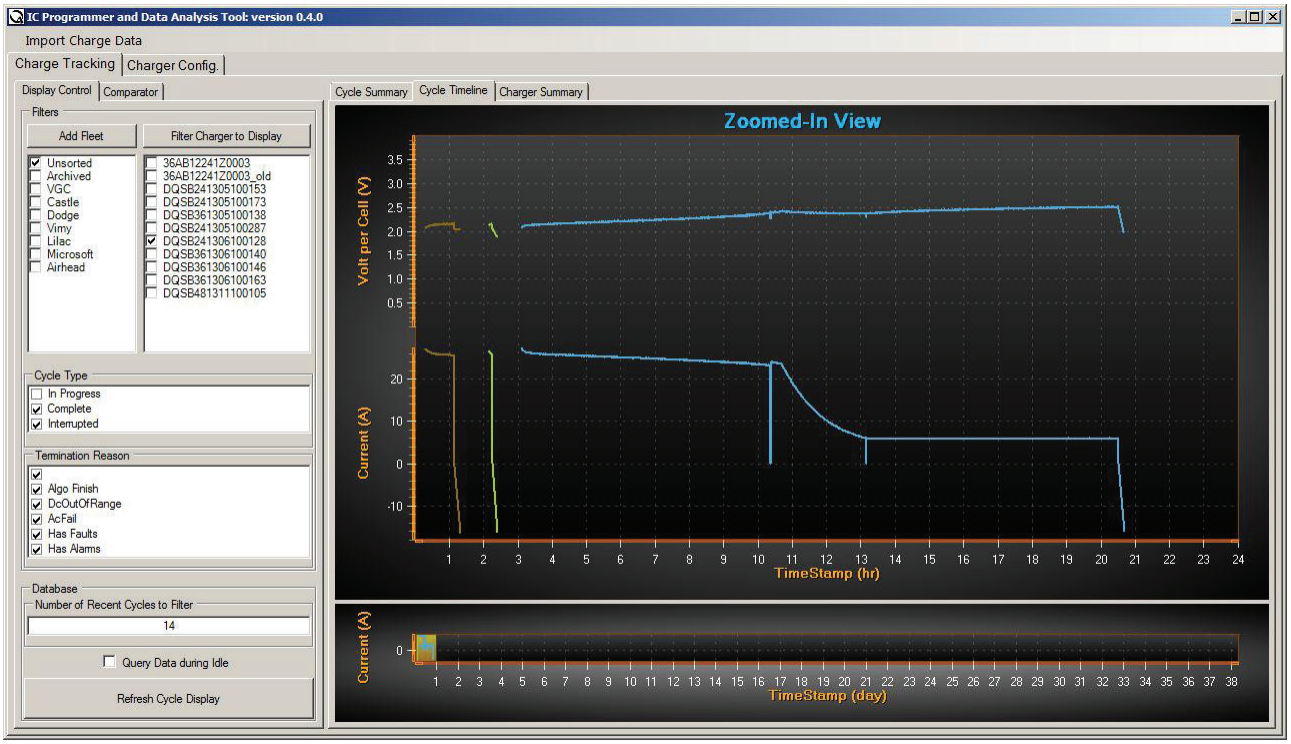
Delta-Q IC Series

Programmer & Data Analysis Tool

User Manual



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1.0 Introduction

The IC Series Programmer & Data Analysis Tool is a powerful software tool that allows you to organize and view data from Delta-Q IC Series chargers. Charger data can be used in troubleshooting charging system issues, testing and developing new products, or determining warranty entitlement. The software is also capable of creating files required to update a charger's software or charging profiles via its USB host port.

1.1 Features

Some of the key features of the IC Series Programmer & Data Analysis Tool are:

Data Analysis:

- Retrieve data via USB stick from IC Series charger
- View, filter, and archive all data
- Plot data graphically
- Compare data points
- Organize fleets of chargers

Charger Configuration:

- Define software and algorithms to be loaded
- Charger reprogramming via direct programming of USB stick or e-mailing of files
- Filtering of chargers to be programmed

2.0 Data Analysis

The Data Analysis module of the Delta-Q IC Series Programmer software provides detailed data about the operation of chargers in a fleet. Once installed, run the software and note these key areas of the main screen, which correspond to the numbered list below:

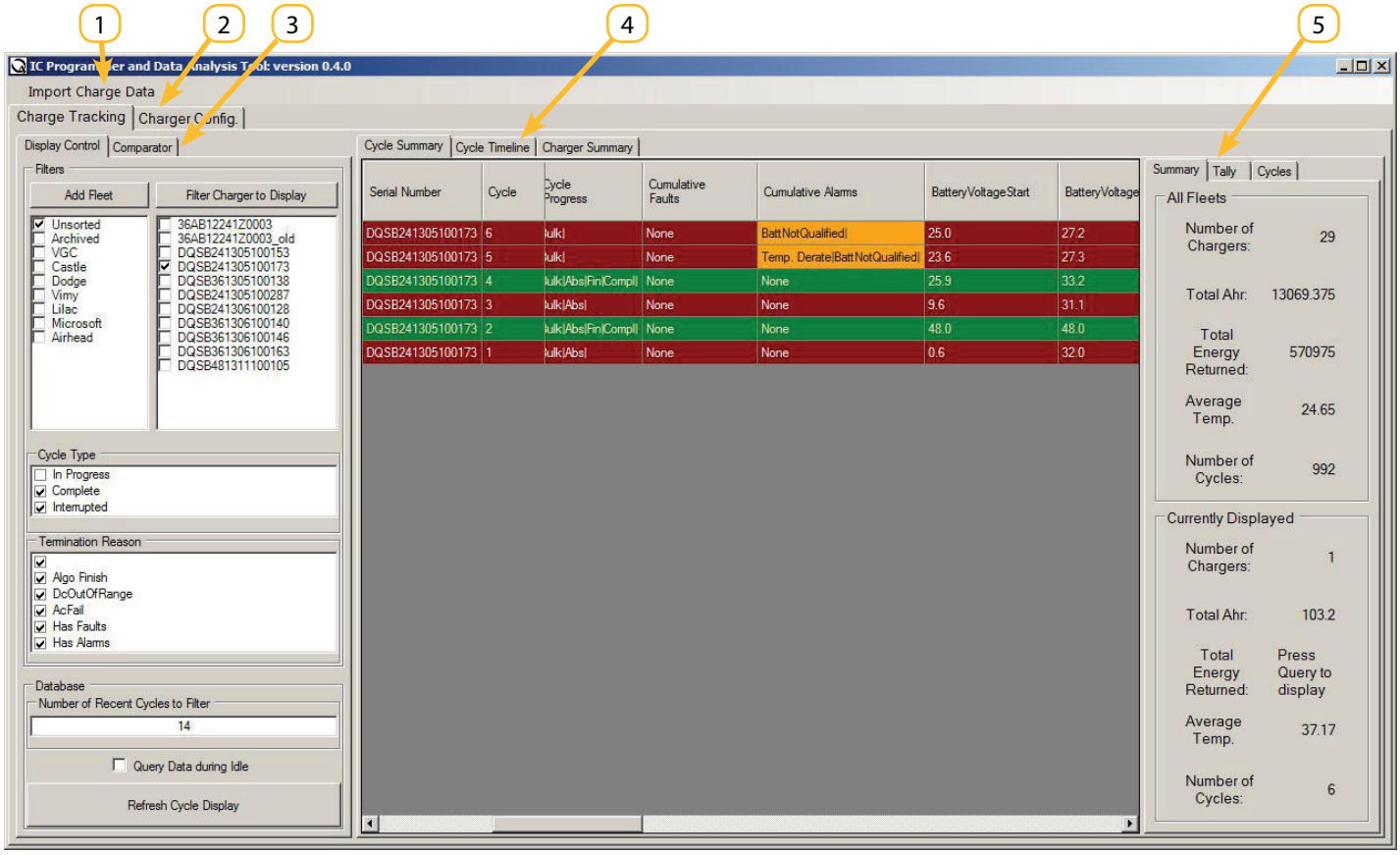

Figure 1.Main Window

1. **Menu Bar:** contains common commands.
   - Import Charge Data: used to import data from a "CHARGER" folder.
2. **Function Tab:** Switch between Charge Tracking and Charger Configuration modes.
3. **Display Control / Comparator Tabs:** Switch the left side panel between options for data display and the Comparator.
4. **Cycle Summary / Cycle Timeline / Charger Summary Tabs:** Switch the central display area between a table of detailed charger / cycle data, a graphical display, or a charger summary.
5. **Summary/Tally/Cycles Tabs:** Switch the right side panel between data summary, and tally or cycle charts for common pieces of data.

2.1 Gathering Data

Delta-Q IC Series chargers automatically record charging data as they are operated to their internal memory. Data can be collected from a charger by inserting a FAT-formatted USB flash drive into the charger's USB host port. Currently, IC series chargers can hold approximately 30 days of cycle data. This will vary depending on how heavily the charger is used and which charging profile is selected.

Once inserted, the green triangle on the charger's LED display will begin flashing, indicating that the data download is in process. Allow time for the charger to complete its write procedure, which will depend on how much data is being stored in the charger's memory.

The green triangle will become solid when the data download is complete.

Figure 2.Inserting a USB flash drive into the IC650 Charger

The IC series charger will automatically create a "CHARGER" folder on the USB storage device if one does not already exist, and writes its data in a sub-folder identified by the charger's serial number. The same USB storage device can be used for multiple chargers or even to collect long-term data from the same charger, so long as the USB flash drive has enough storage space. Ensure that at least 2MB of empty space is available on the USB flash drive for the download.

2.1.1 IC Series Charger Data Folder Structure

- CHARGER: This is the main folder and contains the necessary sub-folders – FILES, FILTERS, and RESP that are used by the charger.
- FILES: The sub-folders in FILES contain the binary (.bin) files that are loaded into the charger when updating software (in SW) or charging algorithms (ALGOS)
- FILTERS – The sub-folders in FILTERS contain the necessary command files that the charger will follow to program charger with new software or charging algorithms. These command files are created by the IC Programmer and Data Analysis Tool.
- RESP – A charger will save its logged data into a folder identified by its serial number under the RESP (for "response") folder. Except for a couple of session and syslog .xml files, this data can only be read by the IC Programmer and Data Analysis Tool.

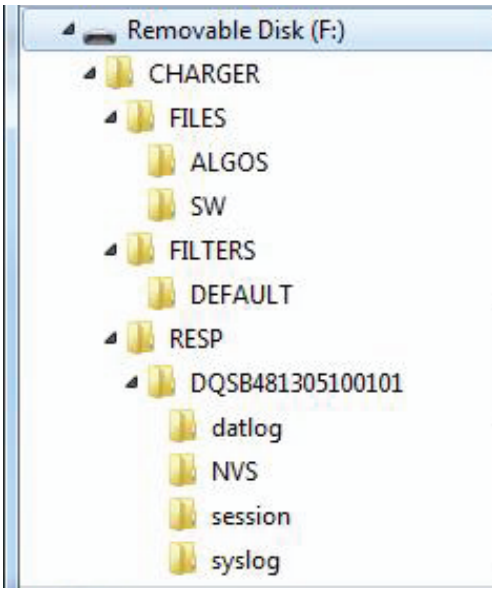

Figure 3.IC Series Data Folder Structure

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2.2 Transferring Data

Once written by the IC Series Charger to the USB flash drive ("CHARGER" folder), the data should be transferred by copying or packaging the entire "CHARGER" folder and it subfolders. It can be copied and pasted within your computer's file system, e-mailed, or the USB flash drive can be couriered for use at another location.

The size of the file will depend upon the number of chargers that have had their data downloaded to the USB flash drive. It is also possible to send only the serial number folder and sub folders under the "RESP" folder.

2.3 Importing Data

When you are ready to import data to your Windows computer, open the IC Programmer & Data Analysis Tool and follow these steps:

1. Click on "Import Charge Data."
2. Browse to the location of the "CHARGER" folder created by the IC Series charger. This can be the "CHARGER" file folder on a USB flash drive, received via e-mail or on your computer's hard drive.
3. Data will automatically be copied from the "CHARGER" folder into the database located on your computer. A progress bar shows the importing process.

2.4 Organizing Data

Once data is imported into the IC Data Analysis Tool, serial numbers of the charger data present will appear bolded in the left window under the "Filter Charger to Display" button. The "Display Control" panel is used to organize the potentially large amount of data that this tool may contain.

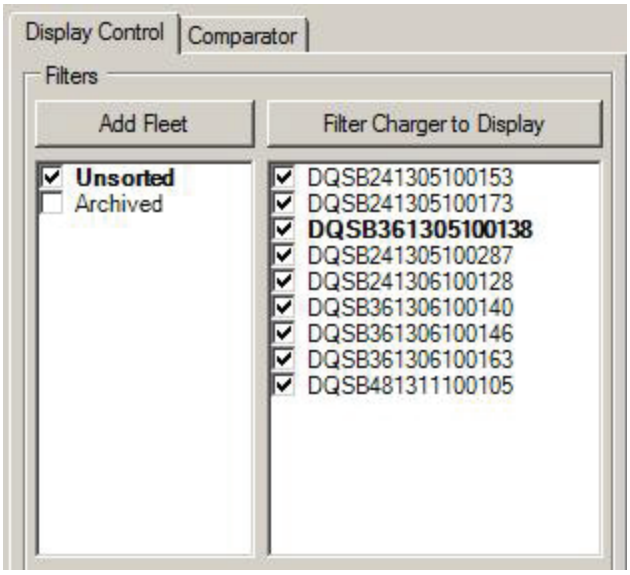

Figure 4. Data organization boxes

Adding and Managing Charger Fleets

The Fleet feature allows the user to organize charger serial numbers into "Fleets," where groups of chargers can be analyzed as a group. For example, a service technician may visit several industrial or commercial customers who each have several vehicles with IC Series chargers, and the Fleet feature allows each facility to be represented in its own folder within the tool.

Add Chargers to a Fleet

To add a new fleet, click on the "Add Fleet" button. Enter the new fleet name into the dialog box and click "Add Fleet."

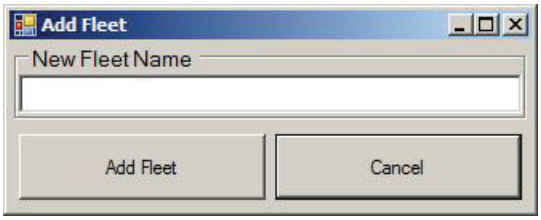

Figure 5. Add Fleet dialog box

Two fleets exist by default:

- Unsorted: Serial Numbers not assigned to another fleet.
- Archived: Default folder created for convenience. There is no automatic archive function.

To assign chargers to a fleet, drag serial numbers from the right window into the desired fleet. Alternatively, check the boxes of the chargers to be assigned and right-click your mouse over one of the selected chargers. Choose the option to "Assign all checked chargers to fleet." Select an existing fleet from the drop-down menu or type in a new fleet name into the dialogue box.

Managing Charger Fleets

Using your mouse, left-click on the fleet name to select it, then right-Click to show a menu of options for this fleet, which will include:

- Delete selected fleet
- Rename selected fleet

Check the boxes next to the name of the fleet to filter fleets out of the chargers to display. Click "Refresh Cycle Display" to apply the filter.

Charger Display Filter

Click the "Filter Charger to Display" button to open the "Filter Charger by S/N [Serial Number]" dialog box, where a filter can be applied that will automatically check the boxes of matching chargers in the window below. Click on "Apply Filter" to search the charger serial numbers for any occurrence of the "Charger Regular Expression" and select them.

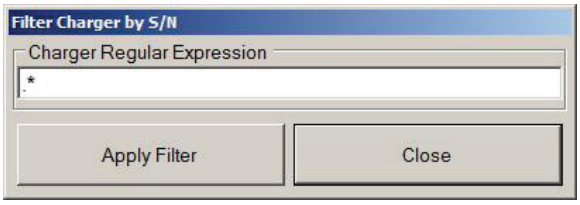

Figure 6. Filter charger dialog box

Right click your mouse to assign chargers to a fleet.

NOTE: "Refresh Cycle Display" must be clicked after selecting previously unselected chargers in order to update the displayed information. Subsequently, those chargers can be immediately hidden by de-selecting the serial numbers.

Figure 7. Assign checked chargers dialog box

Selecting chargers and right clicking also provides options to move the selected chargers to a fleet. Serial numbers just added in this session are bolded.

Tip: Right click in the serial number list to check all checkboxes ("Display all chargers"), or uncheck all checkboxes ("Hide all chargers"). You can also delete chargers from the database.

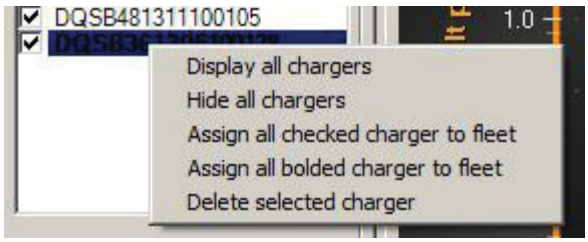

Figure 8. Right-click options for serial numbers

Figure 8 Right-click options for serial numbers

Cycle Type

Check or uncheck boxes in this area to instantly hide or show cycles that apply to the filters offered.

- In Progress: charge cycle was in progress when data was written. Data may be incomplete.
- Normal Finish: Charge cycle finished under normal conditions.
- Interrupted: Charge cycle was interrupted before it could complete normally.

Termination Reason

Check or uncheck boxes in this area to instantly hide or show cycles that terminated for the reasons shown.

- <blank>: Charge cycle without termination reason (In progress cycles)
- Algo Finish: Charge cycle finished normally through the algorithm logic
- DCOutOfRange: Charge cycle terminated due to DC/battery voltage going out of range. (These values are set by the algorithm.) In some applications, DCOutOfRange may be normal and should not necessarily be considered abnormal behavior; for instance, if the charger is being used off-board and it must be disconnected from the battery in order to use the equipment.
- ACFail: Charge cycle terminated due to AC voltage going out of range (<80VAC or >270VAC). In some applications, ACFail may be normal and should not necessarily be considered abnormal behavior; for instance, if the charger is being used on-board and it must be disconnected from an AC source in order to use the equipment.
- Has Faults: Charge cycle terminated due to one or more internal charger hardware fault.
- Has Alarms: Charge cycle recorded alarms during the cycle.

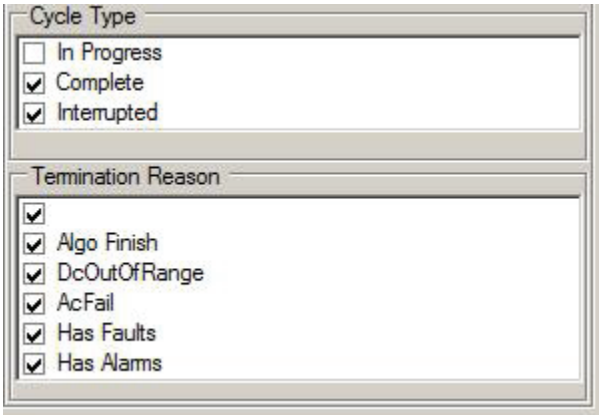

Figure 9. Cycle and termination filters

Number of Recent Cycles to Filter

Enter a number here to limit the number of newest cycles that will appear in the display area. The default is 14 to only display the last week or two of data. Depending on the length of what the program determines to be a "cycle", this number may need to be increased in order to see all relevant recent data.

NOTE: Increasing this number too high and having a large number of chargers may cause very long data retrieval times.

Query Data during Idle

Check this box to see data recorded when the charger was not charging, but connected to a battery pack. This also includes hourly voltage data recorded when the charger is disconnected from AC power, but is still connected to the batteries.

Refresh Cycle Display

Click this button to update the display area with the filters applied above, in the "Add Fleets" box, and/or the "Filter Charger to Display" box.

2.5 Viewing Data

The central area of the IC Data Analysis Tool is where almost all the charging data is organized and displayed. There are three modes: Cycle Summary, Cycle Timeline, and Charger Summary.

2.5.1 Cycle Summary Tab

Cycle Summary | Cycle Timeline | Charger Summary

Serial Number	Cycle	Software Version	Algorithm Version	Cycle Type	Termination Reason	Cycle Progress	Cumulative Faults	Cumulative Alarms	BatteryVoltageStart	BatteryVoltageMax	Duration (hrs)	Amp-Hours Returned
DQSB361305100138	9	0.6.0.8	42.1.22	Complete	Algo Finish	Bulk|Abs|Fin|Compl|	None	Temp. Derate|	36.9	46.3	10.34	68.1
DQSB361305100138	8	0.6.0.8	42.1.22	Interrupted	AcFail	Bulk|	None	Temp. Derate|	30.1	39.8	8.79	61.7
DQSB361305100138	7	0.6.0.8	42.1.22	Interrupted	DcOutOfRange	Bulk|	None	None	30.1	30.1	0.00	0.0
DQSB361305100138	6	0.6.0.8	42.1.22	Complete	Algo Finish	Bulk|Abs|Fin|Compl|	None	Temp. Derate|	32.5	46.2	22.01	134.7
DQSB361305100138	5	0.6.0.8	42.1.22	Interrupted	AcFail	Bulk|	None	None	17.1	34.0	3.41	6.2
DQSB361305100138	4	0.6.0.8	42.1.22	Interrupted	AcFail	Bulk|	None	ChgTimeout|	38.8	41.2	0.17	0.1
DQSB361305100138	2	0.6.0.8	42.1.22	Interrupted	AcFail	Bulk|	None	None	20.8	22.7	0.17	0.0
DQSB361305100138	1	0.6.0.8	42.1.22	Interrupted	DcOutOfRange	Bulk|	None	None	1.3	46.8	0.00	0.0

Figure 10. Charger cycle summary table

This tabular display shows all the "summarized" data for each charge cycle displayed. There are 31 data fields shown as columns:

- Serial Number: Serial Number of the charger which follows this format:
  DQXXVVYYWWZZZZZZ
  DQXX: Delta-Q charger series.
  VV: Model (Voltage).
  YYWW: Year and week of manufacture.
  ZZZZZZ: Serial number.
- Cycle: Sequentially assigned cycle numbers for this charger.
- Software Version: version of software loaded in the charger
- Algorithm Version: Number and version of the active algorithm in the format X.Y.Z where:
  X: Algorithm Number.
  Y.Z: Version number (may be 1, 2 or 3 digits each).
- Cycle Type: State of the charger at the termination of the cycle.
  In Progress: charge cycle was in progress when data was written. Data may be incomplete.
  Normal Finish: Charge cycle finished under normal conditions.
  Interrupted: Charge cycle was interrupted before it could complete normally.
- Termination Reason: Details of the cycle termination.
  <blank>: Charge cycles without termination reasons (In progress cycles).
  Algo Finish: Charge cycle finished normally through the algorithm logic.
  DCOutOfRange: Charge cycle terminated due to DC/battery voltage going out of range. These values are set by the algorithm.
  ACFail: Charge cycle terminated due to AC voltage going out of range (<80VAC or >270VAC).
  HasFaults: Charge cycle terminated due to other faults.
- Cycle Progress: A list of the stages in the algorithm that the cycle progressed through.
- Cumulative Faults: A list of faults that occurred during the cycle, in no particular order.
- Cumulative Alarms: A list of alarms that occurred during the cycle, in no particular order.

2.5.1 Cycle Summary Tab (Continued)

- BatteryVoltageStart: Battery voltage at the start of the cycle
- BatteryVoltageMax: Peak battery voltage during the cycle
- Duration: length of the cycle, in hours.
- Amp-Hours Returned: Calculated amp-hours output during this cycle.
- Processor Temp (Min/Max): The lowest and highest temperature recorded by the microprocessor during this charge cycle. Lowest temperatures are typically at the beginning of the cycle and may closely track to the ambient air temperature. The charger software considers an aggregate of three temperature sensors before deciding to derate output power.
- DCDC, PFC Temp (Min/Max): As above. Temperatures at the charger's DC-DC stage, and Power Factor Correction stage. The other two sensors in the charger's derating decision.
- Battery Temp (Min/Max): Lowest and highest temperatures recorded by the external battery temperature sensor. This value is what the charger uses to calculate temperature compensation in the charge algorithm.
- AC Voltage (Min/Max): Lowest and highest AC Voltage recorded by the charger during the cycle.
- Indicating Finishing Elapsed Time: The time (in seconds) spent this cycle in the "Finishing" phase of charge.
- Battery Voltage End Of Charge: Battery voltage at the end of the cycle.
- Battery Current End Of Charge: Current measured at the end of the cycle.
- Watt-Hrs Returned: Calculated energy returned to the battery during the cycle, in Watt-hours (Wh).
- Average Charger Temperature: Average internal temperature of the charger during this cycle.
- TimeBetweenCycles: Estimated time this charger was left on idle between charges (must be connected to DC or AC in order to record this time).
- ImportDate: Date and time stamp from the PC when the data was first copied from the USB stoage device.
- FileSource: Location of this cycle of data in the local PC database.

Right-click on a charge cycle in the Charger Cycle Summary window to bring up a submenu with further commands:

- Display Charge Cycle Summary for…: Opens the Charge Cycle Data window for the selected cycle. See below for more detail on this window.
- Display Charger Summary for…: Opens the Charger Summary Form for the selected charger serial number. See below for more detail on this form.
- Export Charge Cycle Summary to CSV: Opens a dialog to choose a location to save a .csv file of the displayed charge cycle summary data.
- Export Curves from this Charge Cycle Summary to CSV: Opens a window where data fields to be exported can be selected. Click "Save As" to select the location the file is to be saved to. See "Charge Cycle Data Window" below for a description of the data fields.

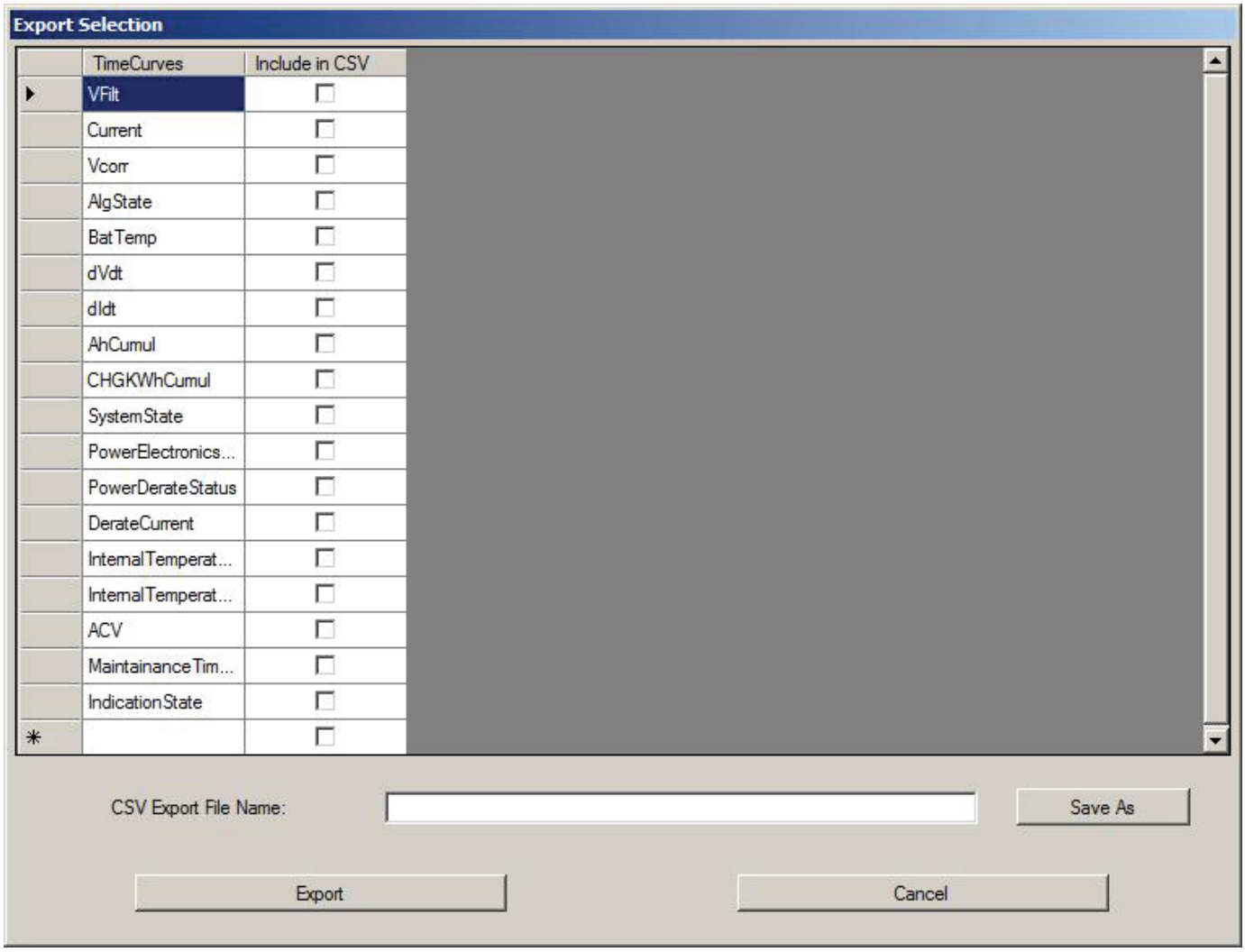

Figure 11. Export Window

NOTE: This feature is still in development and may not function properly. There are no table headers.

2.5.2 Summary

When the "Charger Cycle Summary" Tab is active, the right side of the screen shows the Summary of all the data on this computer and of the data displayed:

- Number of Chargers
- Total Ahr: In Amp-hours
- Total Energy Returned: In Watt-hours
- Average Temp.: Internal temperature of the charger(s)
- Number of Cycles

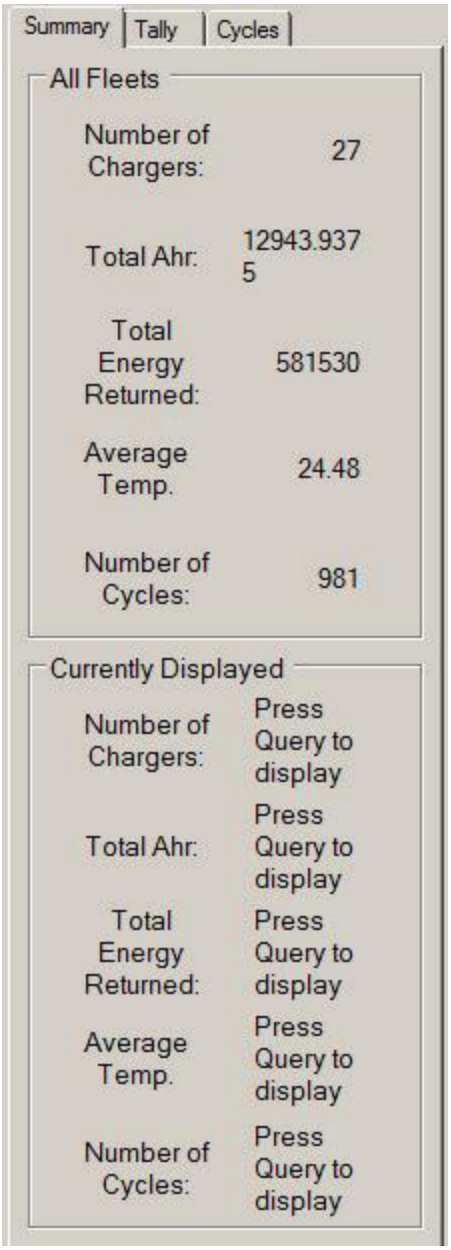

Figure 12. Summary Tab

2.5.3 Tally

These graphs show counts for certain data fields over the displayed cycles. Double click on the charts to open a pop-up of the chart.

NOTE: This feature is still in development and may not function properly.

2.5.4 Cycles

These graphs show the cycles for certain data fields over the displayed cycles. Double click on the charts to open a pop-up of the chart.

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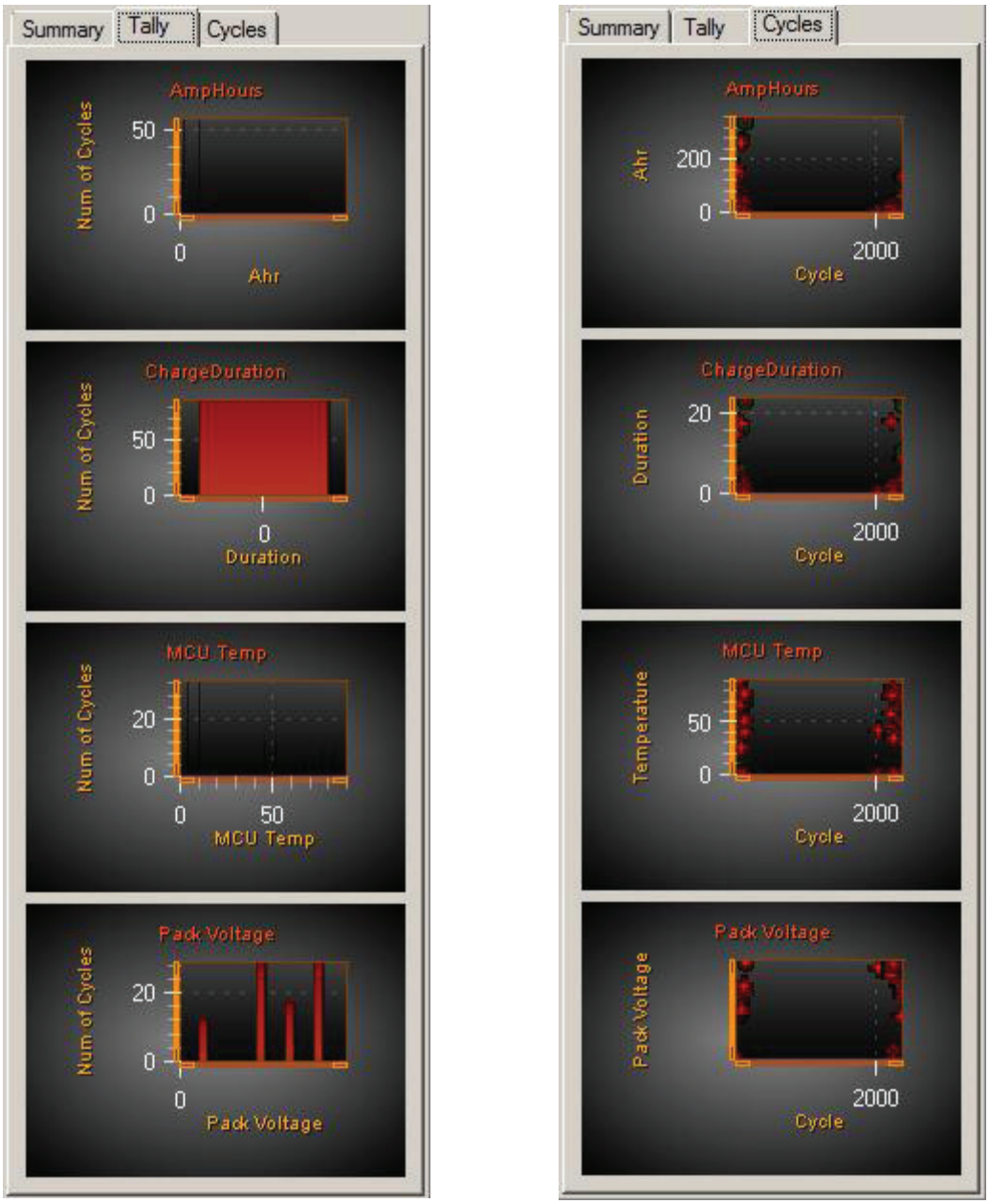


Figure 13. Cycle and tally tabs

2.5.5 Charge Cycle Data Window

Right-click in the Charger Summary window and select "Display Charger Summary for…" to open this window.

The left side of this window shows all the cumulative data that appears in the "Charger Cycle Summary" window for this particular cycle. Right-click to copy the data in each field.

On the right side are data fields that are recorded in real-time during the entire cycle. Right click to display this data in graphical format. Multiple fields can be overlaid in the same graph.

- DC Current: Charger output current in Amps (A).
- DC Voltage: Voltage on the charger output in Volts per cell (V/cell).
- Output Power: Calculated Current * Voltage.
- Battery Temperature: The battery temperature sensor data (if connected).
- Amp-Hours Returned: Cumulative Amp-hours calculated during the cycle.
- Watt-Hrs Returned: NOT FUNCTIONAL
- Power Derate Status: Shows the state of output derating.
- AC Voltage: AC Voltage during the cycle (VAC).
- Charging State: The state that the charge display LEDs are in.

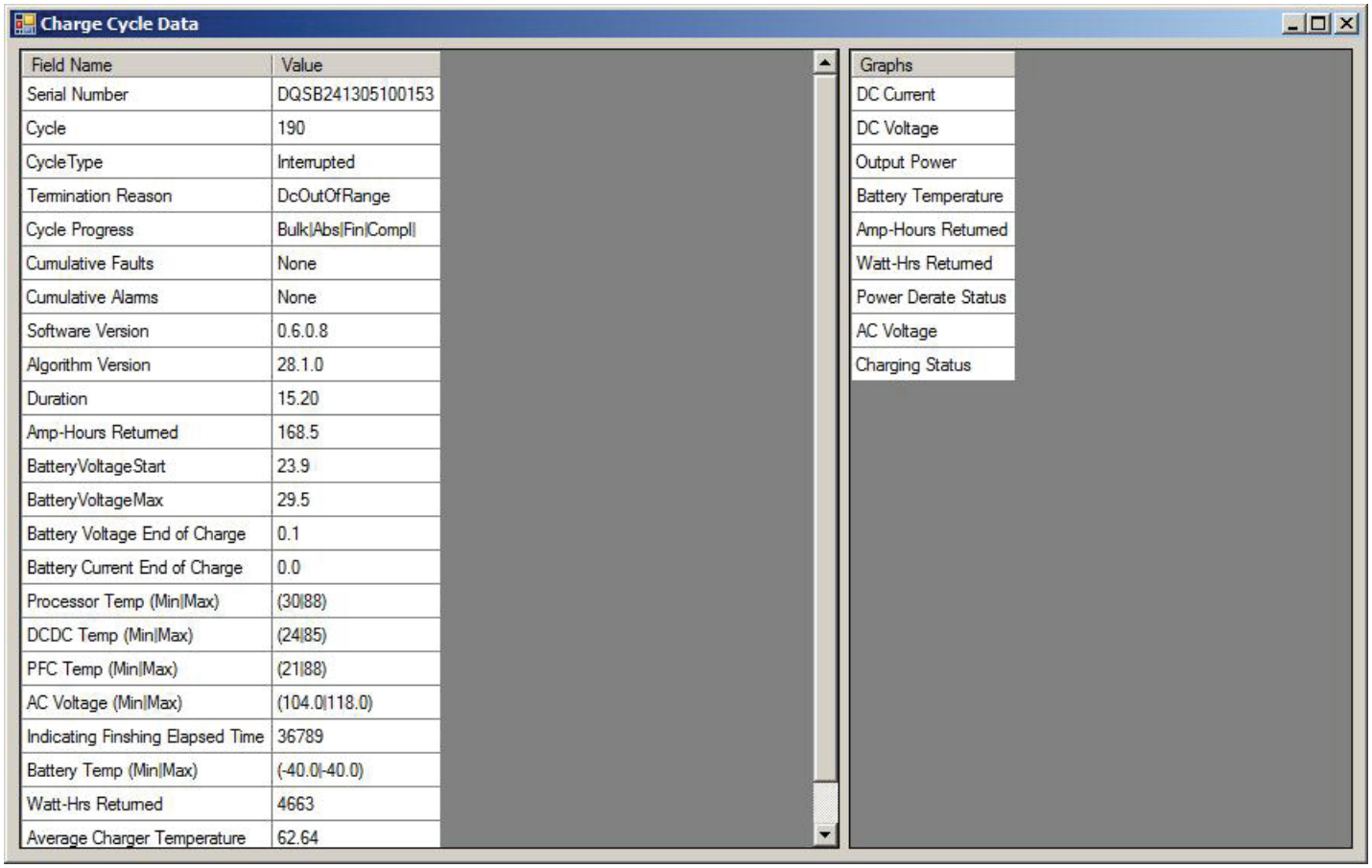


Figure 14. Charge Cycle Data window

2.5.6 Charger Summary Form (Pop-up)

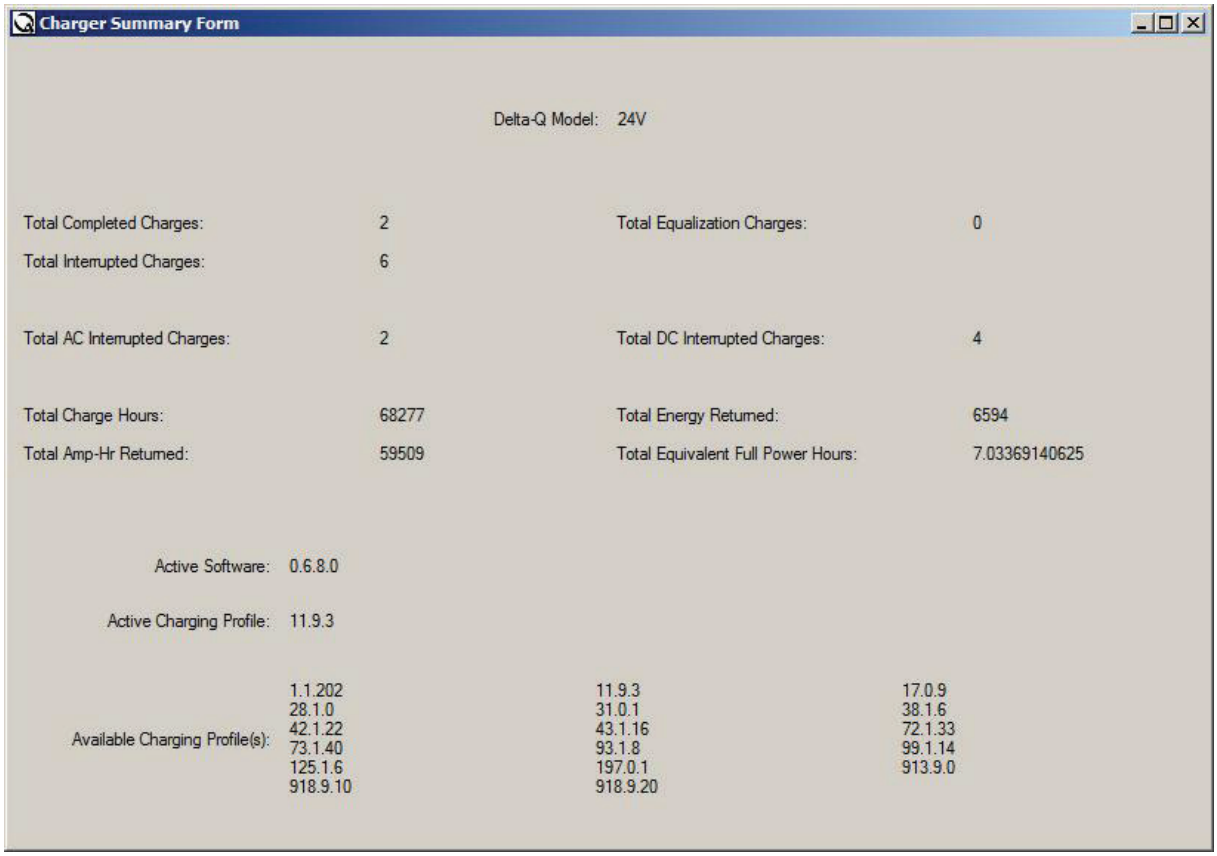


Figure 15. Charger Summary Form

Right-click in the Charger Summary window and select "Display Charger Summary for…" to open this pop-up.

This pop-up window is a quick overview of the selected charger's data. The fields are:

- Delta-Q Model: The voltage model of the charger selected.
- Total Completed Charges: Number of charge cycles that triggered the "Complete" indication.
- Total Equalization Charges: Number of charge cycles considered "Equalization" charges. Note that not all charge profiles have an "Equalization" phase.
- Total Opportunistic Charges: Number of partial charge cycles that may be "Opportunity" charges.
- Total AC Interrupted Charges: Charge cycles interrupted by low or high AC voltage, including disconnection.
- Total DC Interrupted Charges: Charge cycles interrupted due to a battery issue, including disconnection.
- Total Charge Hours: Number of hours of charging this charger has performed.
- Total AmpHr Returned: Number of Amp-Hours this charger has output.
- Total Energy Returned: Number of Watt-Hours this charger has output.
- Total Equivalent Full Power Hours: Number of hours operating at full power this charger has approximately performed.
- Active Software: version of software this charger is running.
- Active Charging Profile: version of charging profile this charger is running.
- Available Charging Profiles: charging profiles loaded in this charger.

2.5.7 Cycle Timeline

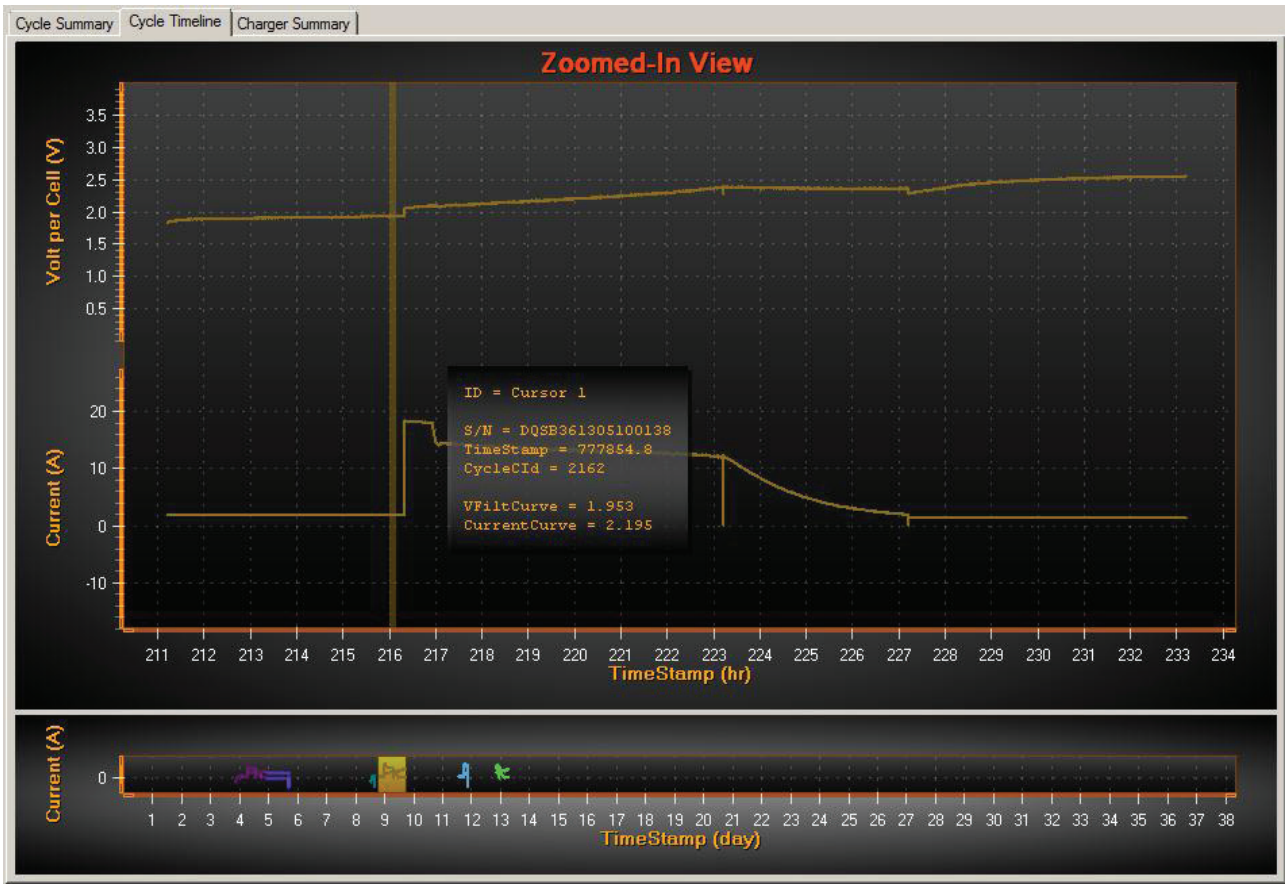


Figure 16. Charger Cycle Timeline

The center tab "Cycle Timeline" is a graphical representation of the voltage and current data from the selected chargers. The upper chart is the detailed view of current and voltage, shown in hours of timestamp. The lower chart is a longer time scale of all the data, shown in days of timestamp.

It is important to remember that the IC Series charger does not have a real-time clock. It does not know the calendar date and time, but it can count the elapsed time it has been "on". This is called the charger's "timestamp". This is only counting when the charger has AC power or is connected to batteries after first being powered up from an AC source.

The highlighted area of the lower chart is always what is displayed on the upper chart. Use the following mouse actions on the lower chart:

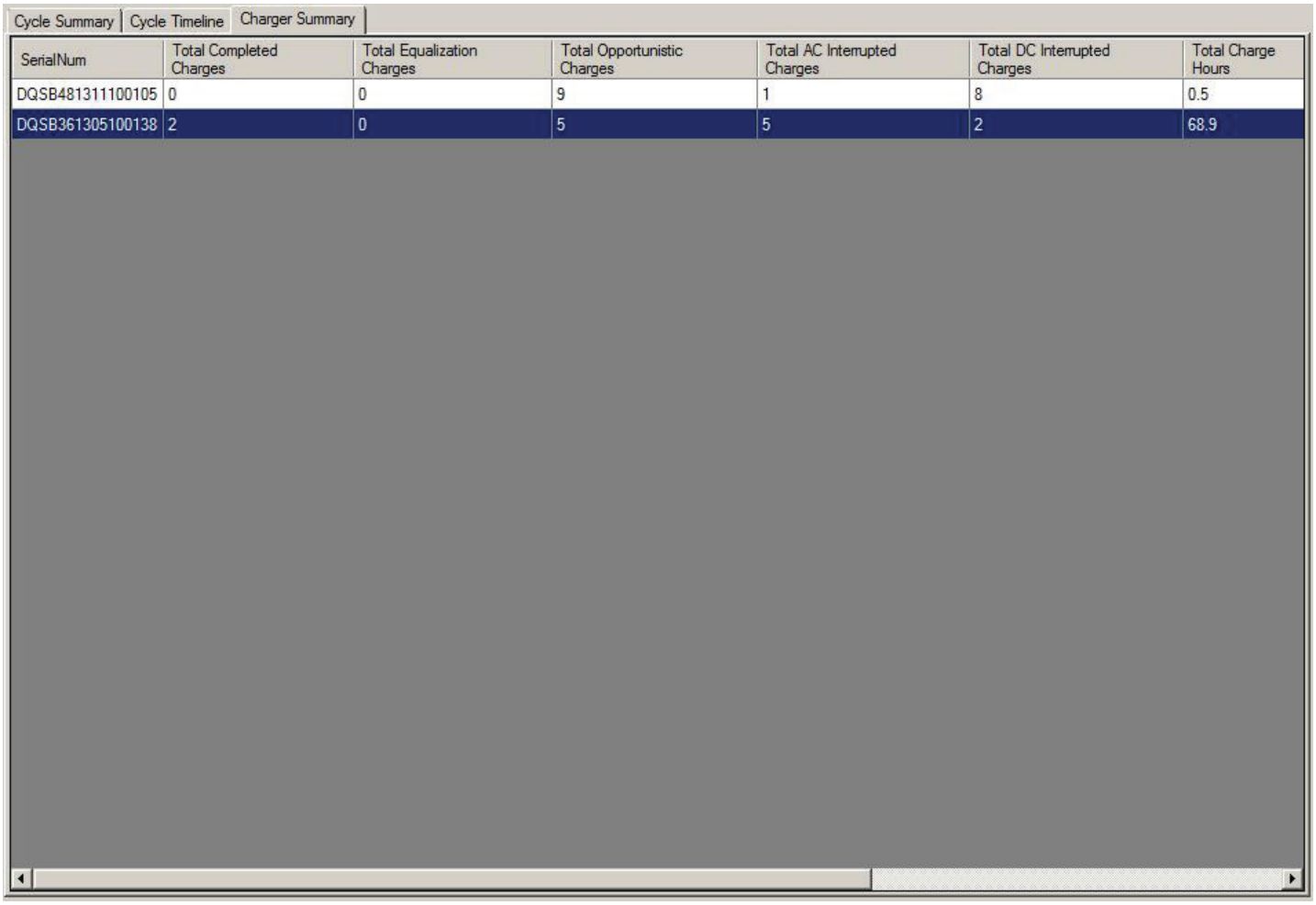
- Move or resize highlighted area: Drag the highlighted area or extend or contract it using the mouse. The cursor will change when it is over the highlighted area. This will change the time scale shown in the upper chart.
- Pan the chart: Right click on the chart and drag the mouse to pan around the chart area.
- Pan and Zoom Y-axes: **TBD**
- Pan and Zoom X-axis: Left click on the X-axis to pan it left and right. Click on the ends of the axis to zoom the axis in or out.
- Zoom In: Click and drag a window to the right zoom into the chart.
- Zoom Limits: Click and drag to the left to reset the zoom to all data.
- Right Click menu: **TBD**

The upper chart has similar mouse actions as the lower chart:

- Pan the chart: Same as above.
- Pan and Zoom axes: Same as above.
- Zoom In: Same as above.
- Reset Zoom: Double Right-Click to reset the zoom to the default.
- Right Click menu: Right click on a data line to reveal a submenu:
- Show Detailed Cycle Summary: Same as "Cycle Summary" on the main tab.
- Hide Graph: Hides the selected cycle.
- Cursor Lines: Left click at a point on a cycle line to mark a "Cursor" point. This will also create a box with relevant data about that point.
- Use the Comparator: With more than 1 Cursor point created, use the Comparator on the left side tab of the IC Data Tool to compare the data in the points created.
- Right Click to Erase: Right click on a Cursor Line to erase it.

Tip: Click "Refresh Cycle Display" to reset the charts.

2.5.8 Charger Summary Tab



SerialNum	Total Completed Charges	Total Equalization Charges	Total Opportunistic Charges	Total AC Interrupted Charges	Total DC Interrupted Charges	Total Charge Hours
DQSB481311100105	0	0	9	1	8	0.5
DQSB361305100138	2	0	5	5	2	68.9

Figure 17. Charger Summary Tab

This table shows much of the data shown in the "Charger Summary Form" Pop-up, but in a tabular form for easy comparison. The fields are:

- SerialNum: Charger Serial Number.
- Total Completed Charges: Number of charge cycles that triggered the "Complete" indication.
- Total Equalization Charges: Number of charge cycles considered "Equalization" charges. Note that not all charge profiles have an "Equalization" phase.
- Total Opportunistic Charges: Number of partial charge cycles that may be "Opportunity" charges.
- Total AC Interrupted Charges: Charge cycles interrupted by low or high AC voltage.
- Total DC Interrupted Charges: Charge cycles interrupted due to a battery issue.
- Total Charge Hours: Hours of active charging.
- Total Energy Returned: Watt-hours output by the charger.
- Total Amp-Hr Returned: Amp-hours output by the charger.
- Total Equivalent Full Power Hours: Number of hours operating at full power this charger has approximately performed.

3.0 Charger Programming

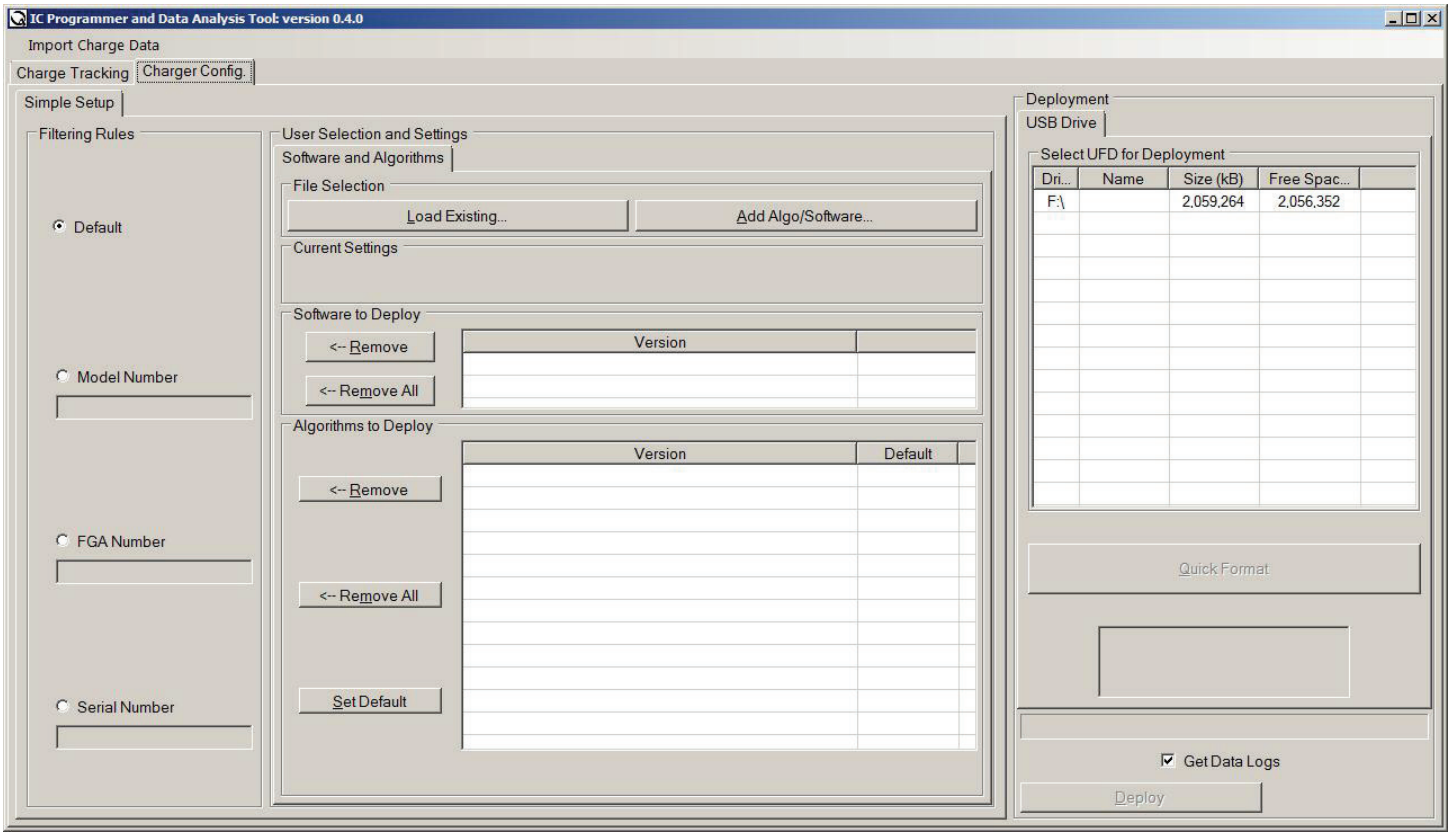


Figure 18. Charger programming mode

At the top of the IC Programmer and Data Analysis Tool, click the "Charger Config." tab to switch to the Programmer function of this software. This portion of the software is used to prepare USB storage devices to program the IC series chargers. Only Simple Setup is available to regular users.

3.1 Simple Setup

3.1.1 Filtering Rules

Use these fields to only program chargers based on the field selected. Partial numbers are allowed.

- Model Number: Filter by the IC Series model number which begins with ICXXXX-YYY and may be followed by –COMM. For example, IC0650-024-COMM.
- FGA Number: Filter by Delta-Q's part number. For example, 940-0004 for the IC0650-024-COMM
- Serial Number: Filter by any part of the serial number. For example, DQSB241301 to filter by the type, voltage, and date code.

3.1.2 User Selection and Settings

Use this part of the software to select software and algorithms to be loaded into the charger.

- File Selection: Click "Load existing…" to get the configuration on a folder or USB storage device or "Add Algo/Software…" to browse for a compatible IC Series software or algorithm file(s). These will normally have to be provided by Delta-Q Technologies. Multiple selection is supported by holding the SHIFT or CTRL keys.
- Current Settings: NOT YET FUNCTIONAL
- Software to Deploy: If the selected files contain software versions, they will be displayed here.
- Algorithms to Deploy: If the selected files contain algorithm files, they will be listed here. Select one as the "Default" algorithm.

3.1.3 Deployment

Use this part of the software to create a USB storage device compatible with the IC Series charger.

1. Select the "UFD" (USB Flash Drive) to deploy to. Available USB Flash Drives connected to the computer are displayed by their Windows drive letter.
2. Quick Format it, if necessary.
3. Select "Get Data Logs" if there is data on the device to be retrieved.
4. Click "Deploy" to begin copying the software and algorithms to the device.

4.0 Getting Results with the IC Series Data Analysis Tool

The IC Series Data tool has powerful benefits when used regularly.

4.1 Troubleshoot fleet or user issues

With the IC series Data tool, users calling with suspected battery, charger, or even machine issues can be quickly diagnosed remotely by simply having the data collected and sent to the support team responsible. The user simply has to insert a commonly found USB "key" or "stick" into the charger and either email the contents of the "CHARGER" folder, or courier the entire stick to the support team.

Once data is loaded, the main graphical display window immediately shows the usage pattern, and the charger summary tab lists all faults that occurred that may have resulted in the user's complaint. Many field issues can be diagnosed and corrected in this manner without the charger leaving the machine, or the support team member leaving their desk.

FUTURE EXAMPLE

4.2 Monitor Usage / Warranty

The IC series Data tool can also be used to monitor battery or machine usage and even warranty. This typically requires the charger to be matched with a particular machine and battery pack. Simply check the data logs regularly for the "Total Amp-Hours" summary number to monitor, in general, the amount of use the machine, and therefore batteries, is undergoing.

In some cases, battery warranty is provided based on an Amp-hour life. This cumulative counter on the ICseries charger will help establish how much the batteries were used based on the amount of Amp-Hours the charger returned to the batteries.

FUTURE EXAMPLE

4.3 Reprogram and upgrade with ease

In the future there may be cases where a new charge profile has been developed, perhaps for a new battery technology, or a new charger software significantly improves a particular feature of the IC Series charger. In these situations, the IC Series Data Tool can be used to create USB drives that will quickly reprogram a number of chargers with the new configurations.

FUTURE EXAMPLE

5.0 System Requirements

In order to run the IC Series Programmer & Data Analysis Tool well on your computer, it should meet the following minimum requirements:

Required:

- Windows XP or Windows Vista or Windows 7 or Windows 8
- Microsoft .NET Framework 4.0 (or an internet connection to download it)
- 50MB free hard disk space for installation
- Account with Administrator access

Recommended:

- 1GHz or faster processor
- 2GB or more of RAM
- USB 1.1 or higher USB Port for importing/deploying to USB storage devices
- 1GB or more of free hard disk space for charger data

Product performance may vary based on your system configuration.