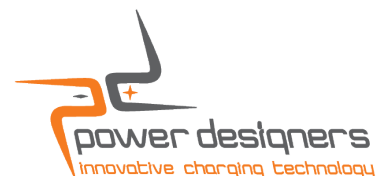


powertrac

PowerTrac USB and Link Users Guide Software Installation & Operation Manual



powertrac
USB User Software



MAN-000038-00 REV A

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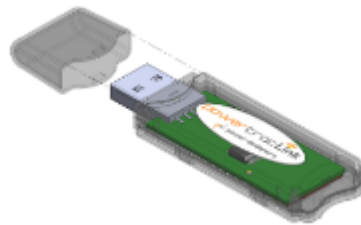
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POWERTRAC USB USER

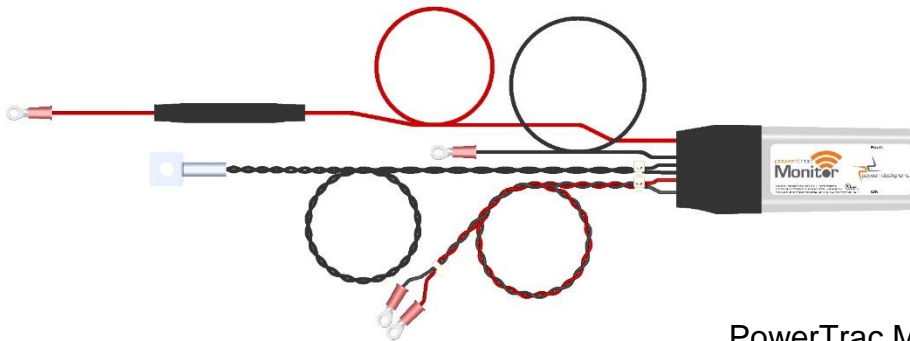
PowerTrac USB user is a program that allows the user to:

- setup the *PowerTrac Monitor* battery parameters
- calibrate the intercell for current sensing
- download and view battery data
- create charts and reports to analyze the data

This program is used in conjunction with the ***PowerTrac Link*** and ***PowerTrac Monitor***



PowerTrac Link



PowerTrac Monitor

POWERTRAC SOFTWARE INSTALLATION AND CONFIGURATION



Attention

- The installation of the PowerTrac USB software automatically uninstalls an existing version (if applicable).
- Do not plug the USB link until you successfully installed the PowerTrac USB software.
- Prior to installing the application, determine your system type 32bit/64bit:
 - If 32 bit you must install PowerTracUSBUser.v2.2.xx.msi
 - If 64 bit you must install PowerTracUSBUser.v2.2.xx_64.msi
- Software can be downloaded from the Power Designers Website, <http://powerdesigners.com/downloads/>

Minimum System Requirements

Operating systems: Vista™, Windows™ 7, Windows™ 8.1/8, Windows™ 10

Communication port: USB Port

Required pre-installed: .NET Framework 2.0 or greater (Run Windows Update)

A note on the .NET framework

For Windows **8.1/8/10**, **.NET Framework 2.0 or greater** must be present prior to installing the PowerTracUSB User software.

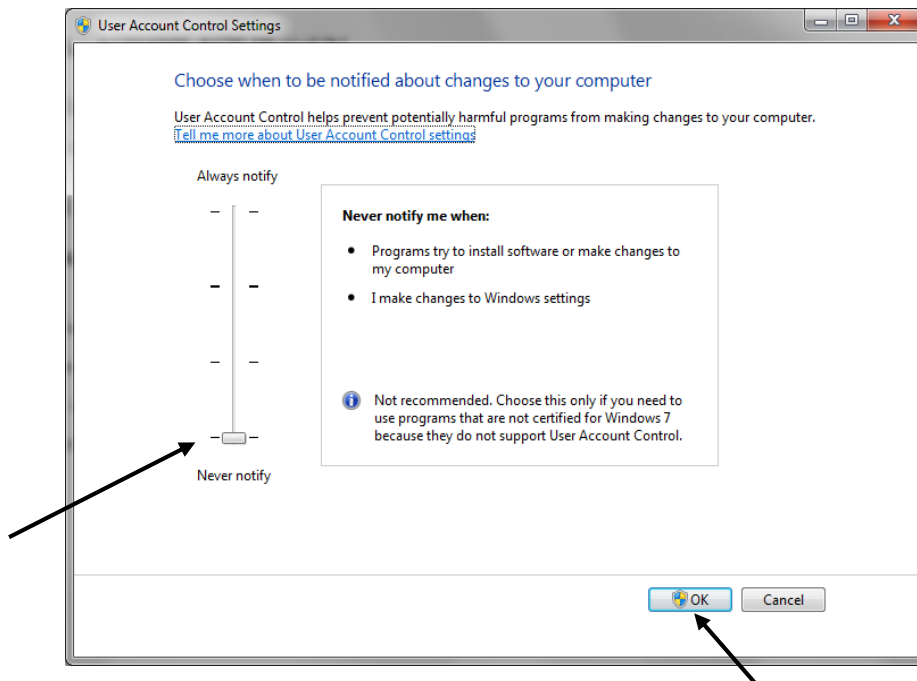
- Open the **Control Panel**, and click the **Programs and Features** icon.
- Click **Turn Windows features on or off** link on the left side.
- The **Windows Features** screen appears.
- Click the box next to **.NET Framework 3.5 (includes .NET 2.0 and 3.0)**
- Click **OK**.

Preparations required prior to installing the software

For Windows Vista/7 (32 and 64 bit), 8.1/8 (32 and 64 bit) and 10

Disable UAC (User Account Control):

- Open User Account Control (UAC) from the computer's **Control Panel**.
- In the search box in the upper right corner of the window, type **UAC**, and click **Change User Account Control Settings**.
- To turn UAC OFF, drag the slider down to **Never notify**, and click **OK**
- Reboot your computer for the change to take effect.



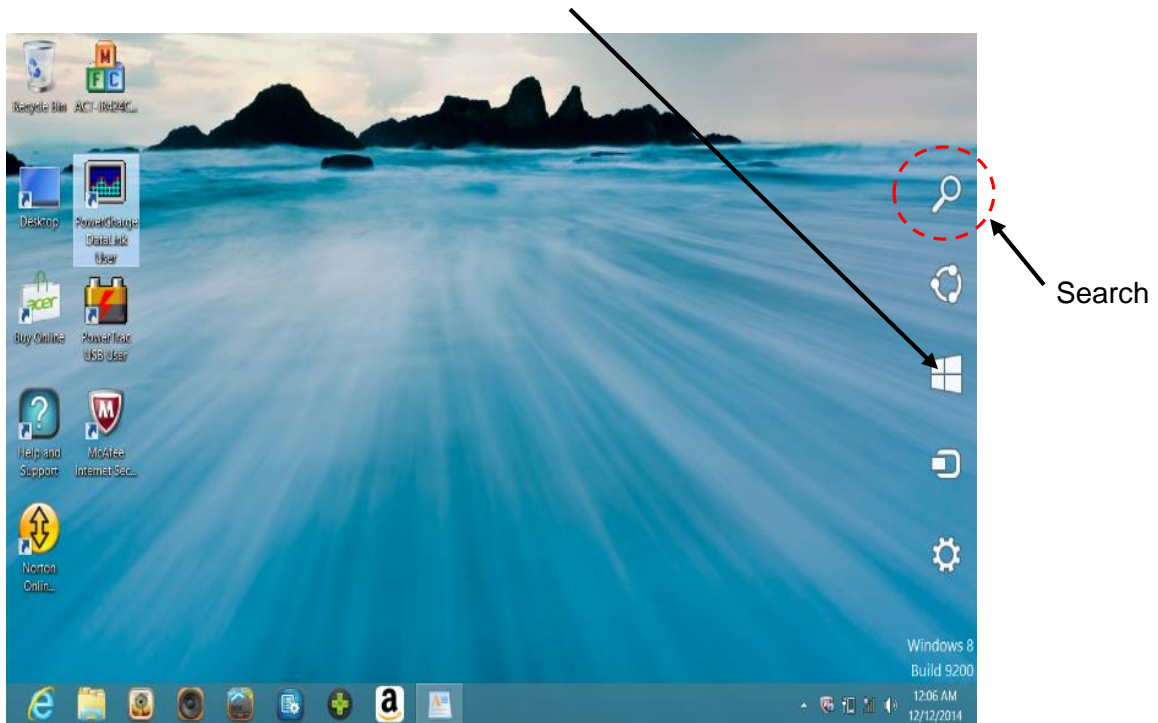
For Windows 8.1/8 (32 and 64 bit) continue on Page 4

For Windows 10 (32 and 64 bit) continue on Page 6

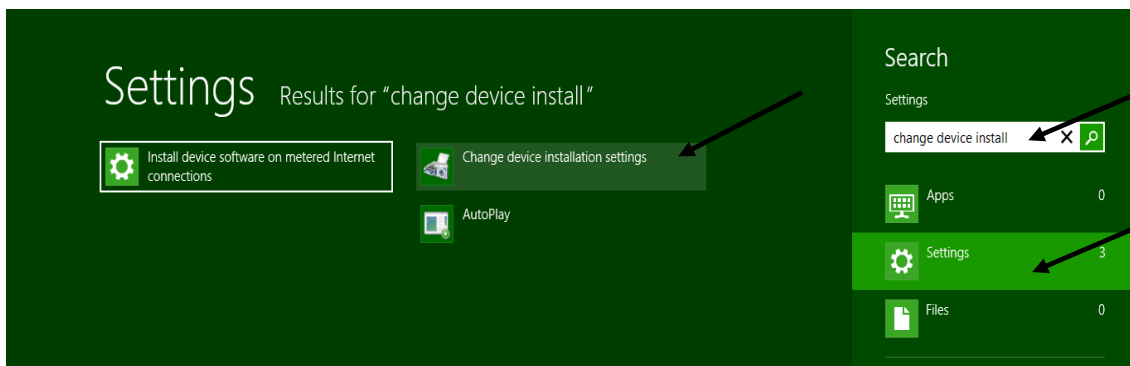
For Windows 8.1/8 (32 and 64 bit) continued from page 3

Disable Driver Installation from Windows Update:

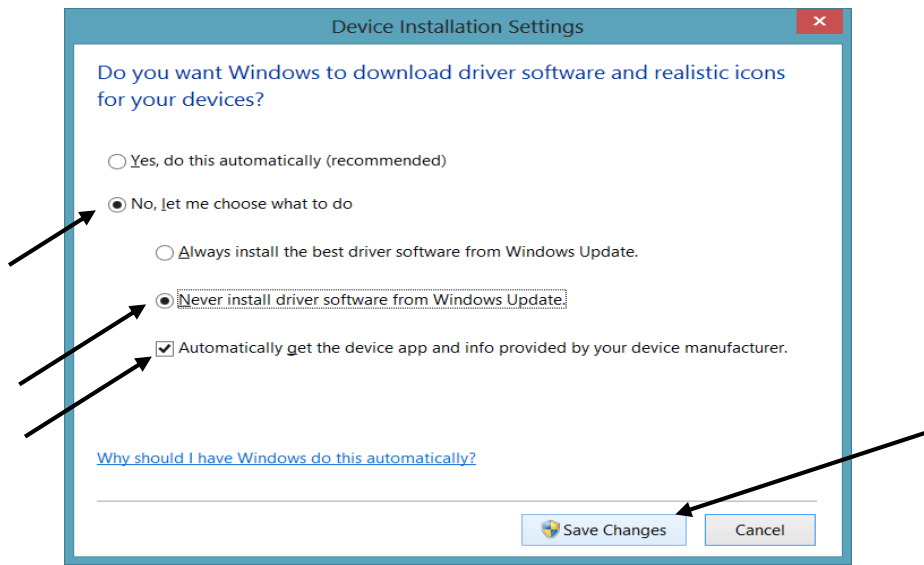
- Log on to Windows 8.1/8
- Once logged on, click the **Desktop** tile
- On the **Desktop** screen drag your mouse to the top or bottom right corners of the screen, and the **Charms Bar** appears along your screen's right edge



- Click the **Search** button
- In the search field type **change device install**
- Click **Settings** to view the results
- On the search results page, select **Change device installation settings** to open it



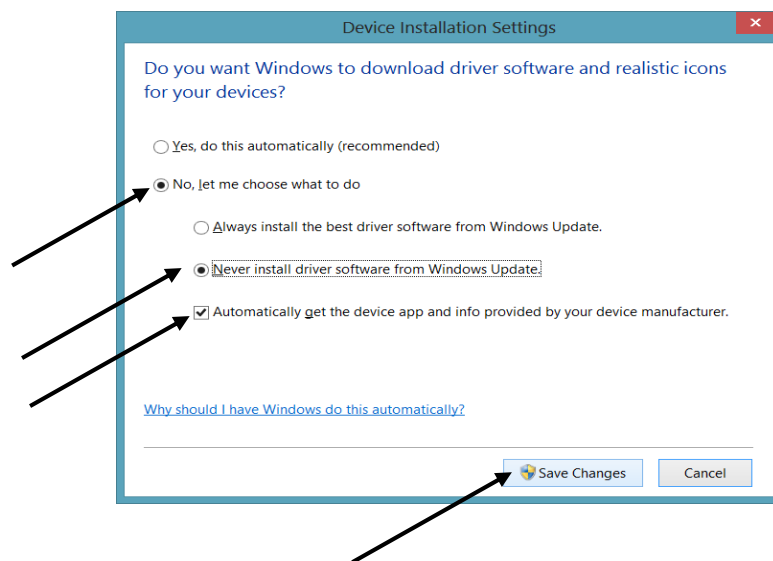
- The Device Installation Settings window appears.
- Select the **No, let me choose what to do** radio button
- Select the **Never install driver software from Windows Update** radio button
- Click **Save Changes** and restart the computer to allow the changes to take effect



For Windows 10 (32 and 64 bit) continued from page 3

Disable Driver Installation from Windows Update:

- Right-click the **Start button**
- Select **Control Panel**
- Click **System**
- Click **Advanced system settings** link on the left, the **System Properties** window appears
- Click the **Hardware tab**
- Click **Device Installation Settings**.
- Select the **No, let me choose what to do** radio button
- Click the **Never install driver software from Windows Update** radio button
- Click **Save Changes**



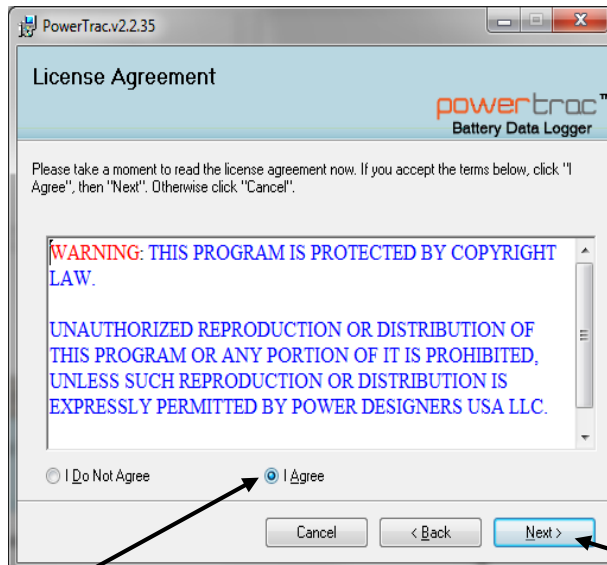
Software Installation

The following summary is a guide for the PowerTrac USB User installation software.

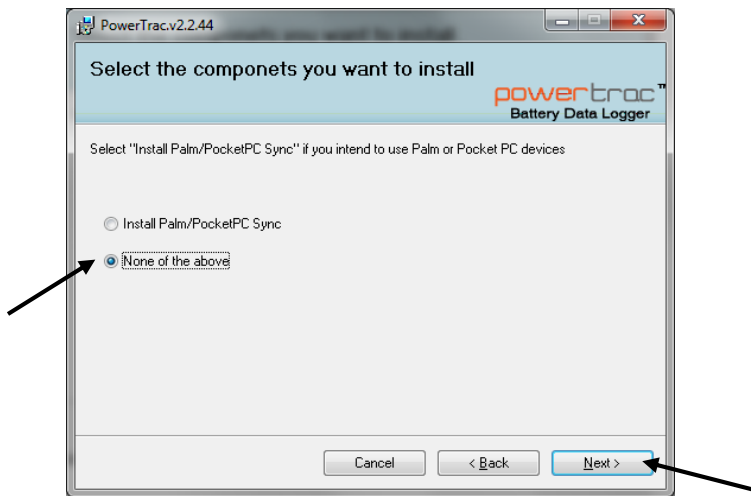
- Double-click the **PowerTracUSBUser.v2.2.xx.msi** (for a 32 bit computer) or **PowerTracUSBUser.v2.2.xx_64.msi** (for a 64 bit computer) file.
- A new window appears. Select **Next** to continue



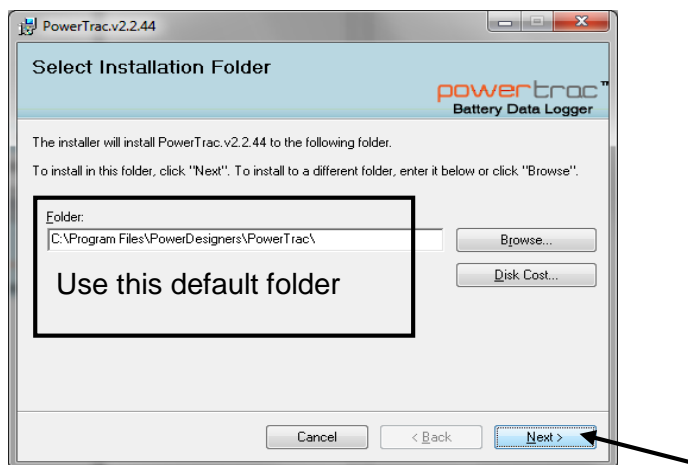
- After reading the License Agreement, select **I Agree** and then select **Next**



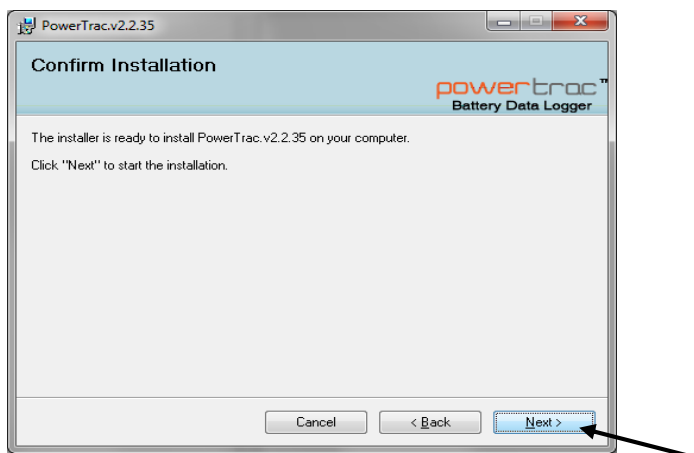
- Select **None of the above** and Click **Next**.



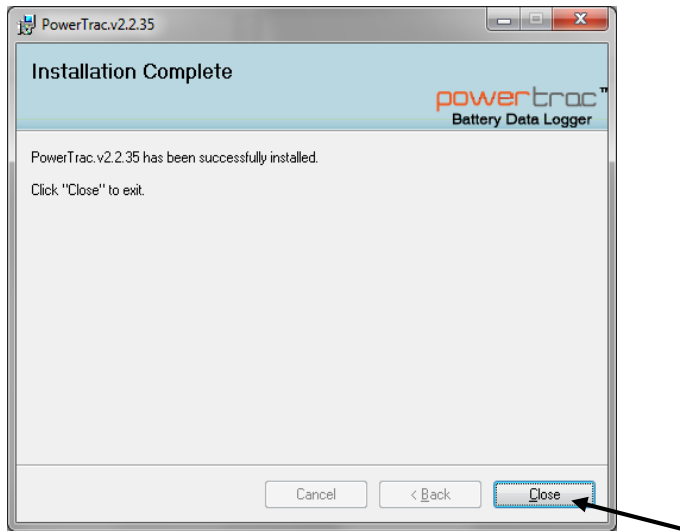
- The Select Installation Folder window appears; keep the default folder, select **Next** to continue.



- A window appears indicating the installer is ready to install PowerTracUSB User, select **Next** to continue.



- An Installation Complete window appears indicating the installation procedure was successful. Select **Close** to exit.

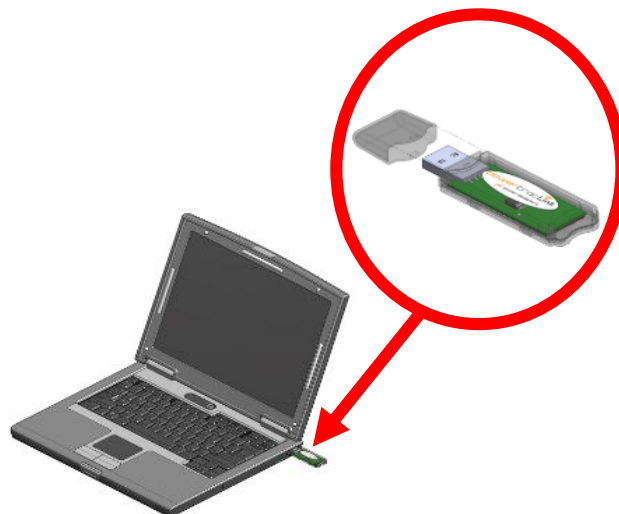


INSTALL THE POWERTRAC LINK

The PowerTrac Link (wireless USB stick) must be plugged into the computer USB port prior to launching the PowerTrac USB User software.

Using the PowerTrac Link

- Remove the end cap from the PowerTrac Link prior to plugging it into the computer USB port.
- Plug the PowerTrac Link into the computer USB port as shown.



LAUNCH THE POWERTRAC USB SOFTWARE

*** Attention Windows 8.1/8/10 users ***

You need to run PowerTrac USB User with full administrator rights in Windows.

- Locate the PowerTrac USB icon on desktop.
- Right-click the icon, and then click **Run as administrator**

Optional method: Start the PowerTrac USB User with Administrator Privileges

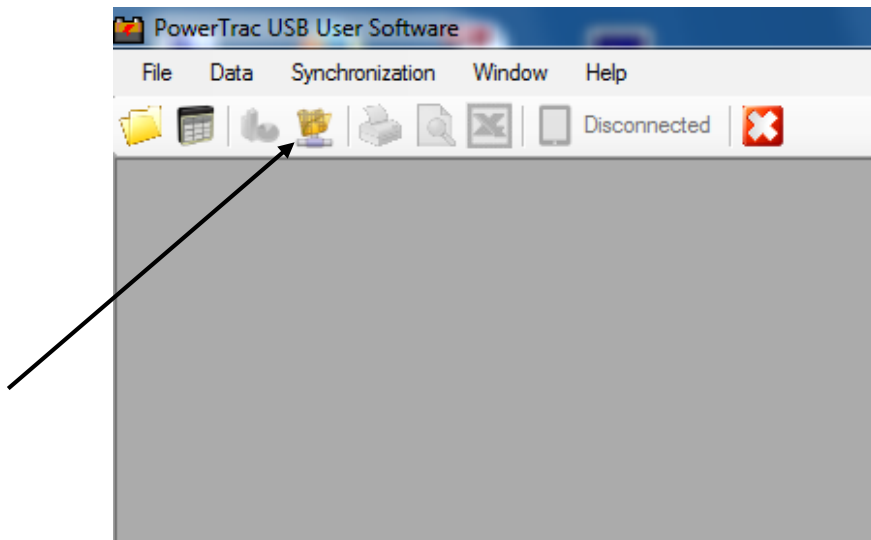
- Right-click the icon and selecting **Properties**
- Click on the **Compatibility** tab
- Check the **Run this program as an administrator** box
- Click on **OK**.

Start up PowerTrac USB User Software


- Double-click the **PowerTrac USB User** icon on the Windows Desktop to open the software.

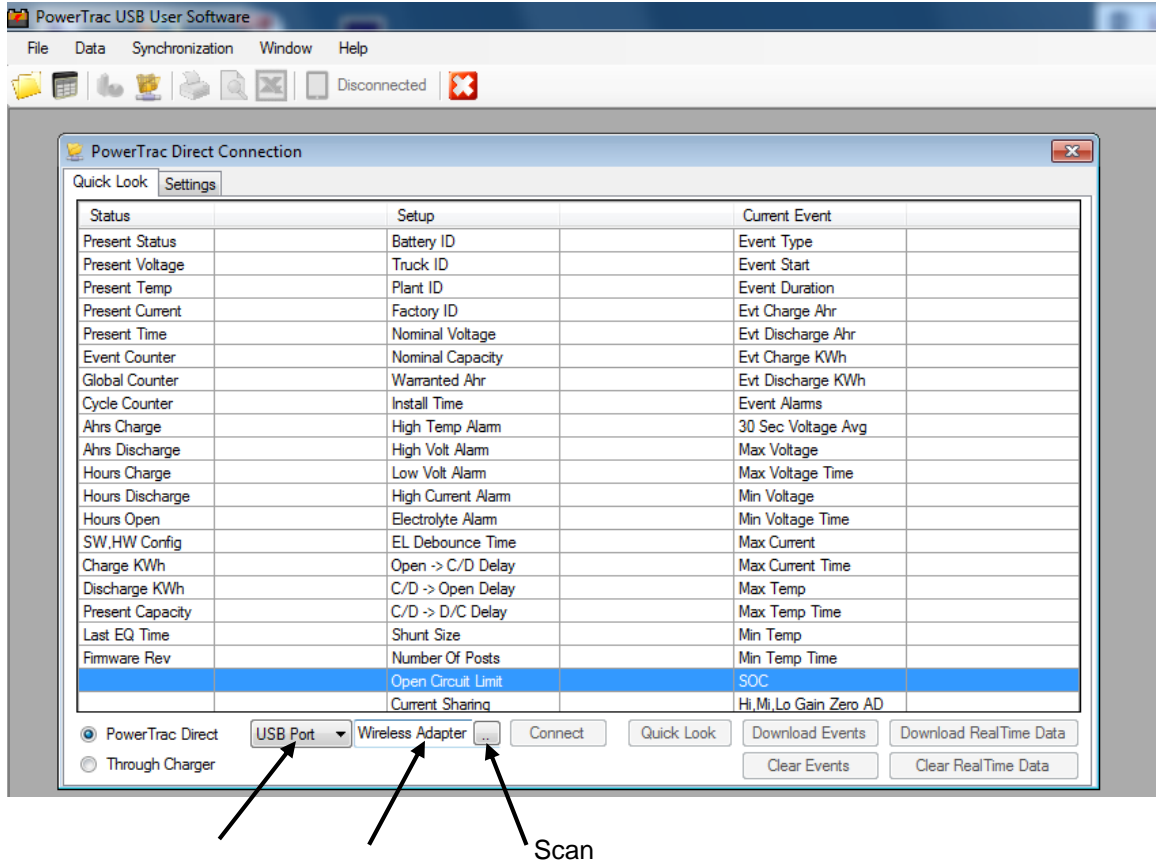


- Select the **Direct Connection Icon**.



SCAN FOR POWERTRAC MONITORS IN RANGE

- At the bottom of the screen, select the **USB port**, Wireless Adapter appears
- Click the scan button denoted by  to search for PowerTrac Monitors in range



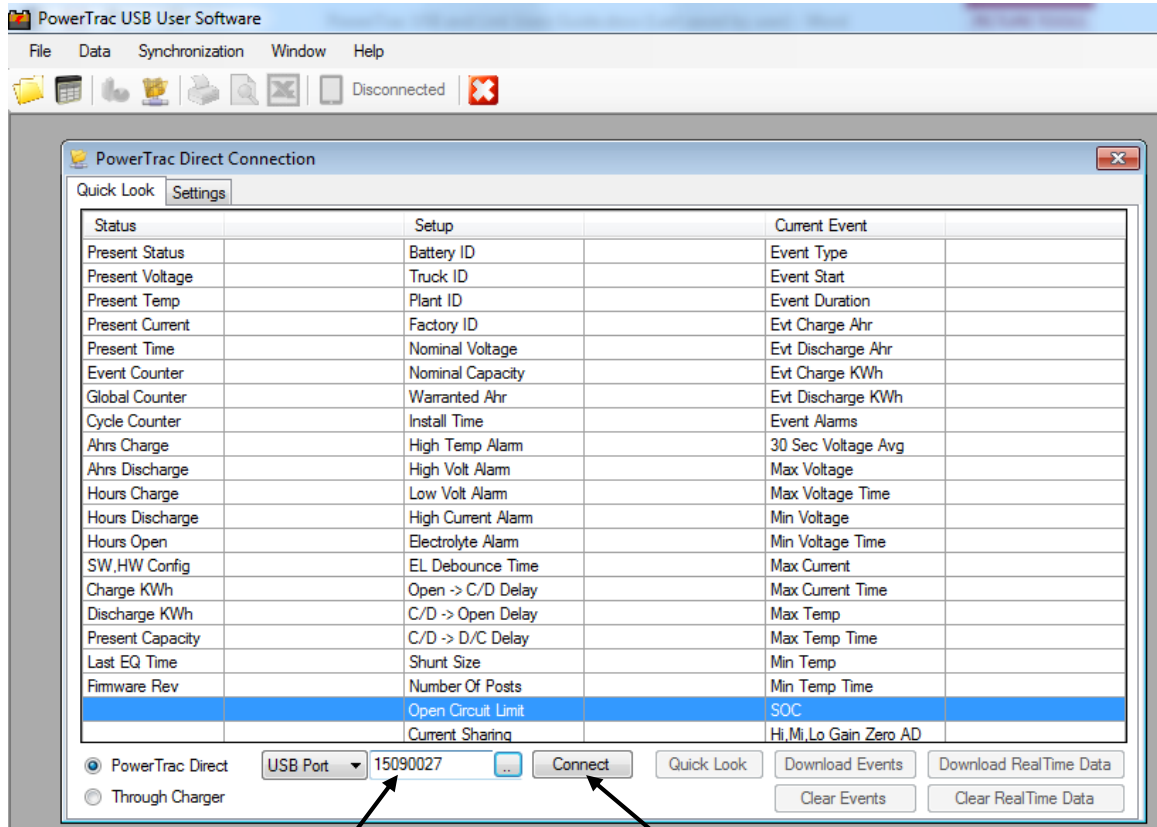
- The PowerTrac Monitors that are discovered by the scan are displayed in a new window

FactoryID	BatteryID	TruckID	Voltage	Capacity	Version	Signal
15090027	PDWW48DK	DEMO	48	1200	2.01	54 ●●●●○
15090042	PDENG48VLAB	RANDY	48	1275	2.01	36 ●○○○○
15090044	PDENG36VLAB	STEVE	36	1360	2.01	42 ●●○○○

Click on one of the rows

- Click on one of the rows to select the PowerTrac Monitor you would like displayed

- The factory ID of the selected PowerTrac Monitor autofills to the left of the scan button
- Click **Connect** to establish communications with this PowerTrac Monitor



Factory ID of selected PowerTrac Monitor

Establish communications with the selected PowerTrac monitor

- Once communication has been established with the PowerTrac Monitor, the factory ID grays out and the Connect button changes to Disconnect.

Quick Look

- Select **Quick Look** to read the setup parameters that are programmed in the PowerTrac Monitor.
- The PowerTrac Monitor parameters populate into the Quick Look screen.

The screenshot shows the 'PowerTrac Direct Connection' window with the 'Quick Look' tab selected. The window title is 'PowerTrac USB User Software' and it has a menu bar with 'File', 'Data', 'Synchronization', 'Window', and 'Help'. The status bar shows 'Disconnected'.

Status	Setup	Current Event
Present Status	Battery ID	Event Type
Present Voltage	Truck ID	Event Start
Present Temp	Plant ID	Event Duration
Present Current	Factory ID	Evt Charge Ahr
Present Time	Nominal Voltage	Evt Discharge Ahr
Event Counter	Nominal Capacity	Evt Charge KWh
Global Counter	Warranted Ahr	Evt Discharge KWh
Cycle Counter	Install Time	Event Alarms
Ahrs Charge	High Temp Alarm	30 Sec Voltage Avg
Ahrs Discharge	High Volt Alarm	Max Voltage
Hours Charge	Low Volt Alarm	Max Voltage Time
Hours Discharge	High Current Alarm	Min Voltage
Hours Open	Electrolyte Alarm	Min Voltage Time
SW,HW Config	EL Debounce Time	Max Current
Charge KWh	Open -> C/D Delay	Max Current Time
Discharge KWh	C/D -> Open Delay	Max Temp
Present Capacity	C/D -> D/C Delay	Max Temp Time
Last EQ Time	Shunt Size	Min Temp
Firmware Rev	Number Of Posts	Min Temp Time
Signal Strength	Open Circuit Limit	SOC
	Current Sharing	Hi, Mi, Lo Gain Zero AD

At the bottom of the window, there are radio buttons for 'PowerTrac Direct' (selected) and 'Through Charger'. To the right, there is a 'USB Port' dropdown menu showing '15090027', a 'Disconnect' button, a 'Quick Look' button, and buttons for 'Download Events', 'Download RealTime Data', 'Clear Events', and 'Clear RealTime Data'.

Grayed out
factory ID

Connect changed
to **Disconnect**


Quick Look reads the
PowerTrac parameters

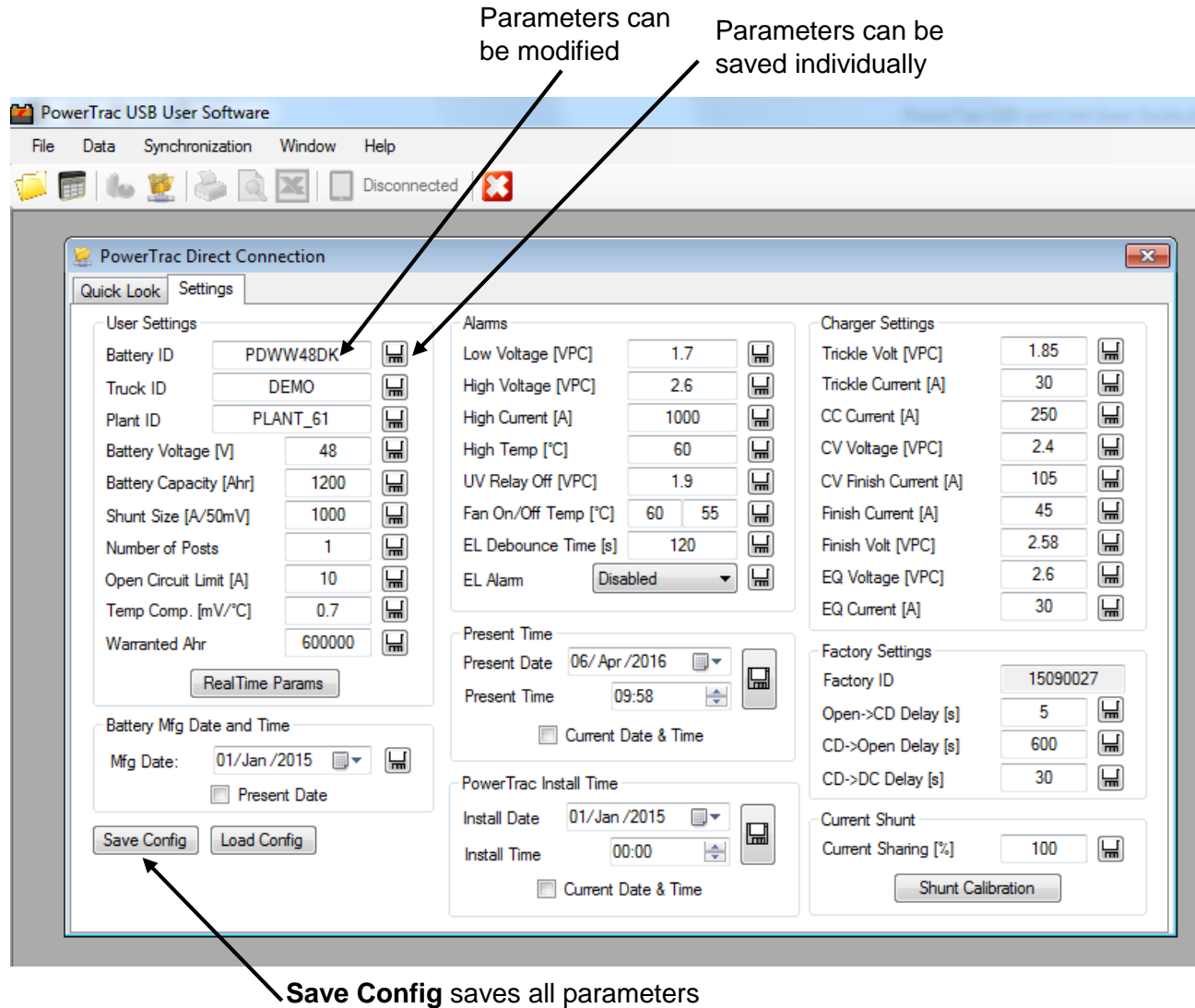
- To modify the parameters, click on **Settings**.

POWERTRAC SETTINGS

The PowerTrac settings screen is shown below.

The PowerTrac parameters are grouped by function and can be changed except for the Factory ID.

Each parameter can be saved individually by clicking on the disk icon  to the right of each parameter. Clicking the **Save Config** button to save all of the parameters.



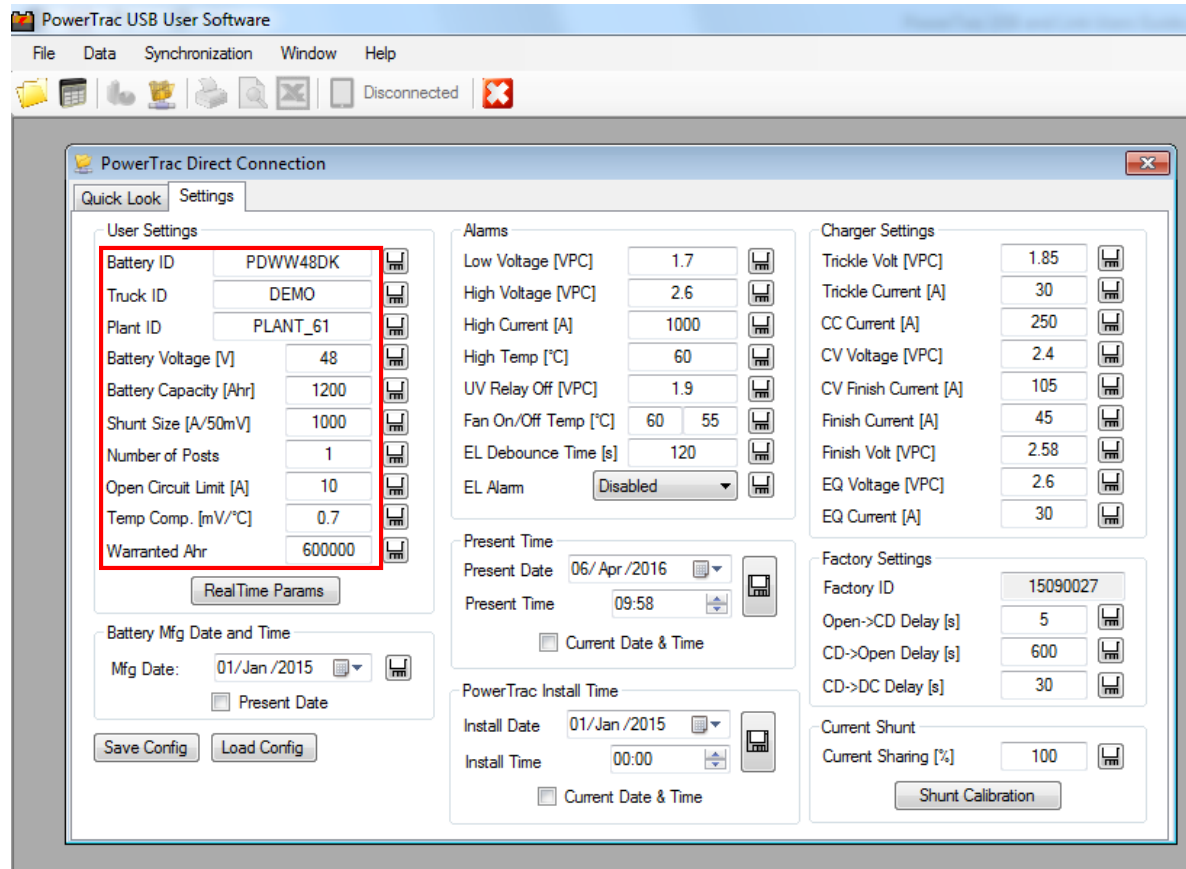
The screenshot shows the 'PowerTrac USB User Software' interface. The 'PowerTrac Direct Connection' window is open to the 'Settings' tab. The settings are organized into several sections:

- User Settings:** Battery ID (PDWW48DK), Truck ID (DEMO), Plant ID (PLANT_61), Battery Voltage [V] (48), Battery Capacity [Ahr] (1200), Shunt Size [A/50mV] (1000), Number of Posts (1), Open Circuit Limit [A] (10), Temp Comp. [mV/°C] (0.7), Warranted Ahr (600000).
- Alarms:** Low Voltage [VPC] (1.7), High Voltage [VPC] (2.6), High Current [A] (1000), High Temp [°C] (60), UV Relay Off [VPC] (1.9), Fan On/Off Temp [°C] (60, 55), EL Debounce Time [s] (120), EL Alarm (Disabled).
- Charger Settings:** Trickle Volt [VPC] (1.85), Trickle Current [A] (30), CC Current [A] (250), CV Voltage [VPC] (2.4), CV Finish Current [A] (105), Finish Current [A] (45), Finish Volt [VPC] (2.58), EQ Voltage [VPC] (2.6), EQ Current [A] (30).
- Present Time:** Present Date (06/Apr/2016), Present Time (09:58), Current Date & Time checkbox.
- PowerTrac Install Time:** Install Date (01/Jan/2015), Install Time (00:00), Current Date & Time checkbox.
- Factory Settings:** Factory ID (15090027), Open->CD Delay [s] (5), CD->Open Delay [s] (600), CD->DC Delay [s] (30).
- Current Shunt:** Current Sharing [%] (100), Shunt Calibration button.

Annotations with arrows point to specific elements:

- Two arrows point to the disk icons next to 'Battery ID' and 'Low Voltage [VPC]', with the text 'Parameters can be modified'.
- Two arrows point to the disk icons next to 'Trickle Volt [VPC]' and 'High Voltage [VPC]', with the text 'Parameters can be saved individually'.
- An arrow points to the 'Save Config' button, with the text 'Save Config saves all parameters'.

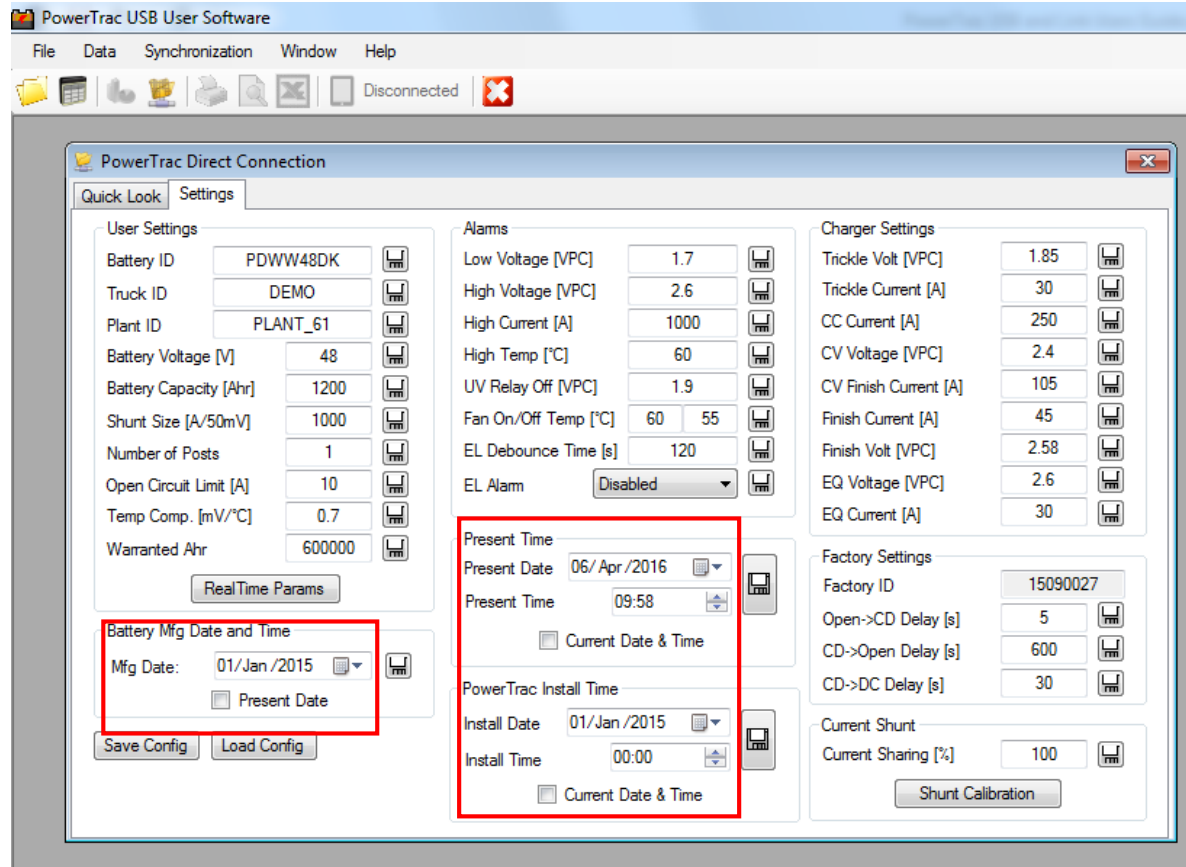
User settings



User Settings definitions:

Battery ID	Unique battery identifier
Truck ID	Unique truck identifier
Plant ID	Plant and location
Battery Voltage	Nominal Battery Voltage
Battery Capacity	Battery Capacity in Ah
Shunt size	Default set at 1000 for the intercell connector
Number of Posts	Number of positive posts per cell
Open circuit limit	Current magnitude that determines an open condition
Temp Comp:	Used for SOC calculations
Warranted Ahr	Total Ah value warranted by the battery manufacturer

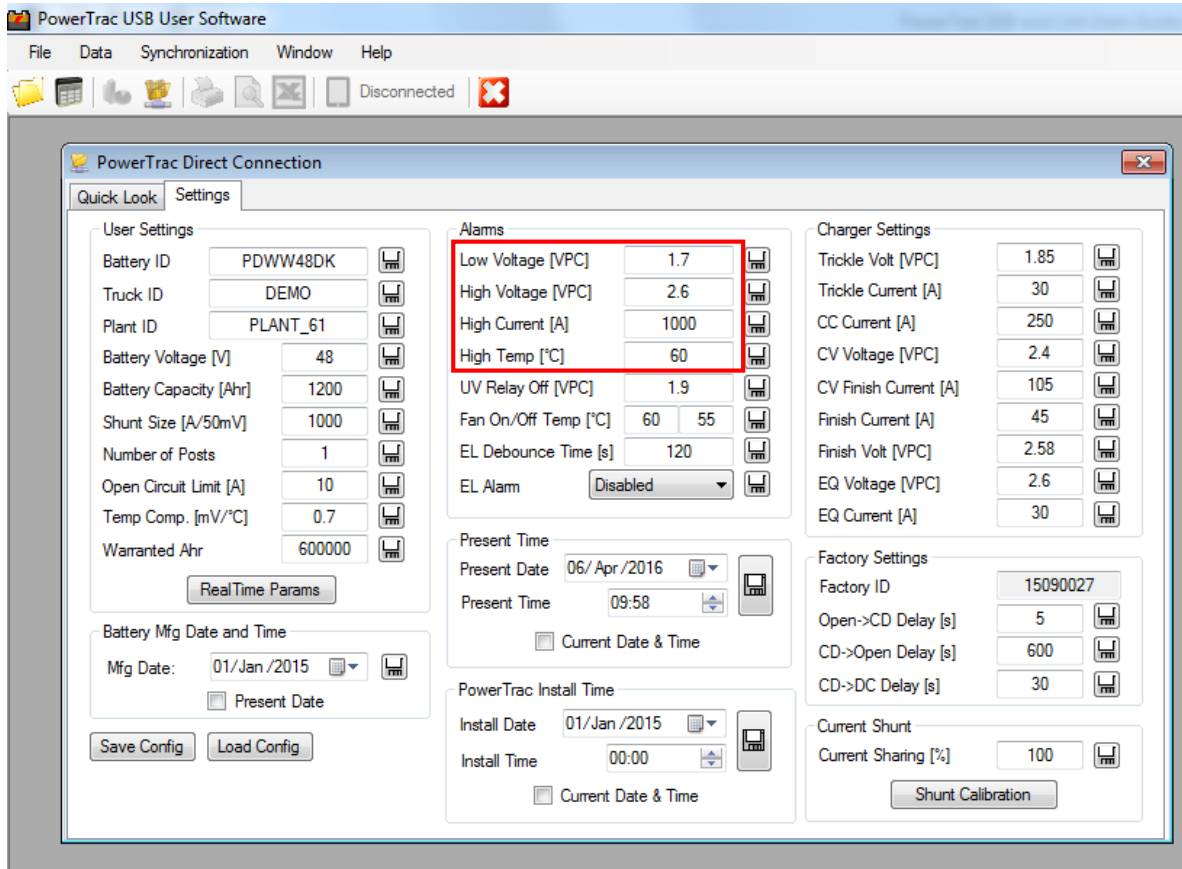
Date and time settings



Date and Time Settings definitions:

Parameter	Definition
Battery Mfg Date	Battery Manufacturing Date
Present Time	Present date and time – used for event time stamping
PowerTrac Install Time	Date and time that this PowerTrac was installed

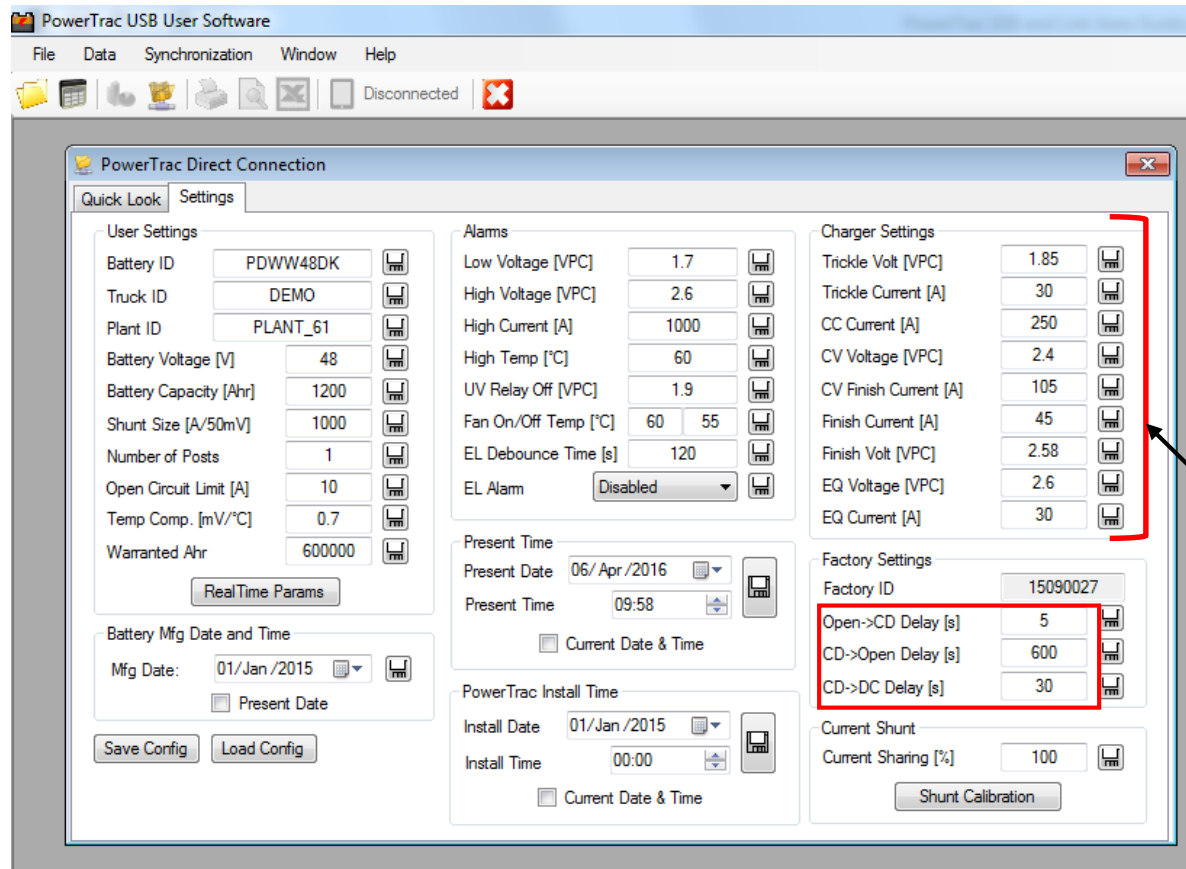
Alarm Settings



Alarm Settings definitions:

Parameter	Definition
Low Voltage [VPC]	A flag bit is set for an event if the battery voltage drops below this value.
High Voltage [VPC]	A flag bit is set for an event if the battery voltage exceeds this value.
High Current [A]	A flag bit is set for an event if the current exceeds this value.
High Temp [°C]	A flag bit is set for an event if the battery temperature exceeds this value.

Event transition delay settings



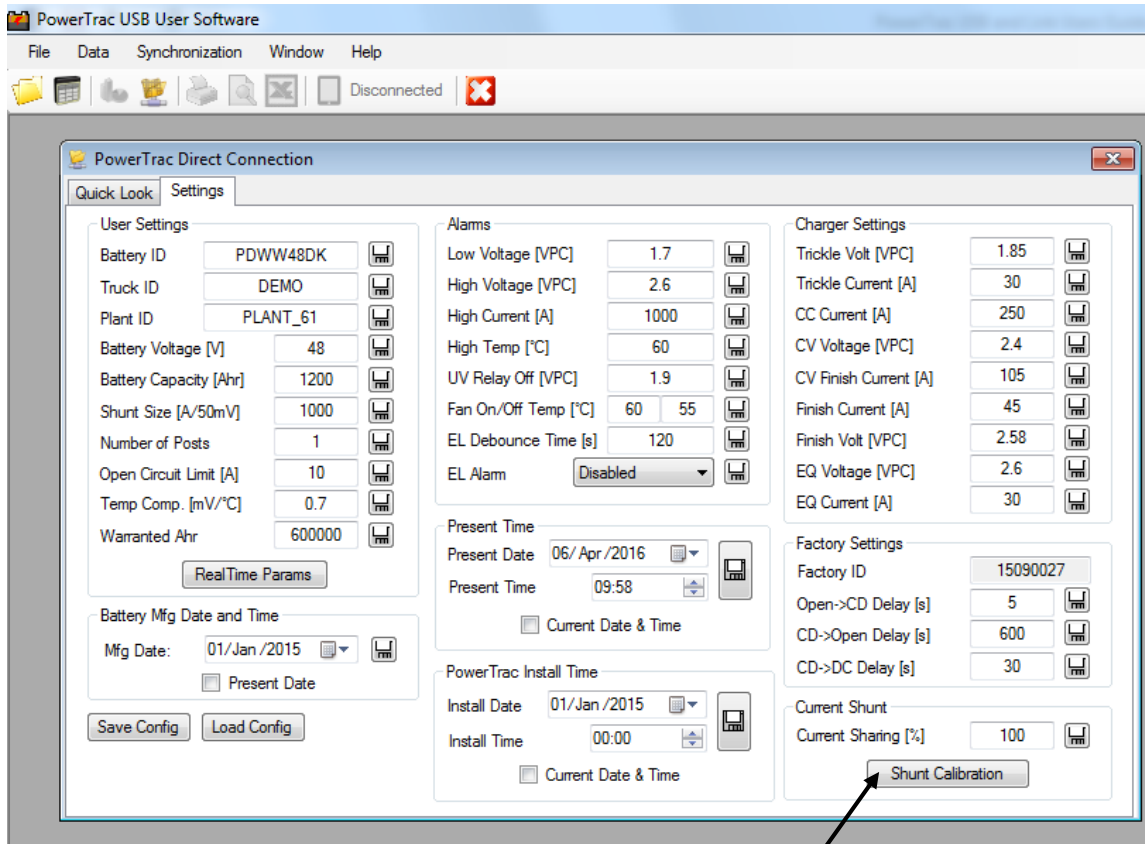
Event Transition Delay Settings definitions:

Parameter	Definition
Open -> CD Delay [s]	Delay time to acknowledge the transition from an open state to a charge (or discharge) state.
CD -> Open Delay [s]	Delay time to acknowledge the transition from a charge (or discharge) state to an open state.
CD -> DC Delay [s]	Delay time to acknowledge the transition from a charge state to a discharge state, or discharge state to charge state.

Note: The charger settings are not used on the PowerTrac Monitor

CALIBRATING THE CURRENT SENSING INTERCELL CONNECTOR

The PowerTrac Monitor uses an intercell connector as a shunt surrogate for current sensing. Due to variances in the intercell connector fabrication, it is recommended that the intercell current measurement be calibrated against a known reference current.



Click **Shunt Calibration**. The intercell connector behaves as a shunt surrogate.

INTERCELL CALIBRATION

Assure that there is no charge or discharge activity (no current flow) on the battery, then click **Read Current**.

1 Click **Read Current**

2 The current should read 0

3 If the present calibration is not at 100%, then it must be reset by clicking the **Clear Calib.** button.

4 Then click **Save Calibration**

2a If the current displayed is not 0, then click **Zero Shunt**. Then repeat step 1.

5 Then re-read the current

6 The current should still read 0

7 The present calibration resets to 100%

Apply a current to the battery (charge or discharge). The magnitude of this current should be approximately 17-25% of the Ah capacity of the battery. Then click on **Read Current**.

Shunt Calibration

1 **Read Current** -137 [A]

Present Calibration 100 [%]

2 Enter measured battery current -98.6 [A]

3 **Calc Calibration** 72.0 [%]

Save Calibration Clear Calib.

Zero Shunt Reset Zero

8 Click **Read Current**

9 The current populates. Note that the negative value denotes a discharge

10 Enter the actual current that has been measured with a calibrated instrument

11 Click **Calc Calibration**

12 A new calibration factor appears

13 Click **Save Calibration**

Shunt Calibration

1 **Read Current** -98.6 [A]

Present Calibration 72 [%]

2 Enter measured battery current -98.6 [A]

3 **Calc Calibration** 72.0 [%]

Save Calibration Clear Calib.

Zero Shunt Reset Zero

14 Re-read the current

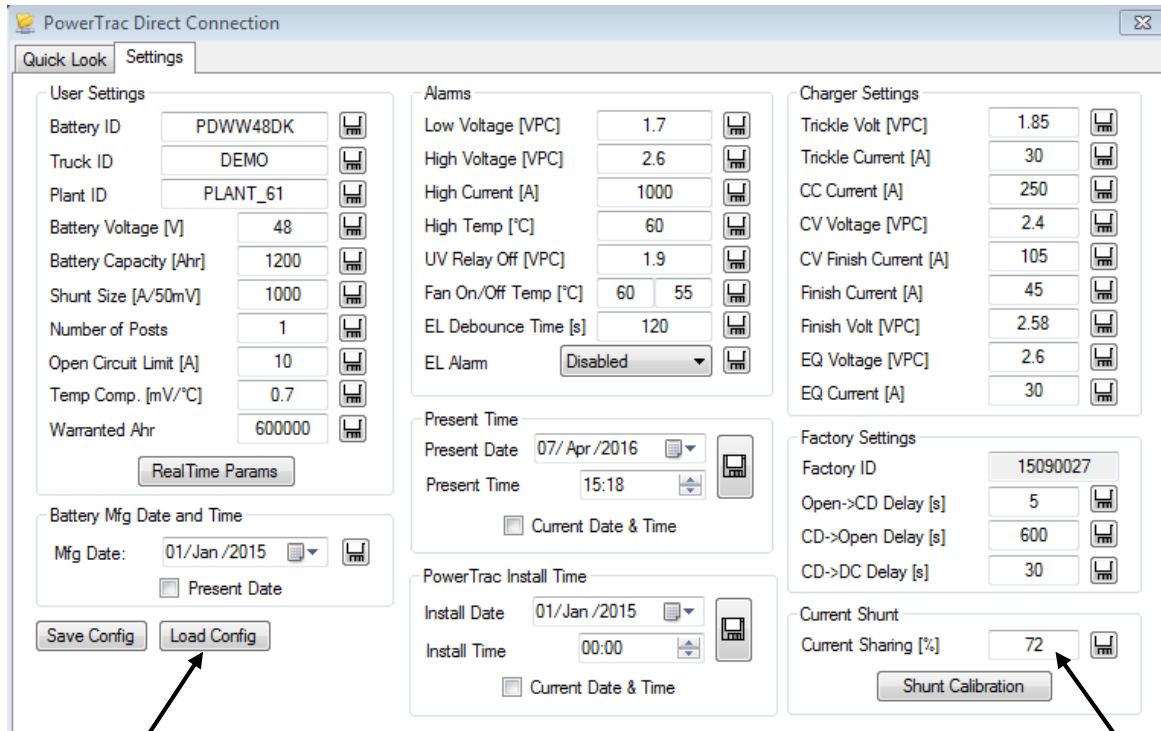
15 With the new calibration factor applied, the current read from the intercell should match the actual current measured by the calibrated reference instrument.

16 Close out of the calibration screen

If the current values do not match, then re-run the calibration procedure. If calibration problems persist, then adjust the shunt value as defined on page 15.

To assure that the calibration has been saved, close out of the calibration screen using the red X in the upper right corner of the window.

Reload the parameters with **Load Config** and then check the current sharing parameter in the settings screen.

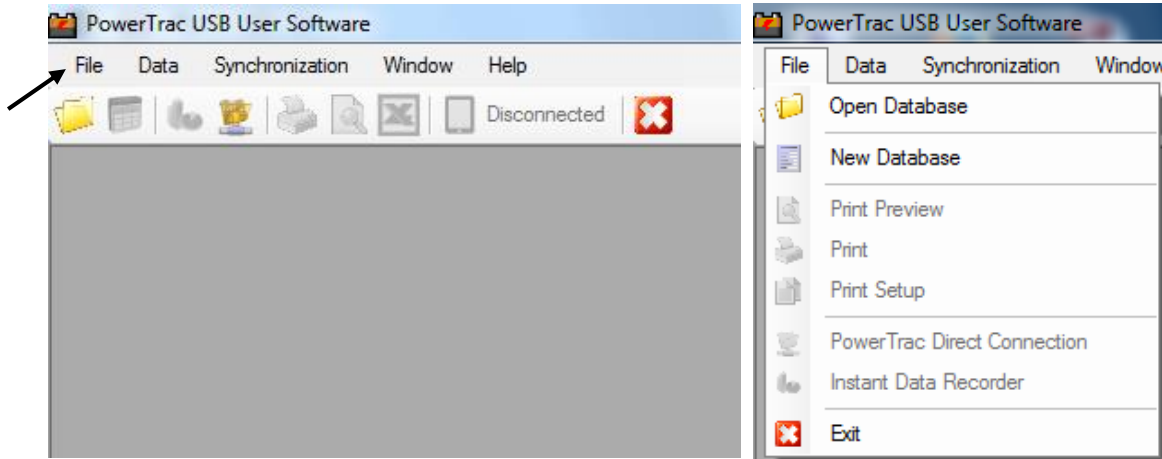


DOWNLOADING THE EVENT HISTORY

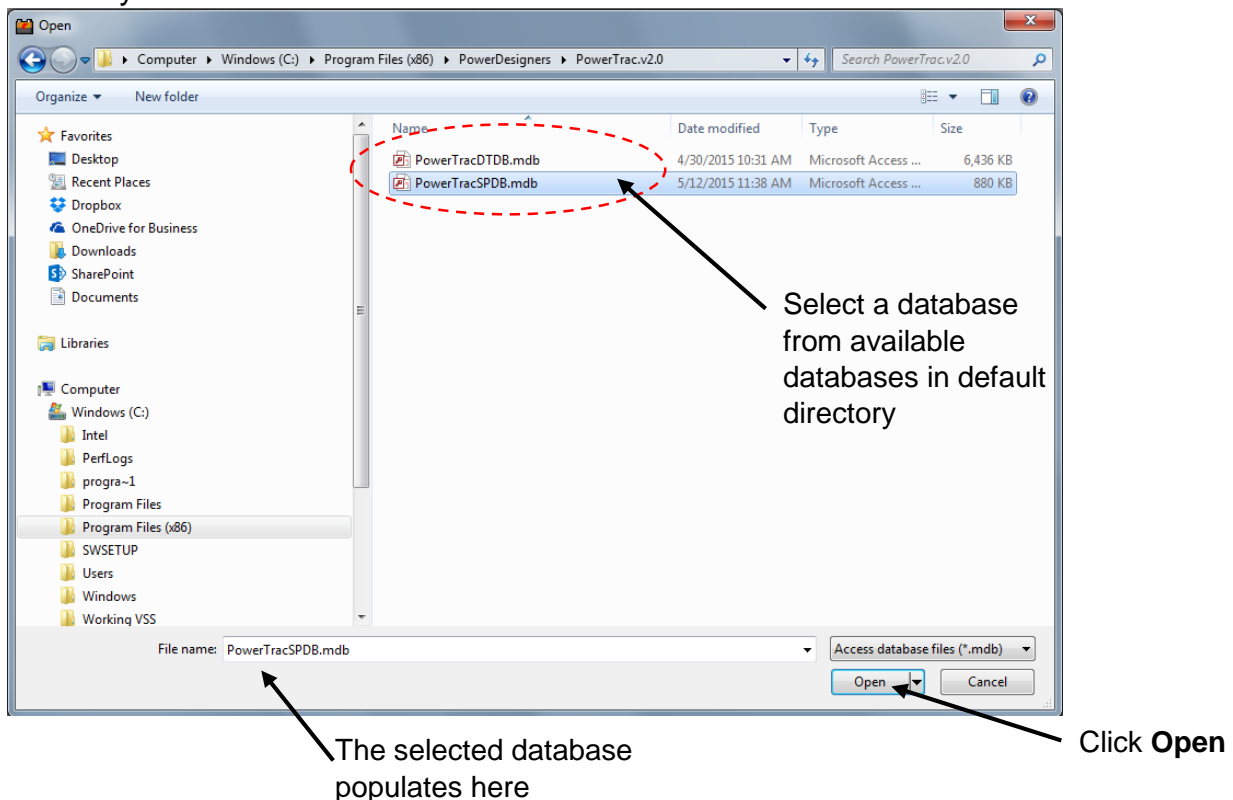
Create a New Database or Open Existing Database

Note: A database can contain several Event History files. Consider the scenario in which the Event History files from several PowerTracs are downloaded at one location. The filename of this database could contain the name of the plant and the location.

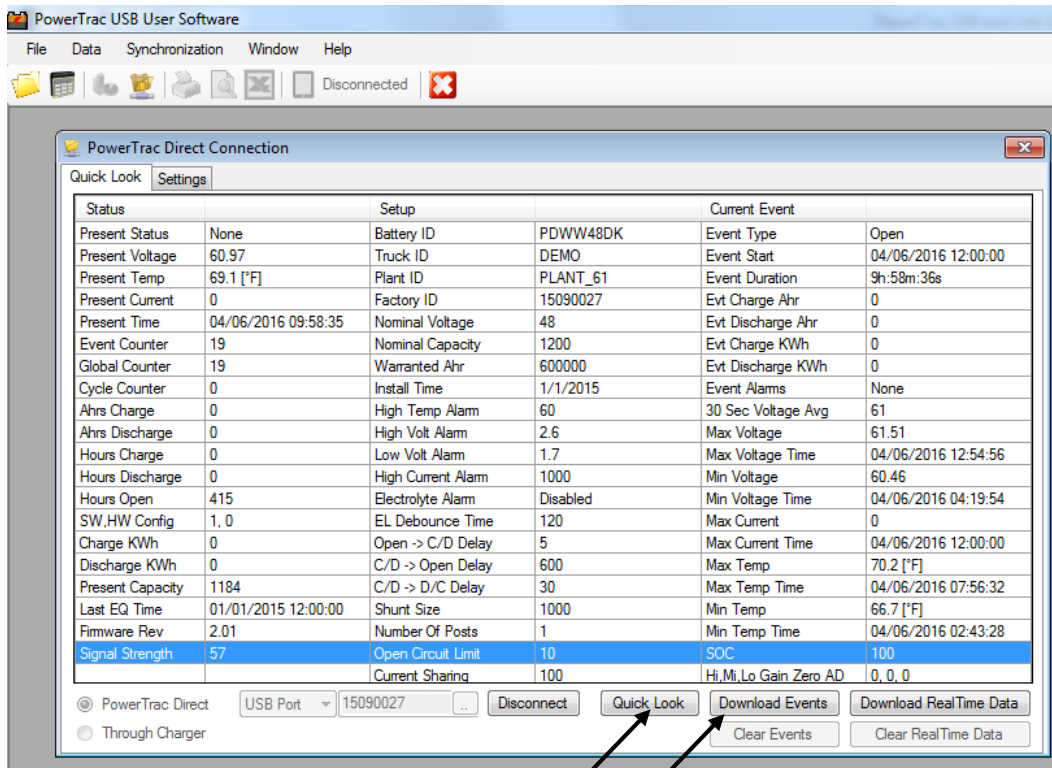
To create new database, go back to the main screen. Click **File** and select **New Database**



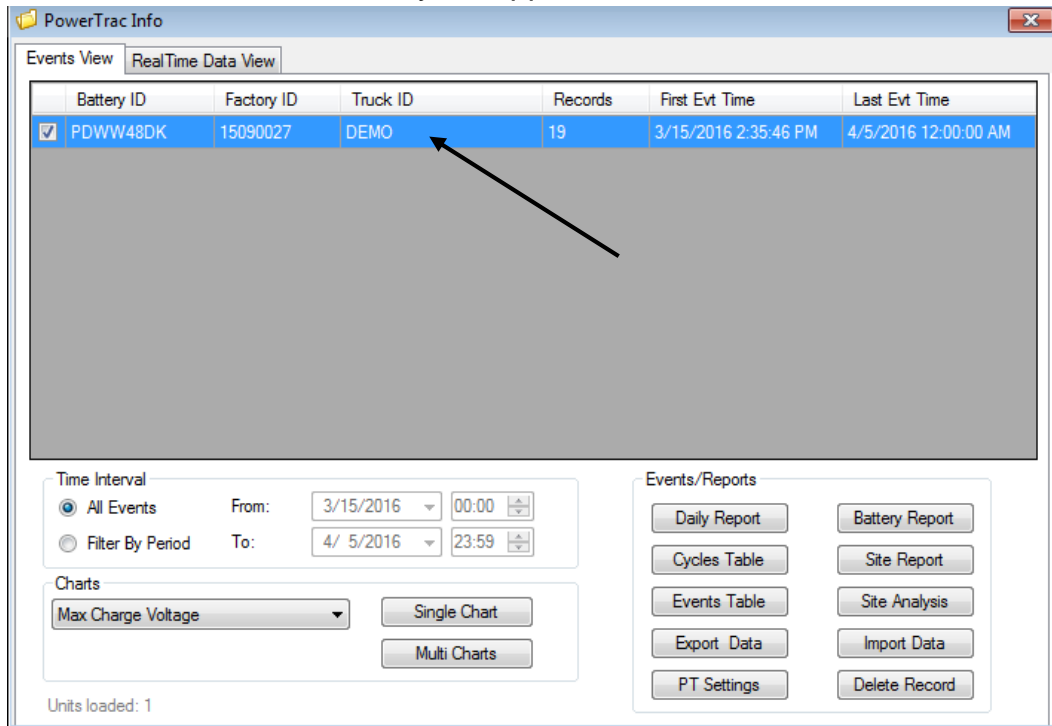
To open an existing go to the main screen. Click **File** and select **Open Database**, then choose your database



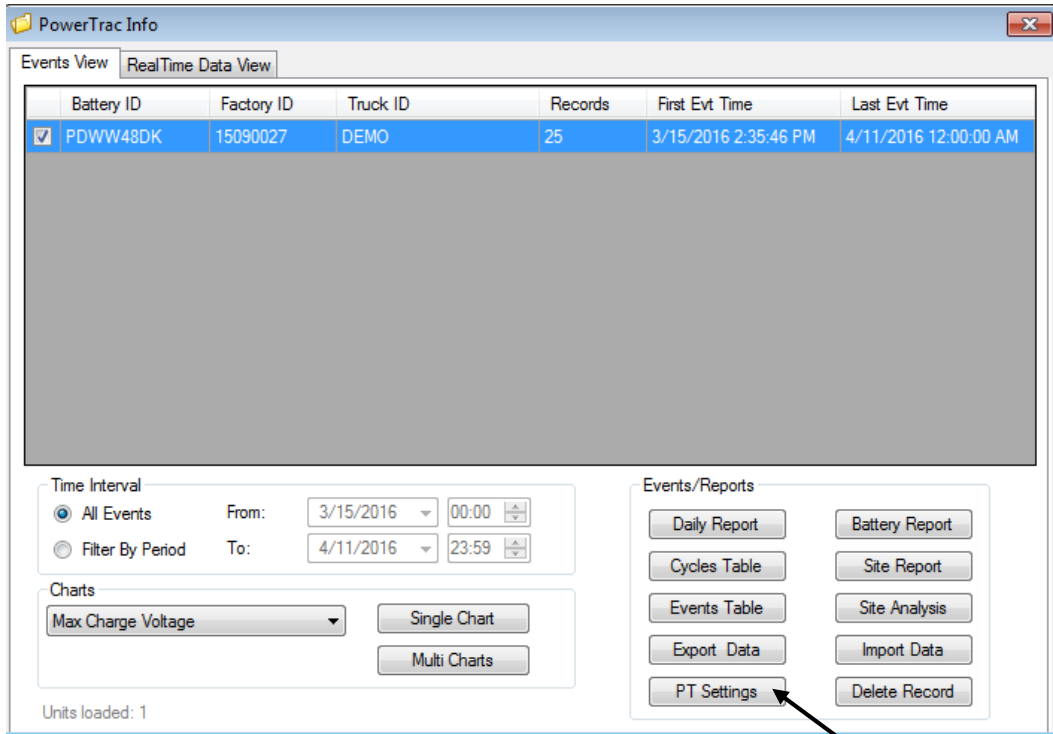
Click **Quick Look** and click **Download Events**.



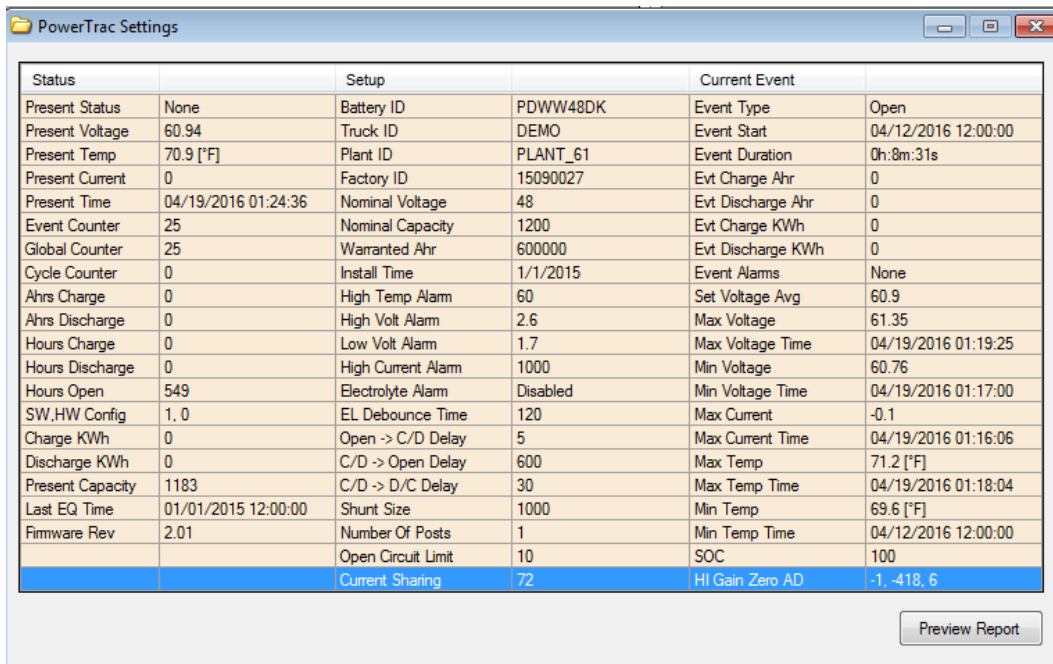
The downloaded event history file appears in the database



Note that the PowerTrac Parameters are saved with the events history file. To view the PowerTrac parameters from the downloaded Events History file, click on **PT Settings**



The PowerTrac parameters are displayed in the Quick Look format.



REPORTS AND CHARTS

The PowerTrac USB software has several data reporting and charting features.

Select a data file, then select a report or chart.

The screenshot shows the 'PowerTrac Info' application window. It features a table with columns for Battery ID, Factory ID, Truck ID, Records, First Evt Time, and Last Evt Time. The row for 'flr0091' is selected. Below the table are sections for 'Time Interval' (with 'All Events' selected), 'Charts' (with 'Max Charge Voltage' selected), and 'Events/Reports'. The 'Events/Reports' section is highlighted with a red box, and an arrow points to it with the text 'Select a report'. The 'Events Table' button is highlighted in blue.

Battery ID	Factory ID	Truck ID	Records	First Evt Time	Last Evt Time
<input type="checkbox"/> ee	00603223	rss220401551	117	6/17/2015 11:00:36 AM	7/21/2015 12:00:00 AM
<input checked="" type="checkbox"/> flr0091	20708836	rss-13-04786	697	6/17/2015 11:14:04 AM	7/29/2015 5:16:25 AM
<input type="checkbox"/> PDWW48DK	15090027	DEMO	19	3/15/2016 2:35:46 PM	4/5/2016 12:00:00 AM

Time Interval

All Events From: 6/17/2015 00:00
 Filter By Period To: 7/29/2015 23:59

Charts

Max Charge Voltage Single Chart Multi Charts

Events/Reports

Daily Report Battery Report
Cycles Table Site Report
Events Table Site Analysis
Export Data Import Data
PT Settings Delete Record

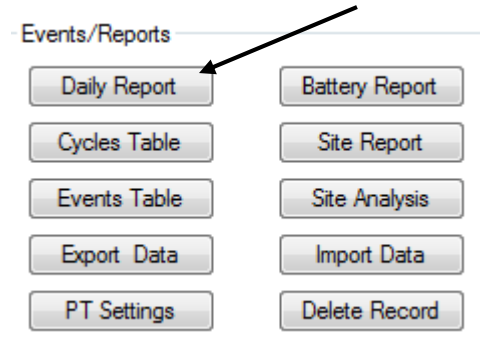
Units loaded: 3

Select a report

Daily Report

The daily report displays a daily summary of charge and discharge Ah and their corresponding elapsed times.

Select Daily Report

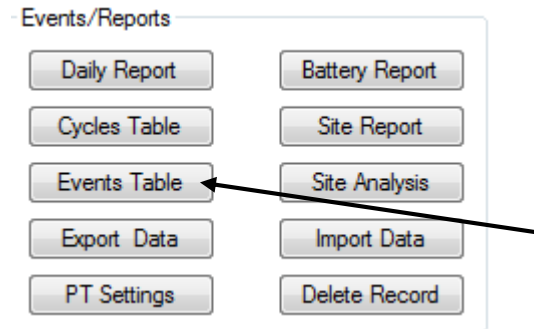


Day	Date	Ahr Charge	Ahr Discharge	Ahr Turnover	Open Hours	Discharge Hours	Charge Hours	End Volt/cell	Max Temp°F	Min SOC	Max SOC
Monday	9/28/2015	0	0	0	0h:0m	0h:0m	0h:0m	2.11	83.3	100	100
Thursday	10/8/2015	18	178	0.33	5h:40m	7h:48m	0h:0m	2.13	98.6	71	99
Friday	10/9/2015	467	84	0.16	7h:23m	4h:41m	6h:17m	2.5	103.1	66	100
Wednesday	10/14/2015	17	202	0.37	6h:18m	8h:12m	0h:0m	2.06	95.54	28	60
Thursday	10/15/2015	510	227	0.42	7h:57m	10h:16m	5h:46m	2.4	96.8	24	93
Friday	10/16/2015	537	231	0.42	6h:50m	9h:49m	7h:20m	2.46	99.14	53	95
Saturday	10/17/2015	229	0	0	19h:5m	0h:0m	4h:54m	2.45	103.46	100	100
Sunday	10/18/2015	0	0	0	24h:0m	0h:0m	0h:0m	2.13	87.8	100	100
Monday	10/19/2015	18	213	0.39	15h:11m	8h:48m	0h:0m	2.13	86.54	65	100
Tuesday	10/20/2015	323	230	0.42	9h:40m	10h:9m	4h:10m	2.47	89.96	57	94
Wednesday	10/21/2015	414	268	0.49	7h:34m	11h:21m	5h:3m	2.49	94.64	50	97
Thursday	10/22/2015	26	283	0.52	13h:21m	10h:38m	0h:0m	2.08	93.02	24	67
Friday	10/23/2015	616	214	0.39	6h:45m	10h:30m	6h:44m	2.48	101.48	22	99

Events Table

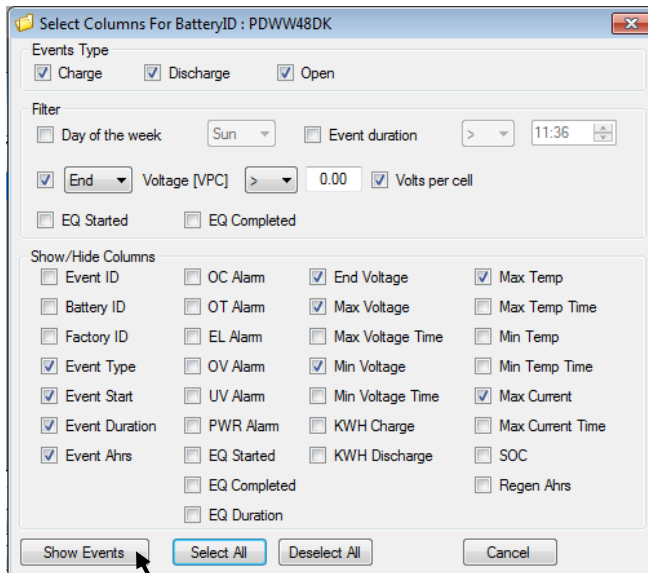
There are three possible states of battery activity: charge, discharge or open (idle). When a change of state occurs, the data from the previous state is saved as an event. These events are captured in the **Events Table**.

Select Events Table



Events table parameter options

- Check parameters to be displayed
- Click **Show Events**



Event Type	Event Start	Duration	Event Ahr	Max Voltage/cc	Min Voltage/cc	Max Temp °F	Max Current	End Voltage/cell
Discharge	Thu, 10/08/20...	03h:04:39	62	2.11	1.82	97.7	-346	2.08
Open	Thu, 10/08/20...	00h:25:02	0	2.1	2.09	98.24	-4.8	2.1
Discharge	Thu, 10/08/20...	02h:06:18	52	2.09	1.76	98.6	-402.6	2.02
Discharge	Fri, 10/09/20...	01h:36:42	32	2.07	1.77	98.42	-378.4	1.99
Charge	Fri, 10/09/20...	04h:30:45	341	2.49	2.13	102.92	127.4	2.48
Discharge	Fri, 10/09/20...	00h:00:11	0	2.27	2.17	102.92	-146.8	2.36
Open	Fri, 10/09/20...	01h:35:09	0	2.26	2.15	103.1	-4.2	2.16
Discharge	Fri, 10/09/20...	00h:02:56	1	2.15	1.93	100.94	-277.6	2.09
Open	Fri, 10/09/20...	00h:53:10	0	2.15	2.12	100.04	3.6	2.15
Discharge	Fri, 10/09/20...	00h:37:39	12	2.13	1.91	99.14	-243.8	2.09

Battery Report

Events/Reports

Daily Report

Battery Report

Cycles Table

Site Report

Events Table

Site Analysis

Export Data

Import Data

PT Settings

Delete Record

PowerTrac Battery Performance Report Print Date : 4/28/2016

Download Date	4/28/2016 3:50:27 PM	Battery ID	PDENG36VLAB
Truck ID	STEVE	Plant ID	POWER DESIGN
Nominal Voltage	36 V	Nominal Capacity	1,360 Ahr

PowerTracSP Settings

High Voltage Alarm	2.6 [VPC]
Low Voltage Alarm	1.7 [VPC]
High Current Alarm	1000 A
High Temp Alarm	140 °F
Open->CD Delay	5 seconds
CD->DC Delay	5 seconds
CD->Open Delay	5 seconds
Open Circuit Limit	5 A
Shunt Size	1000 A
Number of Posts	3
Current Sharing	72 %
Current Zeroing	4;2;2 counts
Firmware Version	2.01

PowerTrac Battery Lifetime Accumulated Summary Since Installation

Install Date and Time	10/14/2015 3:36:00 PM		
Weeks of Operation	28		
Hours of Operation Summary	<u>Charge</u>	<u>Discharge</u>	<u>Open</u>
Total	378 Hrs	248 Hrs	4,011 Hrs
% Usage	8%	5%	86%
Total Ahrs of Operation	<u>Charge</u>	<u>Discharge</u>	<u>% Ahr Returned</u>
	48,374 Ahrs	41,392 Ahrs	117%
Total KWH of Operation	<u>Charge</u>	<u>Discharge</u>	
	2,001 KWH	1,484 KWH	
Warranted Ahrs Summary	<u>Total</u>	<u>Used</u>	<u>Remaining</u>
	600,000 Ahrs	41,392 Ahrs	558,608 Ahrs
Event Counter	830		
Cycles Counter	244		

PowerTrac Battery Data Page 1 of 2 ©Power Designers USA LLC

Download Date	4/28/2016 3:50:27 PM	Battery ID	PDENG36VLAB
Truck ID	STEVE	Plant ID	POWER DESIGN
Nominal Voltage	36 V	Nominal Capacity	1,360 Ahr

Downloaded Events Summary [All Events]

Weeks of Operation	15		
Hours of Operation Summary	<u>Charge</u>	<u>Discharge</u>	<u>Open</u>
Total	127 Hrs	96 Hrs	2,305 Hrs
% Usage	5%	4%	91%
Connect Time Summary	<u>Connect</u>	<u>Run</u>	<u>Plug-In Opportunities</u>
Total	2,193 Hrs	96 Hrs	238 Hrs
% Summary	87%	4%	9%
Total Ahrs of Operation	<u>Charge</u>	<u>Discharge</u>	<u>% Ahr Returned</u>
	18,614 Ahrs	16,186 Ahrs	115%
Total KWH Summary	<u>Charge</u>	<u>Discharge</u>	
	773 KWH	584 KWH	
Average Daily Ahrs Summary	<u>Charge</u>	<u>Discharge</u>	<u>Ahr Turnover</u>
	532 Ahrs	462 Ahrs	0.43
Total Charge Ahr Distribution	<u>Charge</u>	<u>Regen</u>	<u>% Regen</u>
	18,613 Ahrs	1 Ahrs	0%
Equalization Charge Summary	<u>Opportunities</u>	<u>Performed</u>	<u>% of Eq. Cycles</u>
	15	0	0%
Min Discharge Voltage (2 sec)	<u>> 1.70 VPC</u>	<u>1.70 - 1.70 VPC</u>	<u>< 1.70 VPC</u>
Total	28 Days	0 Days	0 Days
% Usage	100%	0%	0%
End Discharge Voltage (30 sec)	<u>> 1.70 VPC</u>	<u>1.70 - 1.70VPC</u>	<u>< 1.70 VPC</u>
Total	28 Days	0 Days	0 Days
% Usage	100%	0%	0%
Battery Temperature Distributions	<u>< 60°F</u>	<u>60 - 100°F</u>	<u>> 100°F</u>
Total	0 Days	99 Days	9 Days
% Usage	0%	92%	8%
SOC Distributions	<u>> 50%</u>	<u>25 - 50%</u>	<u>< 25%</u>
Total	107 Days	1 Days	0 Days
% Usage	99%	1%	0%
Low Electrolyte Level Days	<u>< 7 days</u>	<u>7 - 14 days</u>	<u>> 14 days</u>
Total	0 Days	0 Days	0 Days
% Usage	0%	0%	0%

PowerTrac Battery Data Page 2 of 2 ©Power Designers USA LLC

CHART OPTIONS

The screenshot shows the 'PowerTrac Info' application window. At the top, there are two tabs: 'Events View' (selected) and 'RealTime Data View'. Below the tabs is a table with the following data:

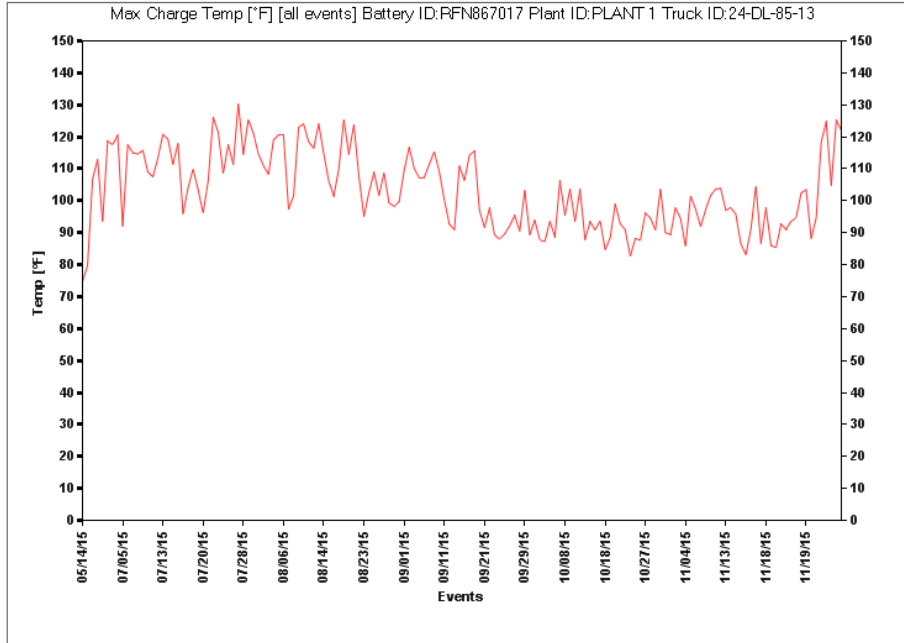
Battery ID	Factory ID	Truck ID	Records	First Evt Time	Last Evt Time
<input type="checkbox"/> ee	00603223	rss220401551	117	6/17/2015 11:00:36 AM	7/21/2015 12:00:00 AM
<input checked="" type="checkbox"/> flr0091	20708836	rss-13-04786	697	6/17/2015 11:14:04 AM	7/29/2015 5:16:25 AM
<input type="checkbox"/> PDWW48DK	15090027	DEMO	19	3/15/2016 2:35:46 PM	4/5/2016 12:00:00 AM

Below the table, there are several control sections:

- Time Interval:** Includes radio buttons for 'All Events' (selected) and 'Filter By Period'. It also has 'From' and 'To' date and time pickers.
- Charts:** A dropdown menu is open, showing a list of chart options. An arrow points from the text 'View Chart Options' to this dropdown.
- Events/Reports:** A grid of buttons for generating reports and tables, including 'Daily Report', 'Battery Report', 'Cycles Table', 'Site Report', 'Events Table', 'Site Analysis', 'Export Data', 'Import Data', 'PT Settings', and 'Delete Record'.

View Chart Options

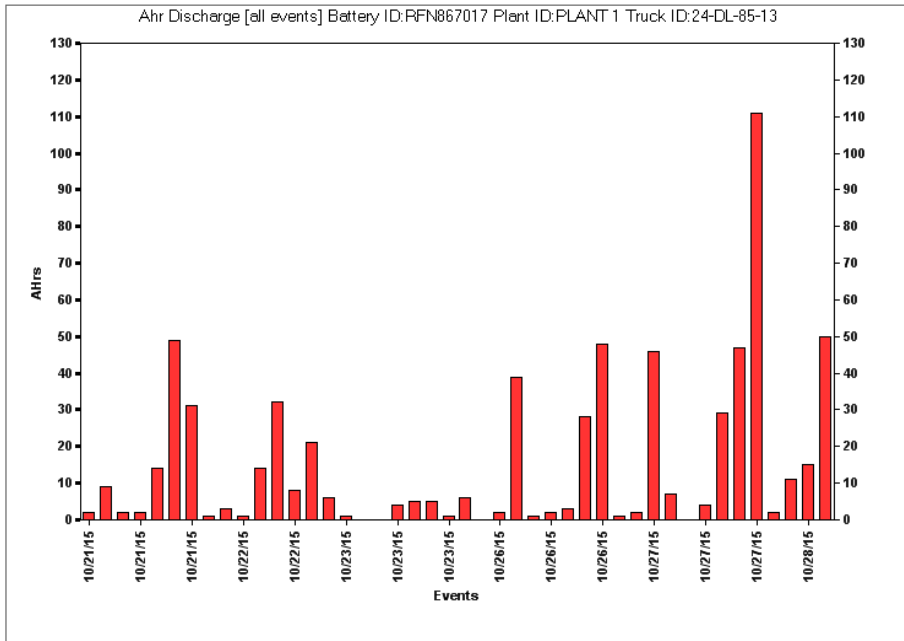
Chart examples



PowerTrac Battery Data

Page 1 of 1

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PowerTrac Battery Data

Page 1 of 1

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RETURN MATERIAL PROCESS

In the event that the troubleshooting steps included in this manual do not resolve the problem,

- a. Record the charger serial number;
- b. Call Power Designers USA LLC with a description of the problem.

Power Designers USA LLC will attempt to resolve the problem over the phone. If the issue cannot be resolved in this manner, a Return Material Authorization (RMA) form must be completed and submitted to Power Designers USA LLC.

Upon receipt of the completed RMA form, Power Designers USA LLC will issue an RMA number for the return. Based on the serial number of the specific charger(s) and the particular problem encountered, Power Designers USA LLC will either repair or replace the defective components under warranty.

For chargers out of warranty, Power Designers USA LLC, upon receipt of the charger and in consideration of a diagnostic fee, will provide a repair estimate.

Power Designers USA LLC
4005 Felland Road, Suite 116
Madison, WI 53718 USA
www.powerdesigners.com

Service Department: 844.263.7050
service@powerdesigners.com

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Main Office Fax: 608.231.9979
Service Department: 844.263.7050

Phones are answered between 8 a.m. and 4 p.m., Monday through Friday Central Time.
After-hours calls are answered by voice mail and returned on the next business day.
Questions and comments can also be submitted via fax or email.