

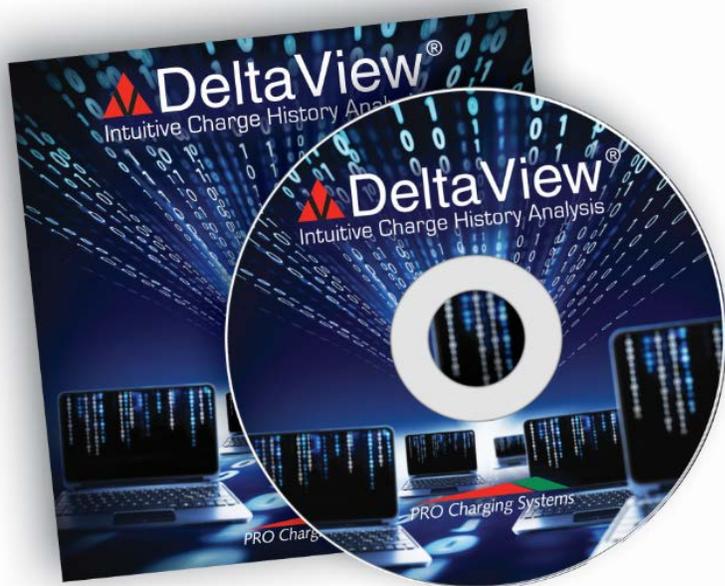


PRO Charging Systems

Safety, Installation and Operating Instructions

Manual for the following DeltaView® Reader model:

DVR001



 **DeltaView®**
Intuitive Charge History Analysis

Made in the


 **DeltaVolt®**
Intuitive Charging Technology

100313

IMPORTANT NOTICE:

Please save and read these safety, operating and installation instructions before installing or using your Pro Charging Systems (PCS) product. Contact technical support at PCS with any product, installation, or service questions (800.742.2740).

Pro Charging Systems, LLC
LaVergne, TN 37086-3539

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Your DeltaView® Reader (Reader):

Before you go any further, you must understand a couple of things about this device:

- 1) This is **NOT** a “memory” stick, “Thumb/Flash Drive” or “Storage Device”. This is a highly sophisticated and technologically advanced data acquisition device. The ability to collect this data without having to make a physical connection to a battery charger is truly unique and requires unique hardware and customer care.*
- 2) This device is powered by a Lithium-Ion battery and can only perform properly if it is properly maintained by the user. It is critically important that the user read and understand the instructions within, and that the user follow these instructions.*

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important safety and operating instructions for future reference.

Understand and relate the Hazard Levels and Signal Words utilized in this manual with the following definitions:



This symbol means: Immediate hazards, which will result in severe personal injury or death.



This symbol means: Hazards or unsafe practices, which could result in severe personal injury or death.



This symbol means: Hazards or unsafe practices, which may result in minor personal injury, product or property damage.



This symbol means BE ALERT! Your safety, or the safety of others, is involved!

PERSONAL SAFETY PRECAUTIONS



Always read all instructions before using your product!

General Safety Considerations

The Reader is a small low voltage device compatible with computer equipment and USB voltages at five (5) volts or less. The battery used in this device is very sophisticated and is not to be replaced by the user. If there is a need to have the battery replaced in the future, please contact PCS to arrange for potential service of the device by the factory.



If any leakage from the Reader is present it should be disconnected from any device it may be connected to so it will not charge. Put the Reader in a zip-lock type bag with most of the air removed and seal it to prevent spreading the leaking material. Do not discard the Reader in any residential or commercial waste system. Take it to a recycling center for proper disposal.

Do not drop the reader. If it is dropped, it will likely be undamaged but watch it closely during use for any leakage or higher than usual temperatures. If either are noticed disconnect the Reader and stop using it.

IMPORTANT BATTERY CARE INSTRUCTIONS

Battery

A rechargeable Lithium-Ion battery powers the Reader and is recharged only when the Reader is connected to a computer or other USB capable charging device. There is no external 'wall type' charger available. The battery capacity is 85 mAh at a working voltage of 3.7 Volts.

An internal charge management device controls the batteries rate of charge and monitors its temperature to limit all charging to the batteries safe operating range.

The Reader is designed to be used over a long period of time (years if properly maintained). When the Reader is not in use, it will go into a "Sleep" in order to conserve the amount current draw. However, there is still enough draw, combined with self discharge characteristics of the battery, to require that the Reader should be charged at least once every thirty (30) days if it is not used for long periods of time. This will greatly increase the battery life. The battery may be damaged if its charge is not maintained.



Disposal

The Reader should be taken to a recycling center for proper disposal as electronic equipment containing a Li-ion polymer battery.



Maximum Temperatures

The storage temperature range of the Reader is defined by the batteries storage range of -4° to 113°F (-20° to +45°C).

The Reader may be charged between 32° to 113°F (0° to +45°C).

The Reader may be discharged (not connected to a charging device) between 14° to 140°F (-10° to +60°C).

Storage humidity range is 0 to 95% Rh non-condensing.

The Reader housing is ABS.

Service Temperatures and Humidity

The Reader is intended to be carried in the users pocket and used in a typical office environment or outdoors. This makes the practical environmental limits for operation between 32° and 113°F (0° and 45°C) with relative humidity between 5 and 95% non-condensing. The Reader is not a sealed device and will be damaged if dropped into water or other solvent. The

photodiode aperture is not sealed so water splashes may enter the Reader. If this happens the Reader should be wrapped in a paper towel and packed in a container of Rice or other desiccant material and left for a minimum of forty-eight (48) hours to dry out. This should remove the moisture but may not prevent premature failure due to ionic contamination of the internal parts.



Repair

The Reader is not designed to be user-repairable but its internal battery is replaceable with the exact type originally installed.



Please follow the cautionary advice below:

Do not operate product with damaged electrical wiring or connections. If damaged, replace the electrical wiring or connections immediately.

Store idle Reader. When not in use, store the Reader in a dry location to inhibit rust.

Maintain Reader with care. Inspect periodically and, if it has received a sharp blow, been dropped, or otherwise damaged in any way, have it repaired by an authorized technician. Do not disassemble the Reader; contact PCS technical support when service or repair is required (800.742.2740). Incorrect reassembly may result in risk of electrical shock or fire.

Check for damaged parts. Before using any PCS product, carefully check any part that appears damaged to determine that it will operate properly and perform its intended function. Check for broken parts and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified PCS technician. Do not use the product if any part does not operate properly.

Replacement parts and accessories. When maintaining, only use accessories intended for use with this product. Approved accessories are available from PCS (800.742.2740).

OPERATING INSTRUCTIONS

SAVE THESE INSTRUCTIONS!

The DeltaView® Reader was designed to be extremely user friendly. Below are the simple steps required collect the data from your charger and how to view that data.

- 1) It is recommended that the device be plugged into a computer before use in order to insure that the device has a full charge. The charge indicator LED will illuminate when the Reader is connected to the USB port of the computer. Yellow indicates that the device cannot be charged. Red indicates that it is accepting a charge. Green indicates that the device has been fully charged and is ready to use. **To avoid the possibility of a dead battery or a damaged battery, it is highly recommended that the Reader be connected to a charger every thirty (30) days.**
- 2) To collect data:
 - a) Collect data while the Reader is not connected to a host computer.
 - b) First be sure that one of the D/C leads is disconnected from the battery pack and then plug the charger into A/C. The Charge Status Display for the charger will begin sending a signal out thru its pulsing GREEN LED.
 - c) Press the Reader against the solid surface of the Charge Status Display for the Charger in order to activate a collection cycle.
 - d) The LED status indicator will start off RED indicating there is no optical signal received by the Reader. During this mode is important to leave the Reader against the solid surface of the Charge Status Display.
 - e) Slide the Reader over the Green LED of the charger aligning the optical aperture described in the figure below.



The USB connector without its cap is to the upper left. The small button activates a read cycle when pressed. The round aperture allows light from the charger's Green LED to enter the unit and be received on the surface of the PIN photodiode.

A clear film may be placed over the aperture on the inside surface to prevent ingress of dust and liquids. The aperture is left uncovered from the outside of the Reader to help align the aperture to the domed feature of the charger's LED.

When used on chargers with flat surfaces, the user will need to make the best alignment they can without the aid of physical registration features. In these cases, the state of the LED assists the user in aligning the Reader with the charger.

- f) The Reader will start flashing GREEN indicating the Reader is receiving an acceptable data signal.
- g) When the Reader completes its data collection (which should only take a few seconds), the GREEN LED should stop flashing and turn SOLID GREEN indicating a charge log file has been stored from the charger.
- h) The LED will turn off when the Reader is removed from the surface of the charger.
- i) Now the Reader is ready to use as a Memory Device by following these steps:
 - i) When connected to a host computer a solid GREEN LED indicates the Reader is powered by the computer and the battery is charged. When retrieving data to an i-Phone or i-Pad, the LED will flash red for approximately 30 seconds after pressing the collection button.
 - ii) Solid RED indicates the battery is charging.
 - iii) Solid YELLOW indicates the battery is not able to properly hold a charge.
 - iv) Any of these colors flashing indicates the Reader files are being accessed.
- j) When accessing on a computer, simply insert the Reader into a USB port on a computer that has the DeltaView® Reader software and follow the prompts. An icon "labeled" PCS DeltaView® Log Files will appear on the desktop and will hold the latest data files collected on the Reader. These can be renamed as you wish and can be saved in another location on your computer as you so desire.



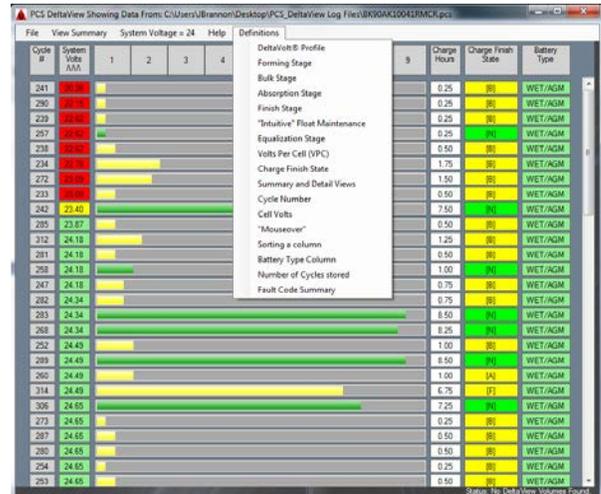
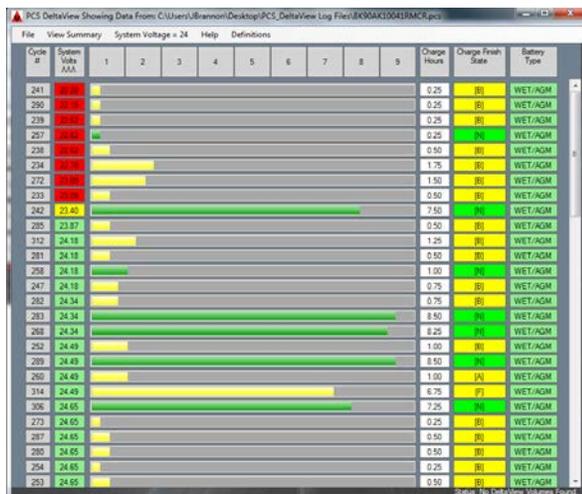
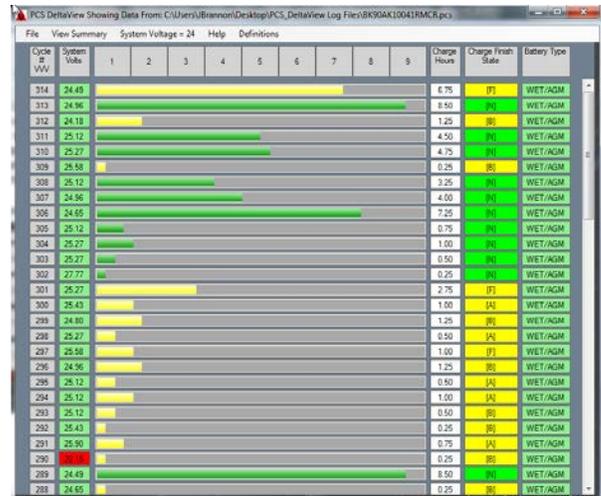
After opening, select "File" and then choose the existing file you want to view from your Reader.



IMPORTANT NOTE: The Reader will store approximately 14 different logs. Each separate log will allow the user to view the detail of the last 83 charge cycles. When the reader is inserted into the USB port of your host computer, the reader will "shake hands" with the computer, a DeltaView® Log Files icon will appear on your desktop showing that a folder has been created and the data that has been collected will be transferred and saved to this folder. As long as this folder remains on the desktop with its original name, future files will automatically be downloaded to this location when the Reader is connected. If you wish to delete this folder after saving the files to another location, this folder will be recreated the next time the DeltaView® Reader is connected and a "handshake takes place". Once the

Reader is removed from the USB port, ALL of that information will be automatically cleared from the Reader in preparation for use to retrieve information from more chargers. If the “handshake” did not take place, the data will remain on the Reader.

Software was included with the purchase of your DeltaView® Reader, the same software, or newer version, is available by visiting our website, www.pcsdv.com. To download new versions, go to our products page and select DeltaView® Software and follow the instructions. We upgrade this software periodically and we recommend you check to see if you are using our latest versions. Always uninstall the previous version before upgrading to the newest. To be on the safe side, please check our website for the latest version and compare to the version noted on your CD, or at the top of the DeltaView® Reader home page if the software has previously been installed on your computer. Further, this is also true of the firmware for the DeltaView® Reader itself, and can be downloaded from our website in the same manner.



Note: Files collected by the DeltaView® Reader are also accessible using an iPhone or iPad. The minimum requirements for the DV Reader App are: iOS6 on iPhone 4S or iPad 3 (or higher). Go to the App store on the device and search for and download the free “DV Reader” App. After installing the DV Reader App, the files can be accessed, as long as they are still on the DeltaView® Reader. Remember that once these files are downloaded to a computer, the files are removed from the Reader.

Viewing files on the DeltaView® Reader using an iPhone 4S or iPad 3 (or higher):

- 1) Open the DeltaView® App.
- 2) Press the button on the back side of DeltaView® Reader, and you will have 30 seconds to complete step 3.
- 3) Press the “Connect” button on the screen of the iPhone 4S or iPad 3 (or higher).
- 4) All of the files that are currently on the DeltaView® Reader will become available to view on the device.
- 5) Now scroll to the file you wish to view and tap that specific file.
- 6) Tap the “Get File” file button on the screen.
- 7) Navigation of the different pages within the DeltaView® Folder will now be available.
- 8) Determine the “System Voltage” setting you wish to view and then select “Summary” or “Detail”.
- 9) There is also a “Definitions” feature that will help explain key terms that are referenced within the files. Simply press the  icon at the top right corner of the Summary or Detail page and the definitions will appear.
- 10) Up and Down arrows can be used to sort data.
- 11) Below are screen shots of the information that can be viewed:

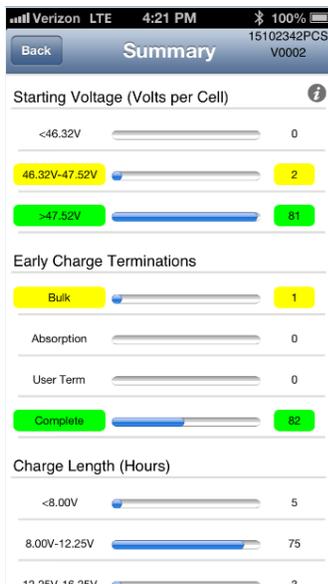


System Voltage

Cell 12V 24V 36V 48V 64V 72V

Summary

Details



Cycle	Volt	Hours	State	Type
83	49.61	9.00	[N]	WET/AGM
82	49.61	8.75	[N]	WET/AGM
81	49.61	8.75	[N]	WET/AGM
80	49.61	8.75	[N]	WET/AGM
79	49.30	8.75	[N]	WET/AGM
78	52.10	6.00	[N]	WET/AGM
77	49.61	2.00	[B]	WET/AGM
76	49.61	9.25	[N]	WET/AGM

Cycle	Volt	Hours	State	Type
56	46.80	13.75	[N]	WET/AGM
55	46.80	15.50	[N]	WET/AGM
23	48.98	8.75	[N]	WET/AGM
36	49.30	9.25	[N]	WET/AGM
29	49.30	8.25	[N]	WET/AGM
22	49.30	9.25	[N]	WET/AGM
35	49.30	9.25	[N]	WET/AGM
28	49.30	8.75	[N]	WET/AGM



The end user of should allow the charger to run through all of its stages and terminate automatically. If the charge cycle is terminated manually, the pack will not be maintained properly and performance of the pack will be adversely affected.

Our DeltaView® Data Acquisition program will show how each charge cycle performed and whether or not the charge cycle terminated



DeltaView Reader LED Indications

Operational Features

- 1) File Structure – Connecting the unit to a host computer enables the user to access collected charger log data as a collection of files. The unit appears to the operating system as an external storage device. It will hold about 14 log files. Each log file will show the last 83 charge cycles. The Reader will also show the total number of charge cycles.
- 2) Power Management – the Reader remains in a low power sleep mode until activated by pressing it against a charger to take a reading. Remember to charge the reader every thirty (30) days and to charge before use.
- 3) Status LED – Operates in two modes:
 - a) Data Collection
 - i) When collecting data, the Reader is not connected to a host computer.
 - ii) Pressing the Reader against a solid surface activates a collection cycle.
 - iii) Flashing RED indicates there is no optical signal received by the Reader.
 - iv) Flashing YELLOW indicates an optical signal can be seen by the Reader.
 - v) Flashing GREEN indicates the Reader is receiving an acceptable data signal.
 - vi) Solid GREEN indicates a charge log file has been stored from the charger.
 - vii) The LED is off when the Reader is removed from the surface of the charger.
 - b) Memory Device
 - i) When connected to a host computer...
 - ii) Solid GREEN indicates the Reader is powered by the computer and the battery is charged.
 - iii) Solid RED indicates the battery is charging.
 - iv) Solid YELLOW indicates the battery is not able to properly hold a charge.
 - v) Any of these colors flashing indicates the Reader files are being accessed.
 - vi) EVERY time the Reader is removed from the USB port of a computer the charge profile history data is cleared and the Reader is reinitialized, ready for its next use.

LIMITED WARRANTY

Pro Charging Systems, LLC (PCS) makes this Limited Warranty only to the original retail purchaser.

PCS warrants this DeltaView® Reader (Reader) for ninety (90) days from the date of retail purchase against defective materials and/or workmanship. If such defects should occur, this unit will either be repaired or replaced at the discretion of the manufacturer. It is the responsibility of the original purchaser to return the Reader along with proof of purchase, transportation, and/or any mailing or handling charges prepaid to the manufacturer or its authorized representative.

This limited warranty is void if the product is misused, improperly maintained, handled carelessly or incorrectly operated. Additionally, this warranty is void if the Reader is disassembled, altered without authorization from PCS, the serial number is removed, or repair is attempted by anyone other than an authorized representative.

PCS makes no other warranty other than this limited warranty and expressly excludes any implied warranty, including warranty for any incidental or consequential damages.

This is the only expressed limited ninety (90) day warranty authorized by PCS and does not authorize anyone to assume or make any other obligation towards the product other than this ninety (90) day limited warranty. Some states do not allow limitation of incidental or consequential damages.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Please call Pro Charging Systems, LLC for full warranty information and/or service please call (800.742.2740).