. A selected charger is indicated by its row turning yellow.



2. Click the Configure command 

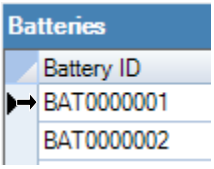
. The **Edit Charger Details** dialog box opens.



3. Enter charger details that make it easier for you to identify the elements of your operation and click **OK**. The updated charger information will appear in the **Chargers** pane.

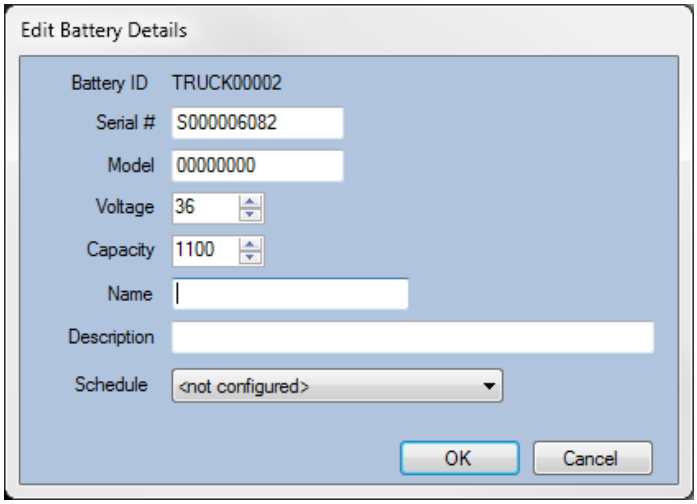
To edit battery details:

1. From the **Setup** tab select a charger from the list in the **Batteries** pane. To do this move the cursor into the vertical band next to the battery you want to select. Once the cursor changes into a horizontal arrow, click the mouse. A selected battery is indicated by its row turning yellow.



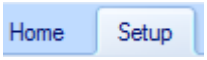
2. Click the Configure command 

. The **Edit Battery Details** dialog box opens.



3. Enter battery details that make it easier for you to identify the elements of your operation and click **OK**. The updated information for the battery will then appear in the **Batteries** pane.

Step 8. Configuring Exception Parameters

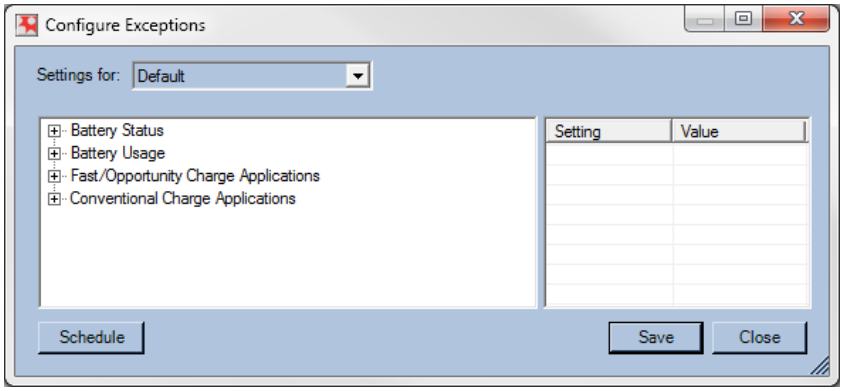


This section explains how to configure exception parameters for all batteries or individual batteries in the database.

To access the Configure Exceptions screen:

From the **Setup** tab and click the Configure command 

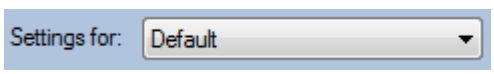
. The **Configure Exceptions** screen will open.



From the **Configure Exceptions** screen you can configure exception parameters and define the scope of those parameters to encompass all batteries or selected batteries.

Choosing the Scope of the Settings

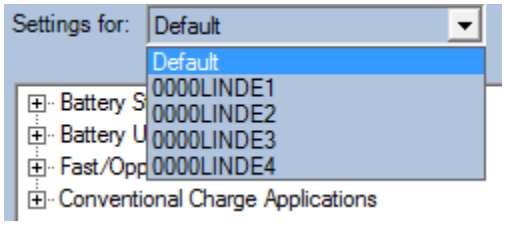
The **Settings for** combo box allows you to choose the scope of the exception parameter settings. The setting, **Default**, establishes the scope of the settings to all batteries in the database.



To limit the scope of parameter values to a specific battery:

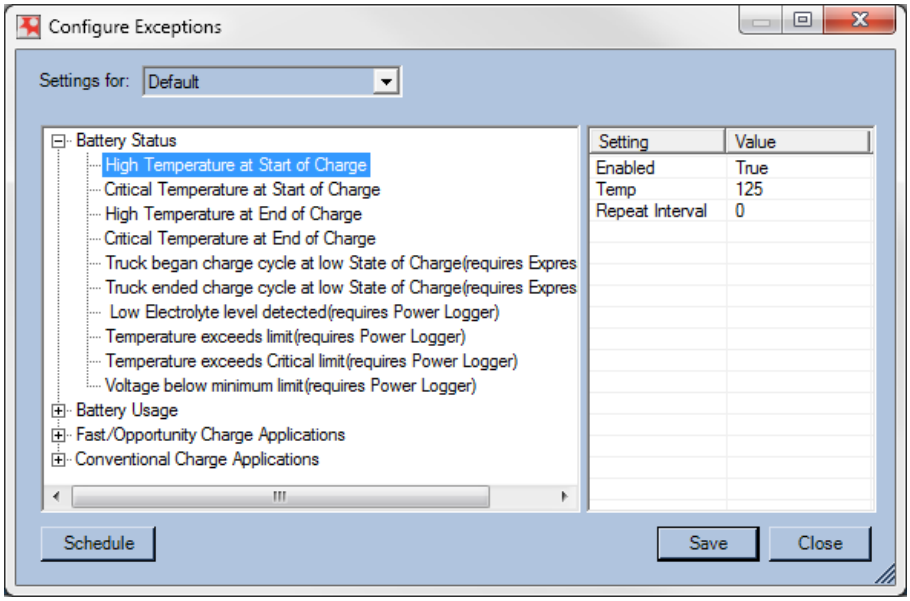
If you want to set unique parameter values for a specific battery, click the **Settings for** text box, choose the battery you want to set those values for, and then change the desired values(s) as explained under "Setting Exception Parameter Values" below.

Note: Any parameter that has a different value than that set under the **Default** scope is identified by the **Setting** and the **Value** appearing in bold type.



Expanding and Collapsing the Exception Categories

The exception categories **Battery Status**, **Battery Usage**, **Fast/Opportunity Charge Applications**, and **Conventional Charge Applications** appear with expansion buttons beside each category. The ⊞ symbol indicates the collapsed state and the ⊟ symbol indicates the expanded state as shown in the screen below.



Each category can be expanded to list all exception parameters by clicking ⊞ beside it. Clicking ⊟ beside **Battery Status** will cause the list to collapse. Clicking an exception parameter such as **High Temperature at Start of Charge** will cause the settings of the parameter to appear.

Setting Exception Parameter Values

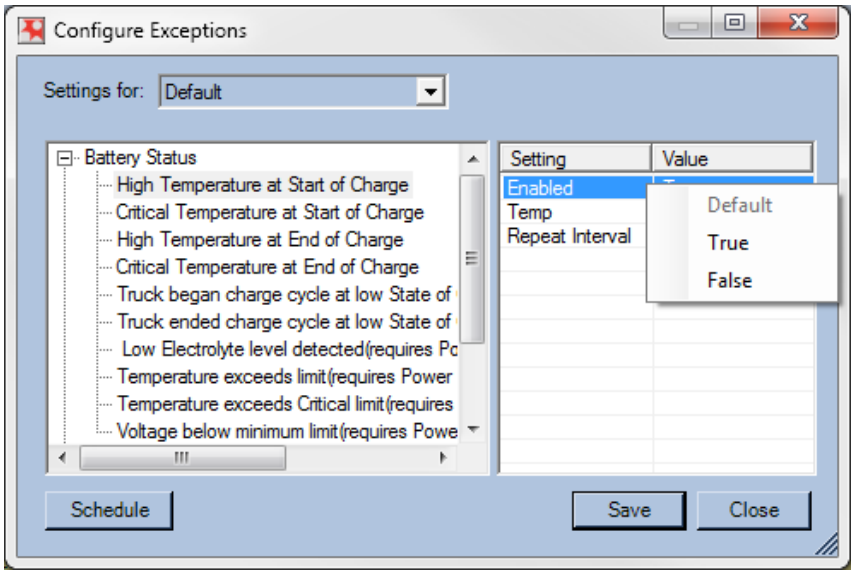
Note: See also "Appendix C. Exception Parameter Definitions and Defaults" for a description of each Exception Parameter, its default settings, and its range of values.

There are two steps in setting each exception parameter. First, decide whether or not you want to include the exception parameter in exception reports, which is done by *enabling* or *disabling* it. Second, if you want to enable the exception parameter, set the *value(s)* of its parameter(s). If the actual value falls outside the set value, the exception will be reported.

Enabling and Disabling an Exception Parameter

To enable or disable an exception parameter:

1. Select an exception parameter, such as **High Temperature at Start of Charge**.
2. Right-click the value (**True** or **False**) for the **Enabled** setting. A pop-up menu will appear.



3. Choose **True** to include the parameter, or **False** to exclude it. This procedure is the same to enable or disable all exception parameters.

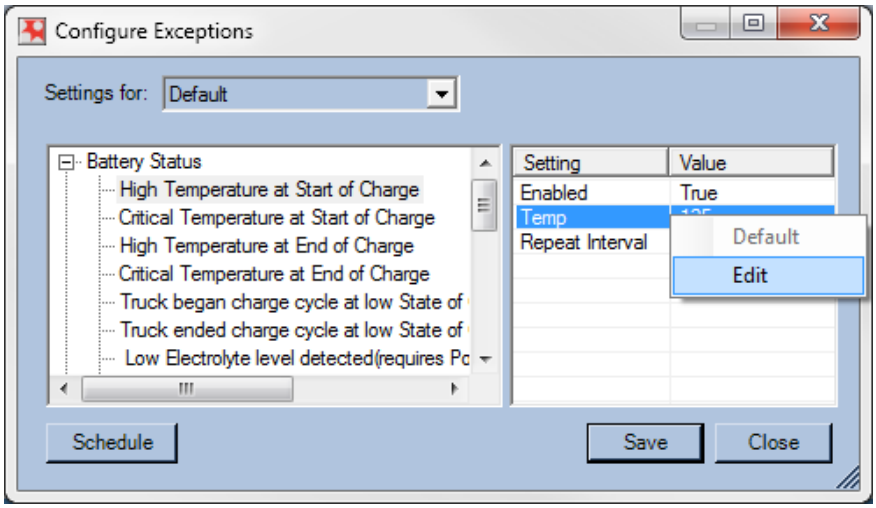
Changing the Value of a Parameter Setting

Nearly all exception parameters have settings in addition to **Enabled/Disabled**. Some values for these settings are numerical, some are True/False, and some consist of a selection of a schedule type (such as in the **Equalize Charge missed** and **Finish Charge missed** parameters).

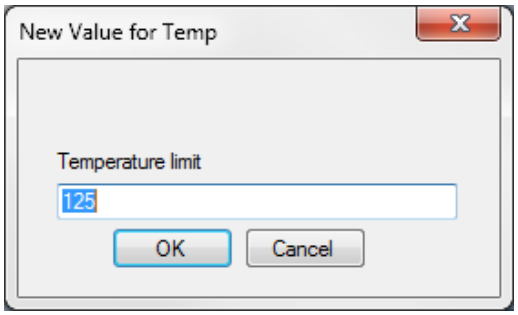
To change numerical values of a parameter:

1. Select an exception parameter such as **High Temperature at Start of Charge**.
2. Right-click the numerical value for the **Temp** setting. A pop-up menu will appear.

Note: The parameter setting, **Repeat Interval,** which is included in all Battery Status parameters, is the minimum wait time, expressed in minutes, before another occurrence of this event is reported



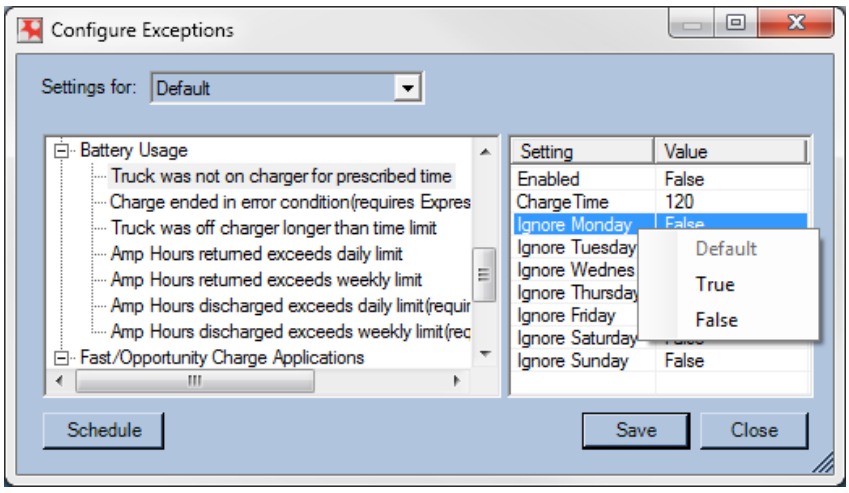
3. Choose **Edit**. A **New Value for …** box will appear.



4. Type in a new value and click **OK**.

To change True/False values for a parameter:

1. Select an exception parameter, such as **Truck was not on charger for prescribed time**.
2. Right-click the value (**True** or **False**) for any of the settings **Ignore Monday-Ignore Sunday**. A pop-up menu will appear.

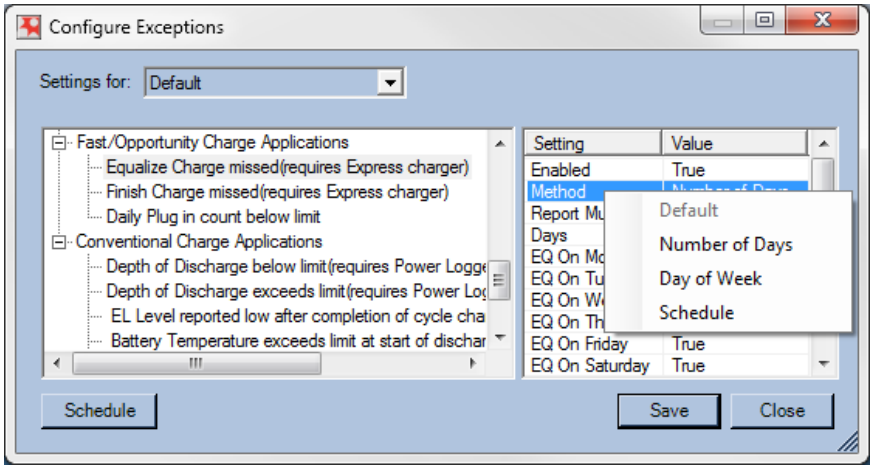


3. Choose **True** to include that day, or **False** to exclude it.

Note: See also "Appendix C. Exception Parameter Definitions and Defaults" for a description of each Exception Parameter, its default settings, and its range of values.

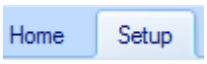
To change the selection of a schedule type (for Equalize Charge missed and Finish Charge missed)

1. Select either the **Equalize Charge missed** or **Finish Charge missed** exception parameter.
2. Right-click the value for the **Method** setting. The **Method** setting selects the type of schedule desired for the **Equalize Charge missed** or **Finish Charge missed** exception parameter. A pop-up menu will appear.



3. Choose **Number of Days** or **Day of Week**.

Step 9. Defining Shift Schedules and Groups for Conventional Charging Applications



Perform this step only if you are setting-up a fleet management system for a conventional charging application that is monitoring truck utilization over multiple shifts.

The **Shift Schedule** and **Groups** features are used to monitor truck utilization by shift and by groups. Use of these features requires the installation of a Truck ID module on each truck to be monitored. The Truck ID module identifies the truck to the Power Logger module mounted on the battery. Once you have defined a schedule and /or group and associated your trucks to them, the **Fleet** reports will monitor truck utilization on a shift and group basis.

This step includes three parts:

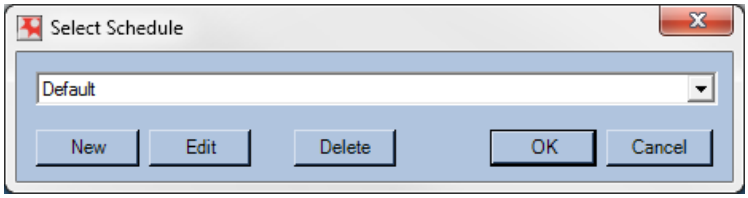
1. Defining a **Shift Schedule** that corresponds to your operation.
2. Defining a **Group** or **Group(s)** of trucks you wish to monitor together if desired.
3. Adding truck details and assigning the trucks to a **Schedule** and **Group** in the **Trucks** pane.

Defining a Shift Schedule

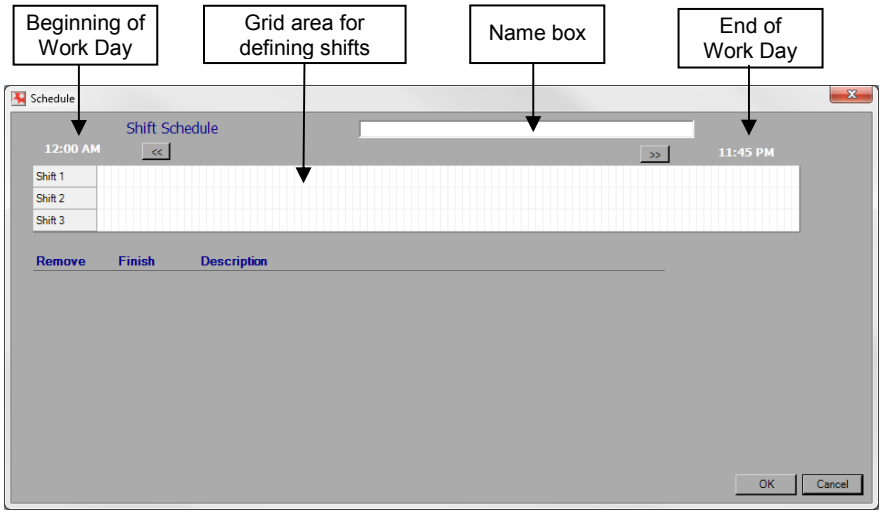
To Create or Edit a Shift Schedule:

1. From the **Setup** tab click the Configure command Schedules.

   The **Select Schedule** dialog box will open.



2. Choose **New** to create a new schedule or select an existing schedule from the combo box and choose **Edit**. The **Schedule** configuration box will open.

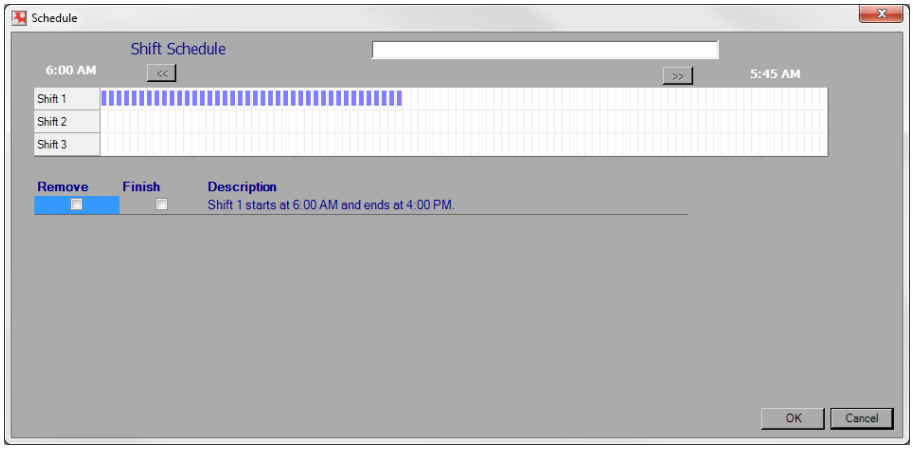


Up to three shifts can be defined in the shift grid area, including break times. Each cell of the grid represents a 15-minute segment. As you mouse over the grid a pop-up window will identify the beginning and end times of each cell.

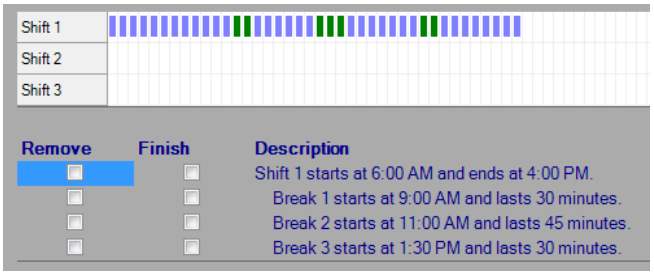
To Set Up Shifts and Breaks:

1. To define Shift 1, click and hold in the cell whose begin time matches the beginning time of Shift 1 in your operation and drag to the right until you reach the cell whose end time matches the end of Shift 1 in your operation. The cells defined for Shift 1 will automatically shift to the left resetting the beginning of the work day to the beginning of Shift 1. Also, a description of Shift 1 appears below the grid area. The example below shows Shift 1 defined from 6 am to 4 pm.

Note: If you don't have room to define Shift 1 in your operation (for example if Shift 1 is from 11 pm – 7 pm), you can shift the beginning of the work day by repeatedly clicking >> until the beginning of the work day corresponds to the beginning of Shift 1 in your operation.



2. To identify breaks for Shift 1, within the cells defined for Shift 1 select the cell or cells that correspond to the breaks in your operation.



3. Set up the second and third shifts as desired.
4. Name the schedule by typing a name in the **Name** box and click **OK**.

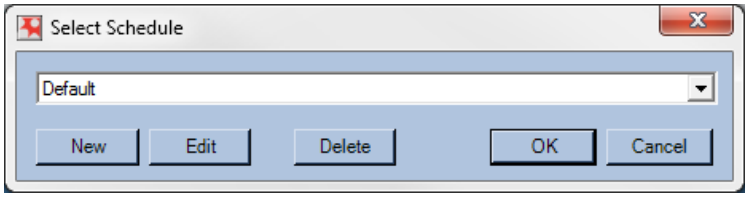
To Remove a Shift:

Check the box in the **Remove** column, in the shift description area below the grid, for the shift you want to remove.

To Delete an Existing Schedule:

1. From the **Setup** tab click Schedules.

   The **Select Schedule** dialog box will open.



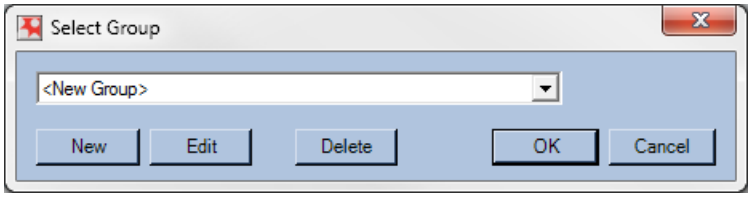
2. Select an existing schedule from the combo box and choose **Delete**.

Defining Truck Groups

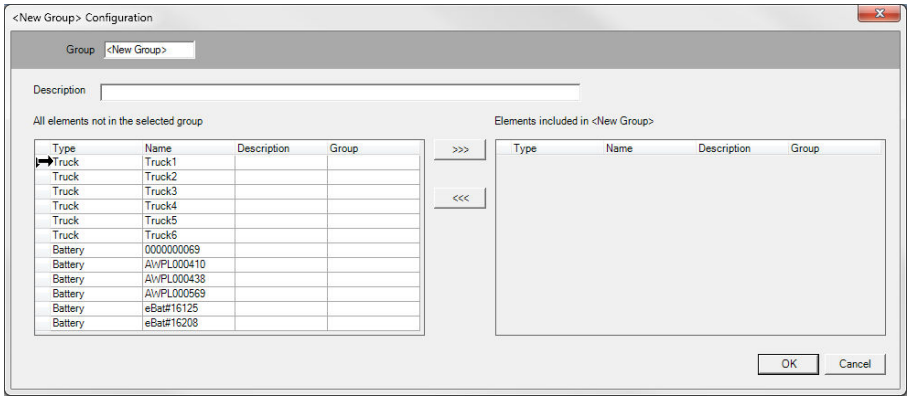
To Create or Edit a Truck Group:

1. From the **Setup** tab click the Configure command Groups.

   The **Select Group** dialog box will open.



2. Choose **New** to create a new group or select an existing group from the combo box and choose **Edit**. The **Group** configuration box will open.

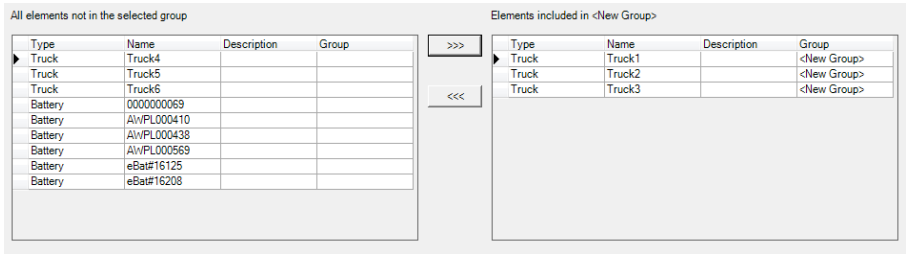


3. Select a truck or trucks to move. To do this move the cursor into the column to the left of the charger you want to select. Once the cursor changes into a horizontal arrow, click the mouse. A selected truck is indicated by its row turning blue.

Selecting a block of trucks: Select the first truck in the range, press and hold the **Shift** key, then select the last in the range.

4. Click >>> to move the truck into the new group.

5. Repeat this process until you have added all the trucks. For example if you wanted to add Trucks1-3 to the new group, the **Configure** box would appear as follows.



Selecting multiple trucks not in a block: Select a truck, press and hold the **Ctrl** key, then select other trucks as desired.

6. Type in a name and description for the group in the **Group** and **Description** boxes.

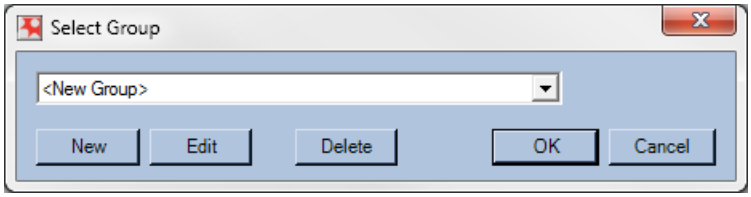
Note: Trucks can be removed from a group by selecting the truck in the **Elements included** box then clicking <<<.

7. Click **OK**. The truck/group assignment will appear in the **Group** column in the **Trucks** pane.

To Delete an Existing Group:

1. From the **Setup** tab click Groups.

   The **Select Group** dialog box will open.

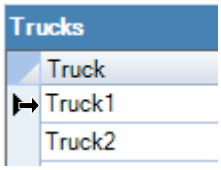


2. Select an existing group from the combo box and choose **Delete**.

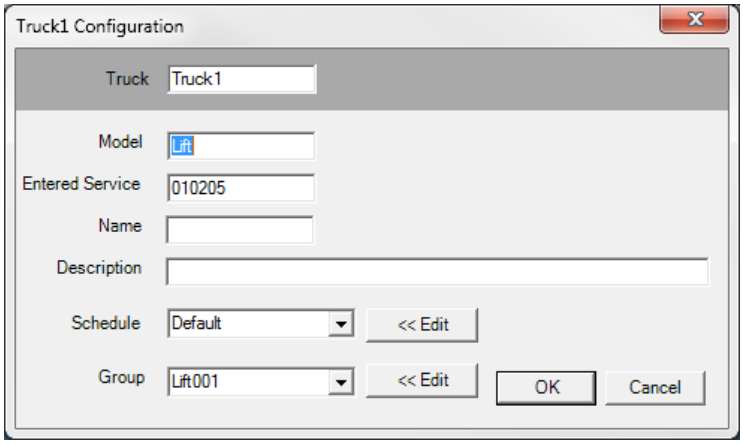
Adding Truck Details and Assigning Trucks to a Schedule

To add truck details and assign a truck to a Schedule:

1. From the **Setup** tab select a truck from the list in the **Trucks** pane. To do this move the cursor into the vertical band next to the charger you want to select. Once the cursor changes into a horizontal arrow, click the mouse. A selected truck is indicated by its row turning yellow.



2. Right-click the truck you want to configure and choose **Configure** from the pop-up menu. The **Truck Configuration** dialog box opens.



3. Enter truck details for **Model**, **Entered Service**, **Name**, and **Description** that make it easier for you to identify the elements of your operation.

4. If you defined a schedule previously you can choose it from the **Schedule** combo box. If you defined a group for the truck previously, the name of the group will appear in the **Group** combo box. You can reassign the truck to another group, if desired, using the **Group** combo box. You can also edit the current schedule or group by clicking << Edit.

5. Click **OK**. The updated truck information will appear in the **Trucks** pane.

Setting Up Auto-Log

Home | Setup

[This feature is not yet implemented.]

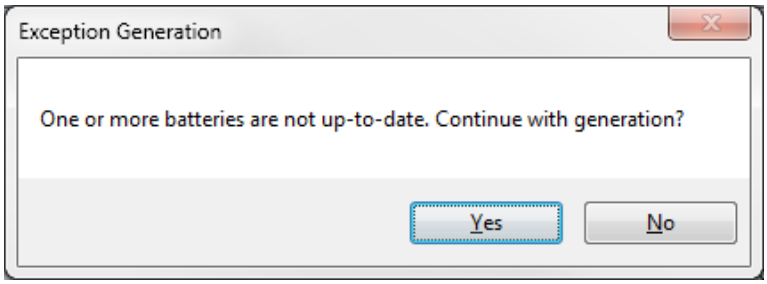
Setting Exception View Parameters

Home | Setup

Note: See "Chapter 4. Viewing Exceptions and Generating Reports" for more viewing options.

Setting Maximum Out-Of-Sync Days

Maximum Out-Of-Sync Days sets the maximum number of days allowed from the most recent date recorded in the battery data residing in the database. If it has been longer than the number-of-days setting, the following reminder will appear when you initiate the Check Exceptions command.



To set the Maximum Out-Of-Sync days:

From the **Setup** tab click the up arrow or down arrow of the **Max Out-Of-Sync Days** spin box to set the number of days.

Note: The **Check Exceptions** command automatically performs the **Clear Charger**, the **Clear Battery**, and the **Clear Trucks** commands found on the **Home** tab.

The **Check** command displays only exceptions within the range of dates set in the **Start Date** and **End Date** boxes.

Viewing Exceptions in the Exceptions Pane

To check for exceptions:

From the **Setup** tab click Check Exceptions. Any exceptions that are detected appear in the **Exceptions** pane.

To clear exceptions:

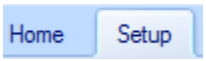
From the **Setup** tab click Clear Exceptions. Any exceptions that are displayed in the **Exceptions** pane are cleared leaving the pane blank.

To view exceptions within a range of dates:

1. From the **Setup** tab set the Exceptions **Start Date** and **End Date** to define the time window for which exceptions are displayed.
2. Click Check Exceptions. The exceptions displayed in the **Exceptions** pane will only include those that fall within the time window.

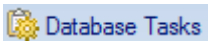
Note: Setting a range of dates does not delete any data in the database, but only affects the reporting of exception and log data. Only exceptions that fall within the time span are displayed or reported.

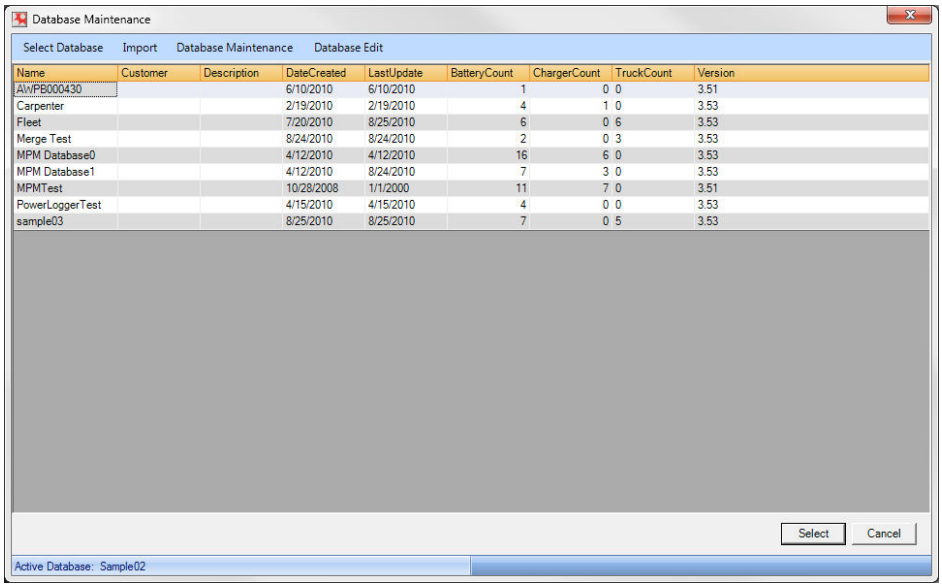
Performing Database Tasks



Opening the Database Maintenance Screen

To open the Database Maintenance screen:

Click  on the **Setup** tab. When the screen opens, all MPM databases that have been created on your MPM Netbook or personal computer, as well as databases that have been imported, will appear on the list.



From the **Database Maintenance** screen you can:

- Change the active database.
- Import a database.
- Perform database maintenance operations.
- Edit (trim) a database.

Selecting (Activating) a Database

Note: Double-clicking a database in the list will also select it.

To activate a database from the list of databases:

1. From the **Database Maintenance** screen choose a database from the list by clicking it.
2. Click **Select Database** or the command button **Select**. The **Database Selected** dialog box will open.
3. Click **Yes** to activate the selected database.

Importing a Database

To import a PC database from Data Manager:

1. From the **Database Maintenance** screen click **Import** and choose **Import PC Database**. The **Select Existing FASTWare Database** dialog box opens.
2. Navigate to the location you have stored the database and click **Open**.
3. Once the **Confirm Database Name** dialog box opens, click **OK**.

   After a moment the database will appear in the list on the **Database Maintenance** screen.

Adding a Description for the Database

This feature is primarily used if you are managing multiple databases. You can add a user-friendly customer name and description for each database.

To add a customer name and database description:

1. From the **Database Maintenance** screen double-click the **Customer** or **Description** field for the database. The blinking cursor will indicate that you can edit the field.
2. Type in a customer name or description.
3. Press **Enter**.

Performing Other Database Maintenance Operations

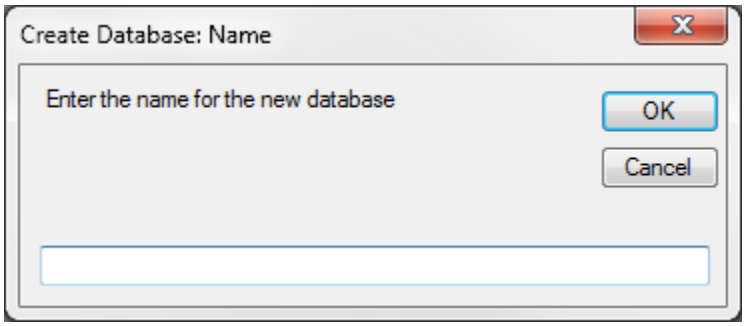
The following operations can be performed from the **Database Maintenance** menu.

- Create and delete a database.
- Detach or attach a database to an Aker Wade server.
- Edit SQL Server parameters.
- Move a database or email a database.

Creating a New Database

To create a new database:

1. Click **Database Maintenance** from the **Database Maintenance** screen, then choose **New Database**. The **Create Database** dialog box will open.



NOTE: The following characters are not permitted as part of a database name: ' " : < > ? [ ] | *

Also, a name that includes a number within parentheses, such as (1), is not permitted.

2. Type a name for the database and click **OK**.

NOTE: Once a database is deleted it cannot be retrieved.

Permanently Deleting a Database

To delete a database:

1. Choose a database from the list by clicking it.
2. Click **Database Maintenance** then choose **Permanently Delete Database**. The **Delete Database** dialog box will open.
3. Click **Yes**.

Detaching a Database from a Server

Detaching a database from a server is a means of removing a database from Motive Power Manager. Detached databases are stored where indicated by the MPM **Database File Path** which is discussed in the section below, "Editing SQL Server Parameters".

To detach a database:

1. Select a database in the list by clicking it.
2. Click **Database Maintenance** then choose **Detach Database from Server**. The **Detach Database** dialog box will open.
3. Click **OK**.

Attaching a Database to a Server

Attaching a database allows you to re-attach a detached database.

NOTE: Motive Power Manager databases are identified by the file type .MDF.

To attach a Motive Power Manager database:

1. Click **Database Maintenance** and choose **Attach Database to Server ► From Database File.** The **Existing FASTWare PC Databases** dialog box opens.
2. Navigate to the location you have stored the database and click **Open**.
3. Once the **Success** information box opens, click **OK**.

After a moment the database will appear in the list on the **Database Maintenance** screen.

NOTE: Zipped files are identified by the file type .ZIP.

To attach a zipped Motive Power Manager database:

When a database is emailed using the **Move Database** operation described below, it is automatically zipped by MPM and attached to the email. The **Attach Database to Server ► From Zip File** operation described here is how you attach that zipped database to the server on your computer.

1. Click **Database Maintenance** and choose **Attach Database to Server ► From Zip File.** The **Open** dialog box opens.
2. Navigate to the location you have stored the zipped database and click **Open**.
3. Once the **Success** information box opens, click **OK**.

After a moment the database will appear in the list on the **Database Maintenance** screen.

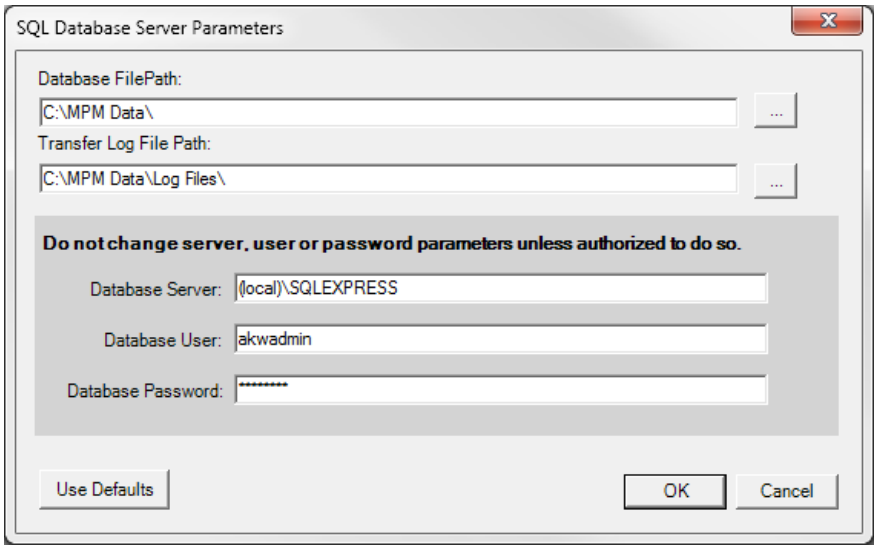
Editing SQL Server Parameters

The file paths for the location of database files and charge logs can be altered if needed.

To change the path for files:

1. Click **Database Maintenance** and choose **Edit SQL Server Parameters.** The **SQL Database Server Parameters** dialog box opens.

NOTE: Do ***not*** edit the Database Server, Database User, or Database Password parameters without authorization from Aker Wade Power Technologies.



2. To change the path, either type-in a new path in the file path or click ... and navigate to a new location.
3. After editing the parameters, click **OK**.

To return server parameters to their defaults:

From the **SQL Database Server Parameters** dialog box click **Use Defaults**.

Moving a Database

To move a database to the Aker Wade server:

This operation is done in cooperation with Aker Wade for troubleshooting purposes only and requires an active internet connection.

1. From the **Database Maintenance** screen choose a database from the list by clicking it.
2. Click **Database Maintenance** and choose **Move Database ► To Server.**

To attach a database to an email:

NOTE: Attaching a database to an email works only if you have an email client such as Outlook, Outlook Express, or Windows Live Mail setup on your computer.

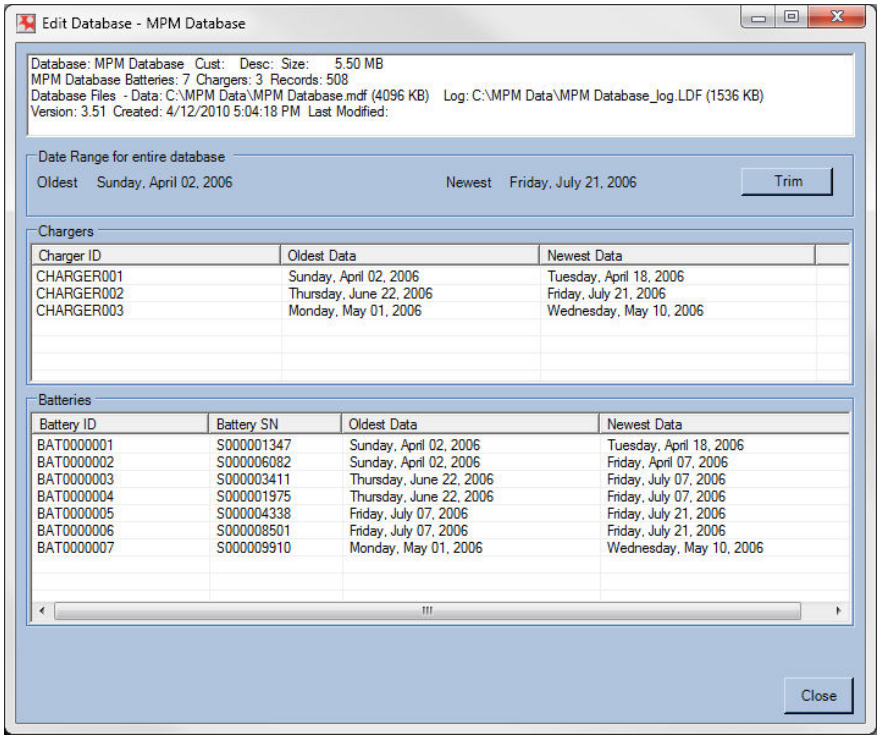
1. From the **Database Maintenance** screen choose a database from the list by clicking it.
2. Click **Database Maintenance** and choose **Move Database ► To email.** An email client window opens with the database attached as a zipped file.
3. Send the email as you would any other email.

Editing a Database

The database edit operation allows you to trim the database to include only data that falls within a specific time span for the entire database or for selected chargers and/or batteries.

To access the Edit Database screen:

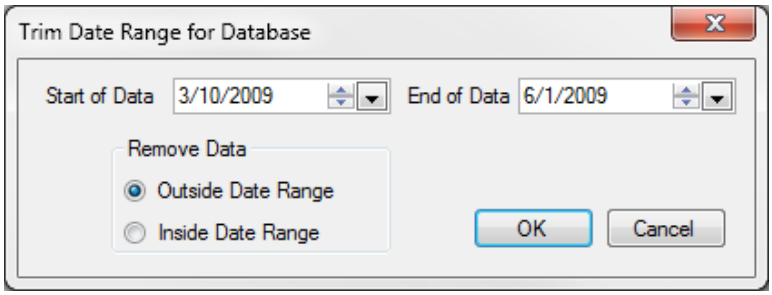
From the **Database Maintenance** screen click **Database Edit**. The **Edit Database** screen opens.



Note: Trimming is a means of removing old data from a database. It does not delete or remove a battery or charger from the list.

To trim the entire database for a range of dates:

1. From the **Edit Database** screen click **Trim**. The **Trim Date Range for Database** dialog box opens.



2. Set the **Start of Data** and **End of Data** dates.
3. Choose either of the trim options, **Outside Date Range** or **Inside Date Range**.
4. Click **OK**.

Selecting a block of chargers or batteries: Select the first charger or battery in the range, press and hold the **Shift** key, then select the last charger or battery in the range.

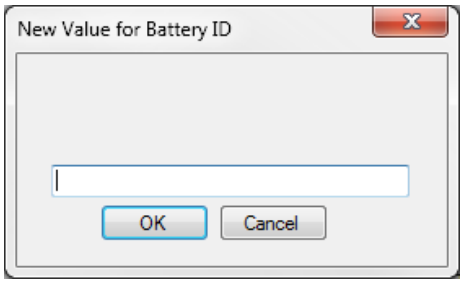
Selecting multiple chargers or batteries not in a block: Select a charger or battery, press and hold the **Ctrl** key, then select other chargers or batteries as desired.

To remove a charger or battery from the database:

1. From the **Edit Database** screen right-click the ID of the battery or charger. See notes for selecting multiple chargers or batteries.
2. Choose **Remove**.

To rename a Charger ID or Battery ID:

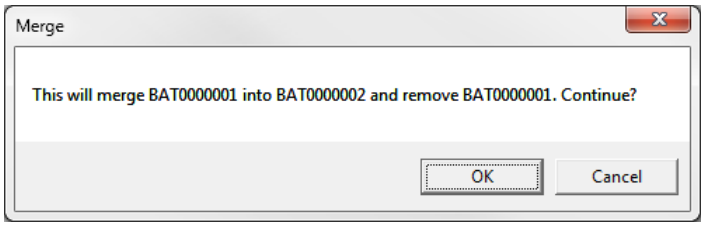
1. From the **Edit Database** screen right-click the ID of the battery or charger.
2. Choose **Rename.** The **New Value for Charger/Battery ID** dialog box will open.



3. Type the new ID and click **OK.**

To merge the data from a charger/battery to another charger/battery:

1. From the **Edit Database** screen right-click the ID of the battery or charger.
2. Choose **Merge To** ►[name of charger or battery]. The **Merge** dialog box opens.

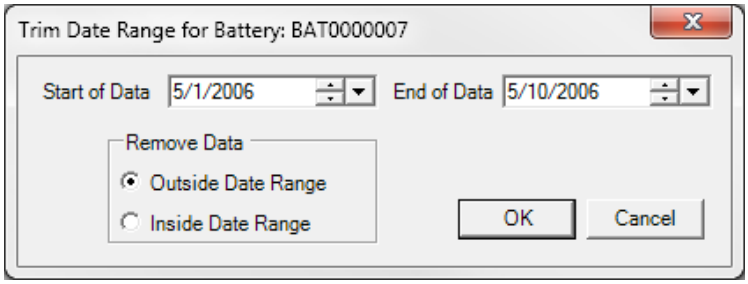


3. Click **OK**.

To trim the data for a battery or charger:

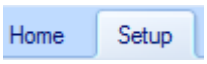
Note: Trimming is a means of removing old data from a database. It does not delete or remove a battery or charger from the list.

1. From the **Edit Database** screen right-click the ID of the battery or charger.
2. Click **Trim Data**. The **Trim Date Range for…** dialog box opens.



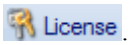
3. Set the **Start of Data** and **End of Data** dates.
4. Choose either of the trim options, **Outside Date Range** or **Inside Date Range**.
5. Click **OK**.

Transferring MPM Software to a Different Computer or Recovering from Corrupted Software



If you need to transfer MPM software to a different computer or if you are recovering from a problem where you cannot run the MPM software, perform the following steps.

To transfer MPM software to a different computer:

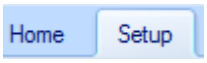
1. On the original computer click the **Setup** tab and then 

. The **MPM License Details** dialog box opens.
2. Click **Remove License**.
3. Install MPM Software on a new computer.
4. Contact Aker Wade (have the information for your MPM purchase available).
5. An Aker Wade agent will provide you with a **PC Key Unlock Code**.
6. Open the **MPM License Details** dialog box on the new computer.
7. Type in the **PC Key Unlock Code** and click **Unlock**. Your original **PC Key** will appear in the PC Key field.
8. Provide the **PC Key** to the Aker Wade agent. Your original **License Code** will be sent to you via e-mail.
9. Copy and paste the code into the **License Code** field.
10. Verify that the code matches exactly and click **Apply** then **OK**.

To recover from corrupted software:

Once you have resolved any problem, such as a bad hard drive, for your computer, reinstall all required MPM software. Then perform steps 4-9 above.

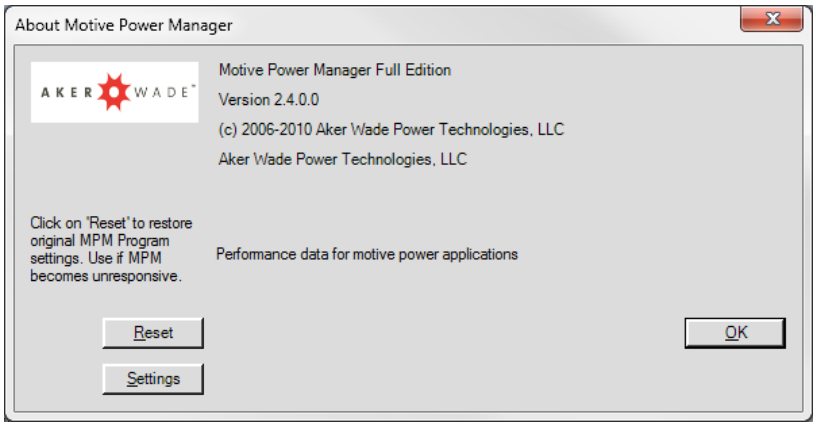
MPM Software Version and Resetting the Software



To find the MPM software version number:

Click 

from the **Setup** tab. The **About Motive Power Manager** screen opens.



To reset the MPM Software:

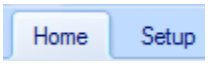
Click **Reset** from the **About Motive Power Manager** screen to reset the MPM software if it becomes unresponsive.

Chapter 3: Transferring and Merging Data

Whether your operation uses Express Fast Chargers or DC Power Logger battery modules, the process of getting battery data into the Motive Power Manager database is essentially the same. You will need to:

1. Transfer charger or Power Logger data via log files to the computer running Motive Power Manager software.
2. Merge the data from the log files into the MPM database.

Transferring and Merging Fast Charger Data



The **Transfer** command on the **Home** tab opens a screen from which you initiate the transfer of data from Fast Chargers or Power Loggers and merge the data into the active database.

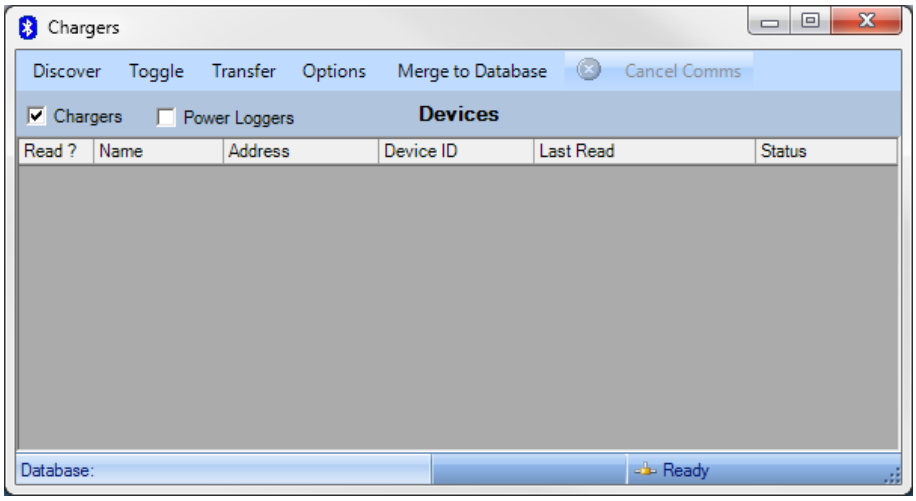
Fast Chargers Transfer Screen

Note: To set the Transfer screen to display Fast Chargers only, make sure Power Loggers is not checked.

NOTE: Any time you intend to transfer data from a Fast Charger or Power Logger you must insert the Bluetooth adapter securely into one of the USB ports before starting Motive Power Manager. The LED on the adapter should illuminate indicating it is ready to communicate.

To access the Fast Chargers screen:

From the **Home** tab click Transfer. All **Charger** transfer commands are available from this screen.



To "Discover" all chargers within range:

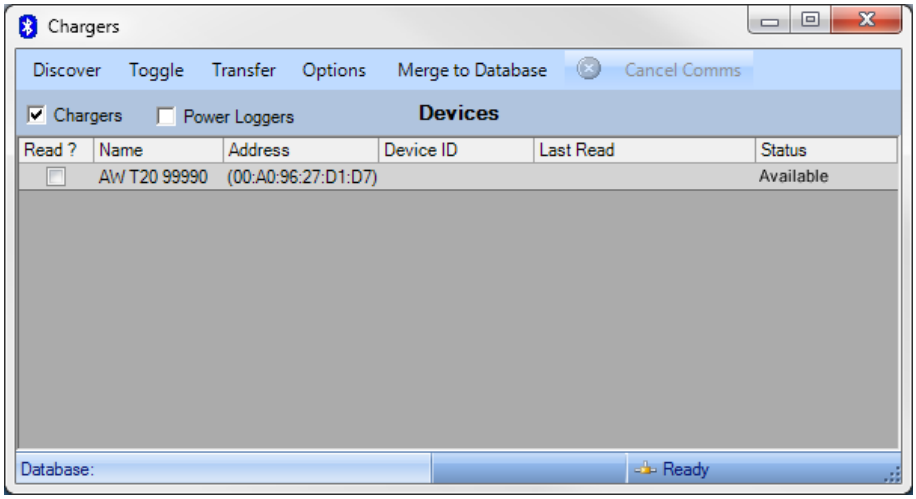
Before transferring data from chargers, you need to initiate a search for all chargers within Bluetooth communications range.

From the **Chargers** transfer screen click **Discover**.

After a few moments any discovered chargers will appear in the **Chargers** transfer screen as shown below.

Note: The "Discover" operation will take several seconds or longer in a noisy environment where there is a lot of electromagnetic interference, either from plant operations or other wireless devices.

You may need to initiate the "Discover" operation more than once in a noisy environment to make sure all devices are discovered.



To toggle the selection of chargers:

Note: A selected charger is indicated by a check in the box next to the charger name.

A charger can be selected or deselected individually by clicking the box next to its name. If you have a large number of chargers this can be a time-consuming process. Deselecting all selected chargers in the list and selecting all deselected charges in the list can be performed all at once by toggling the selection.

From the **Chargers** transfer screen click **Toggle**. For example, if no charger in the list is selected, clicking **Toggle** will select all the chargers.

To transfer data from chargers:

1. Check the charger(s) you want to include in the transfer from the list of discovered chargers.
2. From the **Chargers** transfer screen click **Transfer**.

   After the transfer is complete the **Last Read** and **Status** fields of each charger will be updated with a time/date stamp and the name of the .CLG log file created containing data from the charger.

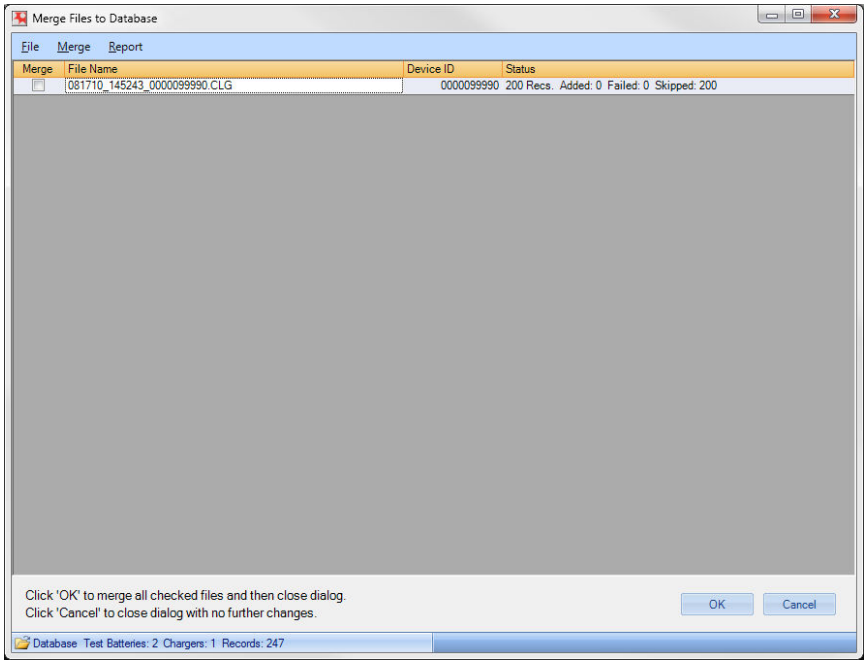
Last Read	Status
08-25-10 10:40	Created - 082510_104026_0000099990.CLG records- 200

Note: It is recommended to merge Charger log files immediately after they are transferred to Motive Power Manager. Log files can, however, be collected over a period of time and then merged later.

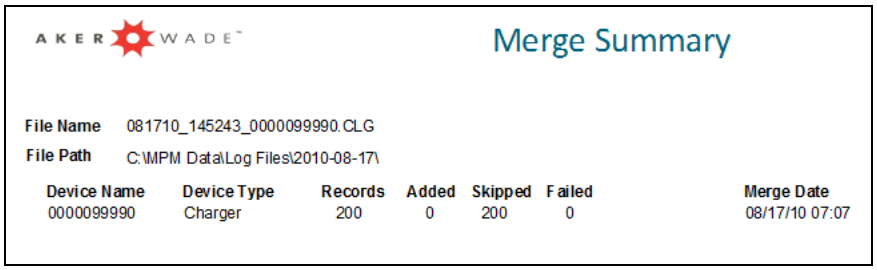
See the section "Merging Existing Data Files" later in this chapter for more information.

To merge charger data into the database:

1. From the **Chargers** screen click **Merge to Database**. The **Merge Files to Database** screen will open. This screen contains a list of charger log files that have been transferred previously.

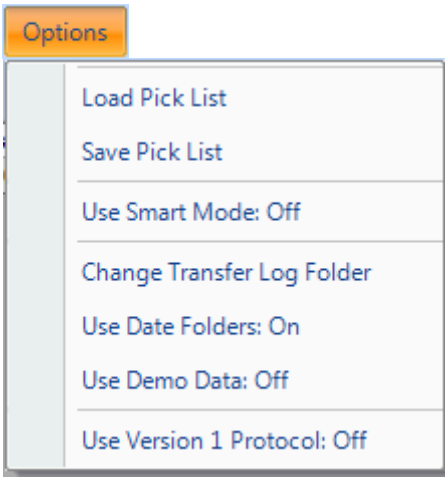


2. Check the charger log file(s) you want to include in the merge.
3. Click **Merge**.
4. If you wish to generate a merge report, click **Report**.



Merge Options

To access the merge options click **Options** from the **Chargers** transfer screen.



Note: A Pick List is a file containing a list of previously "discovered" chargers and Power Logger modules. Saving and loading a Pick List can save time in an environment where electromagnetic interference slows down the "discover" operation.

Note: The **Smart Mode** communications protocol is used to save time when transferring large log files. It will only transfer new data, data that has not already been transferred and merged into the database.

To load a Pick List:

Choose **Load Pick List** to navigate to and open a saved list of "discovered" chargers. Pick List files have the extension .CSX.

To save a Pick List:

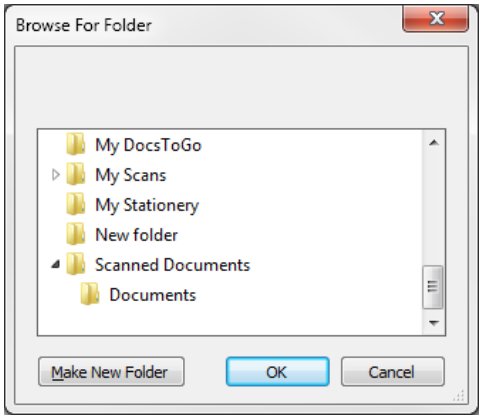
Choose **Save Pick List** to save the list of "discovered" chargers that are currently displayed in the **Chargers** screen.

To turn Smart Mode On or Off:

Choose **Use Smart Mode**. Smart Mode will toggle between **On** and **Off**.

To change the Transfer Log Folder:

1. Choose **Change Transfer Log Folder**.



2. Navigate to a new folder to which log files will be transferred.
3. Click **OK**.

To turn Use Date Folders On or Off:

Choose **Use Date Folders**. **Use Date Folders** will toggle between **On** and **Off**.

When **Use Date Folders** is turned **On**. Transferred log files will be placed in dated folders.

To turn Use Demo Data On or Off:

Choose **Use Demo Data**. **Use Demo Data** will toggle between **On** and **Off**.

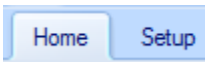
Demo data is available only from older devices.

To turn Use Version 1 Protocol On or Off:

Choose **Use Version 1 Protocol**. **Use Version 1 Protocol** will toggle between **On** and **Off**.

Use Version 1 protocol only if you are unable to transfer data from an older device.

Transferring and Merging Power Logger Data



The **Transfer** command on the **Home** tab opens a screen from which you initiate the transfer of data from Fast Chargers or Power Loggers and merge the data into the active database.

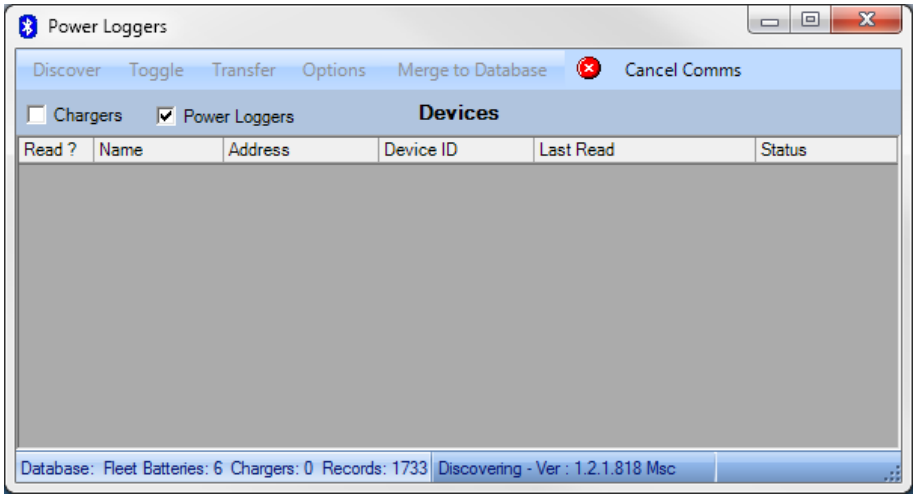
Power Loggers Transfer Screen

Note: To set the Transfer screen to display Power Loggers only, make sure Chargers is not checked.

NOTE: Any time you intend to transfer data from a Fast Charger or Power Logger you must insert the Bluetooth adapter securely into one of the USB ports before starting Motive Power Manager. The LED on the adapter should illuminate indicating it is ready to communicate.

To access the Power Loggers Screen:

From the **Home** tab click Transfer. All **Power Logger** transfer commands are available from this screen.



To "Discover" all Power Loggers within range:

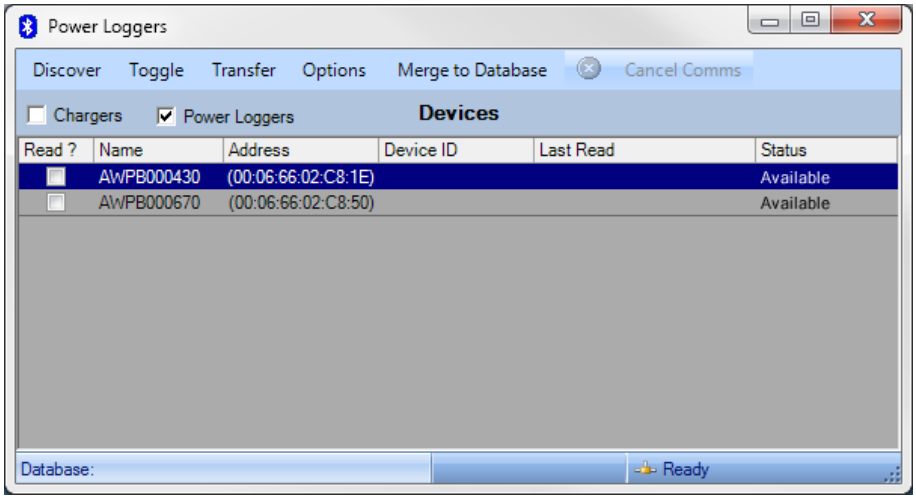
Before transferring data from Power Logger battery modules, you need to initiate a search for all modules within Bluetooth communications range

From the **Power Loggers** transfer screen click **Discover**.

Any discovered battery module will appear in the **Power Loggers** transfer screen as shown below.

Note: The "Discover" operation will take several seconds or longer in a noisy environment where there is a lot of electromagnetic interference, either from plant operations or other wireless devices.

You may need to initiate the "Discover" operation more than once in a noisy environment to make sure all devices are discovered.



To toggle the selection of Power Loggers:

Note: A selected Power Logger is indicated by a check in the box next to the Power Logger name.

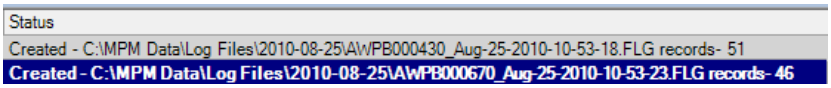
A Power Logger module can be selected or deselected individually by clicking the box next to its name. If you have a large number of modules this can be a time-consuming process. Deselecting all selected modules in the list and selecting all deselected modules in the list can be performed all at once by toggling the selection.

From the **Power Loggers** transfer screen click **Toggle**. For example, if no Power Logger module in the list is selected, clicking **Toggle** will select all the modules.

To transfer data from Power Loggers:

1. Check the Power Logger(s) you want to include in the transfer from the list of discovered Power Loggers.
2. From the **Power Loggers** transfer screen click **Transfer**.

   After the transfer is complete the **Status** field of each Power Logger will be updated with a time/date stamp and the name of the .FLG log file created containing data from the Power Logger.

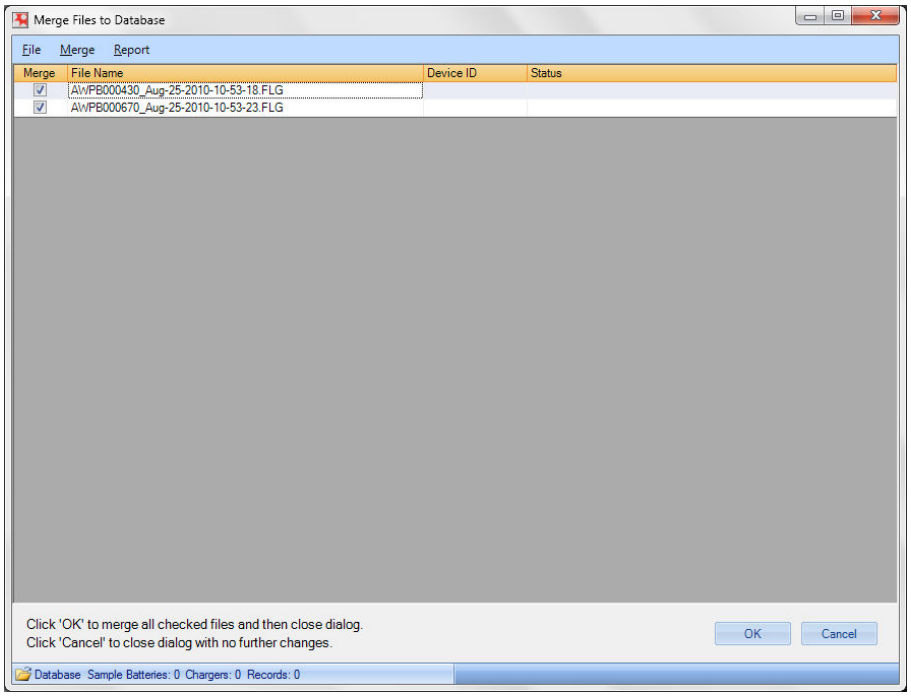


Note: It is recommended to merge Charger and Power Logger log files immediately after they are transferred to the Motive Power Manager. Log files can, however, be collected over a period of time and then merged later.

See the section "Merging Existing Data Files" later in this chapter for more information.

To merge Power Logger data to the database:

1. From the **Power Loggers** screen click **Merge to Database**. The **Merge Files to Database** screen will open. This screen contains a list of Power Logger log files that have been transferred previously.



2. Check the Power Logger log file(s) you want to include in the merge.
3. Click **Merge**.
4. If you wish to generate a merge report, click **Report**.

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Merge Summary

File Name AWPB000430_Aug-25-2010-10-53-18.FLG
File Path C:\MPM Data\Log Files\2010-08-25\

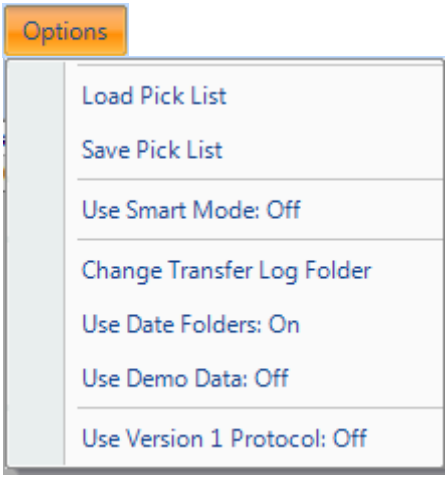
Device Name	Device Type	Records	Added	Skipped	Failed	Merge Date
AWPB000430	Battery Module	51	51	0	0	08/25/10 10:57

File Name AWPB000670_Aug-25-2010-10-53-23.FLG
File Path C:\MPM Data\Log Files\2010-08-25\

Device Name	Device Type	Records	Added	Skipped	Failed	Merge Date
AWPB000670	Battery Module	46	46	0	0	08/25/10 10:57

Merge Options

To access the merge options click **Options** from the **Power Loggers** screen.



Note: A Pick List is a file containing a list of previously "discovered" chargers and Power Logger modules. Saving and loading a Pick List can save time in an environment where electromagnetic interference slows down the "discover" operation.

Note: The **Smart Mode** communications protocol is used to save time when transferring large log files. It will only transfer new data, data that has not already been transferred and merged into the database.

To load a Pick List:

Choose **Load Pick List** to navigate to and open a saved list of discovered Power Loggers. Pick List files have the extension .CSX.

To save a Pick List:

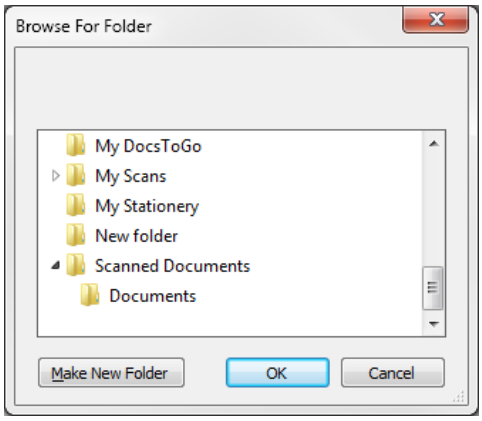
Choose **Save Pick List** to save the list of discovered Power Loggers that are currently displayed in the **Power Loggers** screen.

To turn Smart Mode On or Off:

Choose **Use Smart Mode**. Smart Mode will toggle between **On** and **Off**.

To change the Transfer Log Folder:

1. Choose **Change Transfer Log Folder**.



2. Navigate to a new folder to which log files will be transferred.
3. Click **OK**.

To turn Use Date Folders On or Off:

Choose **Use Date Folders**. **Use Date Folders** will toggle between **On** and **Off**.

When **Use Date Folders** is turned **On**. Transferred log files will be placed in dated folders.

To turn Use Demo Data On or Off:

Choose **Use Demo Data**. **Use Demo Data** will toggle between **On** and **Off**.

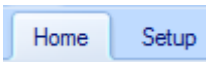
Demo data is available only from older devices.

To turn Use Version 1 Protocol On or Off:

Choose **Use Version 1 Protocol**. **Use Version 1 Protocol** will toggle between **On** and **Off**.

Use Version 1 protocol only if you are unable to transfer data from an older device.

Merging Existing Log Files

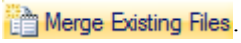


Although it is recommended to merge Fast Charger or Power Logger log files immediately after transfer, they can be collected over a period of time and then merged later. For example, if your operation requires a battery to be charged by more than one Fast Charger (shared charger), then to avoid incomplete data that could lead to false exception alarms, it is important to transfer charger log files from all chargers before merging them into the database.

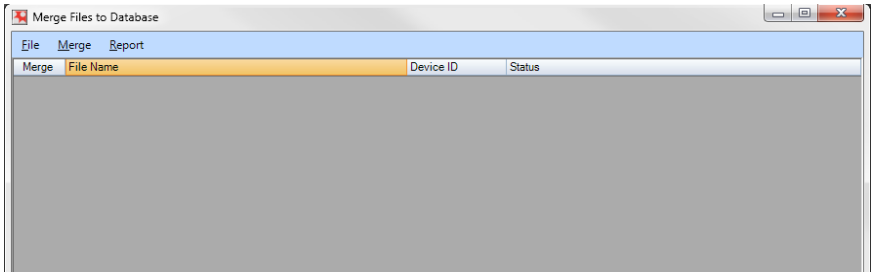
Note: Merging large numbers of log files at one time can slow computer operation.

Aker Wade recommends limiting the number of log files merged at one time to around 10.

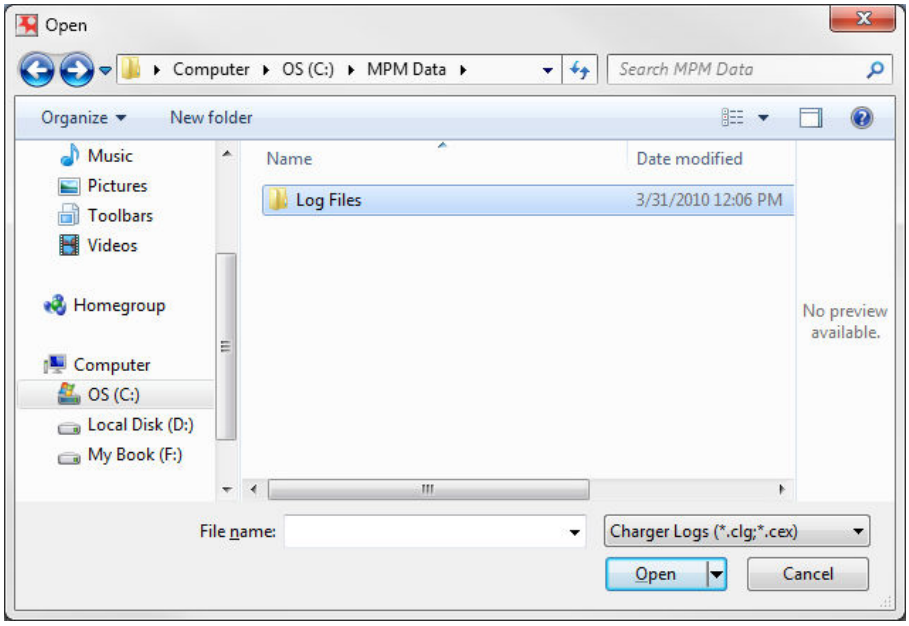
To add and merge existing log files:

1. From the **Home** tab click the Transfer command 

. The **Merge Files to Database** screen will open.



2. Click **File** and choose **Add Files**. The **Open** screen opens allowing you to navigate to the folder where transferred log files are stored.



Note: Charger log files have the extension .CLG. Power Logger log files have the extension .FLG.

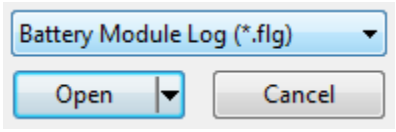
The default path for log files is: C:\MPM Data\Log Files\.

Selecting a block of files: Select the first file you want to add, press and hold the **Shift** key, then select the last file you want to add.

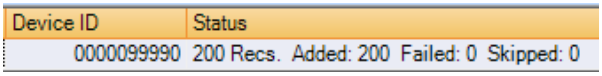
Selecting multiple files not in a block: Select a file, press and hold the **Ctrl** key, then select other files as desired.

3. Navigate to the folder designated to store log files. If you are adding Charger log files, make sure the file type option next to the **File name** box is set as follows:

If you are adding Power Logger log files, make sure the file type option is set as follows:

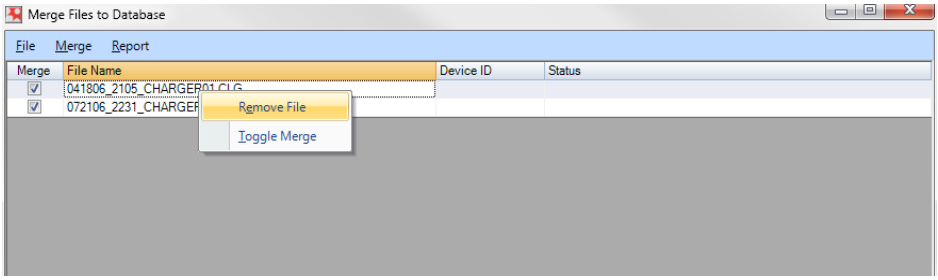


4. Choose the log file or files you want to add and click **Open**. The files will be added to the **Merge Files to Database** screen.
5. Make sure the file(s) you want to merge are checked, then click **Merge**. After the merge is complete the Device ID and Status fields will be updated



To remove files from the merge list:

From the **Merge Files to Database** screen, right-click the name of the file you want to remove from the list and choose **Remove File**.



Note: The **Merge Summary** report must be generated before closing the **Merge Files to Database** screen.

To generate a Merge Summary report:

This operation must be done directly after the files have been merged.

From the **Merge Files to Database** screen, click **Report**.

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Merge Summary

File Name 041806_2105_CHARGER01.CLG
File Path C:\MPM Data\Log Files\2010-03-31\

Device Name	Device Type	Records	Added	Skipped	Failed	Merge Date
CHARGER001	Charger	97	96	1	0	04/02/10 05:59

File Name 072106_2231_CHARGER02.CLG
File Path C:\MPM Data\Log Files\2010-03-31\

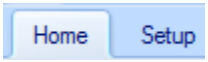
Device Name	Device Type	Records	Added	Skipped	Failed	Merge Date
CHARGER002	Charger	337	337	0	0	04/02/10 05:59

Chapter 4: Viewing Exceptions and Generating Reports

Once you have established communications with Fast Chargers or Power Logger battery modules, transferred and merged data from them into the MPM database, and configured exception parameters for batteries, you are ready to use the broad array of tools available from the **Home** tab to analyze the data you have collected.

Exceptions can be viewed either in the **Exceptions** pane or in a report form for printing and saving as a file. A variety of additional reports and graphs can be generated from either Express Fast Charger data or Power Logger battery module data, depending on your application.

Viewing Exceptions



If your operation uses Express Fast Chargers, a list of chargers and batteries will appear in their respective panes once you have transferred and merged log files from the chargers. If your operation uses Power Logger modules to collect battery data, a list of those batteries will appear in the **Batteries** pane once you have transferred and merged log files from those modules.

The exceptions that appear in the **Exceptions** pane are controlled in three ways:

1. The setting of exception parameters in the **Setup** tab.
2. The setting of the date parameters in the **Setup** or **Home** tab. This establishes a time window for which exceptions are displayed.
3. The selection of a specific charger and/or battery in the **Chargers** and **Batteries** panes (or multiple chargers and/or batteries. This limits the exceptions displayed to only those specific chargers and/or batteries.

Checking for and Clearing Exceptions

Note: The **Check** command automatically performs the **Clear Charger**, the **Clear Battery**, and the **Clear Truck** command.

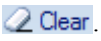
The **Check** command displays only exceptions within the range of dates set in the **Start/End** boxes.

To check for exceptions:

From the **Home** tab click 

. Any exceptions that are detected appear in the **Exceptions** pane.

To clear exceptions:

From the **Home** tab click 

. Any exceptions that are displayed in the **Exceptions** pane are cleared leaving the pane blank.

Controlling How Exceptions are Displayed

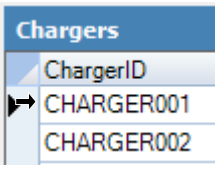
To view the latest exceptions:

From the **Report** tab check Latest Exception. Only the most recent exception of each exception type for each battery is displayed in the **Exceptions** pane.

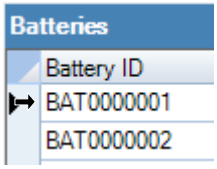
Uncheck Latest Exception to view all exceptions.

To view exceptions for select chargers, batteries and/or trucks:

Select a charger by clicking in the vertical bar just to the left of a charger. Only exceptions associated with that charger will be displayed in the **Exceptions** pane.



Select a battery by clicking in the vertical bar just to the left of a battery. Only exceptions associated with that battery will be displayed in the **Exceptions** pane.



See the side notes for how to select multiple chargers or batteries for displaying exceptions associated only with those devices.

Selecting a block of chargers or batteries: Select the first device in the range, press and hold the **Shift** key, then select the last device in the range.

Selecting multiple chargers or batteries not in a block: Select a device, press and hold the **Ctrl** key, then select other devices as desired.

To view exceptions within a time window:

1. From the **Home** tab set the Exceptions Start date to define the time window for which exceptions are displayed. Exceptions will be shown from the Exceptions Start date until the current date.
2. Click Refresh. This command filters the view of exceptions displayed based on the time window you have set. It does not perform a **Clear Charger**, **Clear Battery**, or **Clear Truck** command as the **Check** command does.

Note: Setting a range of dates does not delete any data in the database, but only affects the reporting of exception and charger log data. Only exceptions that fall within the time span are displayed or reported.

To clear charger selections:

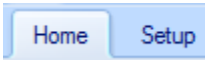
From the **Home** tab click Clear Charger. This command deselects any charger that was selected, so exceptions for all chargers are displayed in the **Exceptions** pane.

To clear battery selections:

From the **Home** tab click Clear Battery. This command deselects any battery that was selected, so exceptions for all batteries are displayed in the **Exceptions** pane.

Note: To make sure exceptions for all batteries and chargers are displayed in the **Exceptions** pane, click Clear Charger and Clear Battery.

Maximizing the Viewing Area



You can maximize the viewing area for data within a pane by increasing the size of a pane or by hiding a pane not currently being used.

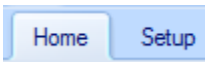
To size the panes:

1. Move the cursor to the gray horizontal bar separating any two panes.
2. Click and hold while adjusting the height of the pane up or down.

To show/hide a pane: :

From the **Home** tab check or uncheck Show Exceptions, Show Chargers, Show Batteries, or Show Trucks.

Generating Reports



Exception reports are available for all charging applications. In addition, a variety of reports and graphs have been designed and grouped specifically for fast, opportunity, and conventional charging applications. Furthermore, fleet reports can be generated for monitoring battery performance on a truck basis for conventional charging applications where multiple batteries are used in a given truck.

Viewing Complete Data in a Report

If a charger, battery, or truck in their viewing panes is selected, data used to generate a report will be limited to those selections. To make sure you are viewing all data in the database you must clear any selections of chargers, batteries, or trucks. If Clear Charger, Clear Battery, or Clear Truck on the **Home** tab is ***no***t grayed out, that indicates that a device is selected.

Note: To make sure your reports include all the data in the database, click Clear Charger, Clear Battery, and Clear Truck.

To view reports for all data in the database:

1. From the **Home** tab clear any selections of chargers, batteries, or trucks by clicking Clear Charger, Clear Battery, and Clear Truck.
2. Choose a report.

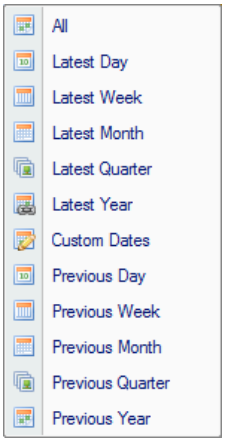
Limiting the Content of a Report

The scope of data displayed in a report can be limited in two ways:

1. Setting report date parameters using the preset selection box or using the **From / To** boxes establishes a time window for the content of a report.
2. The selection of a specific charger, battery, and/or truck in the **Chargers**, **Batteries**, and/or **Trucks** panes (or multiple chargers, batteries, and/or trucks) limits the content of a report to only those chargers, batteries, and/or trucks.

To view reports within a range of dates:

1. From the **Home** tab choose a preset range by clicking the selection box located in the Report Date Range group above the **From** date box and choosing one of the preset date ranges:



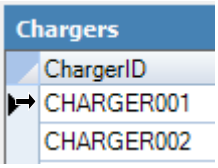
Or,

Set the **From / To** dates to define the time window for which the reports will be generated.

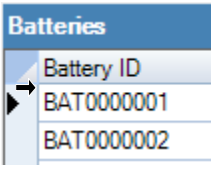
2. Choose a report.

To view reports for select chargers, batteries, and/or trucks:

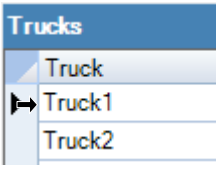
Before choosing a report, select a charger by clicking in the vertical bar just to the left of a charger to display data associated only with that charger in a report.



Before choosing a report, select a battery by clicking in the vertical bar just to the left of a battery to display data associated only with that battery in a report.



Before choosing a report, select a truck by clicking in the vertical bar just to the left of a truck to display data associated only with that truck in a report.



See the side notes for how to select multiple chargers, batteries, and/or trucks for generating reports for only those devices.

Selecting a block of chargers, batteries, or trucks: Select the first device in the range, press and hold the **Shift** key, then select the last device in the range.

Selecting multiple chargers, batteries, or trucks not in a block: Select a device, press and hold the **Ctrl** key, then select other devices as desired.

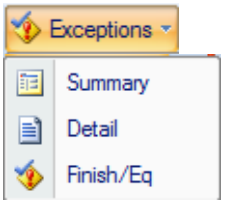
Generating a Report

To generate a report:

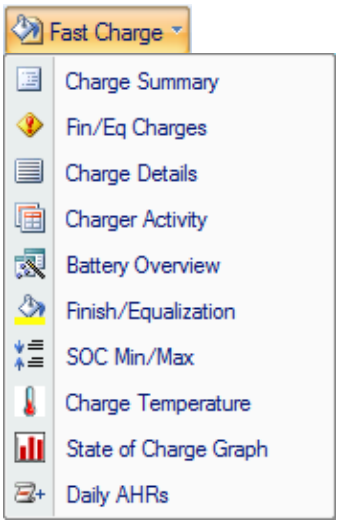
Note: For examples of the reports and graphs, see "Appendix D. Sample Reports and Graphs."

1. To generate a complete report including all data in the database, make sure **All Data** is selected in the preset date selection box. Or limit the scope of the report by a date range, or selected chargers, batteries, or trucks as described in the section "Limiting the Content of a Report" as described above.
2. From the **Home** tab click a report category and choose a report or graph.

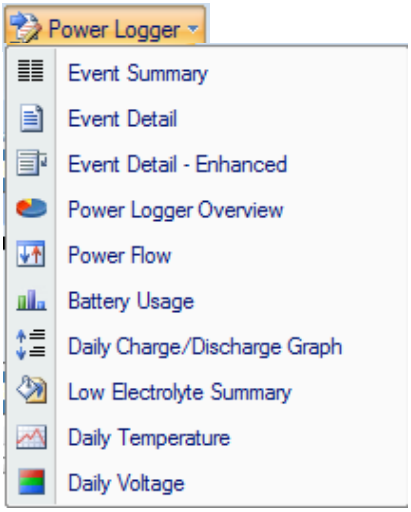
Exception Reports



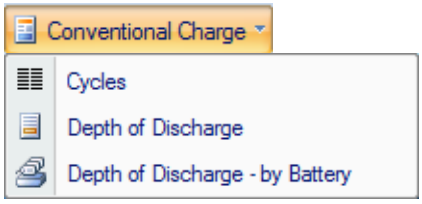
Fast Charge Reports and Graphs



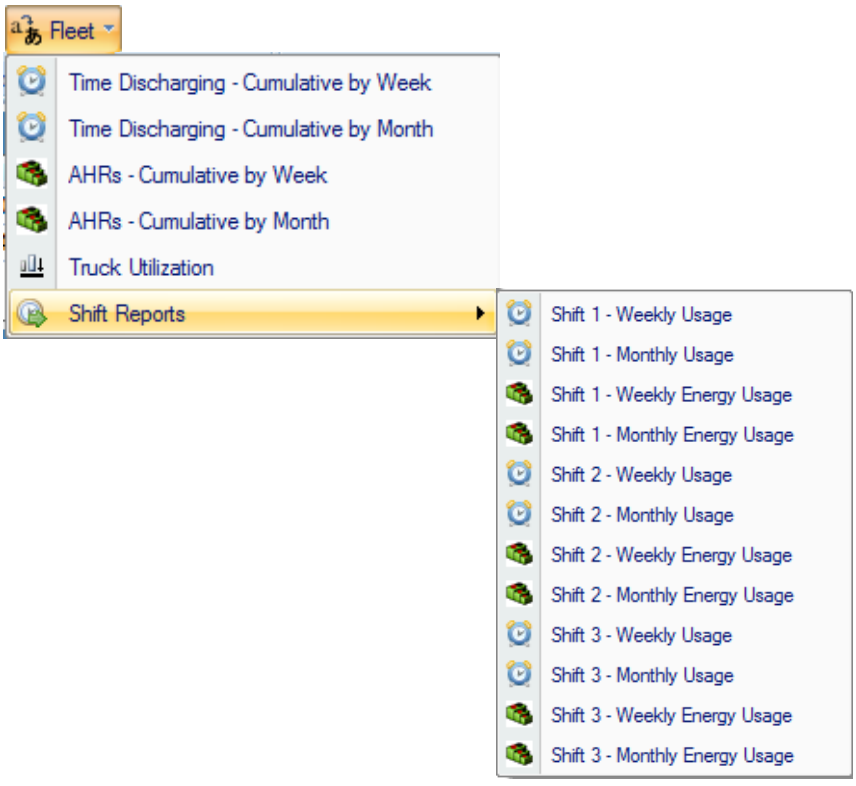
Power Logger Reports and Graphs



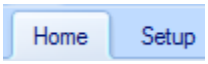
Conventional Charge Reports



Fleet Reports and Graphs



Chapter 5: Using Power Logger Analysis Tools

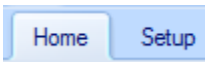


The Power Logger Analysis tools are designed primarily for use by sales engineers to study actual power usage of batteries on site. Portable versions of DC Power Logger battery modules are temporarily installed on batteries or trucks in use and data pertinent to the operation is collected and analysed using the analysis tools.

These tools can also be used by customers using DC Power Logger battery modules who would like to do more analysis of their operation than the Power Logger reports provide.

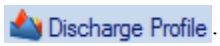
Not only do these tools allow you to analyze key data on screen, but you can also save, print, and export profiles of interest.

Discharge Profile Tool

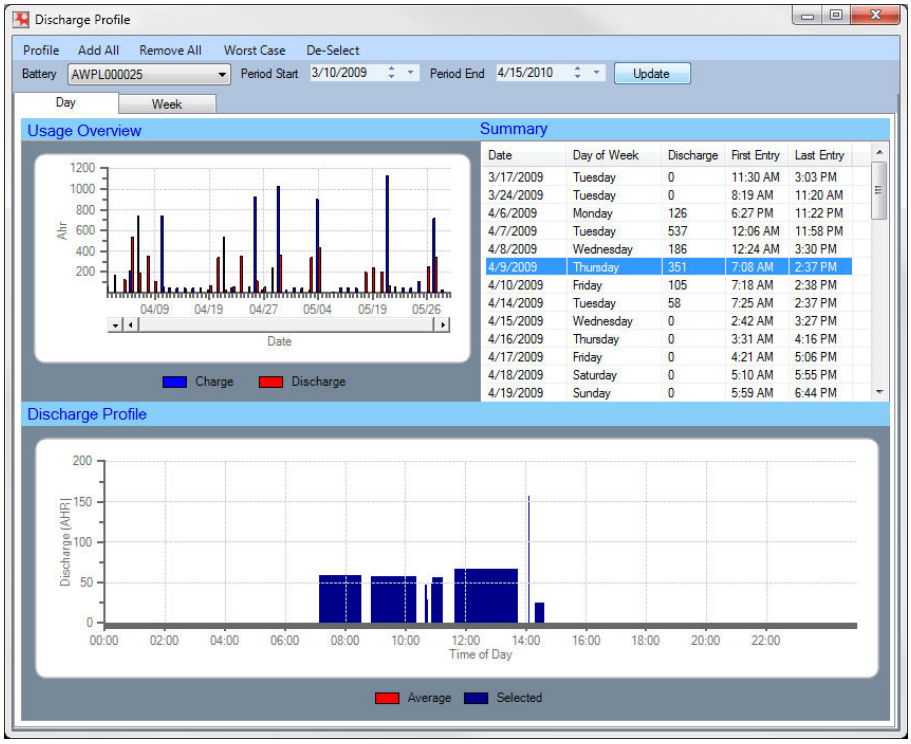


To open the Discharge Profile tool:

From the **Home** tab click the Reports command 

and choose 

. The **Discharge Profile** screen opens.

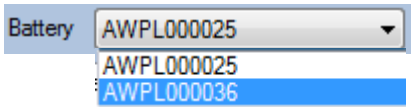


This screen is divided into three main sections: **Usage Overview**, **Summary**, and **Discharge Profile**.

The **Usage Overview** section provides a graphical look at all the discharge data recorded by a Power Logger or data for a range of dates. The **Summary** section contains the same information as the **Usage Overview** section, but in tabular form. The **Discharge Profile** section provides a graphical look at the discharge data from a Power Logger for a specific day, or an average of all days logged, or the days within a range of dates.

To select a battery to view:

From the **Discharge Profile** screen click the **Battery** field and choose from the list of batteries.



To view the Discharge Profile of a specific day:

From the **Discharge Profile** screen click in the **Summary** table on the day desired.

To the compare Discharge Profile of a selected day to the average of all days:

1. From the **Discharge Profile** screen select a day in the **Summary** table.
2. Click **Add All**. The **Discharge Profile** will show a graph of both the selected day and the average of all the days for a specific battery.

To clear the average-of-all-days selection:

From the **Discharge Profile** screen click **Remove All**. The days selected by the **Add All** command are deselected and the average-of-all-days discharge profile is not shown.

To view the Worst Case discharge day:

From the **Discharge Profile** screen click **Worst Case**. The **Discharge Profile** of the worst discharge day for the selected battery is displayed.

To deselect a selected day in the Summary Table:

From the **Discharge Profile** screen click **De-Select**.

To limit the range of dates:

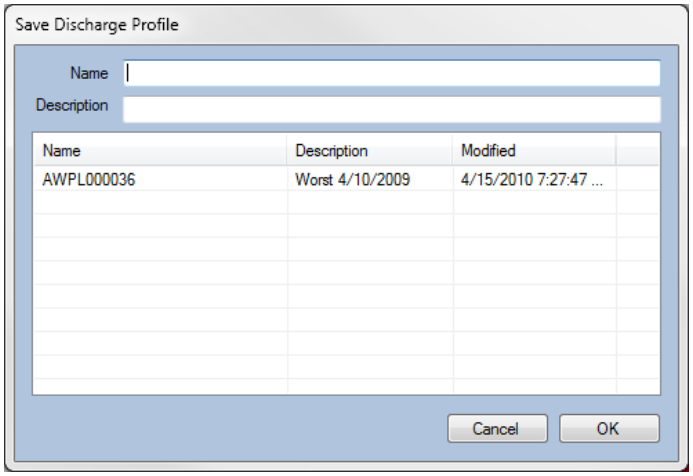
1. From the **Discharge Profile** screen set the **Period Start** and the **Period End** dates.

2. Click **Update.**

Note: Profiles that have been saved can be printed and exported using the **Discharge View** tool.

To save a profile:

1. From the **Discharge Profile** screen click **Profile ►Save.** The **Save Discharge Profile** box opens.



2. Type in a name and description then click **OK**.

To load a profile:

1. From the **Discharge Profile** screen click **Profile ►Load.** The **Load Discharge Profile** box opens
2. Select a profile and click **OK**.

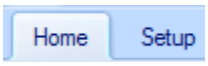
To delete the current profile:

1. From the **Discharge Profile** screen click **Profile ►Delete.** The **Delete Profile** box opens
2. Click **OK**.

To switch from Day view to Week view:

Click either the **Day** tab or the **Week** tab.

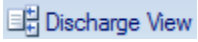
Discharge View Tool



Selecting a block of batteries: Select the first battery in the range, press and hold the **Shift** key, then select the battery in the range.

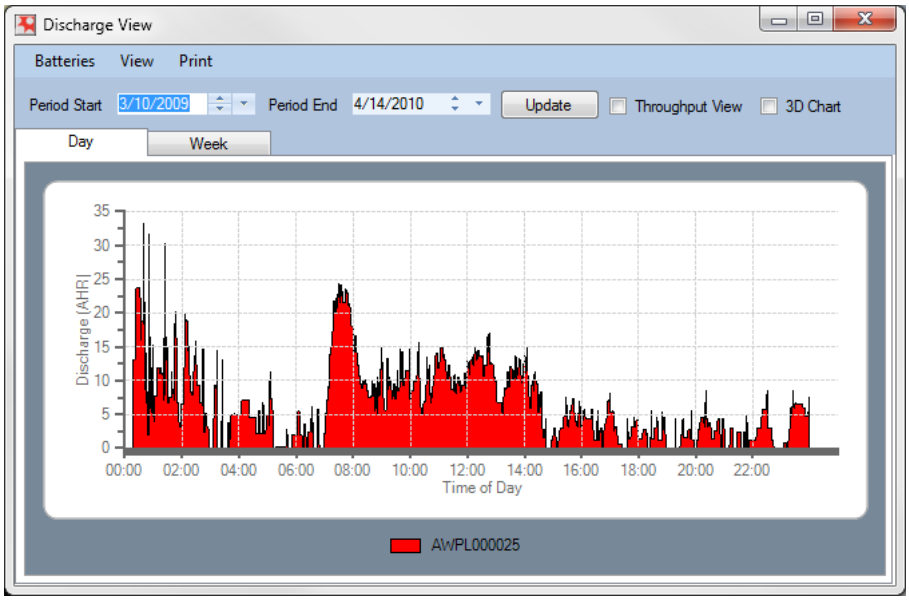
To open the Discharge View tool:

1. From the **Home** tab select a battery in the **Batteries** pane by clicking in the vertical bar just to the left of it. You may select up to 10 batteries to view at one time. At least one battery must be selected to open the **Discharge View** tool.
2. From the **Home** tab click the Reports command 

and 

. The **Discharge View** tool opens.

Selecting multiple batteries not in a block: Select a battery, press and hold the **Ctrl** key, then select other batteries as desired.



To select or deselect a battery for viewing:

This function assumes you selected multiple batteries before entering the **Discharge View** screen.

From the **Discharge View** screen click **Batteries** and choose a battery to select or deselect.

To view all data:

From the **Discharge View** screen click **View ►All Data**.

To view profiles:

From the **Discharge View** screen click **View ►Profiles**.

To select a profile saved using the Discharge Profile tool:

To select a profile **View ►Profiles** must be selected.

1. From the **Discharge View** screen click **Profile**. The **Assigned Discharge Profiles** screen opens.
2. Choose a profile and click **OK**.

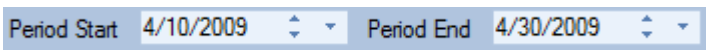
Note: See "Appendix D. Sample Reports and Graphs" for instructions on how to print or save a report or graph.

To print/save/export discharge data:

From the **Discharge View** screen click **Print**. This opens the standard Report/Graph window from which you can print or save the file in various file formats.

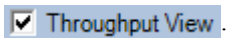
To limit the range of dates:

1. From the **Discharge Profile** screen set the **Period Start** and the **Period End** dates.



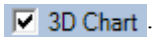
2. Click **Update.**

To view battery throughput:

From the **Discharge View** screen check 

.

To Select the 3D Chart view:

From the **Discharge View** screen check 

.

To switch from Day view to Week view:

Click either the **Day** tab or the **Week** tab.

Appendix A: Installing Motive Power Manager to a User-Provided Computer

Compatibility and Prerequisites

Note: Most users will already have Microsoft .NET Framework 2.0 installed on their computer. If the installation of SQL Server Custom Install described below fails, .NET 2.0 might not be installed.

Microsoft .NET 2.0 is available for download at www.akerwadesoftware.com.

Motive Power Manager is compatible with the following operating systems:

- **Windows 7**
- **Windows XP** (with Service Pack 3 and Microsoft .NET Framework 2.0 installed). Service Pack 3 can be downloaded and installed from the following location. http://www.microsoft.com/windows/products/windowsxp/sp3/default.mspx

Motive Power Manager requires at least 20 G-bytes of disk space and 1 G-byte of RAM.

Installation Overview

Note: Due to large file sizes of the MPM and required supporting software , it is important to secure a high-speed internet connection for downloading the files.

Important: You ***must*** disable any other Bluetooth devices installed on your computer, including internal Bluetooth that may have come with the computer, in order for the Bluetooth adapter to work properly with Motive Power Manager.

Motive Power Manager requires installation of the following software available at www.akerwadesoftware.com. CD-ROM disks are also available for purchase from Aker Wade.

- **SQL Server Custom Install** (32-bit or 64-bit version depending on your operating system)
- **Motive Power Manager**
- **Bluetooth Adapter Software** for communication with Express Fast Chargers and Power Logger battery modules. The Bluetooth Adapter must be purchased from Aker Wade. If you purchase an adapter from another source, we cannot guarantee that Bluetooth communications will work. If you experience problems with Bluetooth communications after inserting the adapter, you might need to download installation software from the manufacturer.

The installation instructions will explain how to download and install SQL Server and Motive Power Manager from the Aker Wade software download website www.akerwadesoftware.com shown below.

AKER WADE™

Aker Wade Software	
Motive Power Manager	
	Motive Power Manager (Version 2.4) **Release Notes** **Note: You must install the SQL Server software shown below to use MPM.**
SQL Server	
	SQL Server Custom Install for Windows 32 bit systems (required for Motive Power Manager) **SQL Server x64 Custom Install** for Windows 64 bit systems (required for Motive Power Manager)
Bluetooth Adapter Software	
	Bluetooth Adapter Software for Windows 32 bit systems (required for supported Aker Wade Bluetooth adapters used with MPM or FASTware)
FASTware PC	
	FASTware PC (Version 1.2.8.10) **This version requires a SUPPORTED Bluetooth adapter and a license code.**
FASTlook Sales Support Software	
	FASTlook Sales Support (Version 4.2.0.5) This software requires a license key. Contact Aker Wade for further information
	FASTLook Release Notes
FAST Reports for the PDA	
	FASTreports PDA (Version 1.2.1m) Download to your PC; Copy to PDA; Click to install
	Microsoft ActiveSync Required to transfer data from the PDA to FASTware Data Manager for reporting
	SQL Server Mobile Edition for the PDA (Use only as directed) Download to your PC; Copy to PDA; Click to install
	.NET Compact Framework for the PDA (Use only as directed) Download to your PC; Copy to PDA; Click to install
Support Files	
	Microsoft .NET Framework 2.0 Required by Motive Power Manager, FASTware PC and FASTlook
	Adobe Acrobat Reader - Required to view manuals

Installing the Custom SQL Server

Note: Download and installation is essentially the same for both 32-bit and 64-bit systems. The screen captures and instructions illustrate download and installation on a 32-bit system.

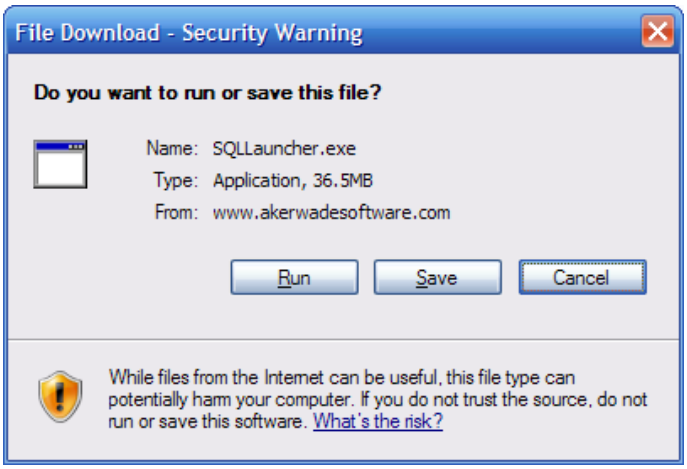
To download and install SQL Server Custom:

1. From www.akerwadesoftware.com click the link:

   SQL Server Custom Install if your computer has a 32-bit operating system or,

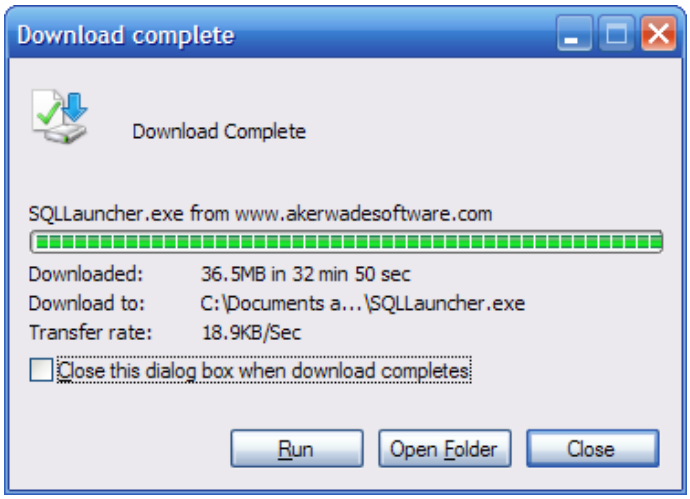
   SQL Server x64 Custom Install if your computer has a 64-bit operating system.

   This will start the download. The **File Download** box opens.

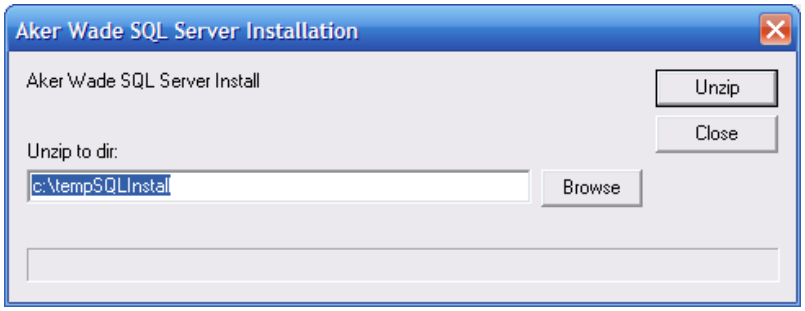


2. Click **Save**. A standard **Save As** box will open allowing you to navigate to the location you want to save the downloaded file. Once you have done this click **Save**.

3. The **Download Progress** box will open and the download will begin. The download will take a few minutes and once completed the **Download Complete** box will open.

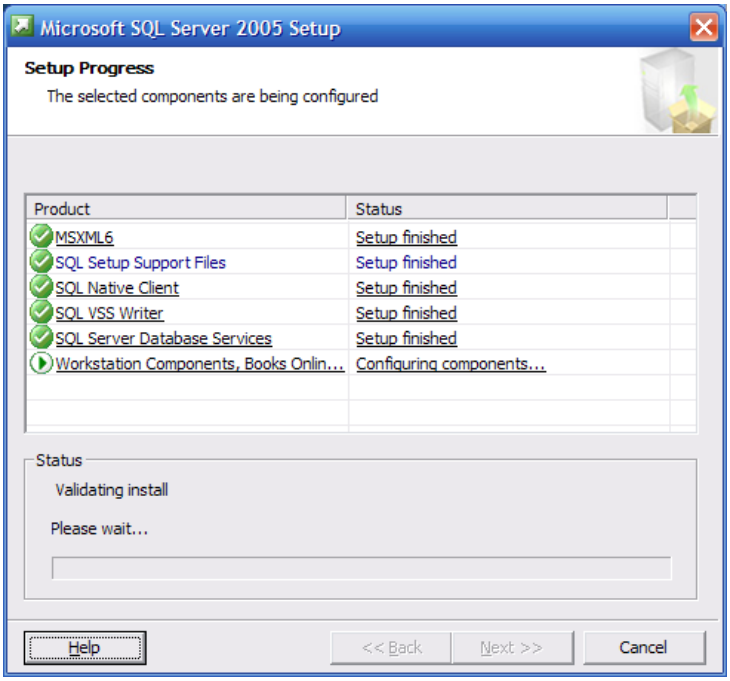


4. Click **Run** to begin the installation of SQL. The **Zip Extractor** box will open.



5. Click **Unzip**. Allow for the installation process to automatically install SQL Server. This may take several minutes.

   As the Microsoft SQL Server 2005 installation proceeds, a **Setup** box will open.



Note: Installation failure of SQL might indicate that .NET Framework 2.0 has not been installed on your computer. You can download .NET 2.0 from www.akerwadesoftware.com.

As the installation progresses a green check should appear next to each product being installed. If a red appears next to a product, uninstall all SQL Server components from your machine and re-install them. If the red continues to appear on this screen, contact Aker Wade Power Technologies directly. When error free installation is complete the **Setup** box will close automatically.

Installing Motive Power Manager

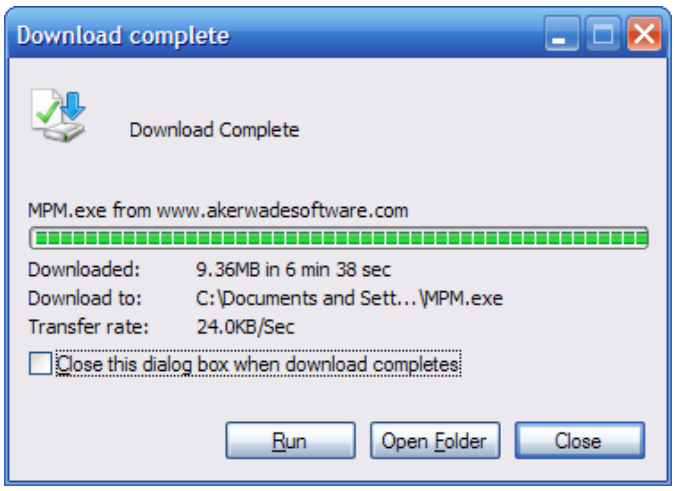
Note: SQL Server must be installed before downloading and installing Motive Power Manager software.

To download and install Motive Power Manager:

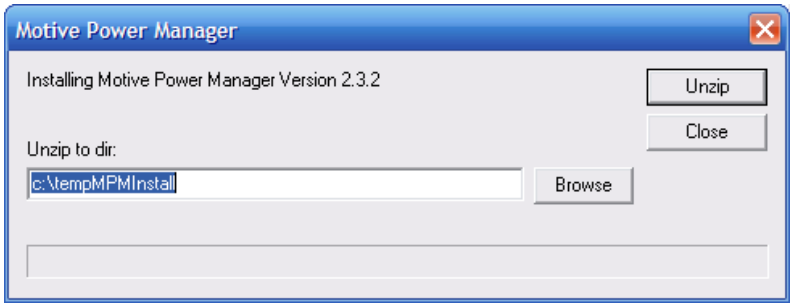
1. From www.akerwadesoftware.com click the link:

   Motive Power Manager

   This will start the download. The download procedure for Motive Power Manager is the same as that for SQL Server. Once Motive Power Manager finishes downloading, the **Download Complete** box opens.

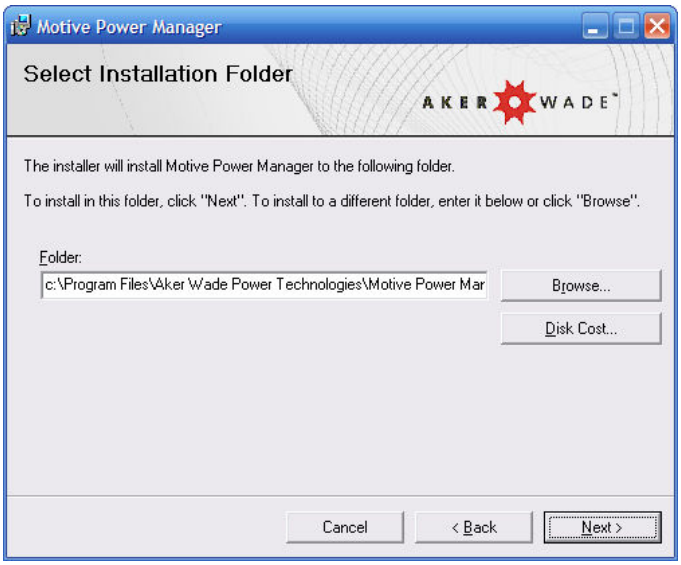


2. Click **Run** to begin installation of Motive Power Manager. The **Zip Extractor** box will open.

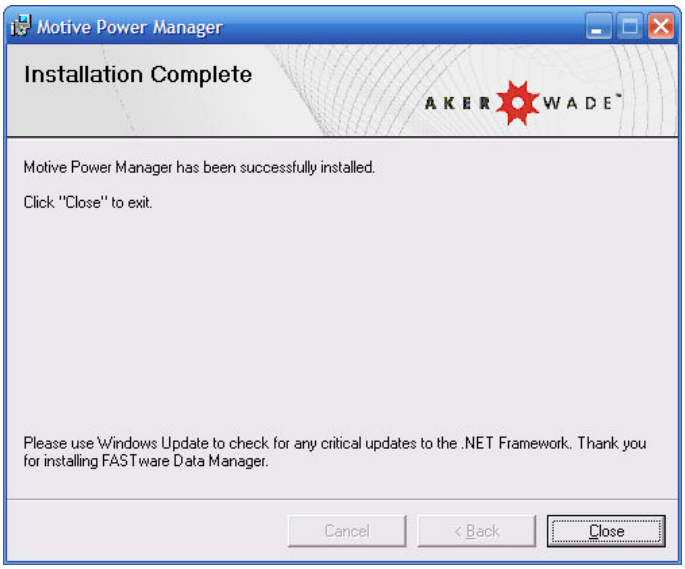


3. Click **Unzip**. The **Motive Power Manager Setup Wizard** will open.

4. Click **Next**. The **Select Installation Folder** box opens.



5. Aker Wade recommends using the default location. Click **Next**.
6. When the **Confirm Installation** box opens, click **Next**. When the installation has finished the **Installation Complete** box will open.



7. Click **Close**.

Appendix B: MPM Features List

Home Tab Functions

Reports		
	Exceptions	
		Summary
		Detail
		Fin/EQ
	Power Logger	
		Event Summary
		Event Detail
		Event Detail Enhanced
		Power Logger Overview
		Power Flow
		Battery Usage
		Daily Charge/Discharge Graph
		Low Electrolyte Summary
		Daily Temperature
		Daily Voltage
	Power Logger Analysis	
		Discharge Profile
		Discharge View
	Fast Charge	
		Charge Summary
		Fin/Eq Charges
		Charge Details
		Charger Activity
		Battery Overview
		Finish/Equalization
		SOC Min/Max
		Charge Temperature
		State of Charge Graph

		Daily AHRs
	Conventional Charge	
		Cycles
		Depth of Discharge
		Depth of Discharge - By Battery
	Fleet	
		Time Discharging - Cumulative by Week
		Time Discharging - Cumulative by Month
		AHRs - Cumulative by Week
		AHRs - Cumulative by Month
		Truck Utilization
Transfer		
	Merge Existing Files	
Report Data Range		
	From/To Functions	
Exceptions		
	Check	
	Clear	
View		
	Show Exceptions	
	Latest Exceptions	
	Exceptions Start	
	Refresh	
	Show Batteries	
	Show Trucks	
	Show Chargers	
	Clear Charger	
	Clear Battery	
	Clear Truck	

Setup Tab Functions

Configure			
	Charger Details		
		Edit Charger Details	
	Battery Details		
		Edit Battery Details	
	Power Logger		
		Get Time/Date	
		Get Current Values	
		Get Configuration	
		Hard Rest	
		Set Time/Date	
		Set Configuration	
		Clear Event Log	
		Calibrate Voltage	
		Zero Current Calibration	
	Exceptions		
		Battery Status	
			High Temperature at Start of Charge
			Critical Temperature at Start of Charge
			High Temperature at End of Charge
			Critical Temperature at End of Charge
			Truck Began Charge Cycle at Low State of Charge (Requires Express Charger)
			Truck Ended Charge Cycle at Low State of Charge (Requires Express Charger)
			Low Electrolyte level detected (Requires Power Logger)
			Temperature exceeds limit (Requires Power Logger)
			Temperature exceeds Critical limit (Requires Power Logger)
			Voltage below minimum limit (requires Power Logger)
		Battery Usage	
			Truck was not on charger for prescribed time
			Charge ended in error condition (requires Express charger)
			Truck was off charger longer than time limit

			Amp Hours returned exceeds daily limit
			Amp Hours returned exceeds weekly limit
			Amp Hours discharged exceeds daily limit (requires Power Logger)
			Amp Hours discharged exceeds weekly limit (requires Power Logger)
		Fat/Opportunity Charge Applications	
			Equalize Charge missed(requires Express Charger)
			Finish Charge missed (requires Expres Charger)
			Daily Plug in count below limit
		Convetntional Charge Applications	
			Depth of Discharge below limit (requires Power Logger)
			Depth of Discharge exceeds limit (requires Power Logger)
			EL Level reported low after completion of cylce charge (requires Power Logger)
			Battery Temperature exceeds limit at start of discharge cycle (requires Power Logger)
			Voltage measured as 10 second minimum is below limit (requires Power Logger)
			Voltage measured as 2 second minimum is below limit (requires Power Logger)
			Daily EQ missed (requires Power Logger)
		Schedules	
		Groups	
		Auto-Log	
Exceptions			
	Start Date		
	End Date		
	Max Out of Sync Days		
	Check Exceptions		
	Clear Exceptions		
Info			
	License		
	About		
	Settings		

Database	Database Tasks		
		Select Database	
		Import	
		Database Maintenance	
			New Database
			Permanently Delete Database
			Detach Database from Server
			Attach Database to Server
			Edit SQL Parameters
			Move Database
			Database Edit

Appendix C: Exception Parameter Definitions and Default Settings

This section lists the default settings for all Motive Power Manager configurable exception parameters. Also provided is a brief explanation of each exception parameter.

Note: "Repeat Interval" is the minimum wait time, expressed in minutes, before another occurrence of this event is reported

Battery Status

Settings / Values	Parameter Name / Description
Enabled: True Temp: 125 Repeat Interval: 0	**High Temperature at Start of Charge** The exception is reported if Temp is exceeded. Temp is expressed as degrees Fahrenheit ranging from 50-250. See note on Repeat Interval.
Enabled: False Temp: 135 Repeat Interval: 0	**Critical Temperature at Start Charge** The exception is reported if Temp is exceeded. Typically it would be a higher value than High Temperature at Start of Charge. Temp is expressed as degrees Fahrenheit ranging from 50-250. See note on Repeat Interval.
Enabled: True Temp: 135 Repeat Interval: 0	**High Temperature at End of Charge** The exception is reported if Temp is exceeded. Temp is expressed as degrees Fahrenheit ranging from 50-250. See note on Repeat Interval.
Enabled: False Temp: 140 Repeat Interval: 0	**Critical Temperature at End of Charge** The exception is reported if Temp is exceeded. Typically it would be a higher value than High Temperature at End of Charge. Temp is expressed as degrees Fahrenheit ranging from 50-250. See note on Repeat Interval.
Enabled: True SOC%: 20 Repeat Interval: 0	**Truck began charge cycle at low State of Charge** Requires Express charger. An exception is reported if SOC% falls below this value. SOC% is expressed as a percentage from 0% -100%. See note on Repeat Interval.
Enabled: True SOC%: 30 Repeat Interval: 0	**Truck ended charge cycle at low State of Charge** Requires Express charger. An exception is reported if SOC% falls below this value. SOC% is expressed as a percentage from 0% -100%. See note on Repeat Interval.
Enabled: False Repeat Interval: 0	**Low Electrolyte level detected** Requires Power Logger. An exception is reported if Low Electrolyte Level is detected by Power Logger. See note on Repeat Interval.
Enabled: False Temp: 150 Repeat Interval: 0	**Temperature exceeds limit** Requires Power Logger. The exception is reported if Temp is exceeded. Temp is expressed as degrees Fahrenheit. See note on Repeat Interval.

Note: "Repeat Interval" is the minimum wait time, expressed in minutes, before another occurrence of this event is reported

Battery Status

Settings / Values	Parameter Name / Description
Enabled: False Temp: 160 Repeat Interval: 0	**Temperature exceeds Critical limit** Requires Power Logger. The exception is reported if Temp is exceeded. Temp is expressed as degrees Fahrenheit. See note on Repeat Interval.
Enabled: False Voltage: 36 Repeat Interval: 0	**Voltage below minimum limit** Requires Power Logger. The exception is reported if Voltage is exceeded. Voltage is expressed in Volts. See note on Repeat Interval.

Battery Usage

Settings / Values	Parameter Name / Description
Enabled: False Charge Time: 120 Ignore Monday: False Ignore Tuesday: False Ignore Wednesday: False Ignore Thursday: False Ignore Friday: False Ignore Saturday: False Ignore Sunday: False	**Truck was not on charger for prescribed time** An exception is reported if Charge Time is exceeded. Charge time is expressed in minutes. To exclude days from exception checking, set Ignore … to True.
Enabled: False	**Charge ended in error condition** Requires Express charger. An exception is reported if error is detected by Express charger.
Enabled: False Charge Time: 240 Ignore Monday: False Ignore Tuesday: False Ignore Wednesday: False Ignore Thursday: False Ignore Friday: False Ignore Saturday: False Ignore Sunday: False	**Truck was off charger longer than time limit** An exception is reported if Charge Time is exceeded. Charge time is expressed in minutes. To exclude days from exception checking, set Ignore … to True.
Enabled: False AHRLimit: 1600	**Amp Hours returned exceeds daily limit** An exception is reported if AHRLimit is exceeded. Expressed in Ampere Hours.
Enabled: False AHRLimit: 8000	**Amp Hours returned exceeds weekly limit** An exception is reported if AHRLimit is exceeded. Expressed in Ampere Hours.
Enabled: False AHRLimit: 1600	**Amp Hours discharged exceeds daily limit** Requires Power Logger. An exception is reported if this number is exceeded. Expressed in Ampere Hours.
Enabled: False AHRLimit: 8000	**Amp Hours discharged exceeds weekly limit** Requires Power Logger. An exception is reported if AHRLimit is exceeded. Expressed in Ampere Hours.

Fast/Opportunity Charge Applications

Settings / Values	Parameter Name / Description
Enabled: True Method: Number of Days Report Multiple Misses: True Days: 7 (Number of Days Only) EQ On Monday: False EQ On Tuesday: False EQ On Wednesday: False EQ On Thursday: False EQ On Friday: False EQ On Saturday: False EQ On Sunday: False EQ Time: 120	**Equalize Charge missed** Requires Express charger. Method of calculating the Equalize exception. The options are either "Number of Days" or "Day of Week". If "Number of Days" is selected the "Days" value indicates the number of days within which Equalize must be done or an exception will be reported. If "Day of Week" is selected the "Day of Week" value indicates which day of the week on which Equalize must be done or an exception will be reported.
Enabled: True Method: Number of Days Report Multiple Misses: True Days: 7 (Number of Days Only) Finish On Monday: False Finish On Tuesday: False Finish On Wednesday: False Finish On Thursday: False Finish On Friday: False Finish On Saturday: False Finish On Sunday: False Finish Time: 120	**Finish Charge missed** Requires Express charger. Method of calculating the Finish exception. The options are either "Number of Days" or "Day of Week" If "Number of Days" is selected the "Days" value indicates the number of days within which Finish must be done or an exception will be reported. If "Day of Week" is selected the "Day of Week" value indicates which day of the week on which Finish must be done or an exception will be reported.
Enabled: False Count: 2 Minimum AHRs: 0 Minimum Time: 5 Ignore Monday: False Ignore Tuesday: False Ignore Wednesday: False Ignore Thursday: False Ignore Friday: False Ignore Saturday: False Ignore Sunday: False	**Daily Plug-In count below limit** An exception is reported if Count is less than this value. A Plug-In must exceed Minimum AHRs AND Minimum Time. Minimum AHRs is expressed in Ampere Hours and Minimum Time is express in minutes. To exclude days from exception checking, set Ignore … to True.

Conventional Charge Applications

Settings / Values	Parameter Name / Description
Enabled: False Discharge %: 40	**Depth of Discharge below limit** Requires Power Logger. An exception is reported if Discharge % is too great. Expressed as a percentage.
Enabled: False Discharge %: 80	**Depth of Discharge exceeds limit** Requires Power Logger. An exception is reported if Discharge % insufficient. Expressed as a percentage.
Enabled: False	**EL Level reported low after completion of cycle charge** Requires Power Logger. An exception is reported if the electrolyte level detected by the

Conventional Charge Applications

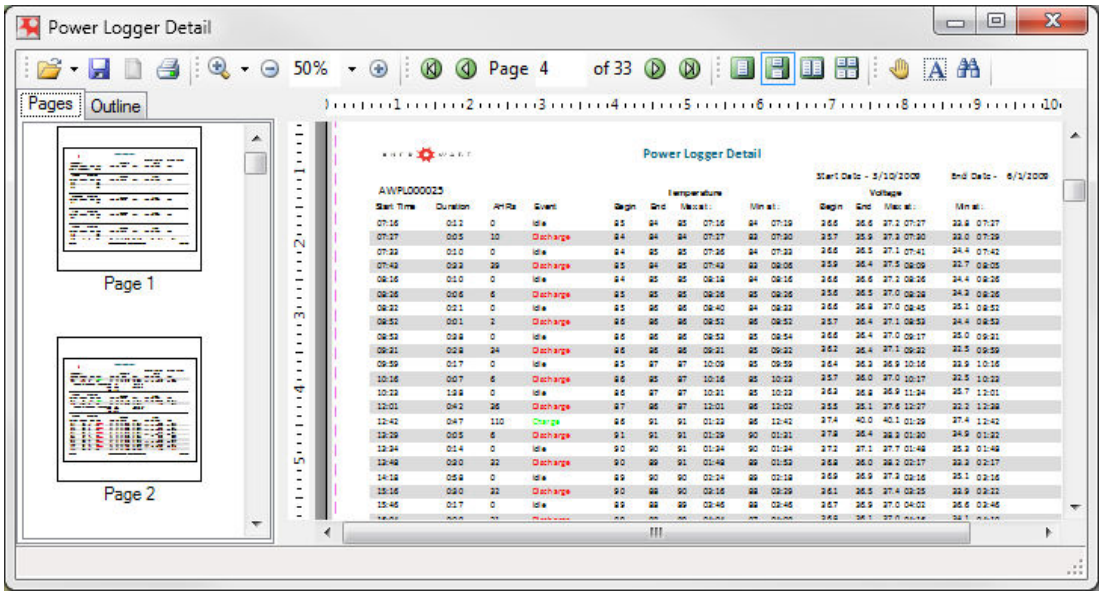
Settings / Values	Parameter Name / Description
	Power Logger is too low.
Enabled: False Temperature: 125	**Battery Temperature exceeds limit at start of discharge** Requires Power Logger. The exception is reported if Temperature is exceeded. Temperature is expressed as degrees Fahrenheit.
Enabled: False Cell Voltage: 2.22000002861023 Repeat Interval: 0	**Voltage measured as 10 second minimum is below limit** Requires Power Logger. The exception is reported if Cell Voltage is below the set limit. Cell Voltage is expressed in Volts. See note on Repeat Interval.
Enabled: False Cell Voltage:2.22000002861023 Repeat Interval: 0	**Voltage measured as 2 second minimum is below limit** Requires Power Logger. The exception is reported if Cell Voltage is below the set limit. Cell Voltage is expressed in Volts. See note on Repeat Interval.
Enabled: False Ignore Monday: False Ignore Tuesday: False Ignore Wednesday: False Ignore Thursday: False Ignore Friday: False Ignore Saturday: True Ignore Sunday: True	**Daily EQ missed** Requires Power Logger. The exception is reported if Daily EQ is missed. To exclude days from exception checking, set Ignore … to True.

Note: "Repeat Interval" is the minimum wait time, expressed in minutes, before another occurrence of this event is reported

Appendix D: Sample Reports and Graphs

View and Export Options for Reports and Graphs

As the sample report shows below there are many viewing options available for reports and graphs. In addition the Save command provides options for exporting reports and graphs into different file formats.



Key to commands for viewing and saving a report or graph:

- Open File – Open an existing report
- Save – Save the report. Can be saved as a .PDF, a Word or Excel document, or a .JPG
- Page Setup Button (currently not active)
- Print Button – Print the report
- Zoom-In/Out Tool – Choose whether you want to zoom in or out with the report
- Zoom-Out Button – Zooms the page out at 25% intervals
- 50% Zoom Percentage – Manually enter in the zoom percentage
- Zoom-In Button – Zooms the page in at 25% intervals
- Page 1 Button – Goes directly to the first page in the report

Page Back Button – Goes directly to the previous page in the report

Page 4 Page Number – Typing a page number automatically directs you to that page

Next Page Button – Goes directly to the next page

Last Page Button – Goes directly to the last page in the report

Single Page View Button – Shows the report in single pages

Continuous View Button – Allows you to view the report on a continuous basis meaning you can view part of one page and part of another

Pages Facing View Button – Lines the pages side by side for viewing

Pages Facing Continuous View Button – Lines the pages side by side for viewing while allowing for partial pages to be viewed

Hand Tool Button – Allows you click and drag pages

Text Select Button – Allows you to select just text within the report

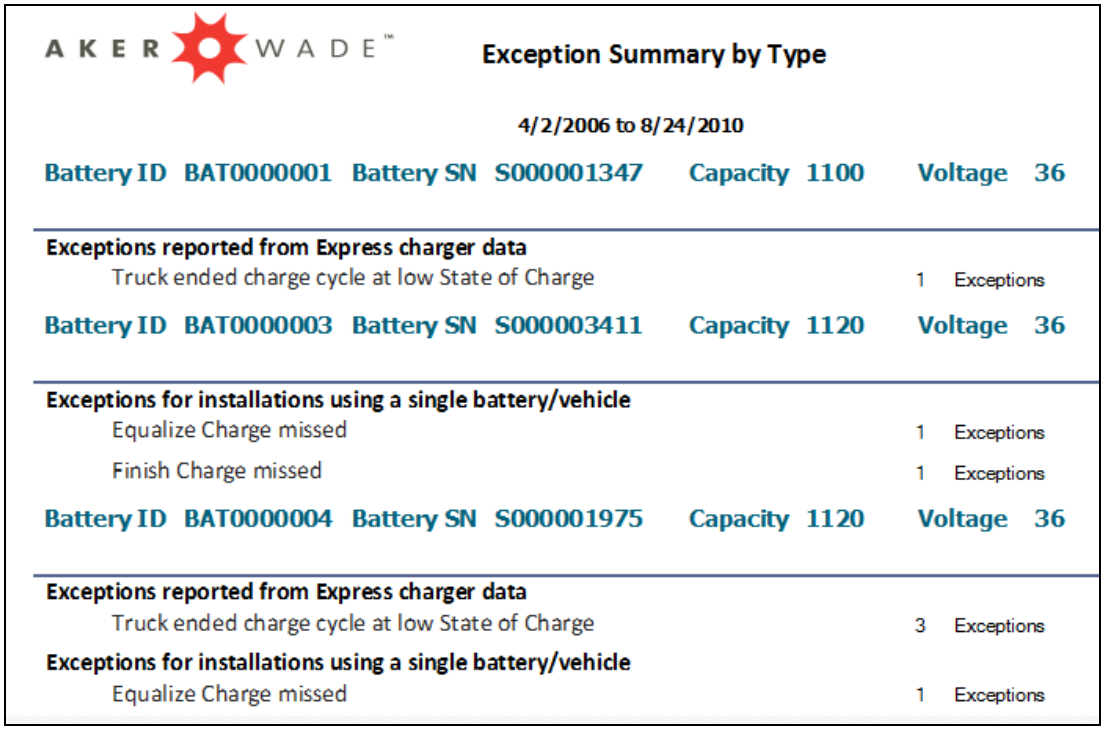
Find Text Button – Allows you to search the report for particular text

Pages Page View – In Navigation pane

Outline Outline View – In Navigation pane

Exceptions

Summary



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Exception Summary by Type

4/2/2006 to 8/24/2010

Battery ID BAT0000001 Battery SN S000001347 Capacity 1100 Voltage 36

Exceptions reported from Express charger data

Truck ended charge cycle at low State of Charge 1 Exceptions

Battery ID BAT0000003 Battery SN S000003411 Capacity 1120 Voltage 36

Exceptions for installations using a single battery/vehicle

Equalize Charge missed 1 Exceptions

Finish Charge missed 1 Exceptions

Battery ID BAT0000004 Battery SN S000001975 Capacity 1120 Voltage 36

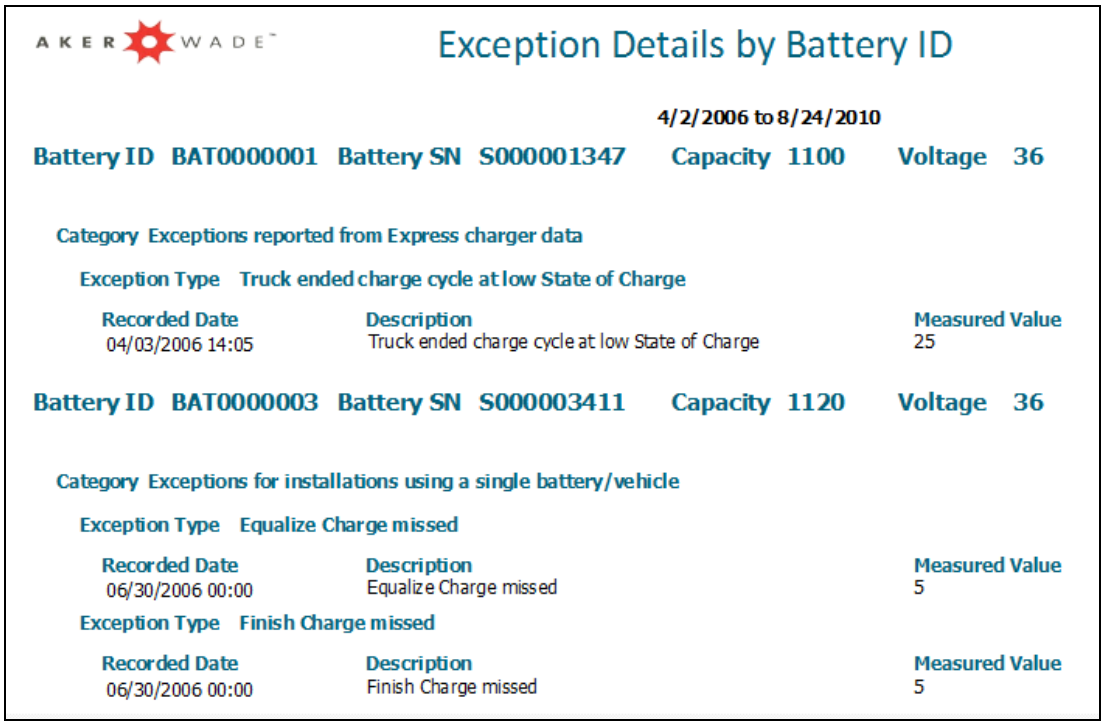
Exceptions reported from Express charger data

Truck ended charge cycle at low State of Charge 3 Exceptions

Exceptions for installations using a single battery/vehicle

Equalize Charge missed 1 Exceptions

Detail



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Exception Details by Battery ID

4/2/2006 to 8/24/2010

Battery ID BAT0000001 Battery SN S000001347 Capacity 1100 Voltage 36

Category Exceptions reported from Express charger data

Exception Type Truck ended charge cycle at low State of Charge

Recorded Date	Description	Measured Value
04/03/2006 14:05	Truck ended charge cycle at low State of Charge	25

Battery ID BAT0000003 Battery SN S000003411 Capacity 1120 Voltage 36

Category Exceptions for installations using a single battery/vehicle

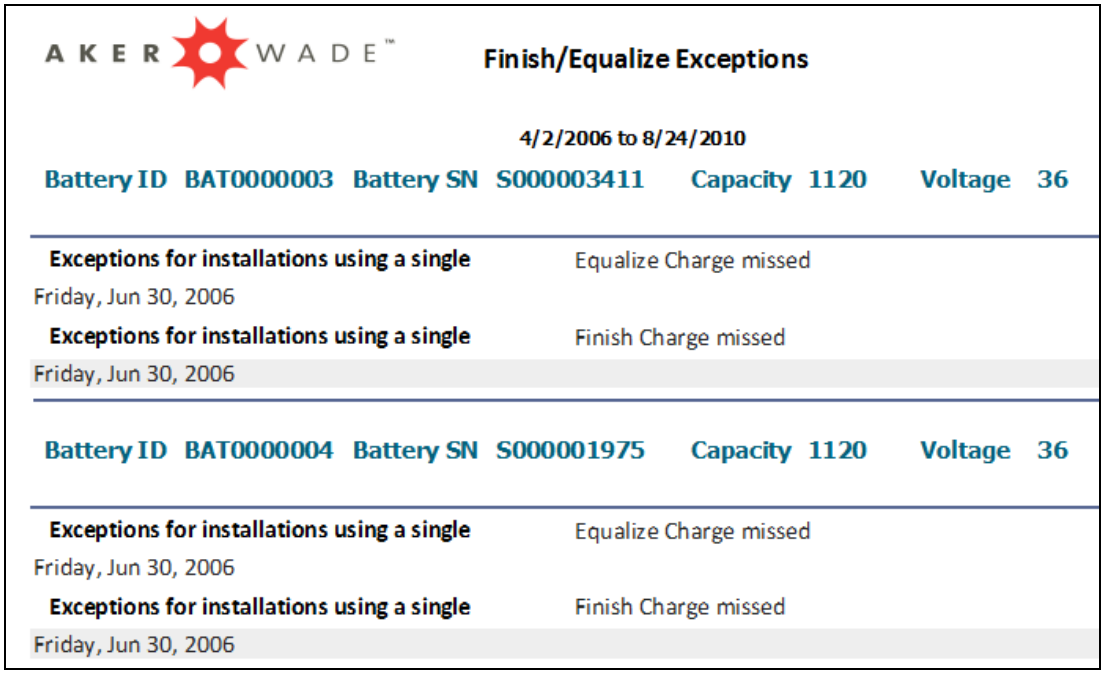
Exception Type Equalize Charge missed

Recorded Date	Description	Measured Value
06/30/2006 00:00	Equalize Charge missed	5

Exception Type Finish Charge missed

Recorded Date	Description	Measured Value
06/30/2006 00:00	Finish Charge missed	5

Finish/Equalize



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Finish/Equalize Exceptions

4/2/2006 to 8/24/2010

Battery ID BAT0000003 Battery SN S000003411 Capacity 1120 Voltage 36

Exceptions for installations using a single	Equalize Charge missed
Friday, Jun 30, 2006	
Exceptions for installations using a single	Finish Charge missed
Friday, Jun 30, 2006	

Battery ID BAT0000004 Battery SN S000001975 Capacity 1120 Voltage 36

Exceptions for installations using a single	Equalize Charge missed
Friday, Jun 30, 2006	
Exceptions for installations using a single	Finish Charge missed
Friday, Jun 30, 2006	

Fast Charge

Charge Summary

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Battery Charge Daily Summary

4/2/2006 to 8/24/2010

Battery ID BAT0000001 Battery SN S000001347 Capacity 1100 Voltage 36

Date	Plug Ins	AHRs Returned	SOC Min	SOC Max	Voltage Min	Voltage Max	Temp Min	Temp Max
Sun Apr 02, 2006	2	342	74	90	36.8	45.9	69	95
Mon Apr 03, 2006	15	1628	12	90	35.7	45.9	58	106
Tue Apr 04, 2006	9	1378	47	91	36.5	45.1	80	124
Wed Apr 05, 2006	12	1670	51	87	36.3	44.9	92	130
Thu Apr 06, 2006	11	1045	40	90	36.8	46.0	88	117
Fri Apr 07, 2006	2	229	80	90	38.4	44.7	87	98
Tue Apr 18, 2006	1	3						

Finish/Equalize Charges

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Finish and Equalize Charge Report

4/2/2006 to 8/24/2010

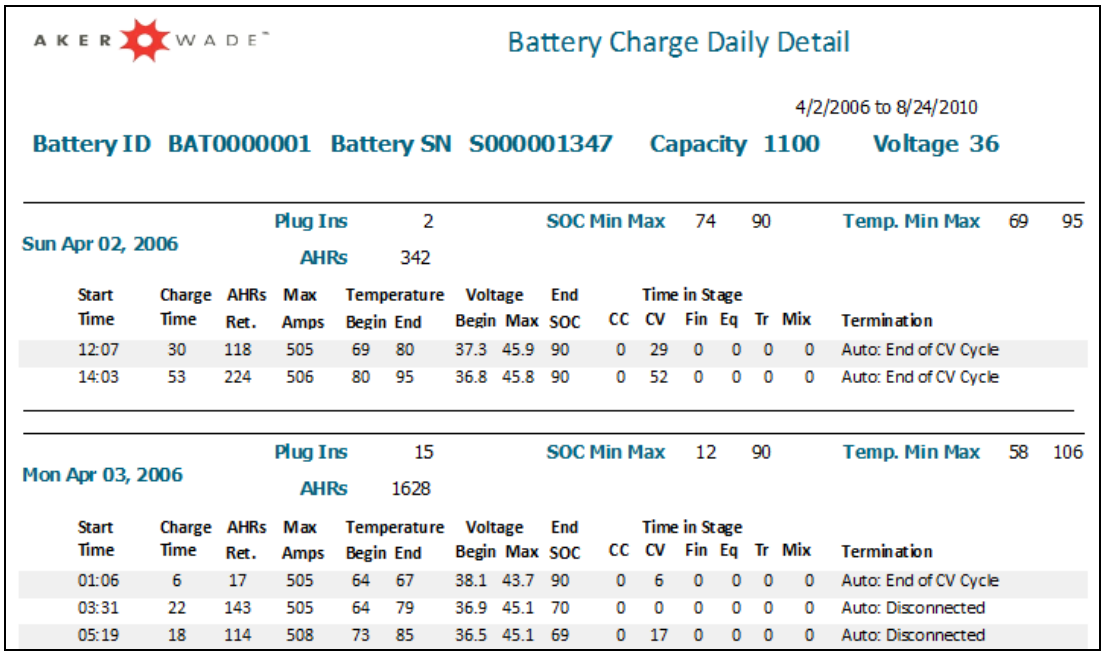
Battery ID BAT0000001 Battery SNS000001347 Capacity 1100 Voltage 36

Charge Start	Dur.	Charger	Termination Code	AHRs Returned	SOC Start	SOC End	Temp Start	Temp End	Time in Stage CC	CV	Fin	EQ	Tk	Mix
Thu Apr 06, 2006														
01:09	282	CHARGER00	Error: Unknown	386	72	100	117	123	0	42	240	0	0	0

Battery ID BAT0000002 Battery SNS000006082 Capacity 1100 Voltage 36

Charge Start	Dur.	Charger	Termination Code	AHRs Returned	SOC Start	SOC End	Temp Start	Temp End	Time in Stage CC	CV	Fin	EQ	Tk	Mix
Thu Apr 06, 2006														
00:29	322	CHARGER00	Error: Unknown	487	65	100	111	123	0	82	240	0	0	0

Charge Details



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Battery Charge Daily Detail

4/2/2006 to 8/24/2010

Battery ID BAT0000001 **Battery SN** S000001347 **Capacity** 1100 **Voltage** 36

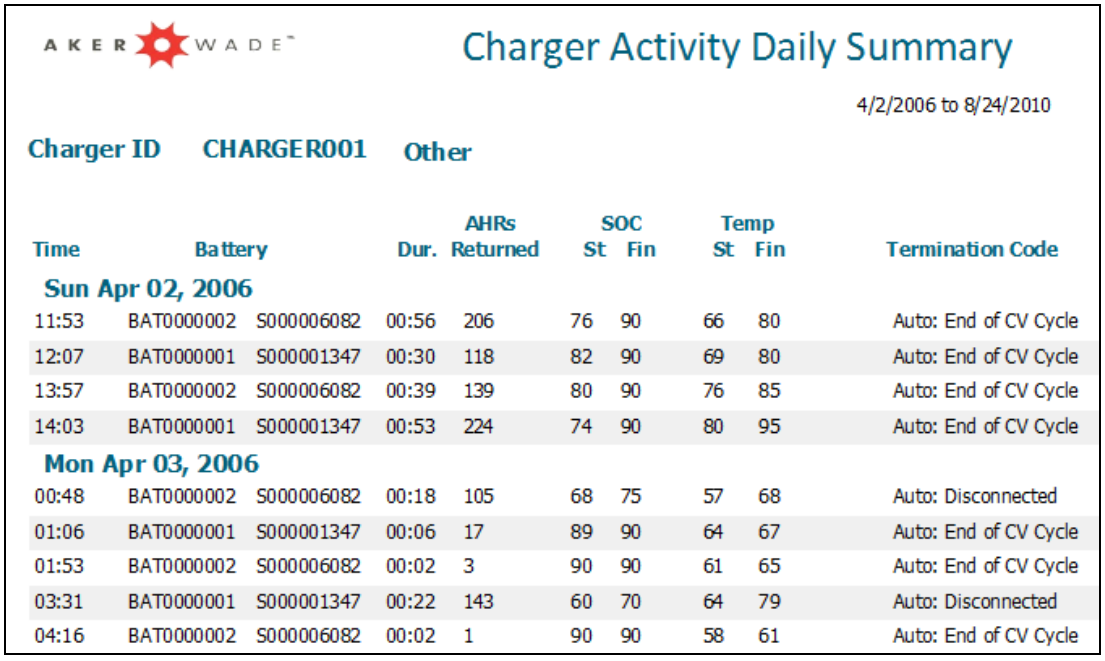
Sun Apr 02, 2006 — Plug Ins 2 — AHRs 342 — SOC Min Max 74 90 — Temp. Min Max 69 95

Start Time	Charge Time	AHRs Ret.	Max Amps	Temperature Begin	Temperature End	Voltage Begin	Voltage Max	End SOC	Time in Stage CC	CV	Fin	Eq	Tr	Mix	Termination
12:07	30	118	505	69	80	37.3	45.9	90	0	29	0	0	0	0	Auto: End of CV Cycle
14:03	53	224	506	80	95	36.8	45.8	90	0	52	0	0	0	0	Auto: End of CV Cycle

Mon Apr 03, 2006 — Plug Ins 15 — AHRs 1628 — SOC Min Max 12 90 — Temp. Min Max 58 106

Start Time	Charge Time	AHRs Ret.	Max Amps	Temperature Begin	Temperature End	Voltage Begin	Voltage Max	End SOC	Time in Stage CC	CV	Fin	Eq	Tr	Mix	Termination
01:06	6	17	505	64	67	38.1	43.7	90	0	6	0	0	0	0	Auto: End of CV Cycle
03:31	22	143	505	64	79	36.9	45.1	70	0	0	0	0	0	0	Auto: Disconnected
05:19	18	114	508	73	85	36.5	45.1	69	0	17	0	0	0	0	Auto: Disconnected

Charger Activity



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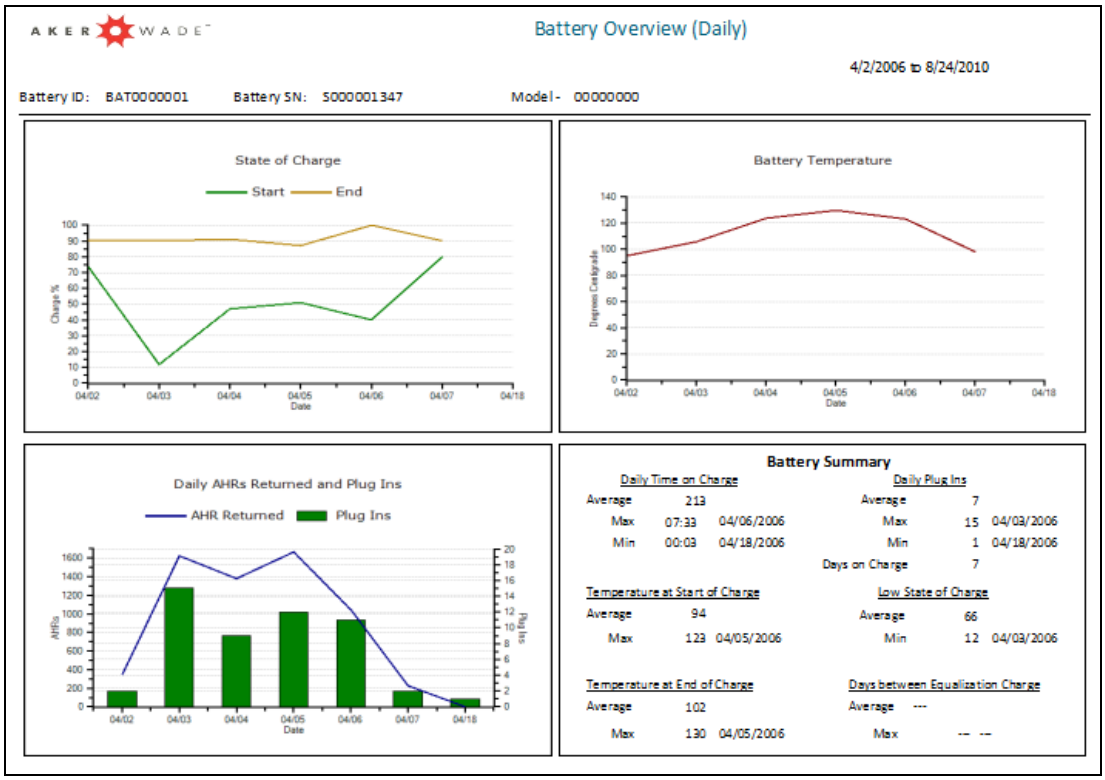
Charger Activity Daily Summary

4/2/2006 to 8/24/2010

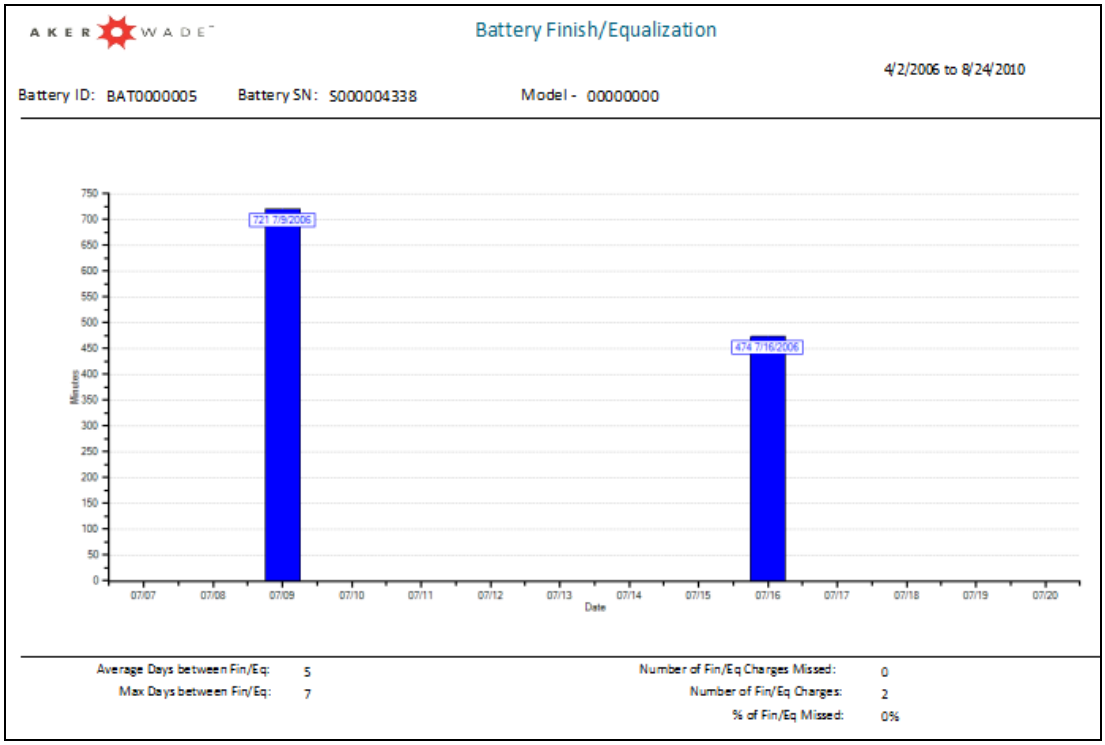
Charger ID CHARGER001 **Other**

Time	Battery		Dur.	AHRs Returned	SOC St	SOC Fin	Temp St	Temp Fin	Termination Code
Sun Apr 02, 2006									
11:53	BAT0000002	S000006082	00:56	206	76	90	66	80	Auto: End of CV Cycle
12:07	BAT0000001	S000001347	00:30	118	82	90	69	80	Auto: End of CV Cycle
13:57	BAT0000002	S000006082	00:39	139	80	90	76	85	Auto: End of CV Cycle
14:03	BAT0000001	S000001347	00:53	224	74	90	80	95	Auto: End of CV Cycle
Mon Apr 03, 2006									
00:48	BAT0000002	S000006082	00:18	105	68	75	57	68	Auto: Disconnected
01:06	BAT0000001	S000001347	00:06	17	89	90	64	67	Auto: End of CV Cycle
01:53	BAT0000002	S000006082	00:02	3	90	90	61	65	Auto: End of CV Cycle
03:31	BAT0000001	S000001347	00:22	143	60	70	64	79	Auto: Disconnected
04:16	BAT0000002	S000006082	00:02	1	90	90	58	61	Auto: End of CV Cycle

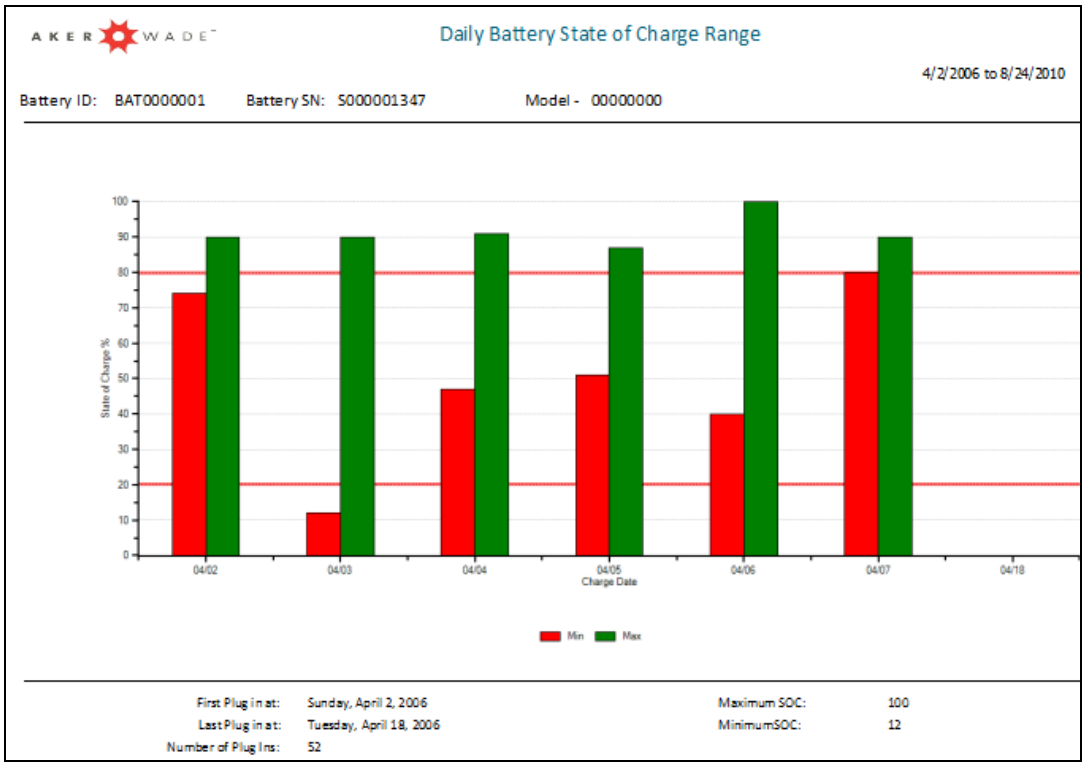
Battery Overview



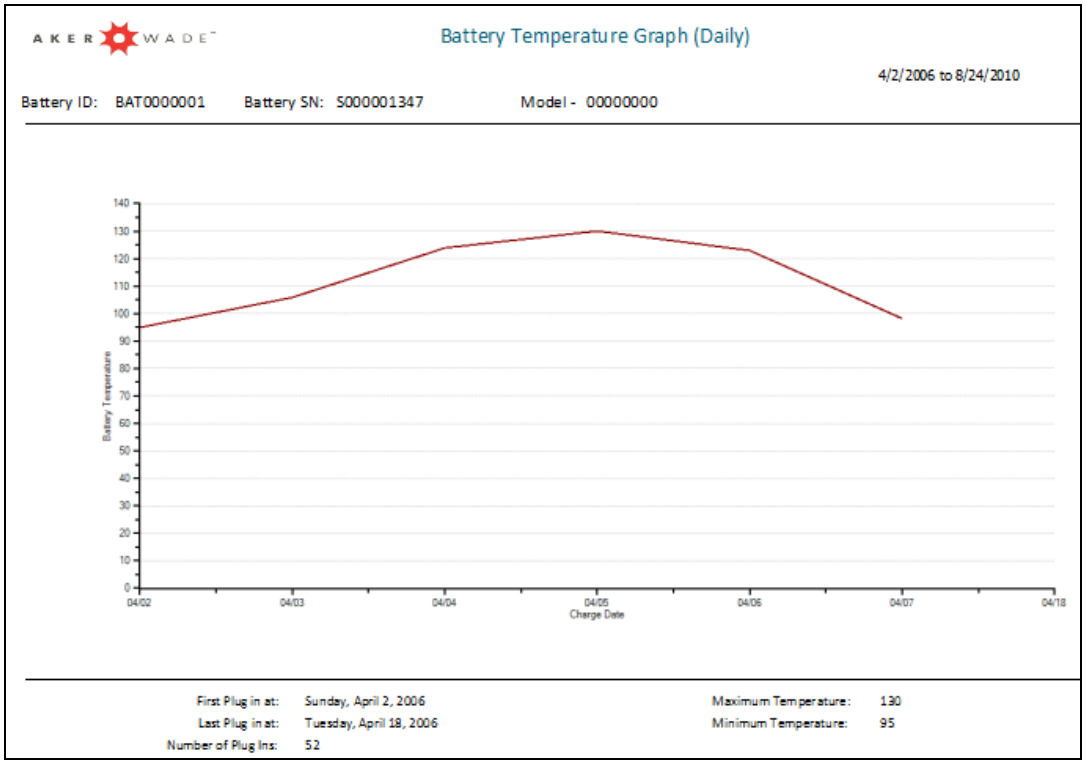
Finish/Equalization



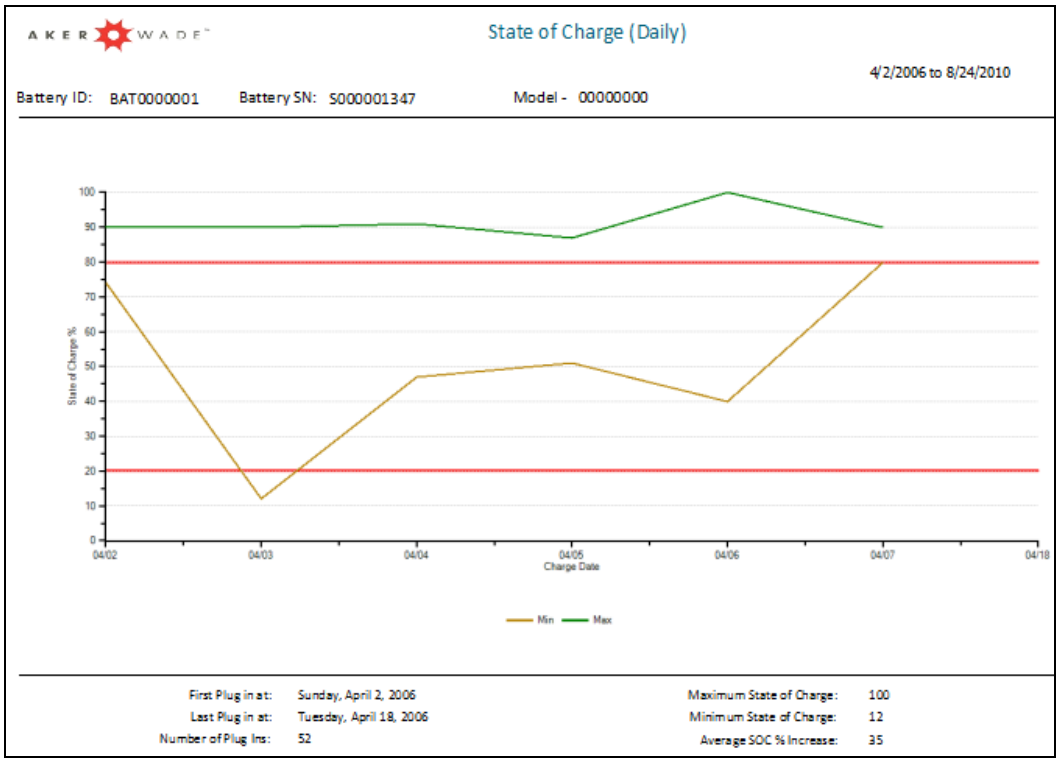
State of Charge, Minimum/Maximum



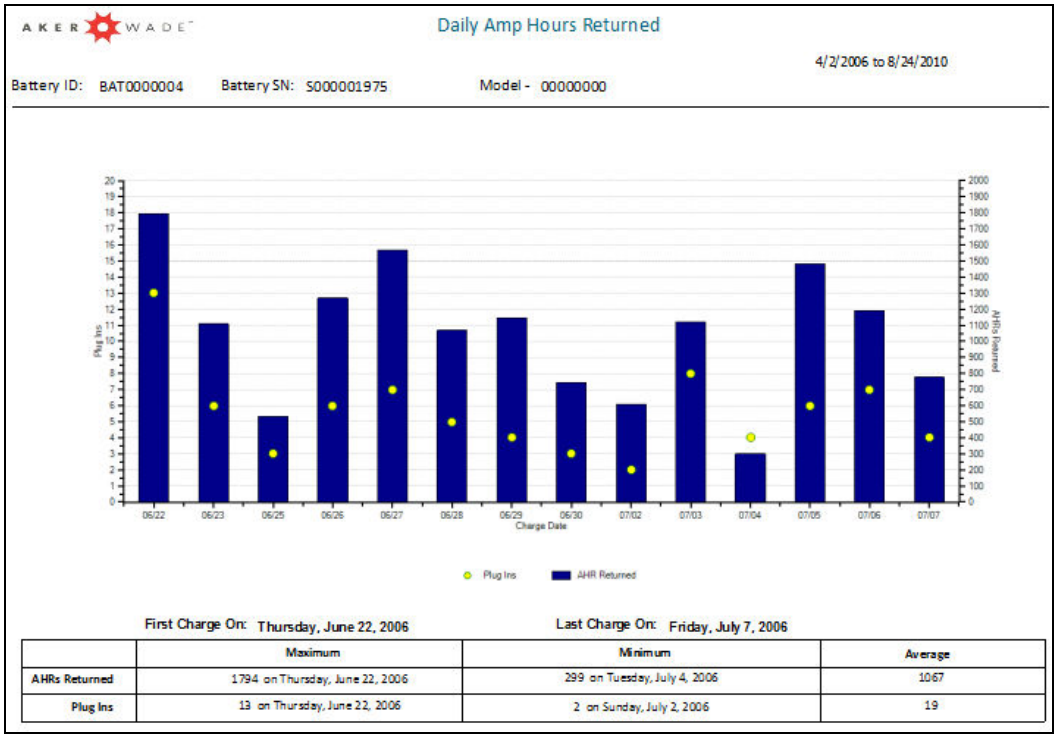
Charge Temperature



State of Charge Graph



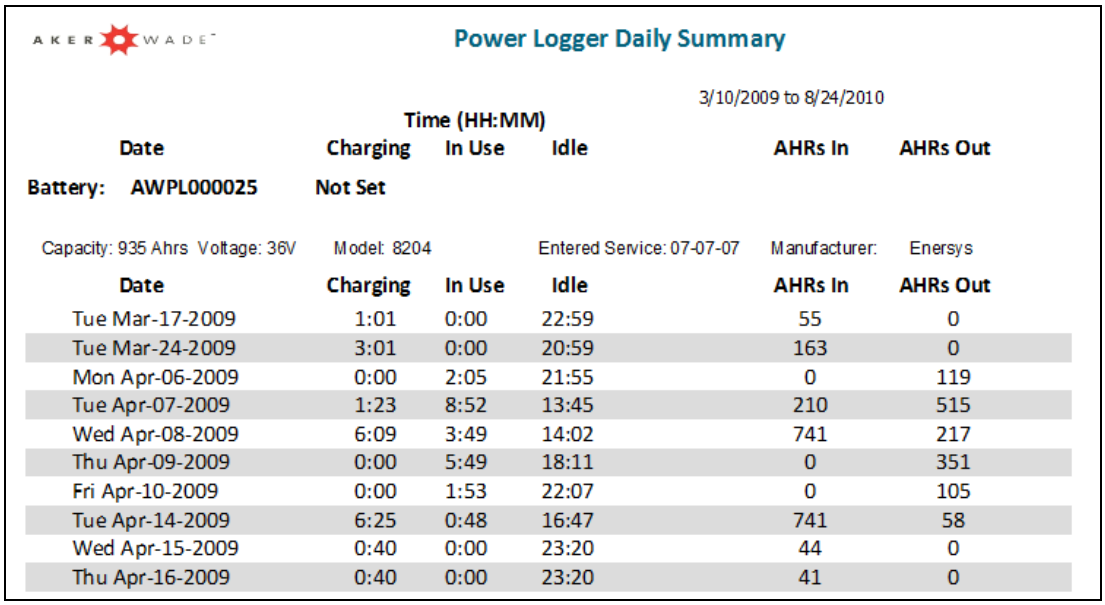
Daily Ampere Hours



	Maximum	Minimum	Average
AHRs Returned	1794 on Thursday, June 22, 2006	299 on Tuesday, July 4, 2006	1067
Plug Ins	13 on Thursday, June 22, 2006	2 on Sunday, July 2, 2006	19

Power Logger

Event Summary



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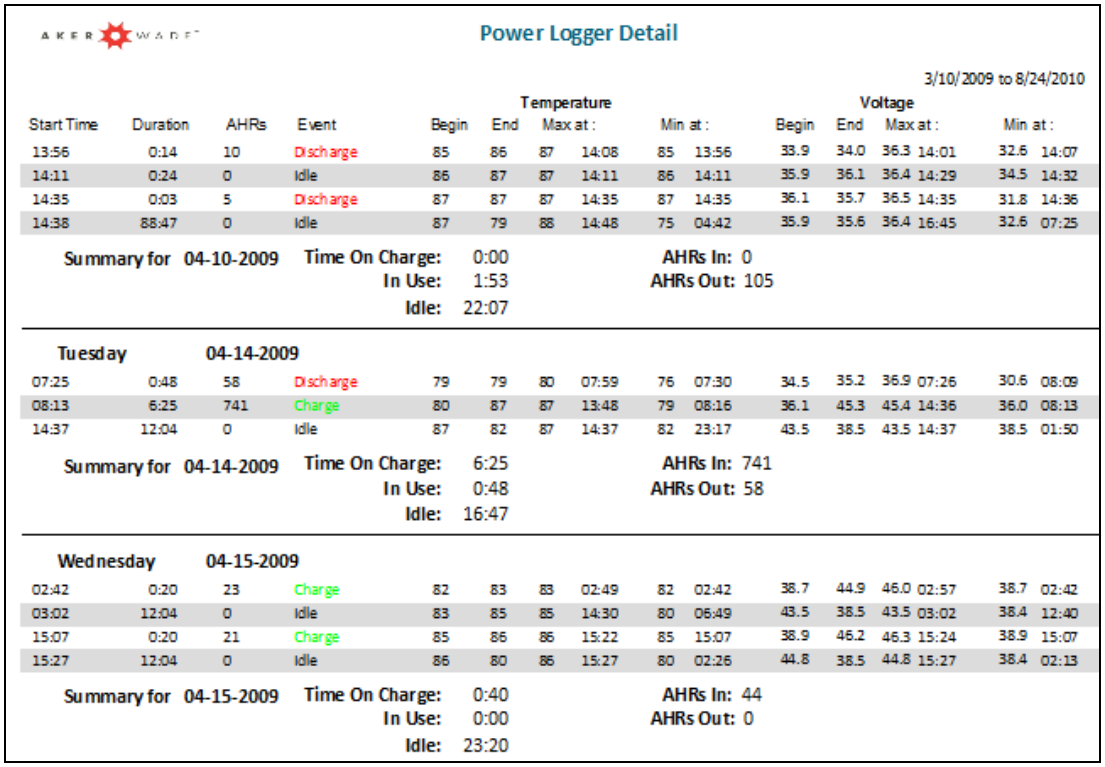
Power Logger Daily Summary

3/10/2009 to 8/24/2010

Date	Time (HH:MM) Charging	In Use	Idle	AHRs In	AHRs Out
Battery: AWPL000025	**Not Set**				
Capacity: 935 Ahrs Voltage: 36V	Model: 8204		Entered Service: 07-07-07	Manufacturer:	Enersys
Date	**Charging**	**In Use**	**Idle**	**AHRs In**	**AHRs Out**
Tue Mar-17-2009	1:01	0:00	22:59	55	0
Tue Mar-24-2009	3:01	0:00	20:59	163	0
Mon Apr-06-2009	0:00	2:05	21:55	0	119
Tue Apr-07-2009	1:23	8:52	13:45	210	515
Wed Apr-08-2009	6:09	3:49	14:02	741	217
Thu Apr-09-2009	0:00	5:49	18:11	0	351
Fri Apr-10-2009	0:00	1:53	22:07	0	105
Tue Apr-14-2009	6:25	0:48	16:47	741	58
Wed Apr-15-2009	0:40	0:00	23:20	44	0
Thu Apr-16-2009	0:40	0:00	23:20	41	0

Event Detail



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Power Logger Detail

3/10/2009 to 8/24/2010

Start Time	Duration	AHRs	Event	Temperature Begin	End	Max at :		Min at :		Voltage Begin	End	Max at :		Min at :	
13:56	0:14	10	Discharge	85	86	87	14:08	85	13:56	33.9	34.0	36.3	14:01	32.6	14:07
14:11	0:24	0	Idle	86	87	87	14:11	86	14:11	35.9	36.1	36.4	14:29	34.5	14:32
14:35	0:03	5	Discharge	87	87	87	14:35	87	14:35	36.1	35.7	36.5	14:35	31.8	14:36
14:38	88:47	0	Idle	87	79	88	14:48	75	04:42	35.9	35.6	36.4	16:45	32.6	07:25

Summary for 04-10-2009 Time On Charge: 0:00 In Use: 1:53 Idle: 22:07 AHRs In: 0 AHRs Out: 105

Tuesday 04-14-2009

Start Time	Duration	AHRs	Event	Temperature Begin	End	Max at :		Min at :		Voltage Begin	End	Max at :		Min at :	
07:25	0:48	58	Discharge	79	79	80	07:59	76	07:30	34.5	35.2	36.9	07:26	30.6	08:09
08:13	6:25	741	Charge	80	87	87	13:48	79	08:16	36.1	45.3	45.4	14:36	36.0	08:13
14:37	12:04	0	Idle	87	82	87	14:37	82	23:17	43.5	38.5	43.5	14:37	38.5	01:50

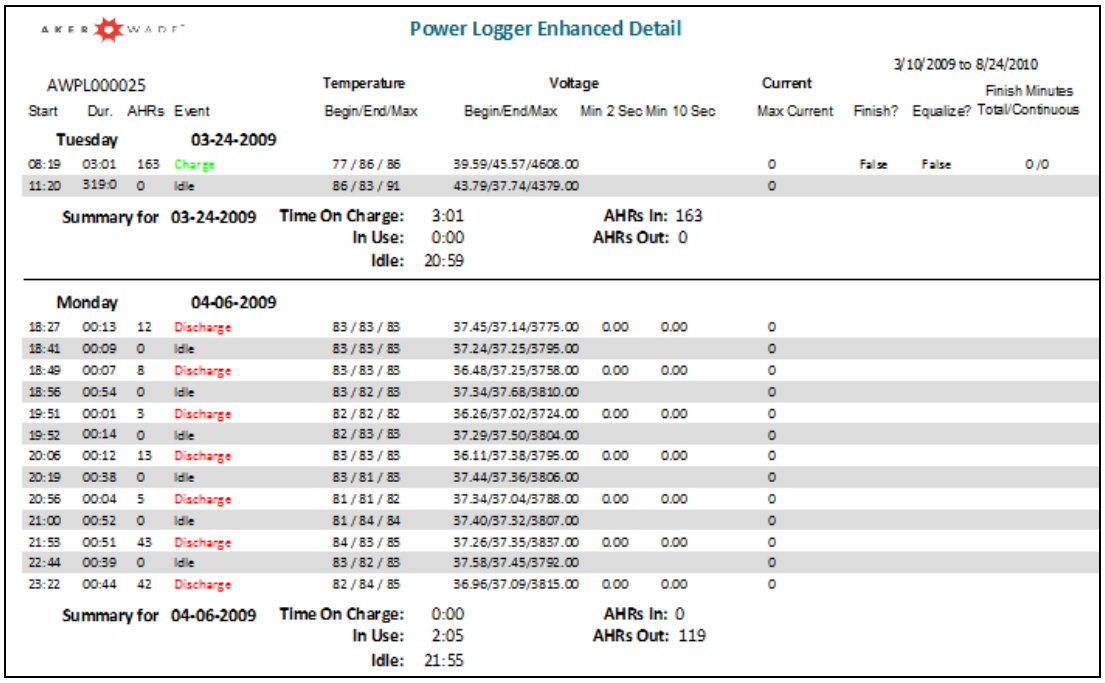
Summary for 04-14-2009 Time On Charge: 6:25 In Use: 0:48 Idle: 16:47 AHRs In: 741 AHRs Out: 58

Wednesday 04-15-2009

Start Time	Duration	AHRs	Event	Temperature Begin	End	Max at :		Min at :		Voltage Begin	End	Max at :		Min at :	
02:42	0:20	23	Charge	82	83	83	02:49	82	02:42	38.7	44.9	46.0	02:57	38.7	02:42
03:02	12:04	0	Idle	83	85	85	14:30	80	06:49	43.5	38.5	43.5	03:02	38.4	12:40
15:07	0:20	21	Charge	85	86	86	15:22	85	15:07	38.9	46.2	46.3	15:24	38.9	15:07
15:27	12:04	0	Idle	86	80	86	15:27	80	02:26	44.8	38.5	44.8	15:27	38.4	02:13

Summary for 04-15-2009 Time On Charge: 0:40 In Use: 0:00 Idle: 23:20 AHRs In: 44 AHRs Out: 0

Event Detail - Advanced



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Power Logger Enhanced Detail

3/10/2009 to 8/24/2010

AWPL000025

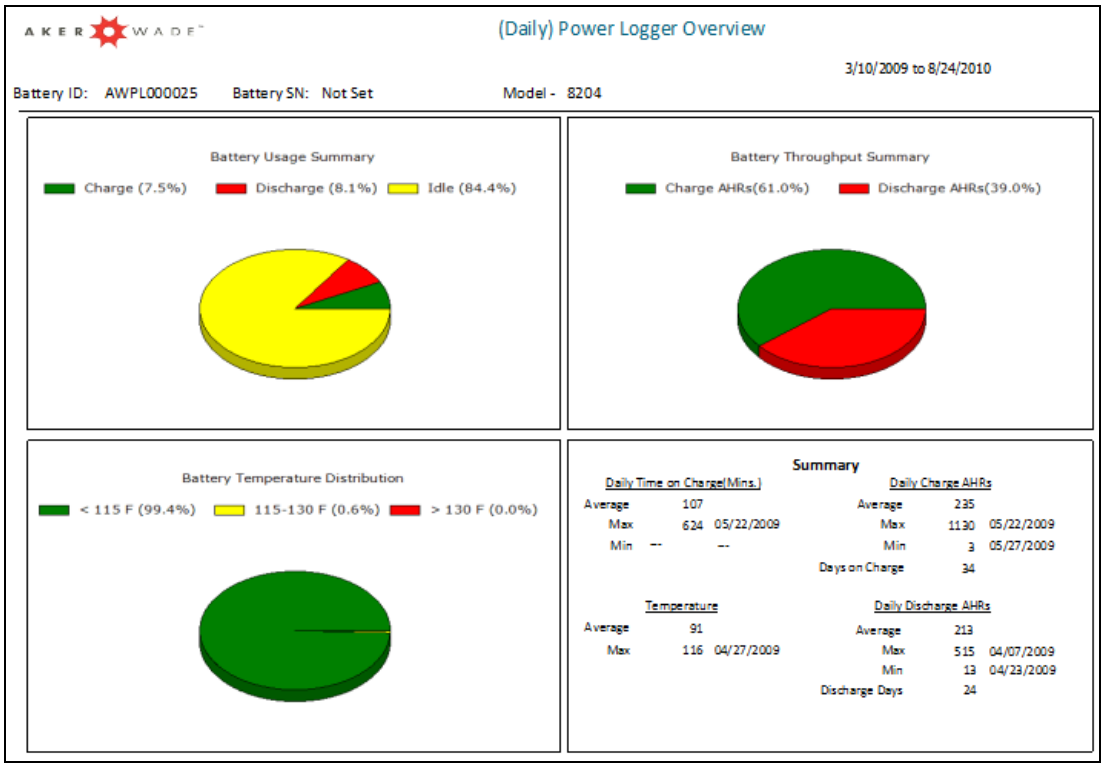
Start	Dur.	AHRs	Event	Temperature Begin/End/Max	Voltage Begin/End/Max	Min 2 Sec	Min 10 Sec	Current Max Current	Finish?	Equalize?	Finish Minutes Total/Continuous
Tuesday			**03-24-2009**								
08:19	03:01	163	Charge	77 / 86 / 86	39.59/45.57/4608.00			0	False	False	0 /0
11:20	319:0	0	Idle	86 / 83 / 91	43.79/37.74/4379.00			0			

Summary for 03-24-2009 — **Time On Charge:** 3:01 — **In Use:** 0:00 — **Idle:** 20:59 — **AHRs In:** 163 — **AHRs Out:** 0

Start	Dur.	AHRs	Event	Temperature Begin/End/Max	Voltage Begin/End/Max	Min 2 Sec	Min 10 Sec	Current Max Current	Finish?	Equalize?	Finish Minutes Total/Continuous
Monday			**04-06-2009**								
18:27	00:13	12	Discharge	83 / 83 / 83	37.45/37.14/3775.00	0.00	0.00	0			
18:41	00:09	0	Idle	83 / 83 / 83	37.24/37.25/3795.00			0			
18:49	00:07	8	Discharge	83 / 83 / 83	36.48/37.25/3758.00	0.00	0.00	0			
18:56	00:54	0	Idle	83 / 82 / 83	37.34/37.68/3810.00			0			
19:51	00:01	3	Discharge	82 / 82 / 82	36.26/37.02/3724.00	0.00	0.00	0			
19:52	00:14	0	Idle	82 / 83 / 83	37.29/37.50/3804.00			0			
20:06	00:12	13	Discharge	83 / 83 / 83	36.11/37.38/3795.00	0.00	0.00	0			
20:19	00:38	0	Idle	83 / 81 / 83	37.44/37.36/3806.00			0			
20:56	00:04	5	Discharge	81 / 81 / 82	37.34/37.04/3788.00	0.00	0.00	0			
21:00	00:52	0	Idle	81 / 84 / 84	37.40/37.32/3807.00			0			
21:53	00:51	43	Discharge	84 / 83 / 85	37.26/37.35/3837.00	0.00	0.00	0			
22:44	00:39	0	Idle	83 / 82 / 83	37.58/37.45/3792.00			0			
23:22	00:44	42	Discharge	82 / 84 / 85	36.96/37.09/3815.00	0.00	0.00	0			

Summary for 04-06-2009 — **Time On Charge:** 0:00 — **In Use:** 2:05 — **Idle:** 21:55 — **AHRs In:** 0 — **AHRs Out:** 119

Power Logger Overview



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(Daily) Power Logger Overview

3/10/2009 to 8/24/2010

Battery ID: AWPL000025 Battery SN: Not Set Model - 8204

Battery Usage Summary

Charge (7.5%) Discharge (8.1%) Idle (84.4%)

Battery Throughput Summary

Charge AHRs(61.0%) Discharge AHRs(39.0%)

Battery Temperature Distribution

< 115 F (99.4%) 115-130 F (0.6%) > 130 F (0.0%)

Summary

Daily Time on Charge(Mins.)

Average	107	
Max	624	05/22/2009
Min	--	--

Daily Charge AHRs

Average	235	
Max	1130	05/22/2009
Min	3	05/27/2009
Days on Charge	34	

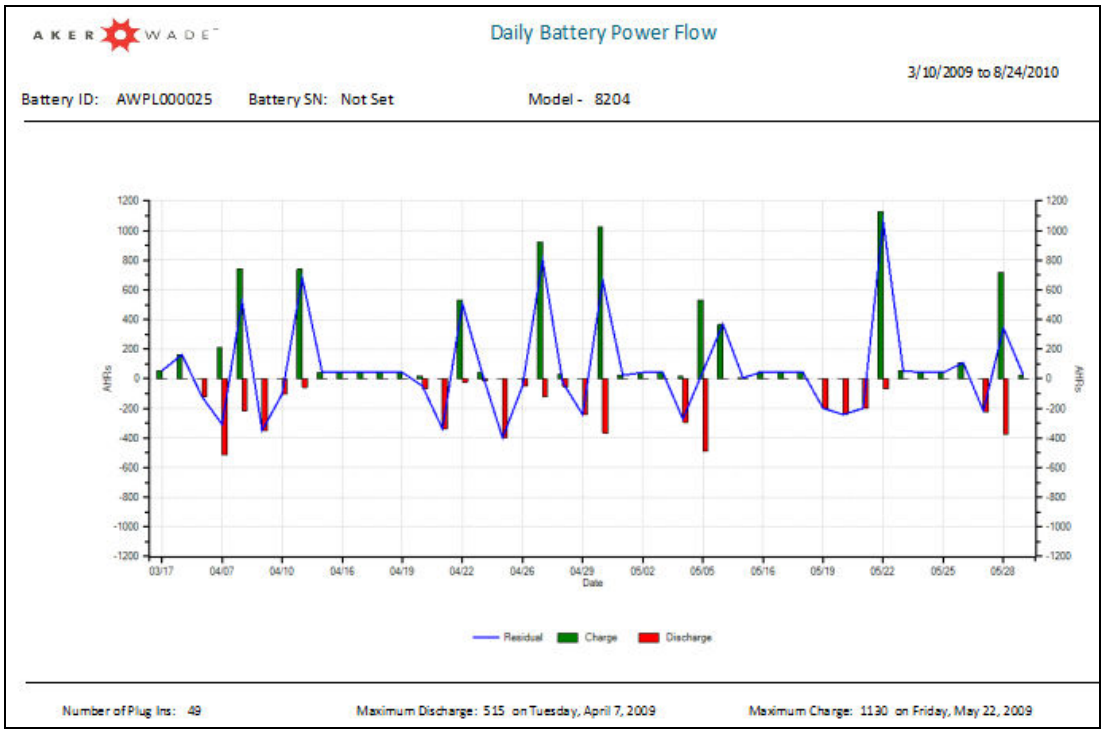
Temperature

Average	91	
Max	116	04/27/2009

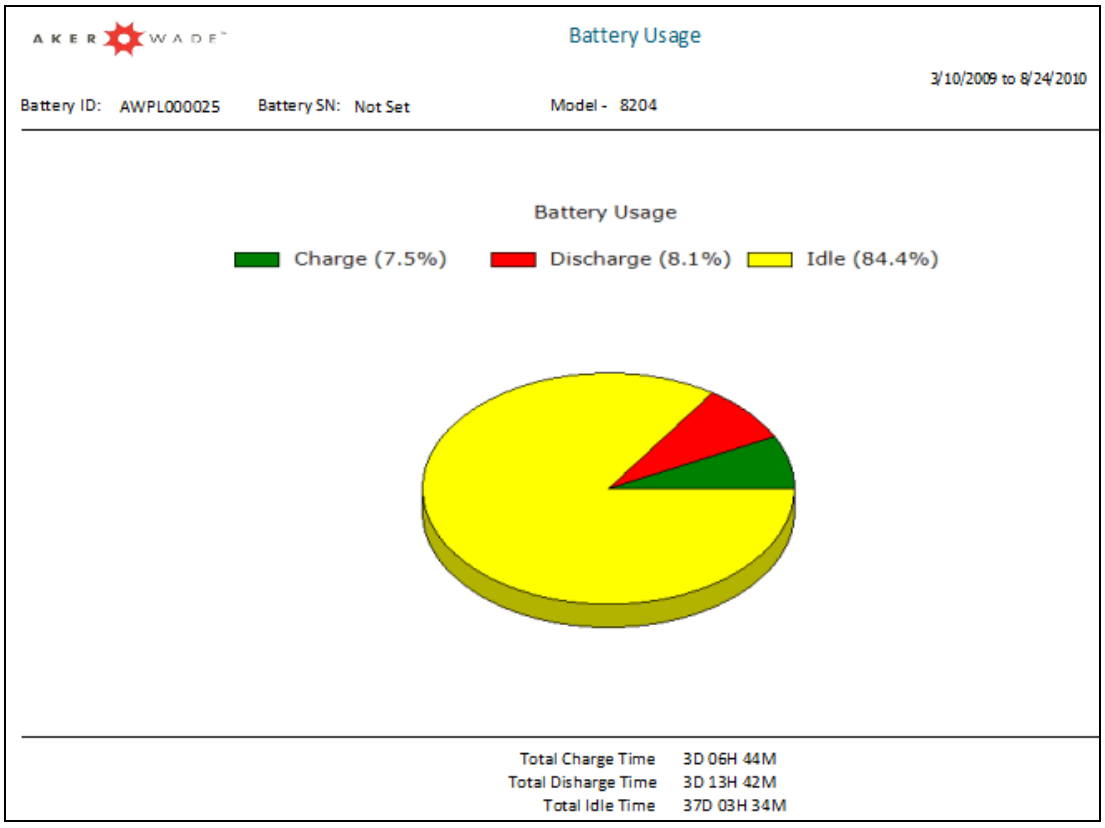
Daily Discharge AHRs

Average	213	
Max	515	04/07/2009
Min	13	04/23/2009
Discharge Days	24	

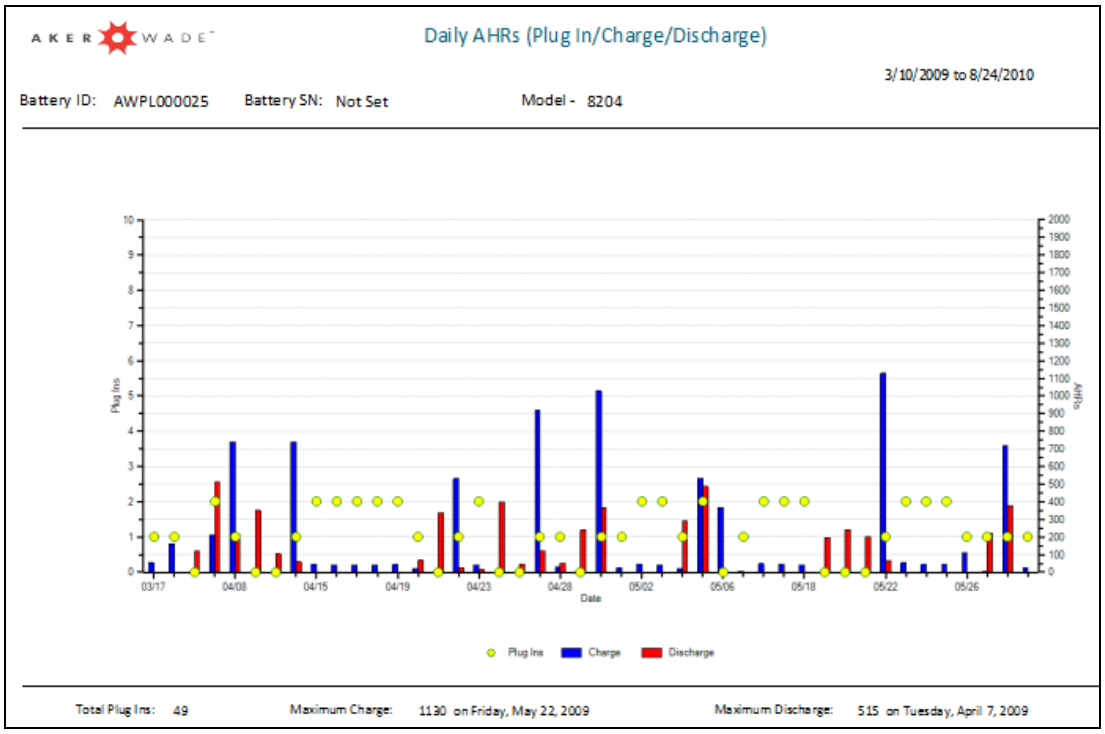
Power Flow



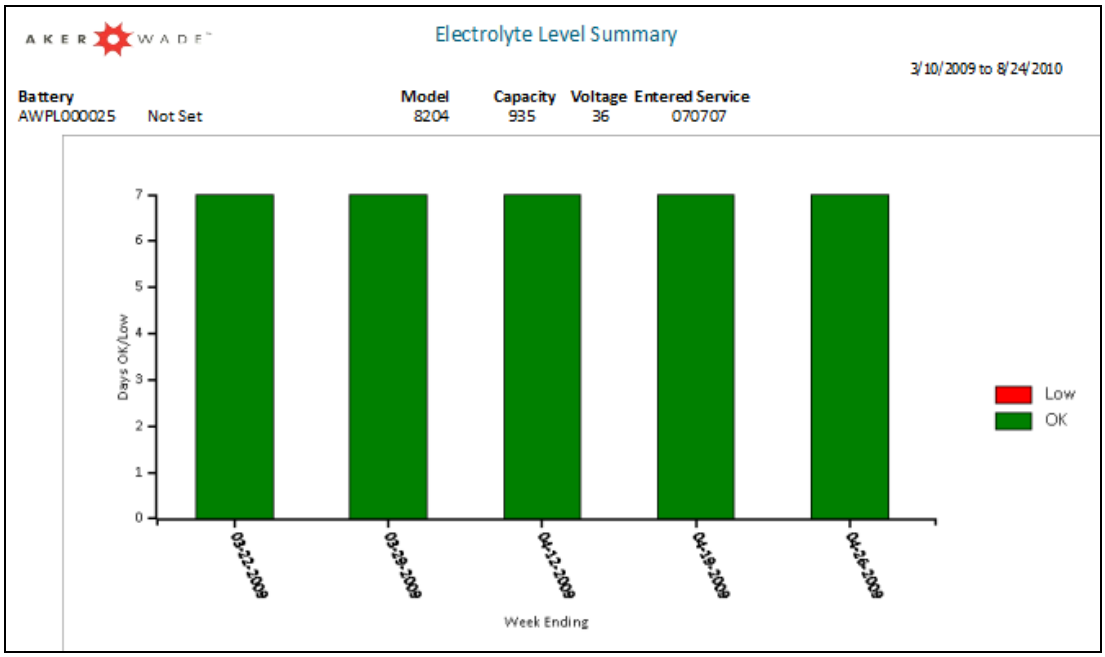
Battery Usage



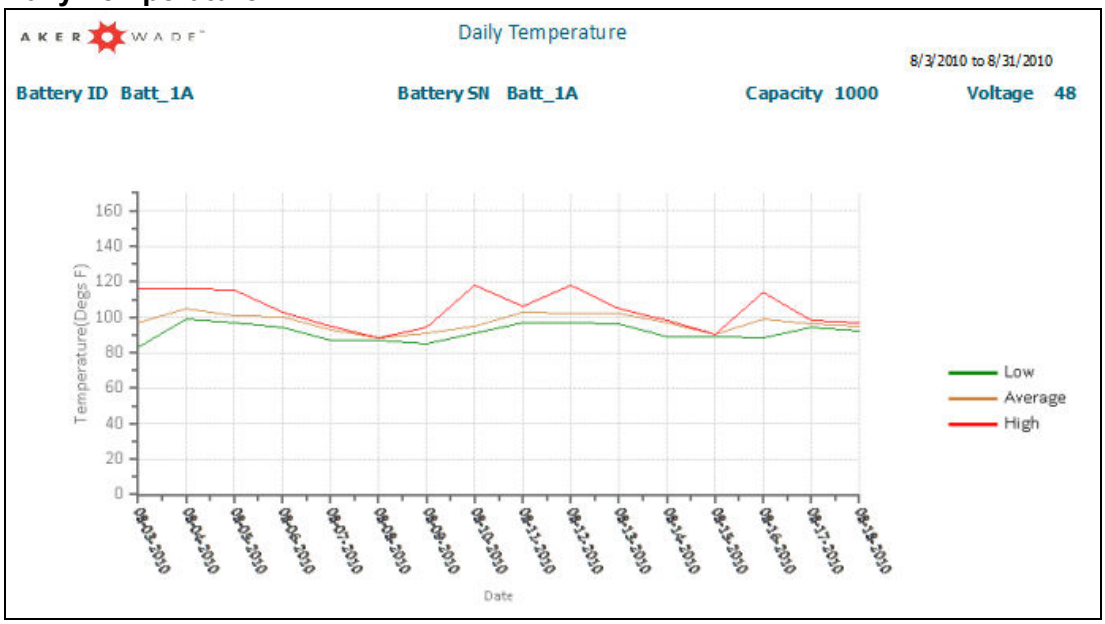
Daily Charge/Discharge Graph



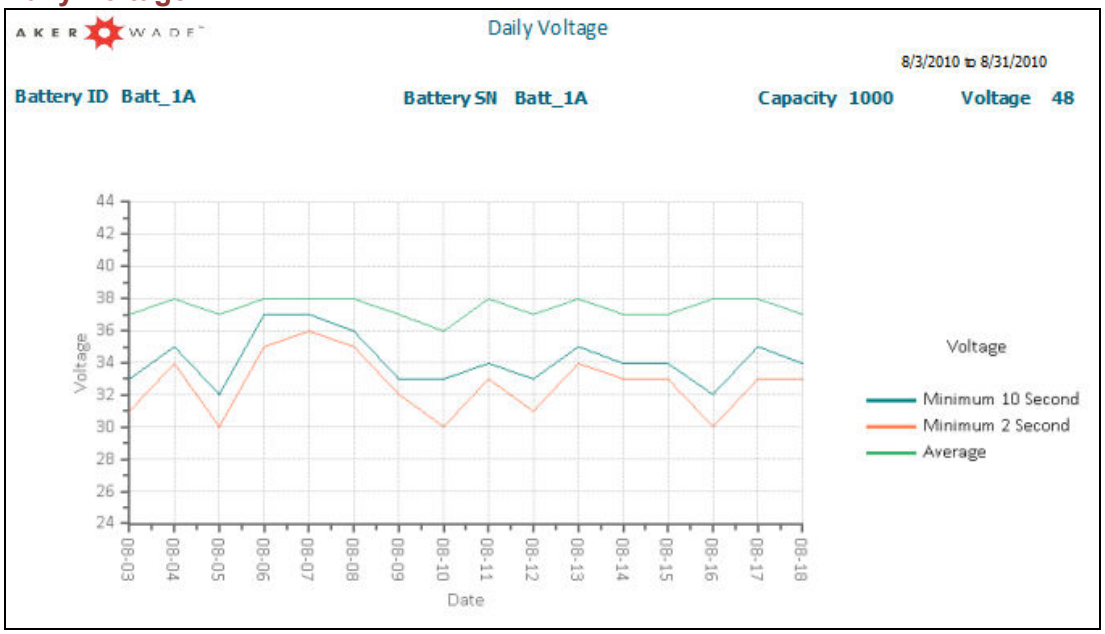
Low Electrolyte Summary



Daily Temperature

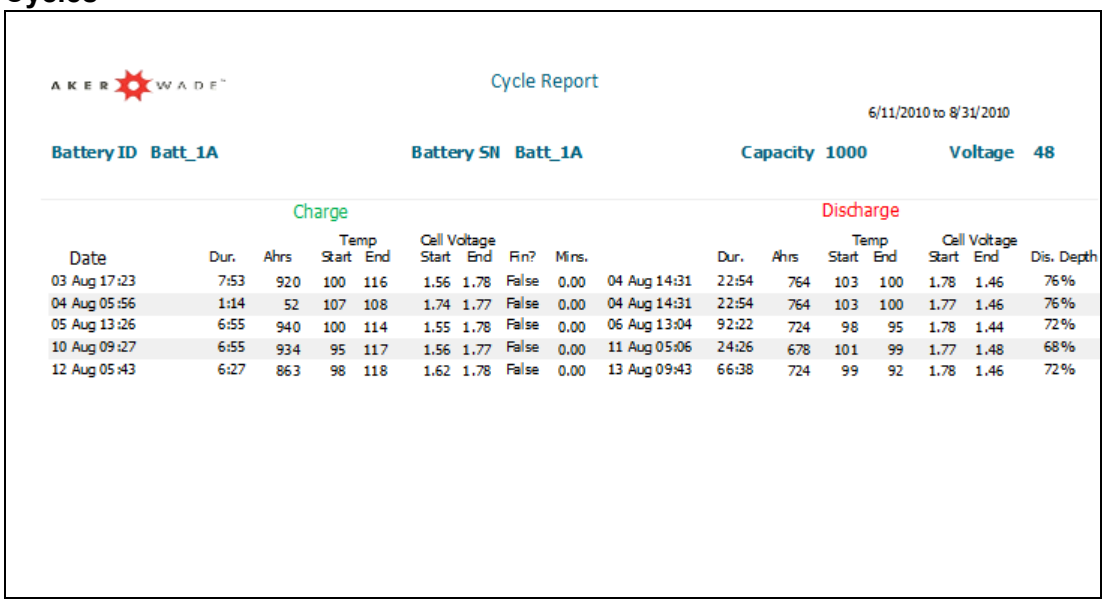


Daily Voltage



Conventional Charge

Cycles



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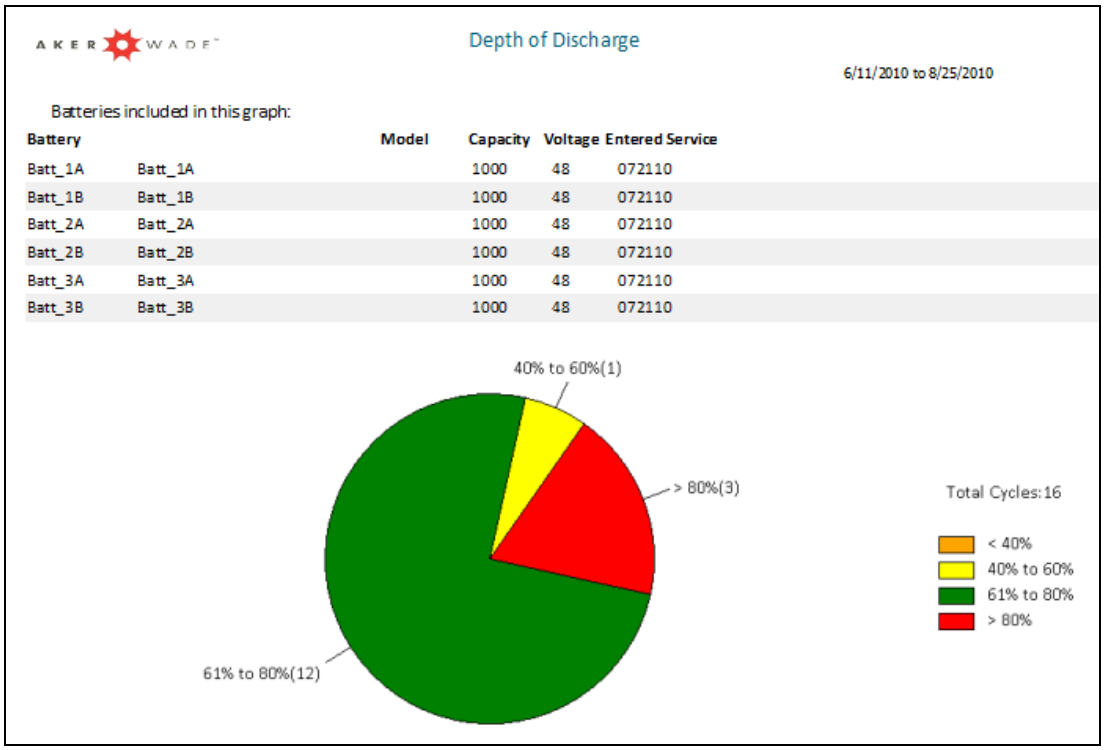
Cycle Report

6/11/2010 to 8/31/2010

Battery ID Batt_1A **Battery SN** Batt_1A **Capacity** 1000 **Voltage** 48

	Charge								Discharge						
Date	Dur.	Ahrs	Temp Start	Temp End	Cell Voltage Start	Cell Voltage End	Fin?	Mins.		Dur.	Ahrs	Temp Start	Temp End	Cell Voltage Start	Cell Voltage End	Dis. Depth
03 Aug 17:23	7:53	920	100	116	1.56	1.78	False	0.00	04 Aug 14:31	22:54	764	103	100	1.78	1.46	76%
04 Aug 05:56	1:14	52	107	108	1.74	1.77	False	0.00	04 Aug 14:31	22:54	764	103	100	1.77	1.46	76%
05 Aug 13:26	6:55	940	100	114	1.55	1.78	False	0.00	06 Aug 13:04	92:22	724	98	95	1.78	1.44	72%
10 Aug 09:27	6:55	934	95	117	1.56	1.77	False	0.00	11 Aug 05:06	24:26	678	101	99	1.77	1.48	68%
12 Aug 05:43	6:27	863	98	118	1.62	1.78	False	0.00	13 Aug 09:43	66:38	724	99	92	1.78	1.46	72%

Depth of Discharge



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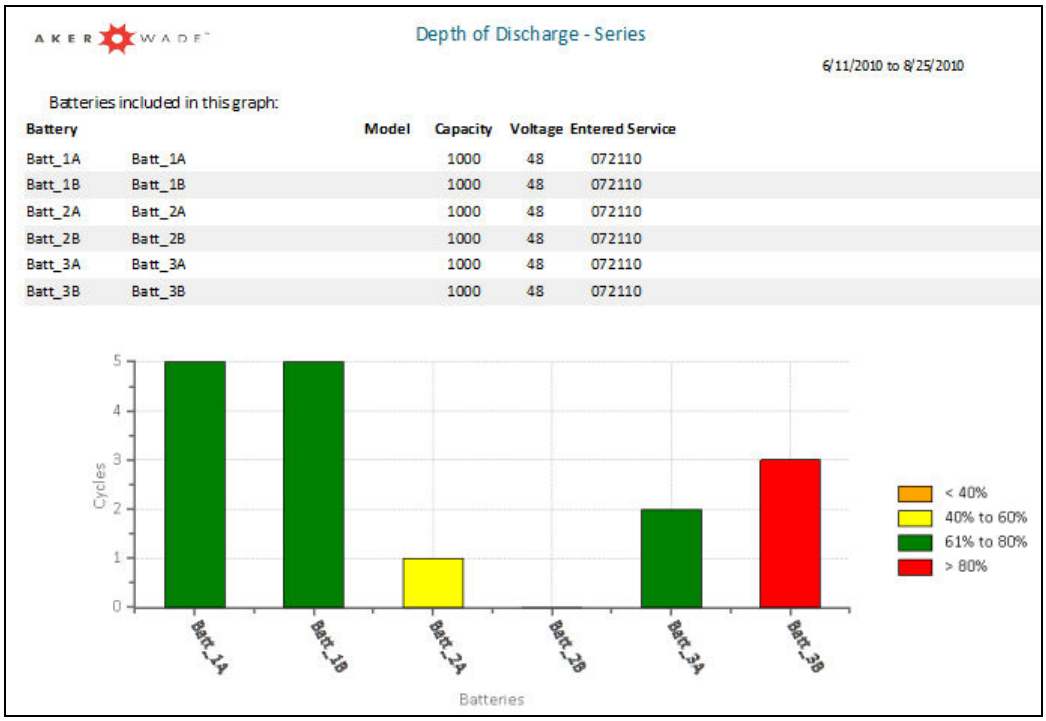
Depth of Discharge

6/11/2010 to 8/25/2010

Batteries included in this graph:

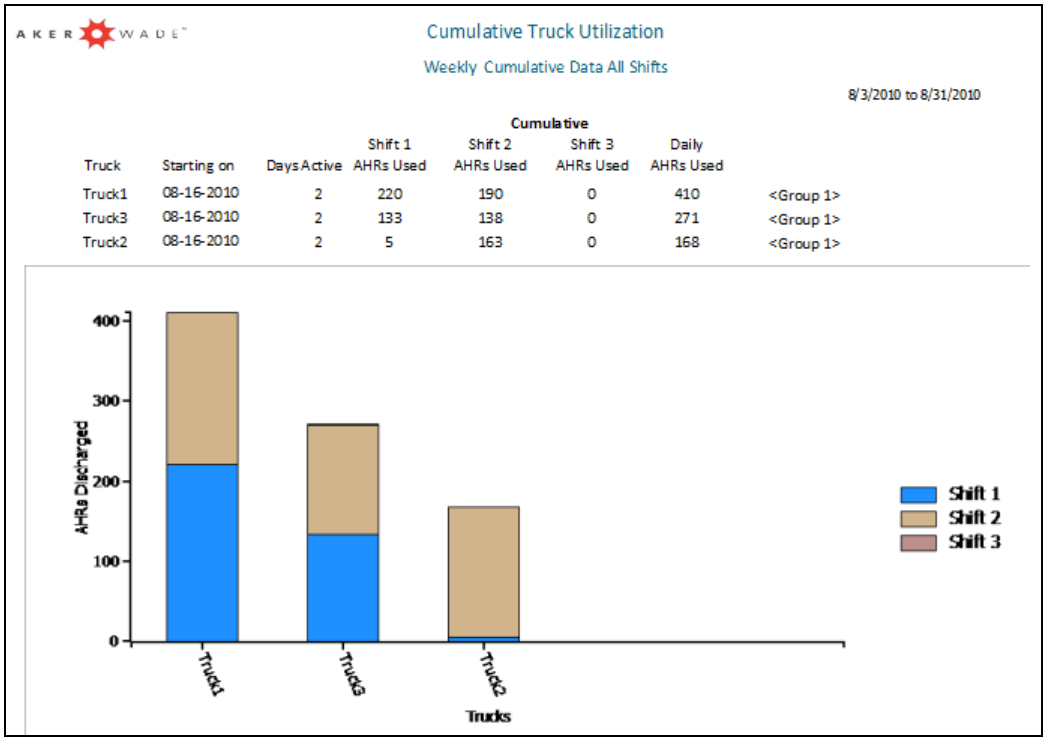
Battery		Model	Capacity	Voltage	Entered Service
Batt_1A	Batt_1A		1000	48	072110
Batt_1B	Batt_1B		1000	48	072110
Batt_2A	Batt_2A		1000	48	072110
Batt_2B	Batt_2B		1000	48	072110
Batt_3A	Batt_3A		1000	48	072110
Batt_3B	Batt_3B		1000	48	072110

Depth of Discharge - by Battery

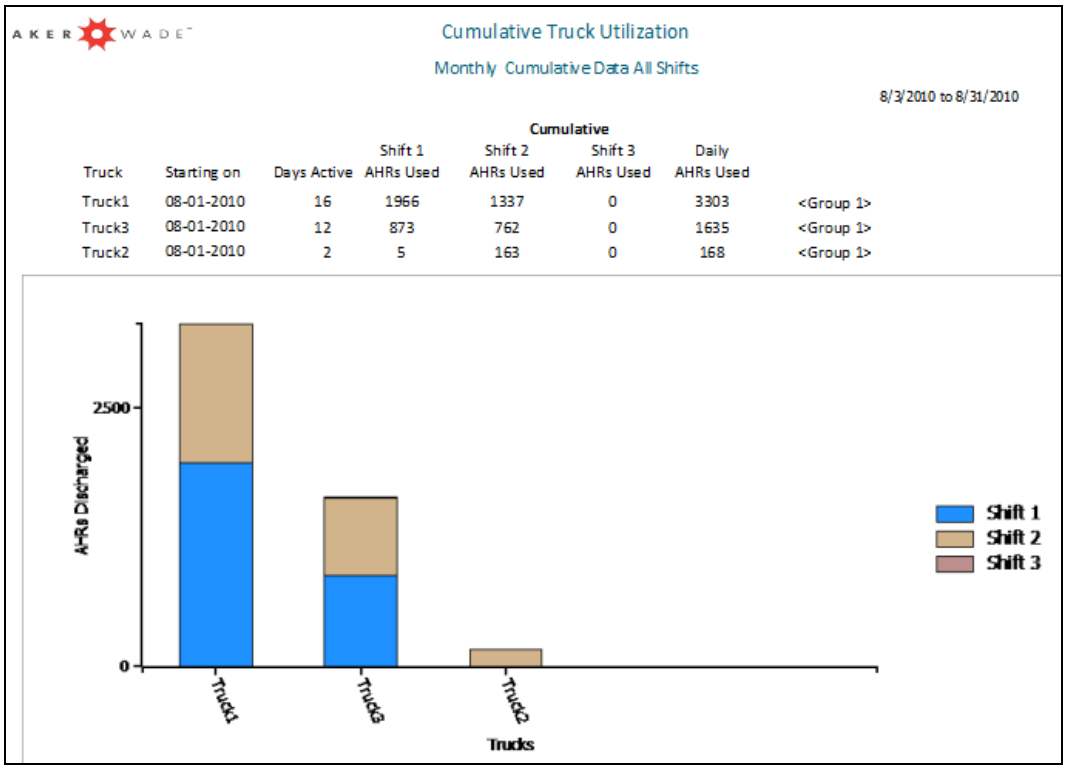


Fleet

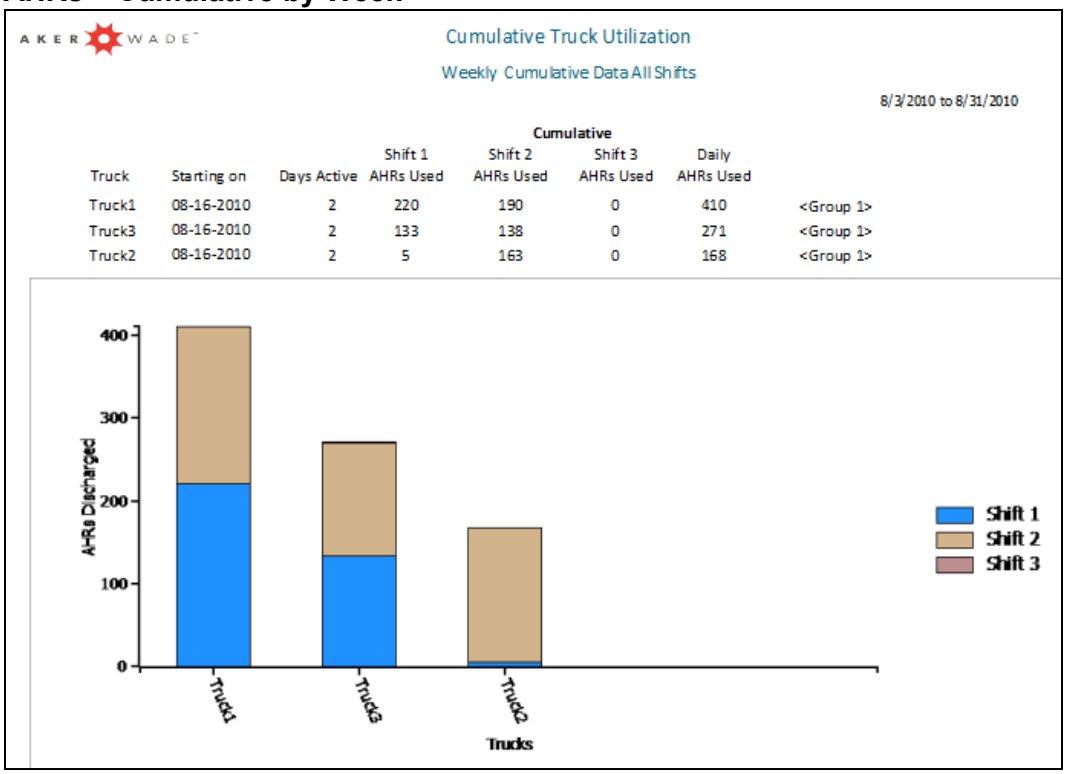
Time Discharging - Cumulative by Week



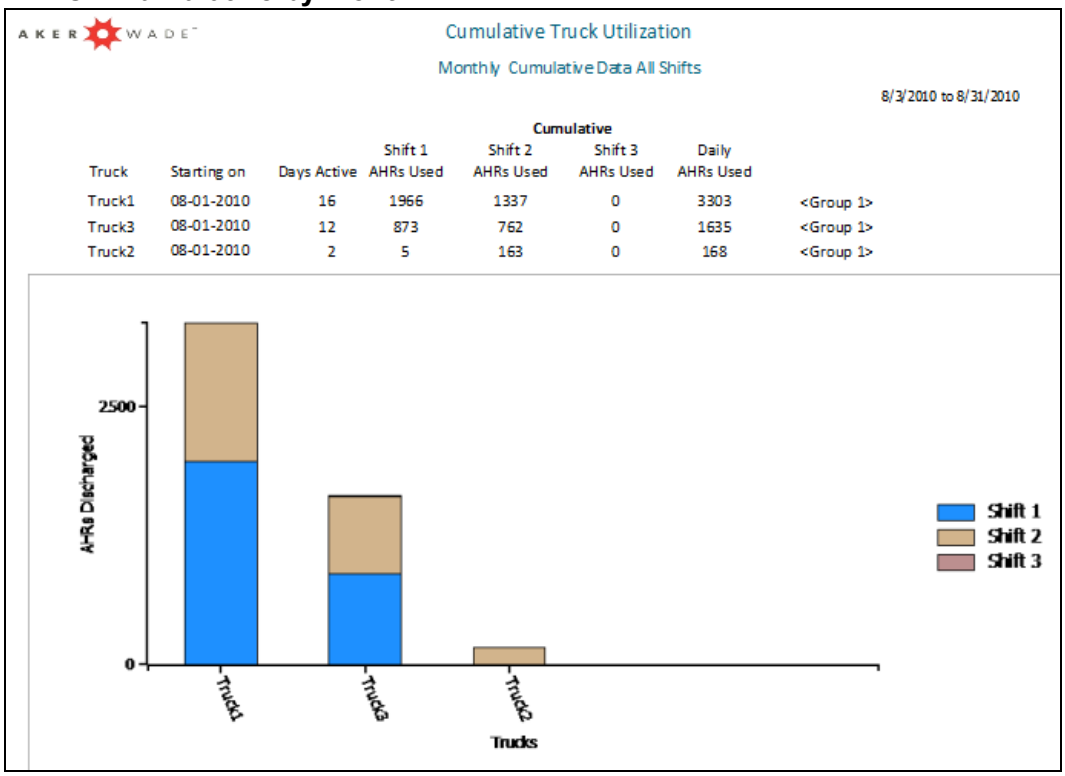
Time Discharging - Cumulative by Month



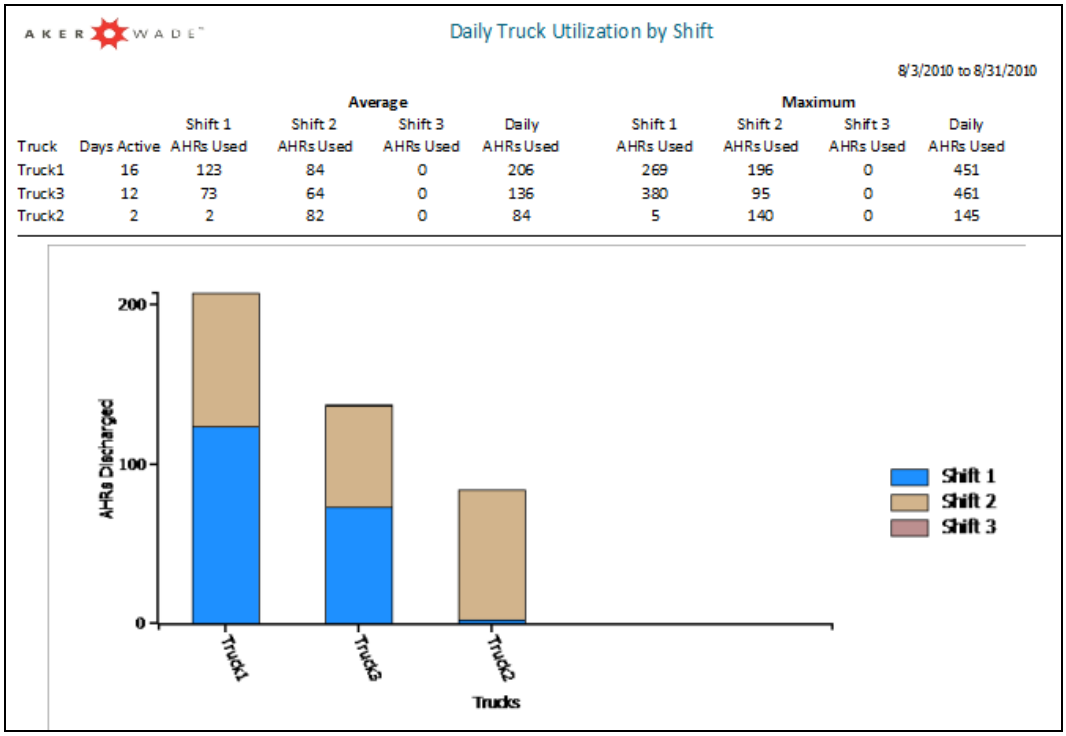
AHRs – Cumulative by Week



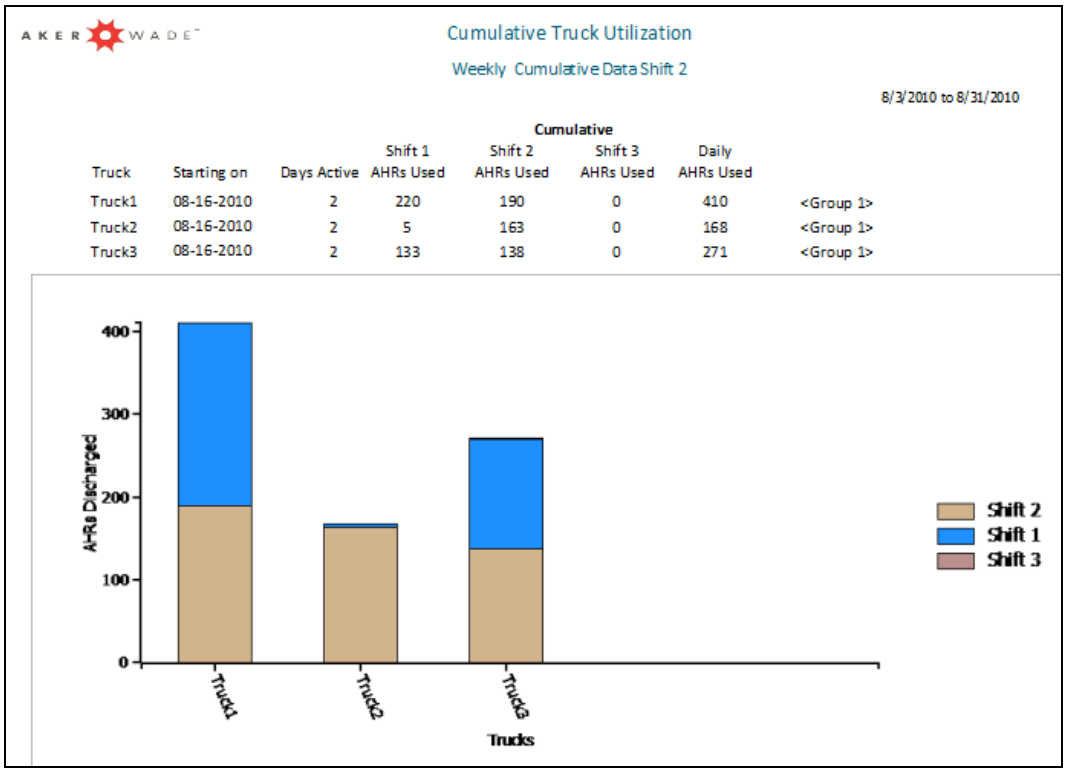
AHRs – Cumulative by Month



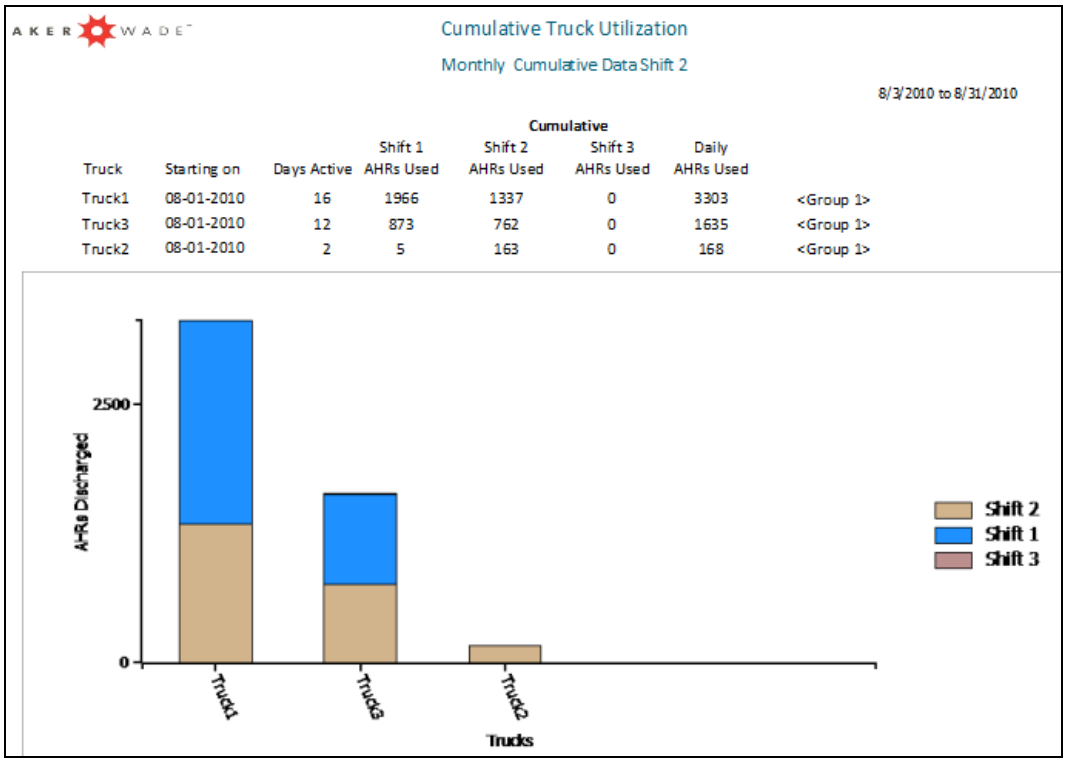
Truck Utilization



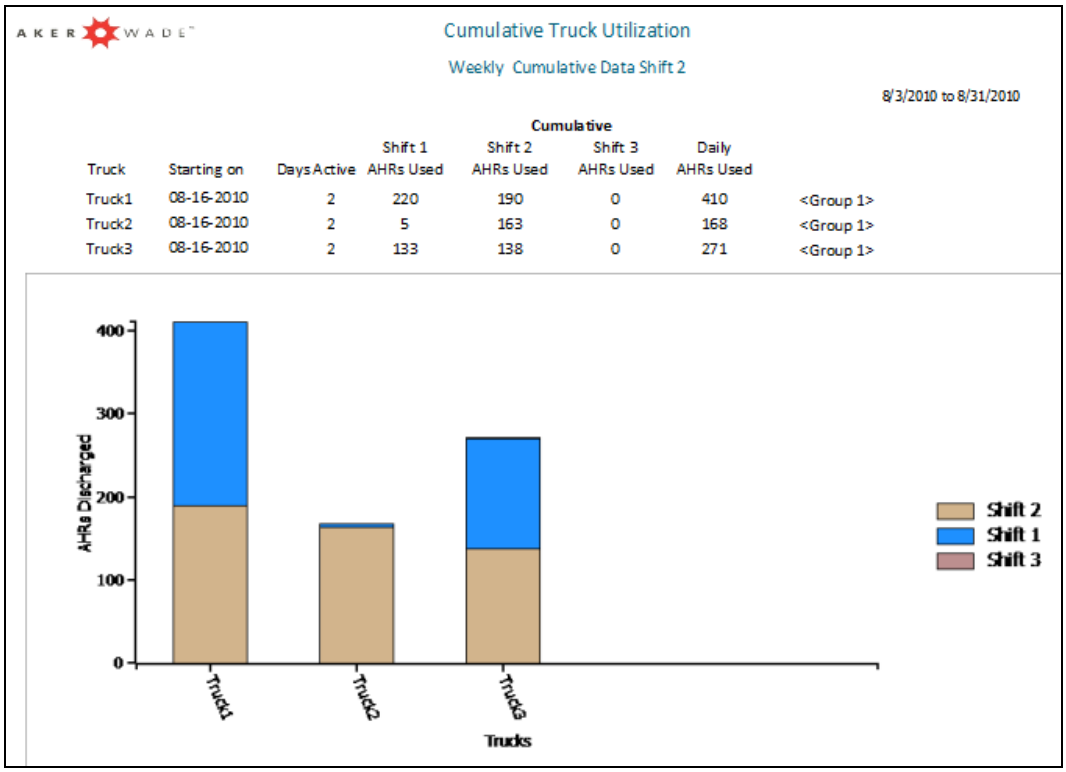
Shift “n” – Weekly Usage



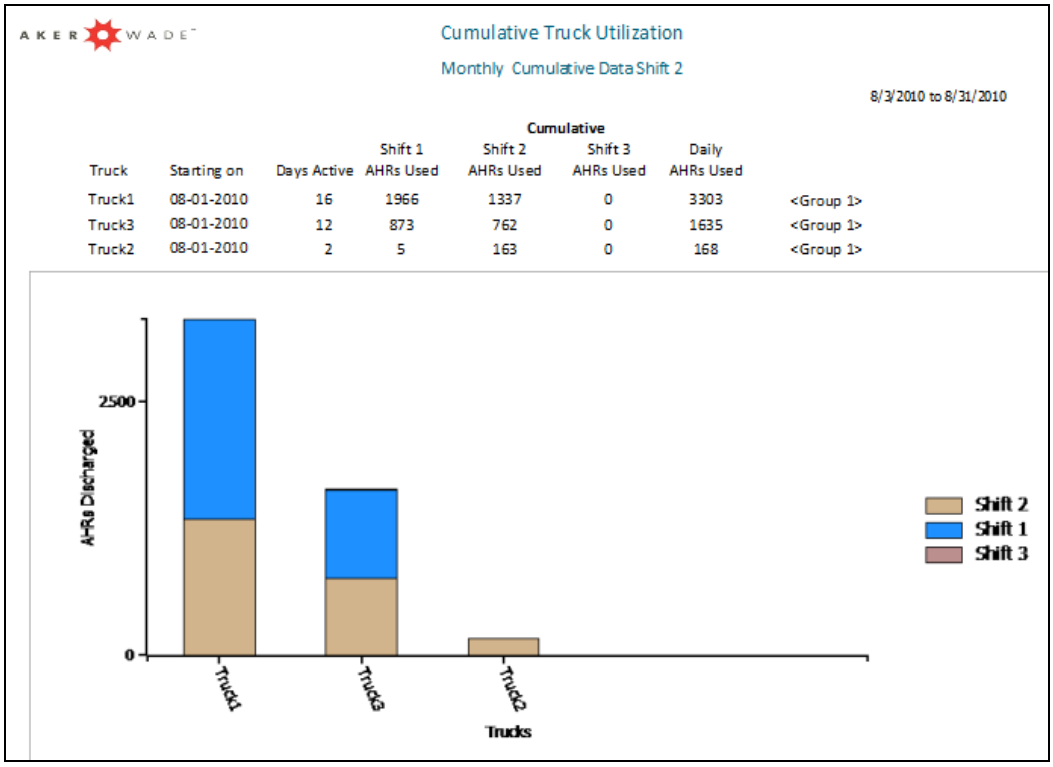
Shift “n” – Monthly Usage



Shift “n” – Weekly Energy Usage



Shift “n” – Monthly Energy Usage



Index

M

P

Q

R

S

T