

# BSCVMon



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In this section:

**Introduction**

introduction to **BSCVMon**.

**System Requirements**

outline of the minimum system requirements for using **BSCVMon** efficiently.

**Connection**

explains the installation sequence to connect to chargers.

**Support**

shows references on how to contact our support team.

**Introduction**

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**BSCVMon**



**BSCVMon** is a powerful software tool that supports users in monitoring chargers and battery fleet.

This tool is intended for usage with Blueshape® V-Lock chargers models CVS8X, CVS4X and CVTR2.

Through the digital connectivity offered by of Blueshape® chargers it is possible to track battery performance during charge, collect digital information from the battery fleet, and diagnose battery performance cycle after cycle.

A special USB cable is required to [connect](#) chargers with the PC.

Additional features are offered by **BSCVMon** to perform maintenance tasks on chargers, such as firmware upgrades.

## System Requirements

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Requirements:

- ▶ OS: Windows 2000/ XP/ Vista/ 7/ 8 either 32bit and 64bit (the drivers for the USB interface may not work properly under older OS such as ME, 98, 95)
- ▶ Minimum configuration: Pentium 3 or higher, 128Mb RAM or greater, 23MB HD disk space
- ▶ A USB 1.0 port or greater per charger, or a USB hub
- ▶ A BSCVMon USB cable per charger

## Connection

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### Cable connection first !

During software installation, the special drivers for the USB cable are made available in the system.

Upon connecting the USB cable for the first time (no matter if the charger is connected or not), the cable is detected and the driver is installed.

See the typical pop-up during the 'Found new hardware' wizard: (below)



Please note the **BSCVMon** can run only after a successful initial installation of the cable drivers.

### Charger connection

Chargers can be connected and switched on even after **BSCVMon** starts.

1. Locate the data port on the back of the charger



2. Plug the push-pull connector aligning the red dots



3. Press down the connector until locked



When **BSCVMon** is launched, it monitors any connected cables (up to a maximum of 4) and any chargers connected through them, if these are switched on.

The USB cables can be connected directly to USB ports or through hubs.

Each single computer can support a maximum of 4 cables.

## Support

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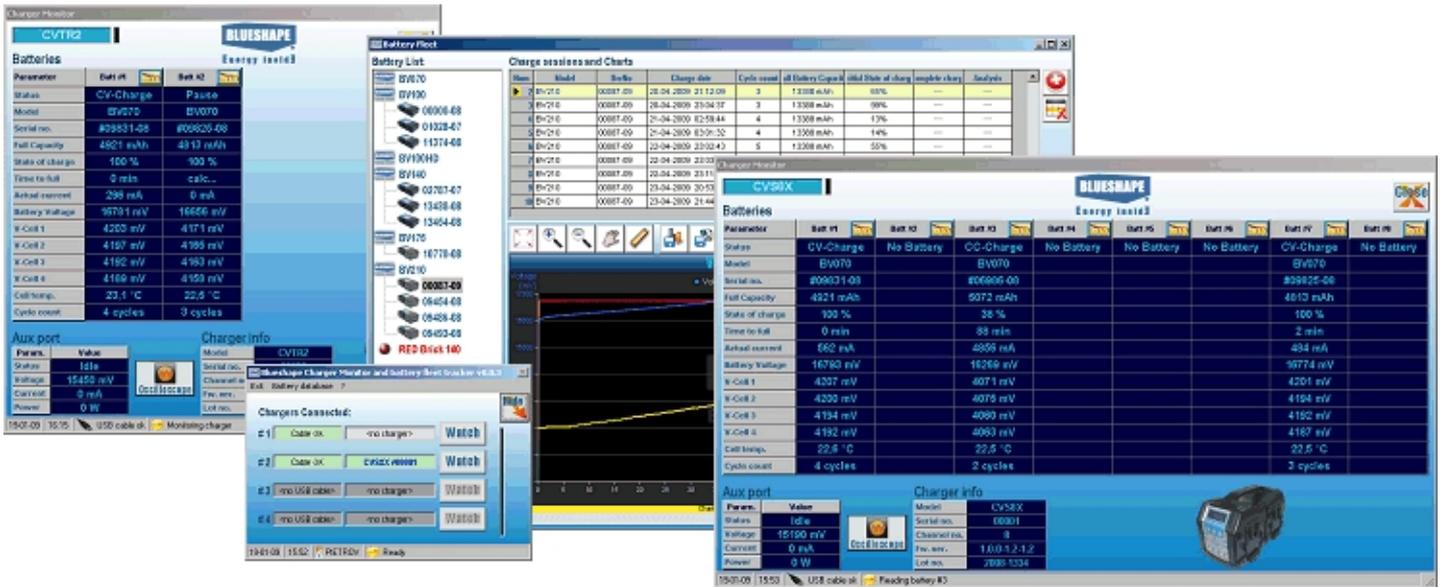
For support please contact the Blueshape® support team on the following numbers:

Tel: +39-0522-518556

Fax +39-0522-277084

Additionally, you can contact us by [email](#) or visit our [website](#) to retrieve additional information

# Usage of BSCVMon



In this section:

## [BSCVMon sentinel](#)

explains the sentinel mode of operation.

## [Charger monitor](#)

explains single the charger monitor.

## [Channel viewer](#)

explains the individual channel viewer.

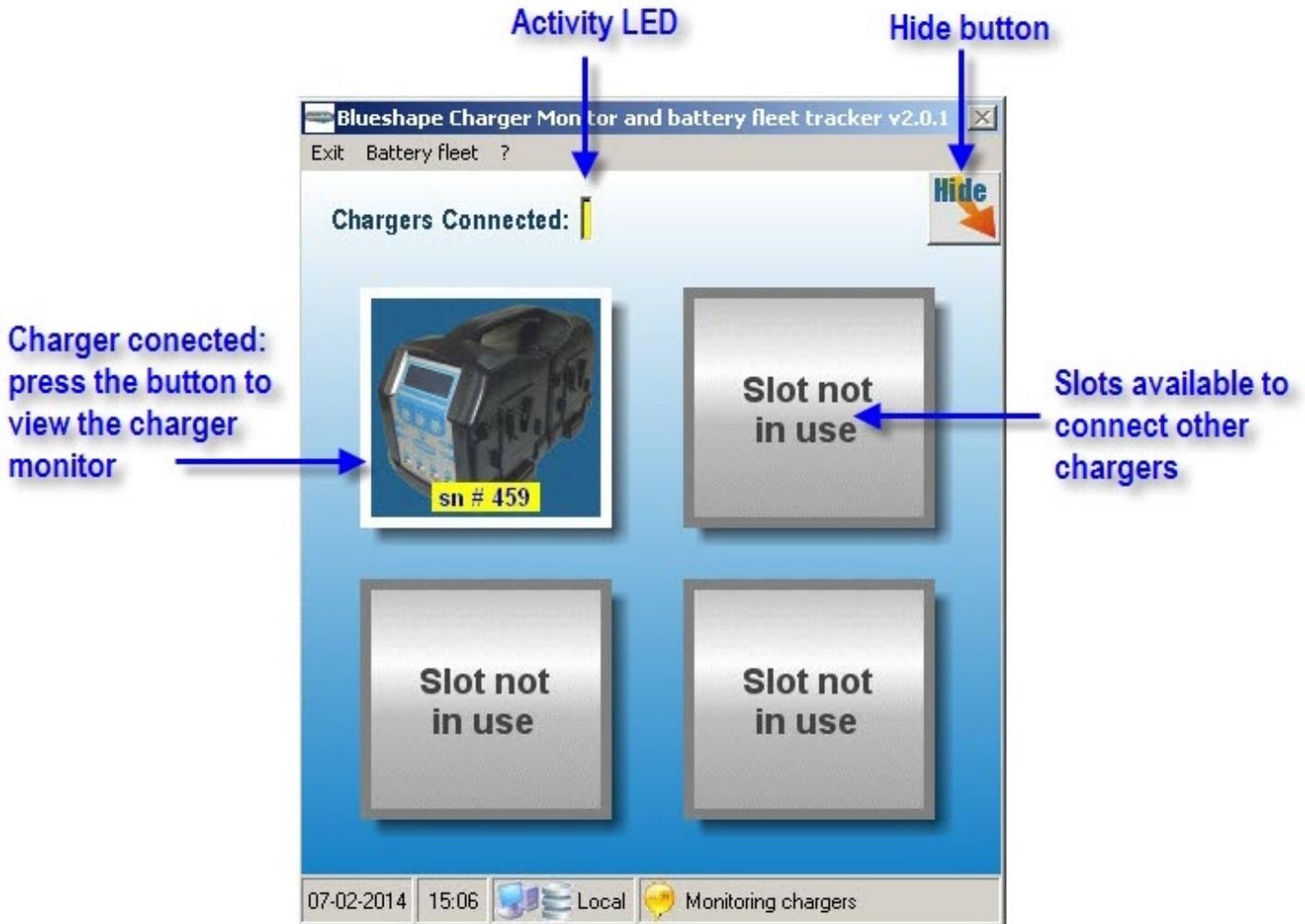
## [Fleet Explorer](#)

explains the fleet explorer.

## [Battery Doctor](#)

explains the powerful battery doctor.

## BSCVMon Sentinel



The **Sentinel** is the main form of **BSCVMon**.

It monitors the cables and chargers connected (up to 4), and through its menu, gives access to the fleet utility.

The cable status is shown and updated when a new one is detected or removed.

As soon as a charger is connected or switched on, the model and the serial number are promptly displayed. The "Watch" button is also enabled to allow showing of the [charger monitor](#) (that is normally hidden by default).

An intermittently flashing LED confirms the monitoring activity.

**BSCVMon Sentinel** must remain active to allow continuous monitoring of chargers and batteries. It is suggested to hide the main form by pressing the "Hide" button and keep an icon in the notification area in the bottom right corner of the screen.



A right-clicking on the minimised sentinel icon in the tray, pops-up a context menu with shortcuts to the charger monitors enabled:



## Charger Monitor

**Charger Monitor**

CVS8X

**Batteries**

Parameter	Batt #1	Batt #2	Batt #3	Batt #4	Batt #5	Batt #6	Batt #7	Batt #8
Status	CV-Charge	No Battery						
Model	BV100							
Serial no.	#01028-07							
Full Capacity	6000 mAh							
State of charge	92 %							
Time to full	calc...							
Actual current	0 mA							
Battery Voltage	16687 mV							
V-Cell 1	4173 mV							
V-Cell 2	4176 mV							
V-Cell 3	4174 mV							
V-Cell 4	4170 mV							
Cell temp.	28.1 °C							
Cycle count	121 cycles							

**Aux port**

Param.	Value
Status	Idle
Voltage	13430 mV
Current	0 mA
Power	0 W

**Charger info**

Model	CVS8X
Serial no.	00001
Channel no.	8
Fw. ver.	1.0.0.1.3-1.3
Lot no.	2008-1334

10-06-09 19:07 USB cable ok Monitoring charger

One **Charger Monitor** is available for each charger connected.

It communicates continuously with the charger and shows in real time, all the channels installed together with the **AUX port**.

Regardless of whether it is visible or hidden, data is always collected.

This window can be resized as needed (the final dimension is saved)

For every channel, several parameters are retrieved and showed

- ▶ Status: charging status, including pause and errors

- ▶ Battery model
- ▶ Battery serial number
- ▶ Battery full capacity
- ▶ Actual state of charge
- ▶ Charge time to full (not available during the first instant of charge)
- ▶ Actual charging current
- ▶ Actual battery voltage
- ▶ Actual individual cell voltage
- ▶ Cells temperature
- ▶ Cycle counter (number of charge/discharge cycles already elapsed)

All this information is available for Blueshape® and compatible batteries

For batteries not communicating with the Blueshape® protocol, only minimal information is available during charge like current and voltage, and the state of charge is approximated based on the charge voltage.

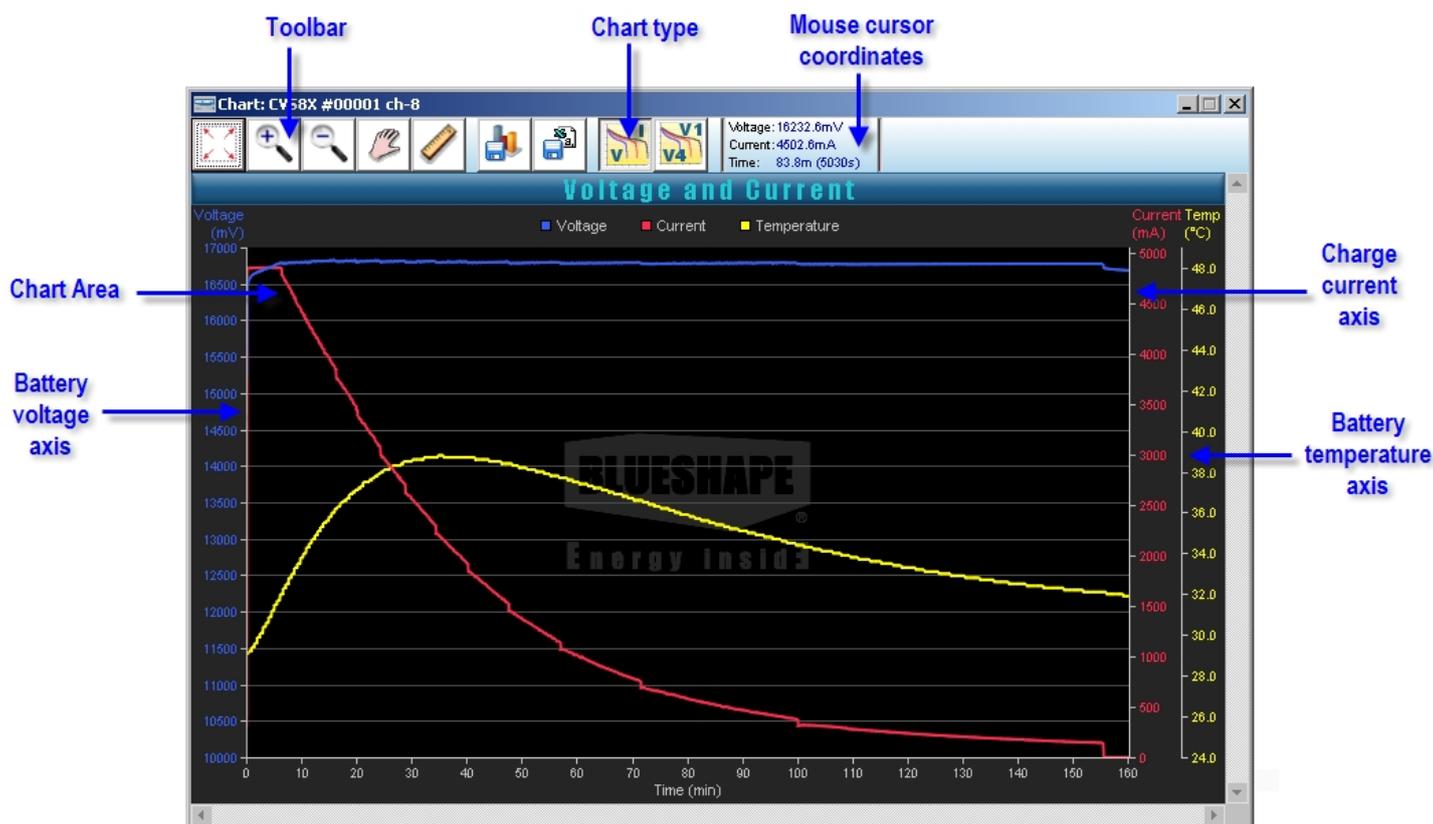
At any time, the [Channel Viewer](#) can be accessed through the related button at the top of the grid.

One channel viewer can be launched concurrently for any battery.

The **Aux Port** status is also displayed as soon as a load is connected. Channels are paused and the port is powered. In a future release, an oscilloscope simulation feature will be available, to graphically monitor the output

Charger identification information is also displayed, including a charger picture

## Channel Viewer



The **Channel Viewer** is launched from the [Charger monitor](#)

It provides a graphical representation in real time of the charger performance for the selected battery.

Two types of charts are available:

- ▶ Battery Voltage, Current, Temperature
- ▶ Single cell voltage, Temperature

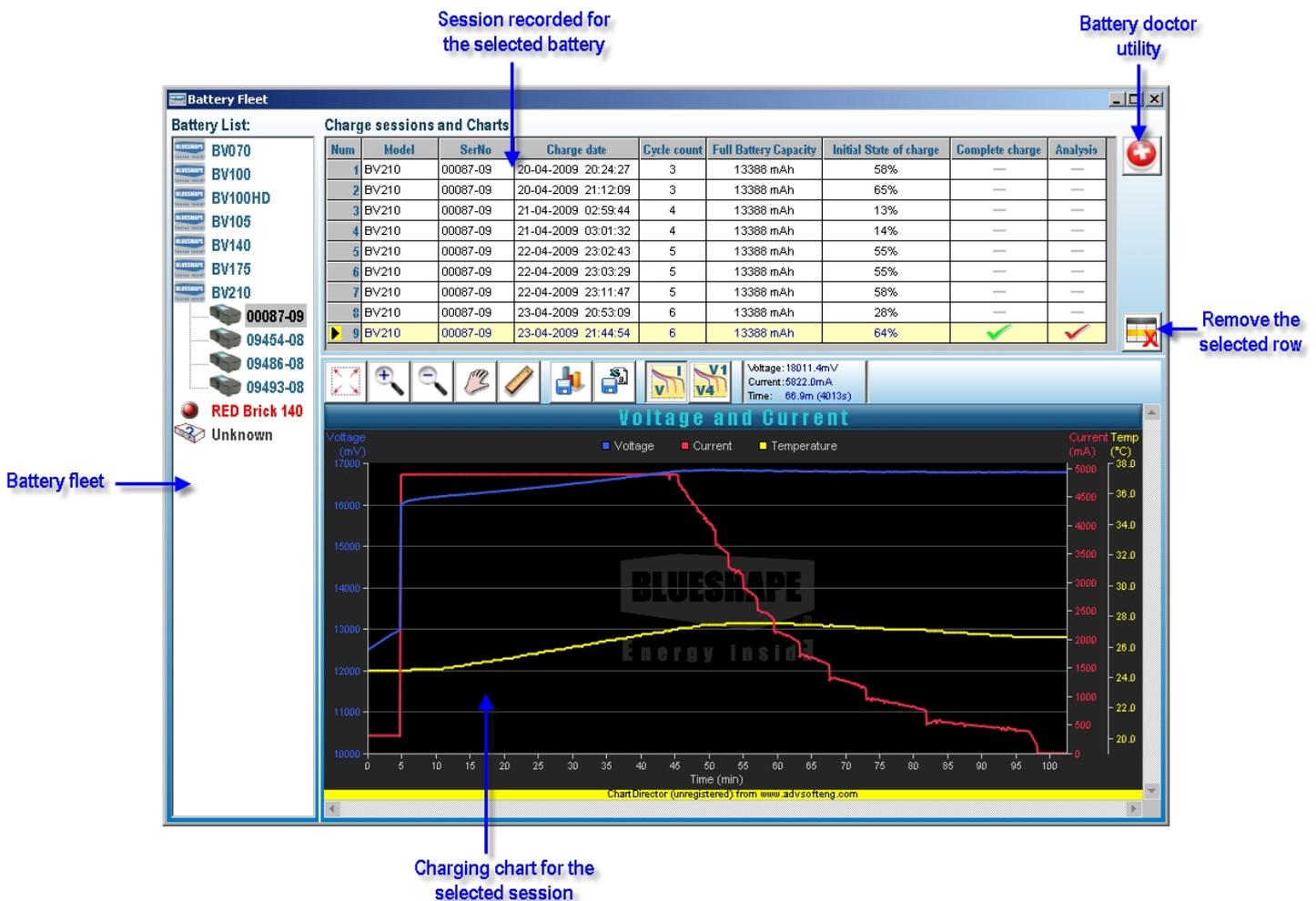
If the **Channel Viewer** is left open during a charge session, it will continue to update automatically as data is being logged (a sampling indicator will flash).

On analyzing a chart, several tools are available from the toolbar on the top:

- ▶ Zoom extent: restore the chart zooming to view all the data
- ▶ Zoom-in: click on the chart area to zoom-in for a certain ratio. Click and drag to enlarge a certain area
- ▶ Zoom-out: click on the chart to zoom-out step by step
- ▶ Scroll: when zoomed-in, the chart can be scrolled in any direction. Alternatively, horizontal and vertical scrollbars are also available to scroll faster.
- ▶ Ruler: allows measuring distances, amplitudes, intervals and other relevant parameters on the chart
- ▶ Save picture: saves a picture of the current chart
- ▶ Export data: exports the actual chart data in a CSV file

Moreover, by moving the mouse cursor over the chart, the current position on each axis is automatically displayed and when chart hotspots are met, labels are shown.

## Fleet Explorer



During the normal charging activity, all batteries are logged by the [Charger Monitors](#). **Fleet explorer** shows the data logged in each charge session.

Batteries are organized in a tree, grouped by model. By selecting a model, the list of serial numbers tracked is shown. For each battery, the list of charge sessions recorded is displayed:-select a session to watch the corresponding charts. Charts can be manipulated in the same way as in the [Channel Viewer](#).

Each charge session stores some data, regardless of whether the battery is a recognized model or not, . The data recorded in each charge session consists of:

- ▶ Model \*
- ▶ Serial number \*
- ▶ Session time
- ▶ Cycle counter (\*) of the battery at the beginning of the charge \*
- ▶ Full battery capacity (\*) recorded by the battery: this parameter is automatically updated by the battery during usage and reflect the available capacity of the battery when fully charged. This value is initially same as the nominal capacity and starts to decrease with use and ageing.
- ▶ Initial state of charge: state of charge of the battery when put on the charger
- ▶ Complete charge: indicate whether the charge session is terminated naturally (battery full) or has been interrupted (battery removed before full)
- ▶ Analysis: indicate if the battery has been analyzed by the battery doctor

(\*) not available for unknown batteries (batteries not communicating)

The [Battery Doctor](#) button if enabled, launches a special function to analyze the battery performance.

The Remove button permits the deletion of unrequired charge session data (one row at a time).

## Battery Doctor

The screenshot shows the 'Battery Doctor' window with the following information:

- Battery info:** Model: **BV210**, Serial no.: **00087-09**
- Session info:** Charge session: **23-apr-2009 21:44**, Terminated naturally
- Analyze button:** A button with a magnifying glass icon labeled 'Analyze'.
- Battery doctor evaluation:** A blue arrow points to the analysis section.

The analysis results are displayed in several panels:

1. Pre-charge	2. Constant-Current charge	3. Constant-Voltage charge
Elapsed time: <b>00:04:46</b>	Elapsed time: <b>00:40:35</b>	Elapsed time: <b>00:52:36</b>
Charge received (mAh): <b>25 mAh</b>	Charge received (mAh): <b>3305 mAh</b>	Charge received (mAh): <b>1434 mAh</b>
Errors occurred: <b>no error</b>	Errors occurred: <b>no error</b>	Errors occurred: <b>no error</b>
	Final State of Charge: <b>89 %</b>	Average imbalance (mV): <b>14 mV</b>
	Average imbalance (mV): <b>23 mV</b>	Imbalance trend: <b>19.0 &gt;&gt; 11.6</b>
	Imbalance trend: <b>23.3 &gt;&gt; 22.7</b>	

4. Charge Summary	5. Battery health	Battery initial registry												
Initial state of charge: <b>64 %</b>	Design capacity (mAh): <b>14100 mAh</b>	B-Status: <b>0x80 - 10000000</b>												
Total charge time: <b>01:37:57</b>	FCC: <b>13388 mAh</b>	<table border="1"> <tr><td>OCA</td><td>TCA</td><td>OTA</td><td>TDA</td><td>RCA</td><td>RTA</td></tr> <tr><td>INIT</td><td>DSG</td><td>FC</td><td>FD</td><td>Err 0x00</td><td></td></tr> </table>	OCA	TCA	OTA	TDA	RCA	RTA	INIT	DSG	FC	FD	Err 0x00	
OCA	TCA	OTA	TDA	RCA	RTA									
INIT	DSG	FC	FD	Err 0x00										
Total charge (mAh): <b>4763 mAh</b>	Cycle counter: <b>6 cycles</b>	P-Status: <b>0x80 - 10000000</b>												
Final State of charge: <b>100 %</b>	Capacity Loss: <b>Not yet evaluated</b>	<table border="1"> <tr><td>PRES</td><td>EDV2</td><td>SEALED</td><td>VDQ</td></tr> <tr><td>AFEFail</td><td>PFFlag</td><td>CVOV</td><td>CVUV</td></tr> </table>	PRES	EDV2	SEALED	VDQ	AFEFail	PFFlag	CVOV	CVUV				
PRES	EDV2	SEALED	VDQ											
AFEFail	PFFlag	CVOV	CVUV											
CC-CV charge ratio: <b>89% - 11%</b>	State of health: <b>n/a</b>													

The **Battery Doctor** is a powerful function to analyze the battery performance during charge.

Any charge session can be analyzed including sessions of alien batteries.

The charge process is divided into 3 steps:

- ▶ 1. Precharge: enabled when the pack voltage is lower than 13000mV. On most Blueshape® packs, Precharge is also enabled when any cell has a voltage lower than 2900mV.
- ▶ 2. Constant current charge: occurs up to 16800mV. In this phase, the pack is charged with constant current and receive the most of the charge
- ▶ 3. Constant voltage charge: after reaching 16800mV, the pack is kept at this level and topped with a limited amount of charge until the charging current decreases to about 150mA

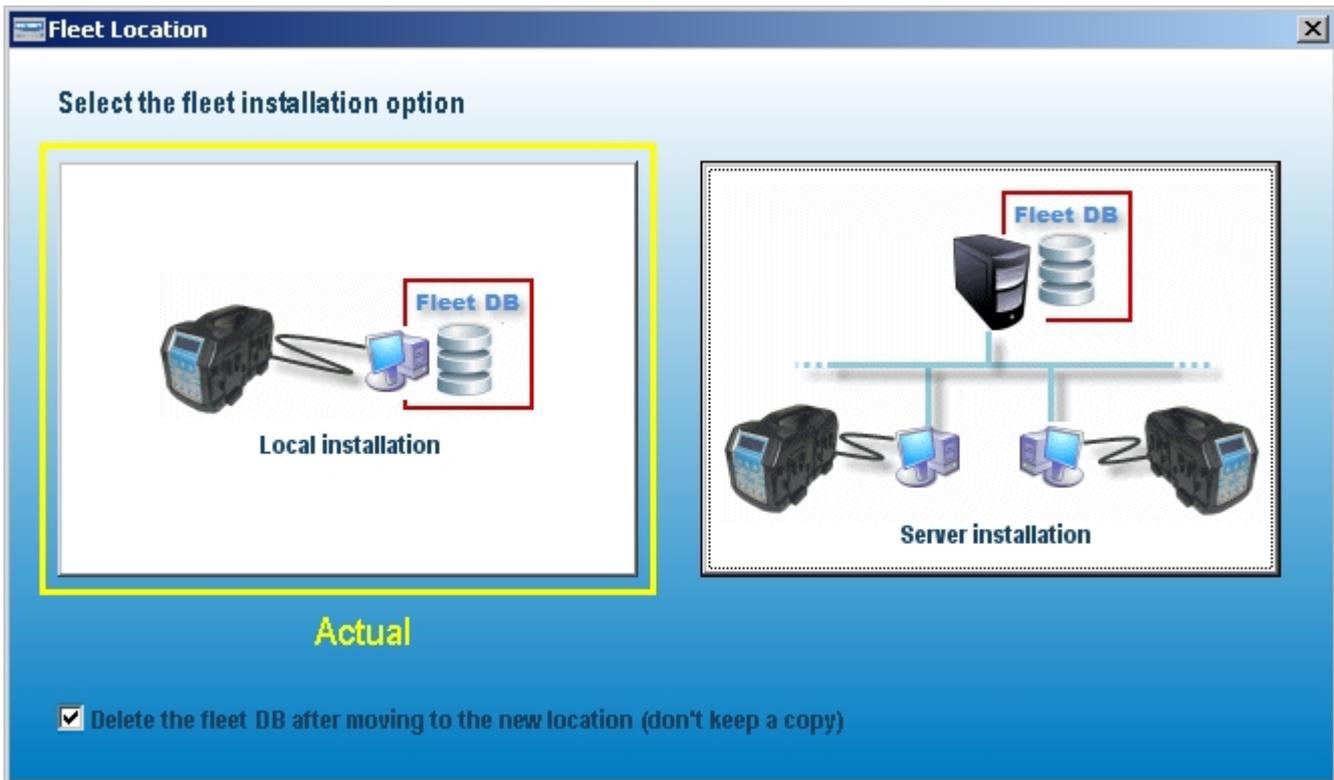
For each one of these three steps, the charging performance is analyzed in terms of time and capacity acquired.

For phase 2 (CC) and 3 (CV) , the imbalance between cells is calculated, and a mathematical analysis is performed to obtain the trend and estimate how healthy are the individual cells during charge.

The charge summary section calculates the overall charge performance, showing the ratio between the charge received in CC and CV.

In the battery health section, the performance deterioration is evaluated against the charge/discharge cycles elapsed and the capacity loss is judged.

## Setup options



**BSCVMon** is designed for both personal and corporate use.

In a typical personal use scenario, **BSCVMon** is installed on only one PC and the fleet database is kept local (**Local installation**). This is also the outcome from a default installation.

In a typical corporate use scenario, **BSCVMon** can be installed on several PCs, each one controlling one or more chargers. In this case however, the fleet database needs to be shared (**Server Installation**).

The set-up utility permits passage from a Local installation to a Server Installation. This operation can be performed at any time after the first installation has been done. The existing local fleet database is moved to the server or integrated with the remote fleet database, if this is already existing on the server.

The operation can also be done in the opposite sense. In this case, all the shared fleet database existing on the server is moved (or copied) to the local computer.

A check box is available to indicate whether to move or simply copy the fleet database between the two locations.

An option is also available to move the fleet database from one server to a new server location.