

BMS Ver5.0

User Guide

Rev 1.0

IDX Company, Ltd.

Contents

1.	About BMS	1
2.	System requirements	1
3.	Software installation	2
3.1	Before installing the software.....	2
3.2	Installation	2
4.	Driver installation.....	3
4.1	Before installing the software.....	3
4.2	Installation	3
5.	Connecting the charger	4
6.	Application program start and close	5
6.1	Before starting	5
6.2	Starting the program.....	5
6.3	Closing the program	5
7.	Name and function on the screen	6
7.1	Charger status screen	7
7.1.1	Data update.....	7
7.1.2	Update setting	7
7.1.3	Charger list.....	8
7.1.4	Channel information	8
7.1.5	Charger setting.....	11
7.2	Battery detail screen.....	12
7.2.1	Battery data.....	12
7.2.2	User ID setting	13
7.2.3	Recording battery data.....	13
7.3	Discharge graph screen.....	14
7.3.1	Displaying the discharge data	14
7.3.2	Printing the discharge graph	15
7.3.3	Saving discharge data file	15
7.3.4	Saving image file	15
7.4	Database screen	16
7.4.1	Data list	16
7.4.2	Data searching	17
7.4.1	Data delete.....	18
7.4.2	Database detail	18

1. About BMS

The BMS is the software that enables you to display the data of charger and manage IDX V-Mount batteries data using a database by connecting the charger to PC via USB Cable.

Please carefully read this document to become familiar with basic usage instructions and other important points before actual use of the product.

- Scope of User's Guide

This Guide does not explain the basic operations of Windows10.

For the basic operation of Windows10, please read the user's guide for the applicable Windows operating system.

- The following abbreviations are used throughout this Guide.

BMS	Battery Management System
PC	Personal Computer
OS	Windows 10
Software	BMS Application Software
Charger	ESC-4i・VAL-4Si・VL-4Si

2. System requirements

- 1) PC Windows 10 installed
- 2) Chargers ESC-4i・VAL-4Si・VL-4Si
- 3) IB Digital Batteries E-7・E-10・E-HL9・ENDURA ELITE・IPL-98・IPL-150・
Imicro-98・Imicro-150
- 4) USB Cable USB cable is required to be connected with VL-4Si・VAL-4Si・ESC-4i and PC.
- 5) Adobe Acrobat Reader Required to display the Instruction manual.

3. Software installation

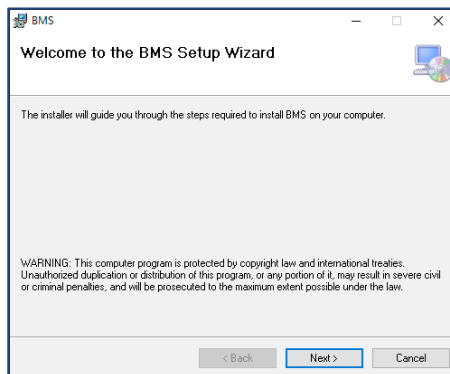
Do not connect the USB cable until the installation has been completed. Log into PC by a user with administrator authority then start install the software.

3.1 Before installing the software

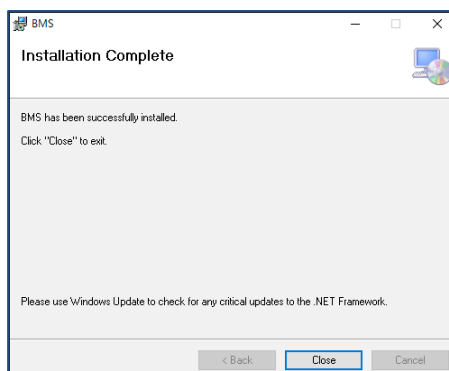
- 1) Click the "Extract all" of the downloaded Zip files.
- 2) Click the "Extract all" of the "Setup.zip" files.

3.2 Installation

- 1) Double-click the "Setup" icon in the folder which unzipped in Section 3.1.2)
If Microsoft Defender SmartScreen displays "Windows protected your PC", select "More info" and click "Run anyway"
- 2) "Welcome to the BMS Setup Wizard" is displayed, click "Next" and follow the instructions on the screen and continue.
"User Account Control" displayed, select "Yes" to allow installing.



- 3) Following screen will be displayed when installation is completed, then click "Close" to finish installation.



4. Driver installation

Do not connect the USB Cable until the installation has been completed. Log into your PC and begin the installation of the software. Note: You must have administrator authority to install this software.

4.1 Before installing the software

- 1) Click the "Extract all" of the downloaded Zip files
- 2) Click the "Extract all" of the "EnduraDriver.zip"

4.2 Installation

- 1) Double-click on the "EnduraDriverSetup" icon in the folder where you unzipped in Section 4.1.2).
"User Account Control" is displayed, click "Yes" to allow installing.
- 2) Click "Next" when the "Welcome to Endura Device Installer" is displayed click and follow the instructions on the screen and continue.



- 3) Following screen will be displayed when installation is completed, then click "Close" to finish installation.



5. Connecting the charger

After the Software and Driver installation are completed, install the device by connecting the PC and charger via USB cable. Log into PC by a user with administrator authority and install the device.

1) "Installing device driver software" will be displayed when connecting charger with PC via a USB cable. Follow the instructions to complete installation.

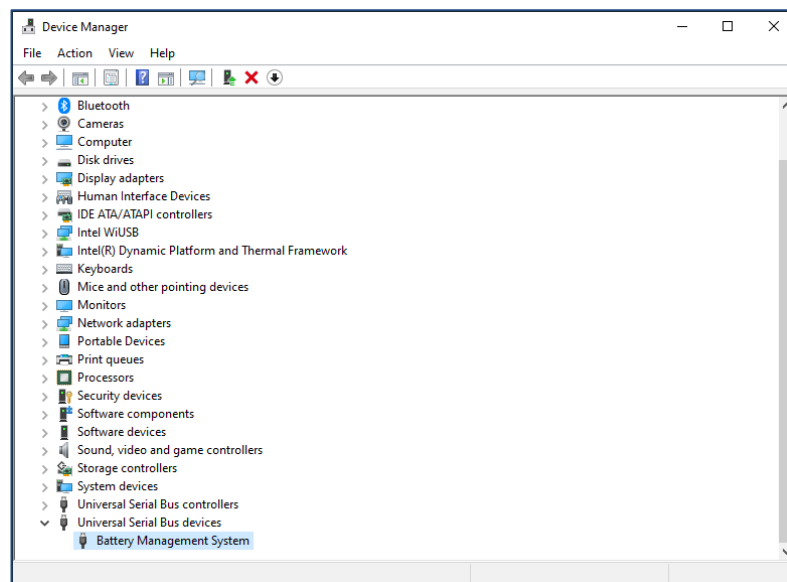
2) Confirmation of device installation

2.1) Right click "Windows logo" → select "Device Manager" then open the "Device Manager" screen.

(Windows key + [X] → select "Device Manager" can also open the "Device Manager" screen.)

2.2) Confirm the "Universal Serial Bus devices" is in the "Device Manager".

If "!" or "?" symbol is displayed, un-install the device by right clicking and re-install again.



6. Application program start and close

6.1 Before starting

Before starting the program, connect the PC and charger via a USB cable.

6.2 Starting the program

There are two methods as shown below.

- 1) Double-click "BMS" icon on the Desktop
- 2) Click "Start" menu → "BMS" folder → Select "BMS"

6.3 Closing the program

- 1) Click close box "X" on the BMS screen to close the application.

7. Name and function on the screen

BMS is mainly composed by 4 screens. Selecting TAB at the top of the screen can switch screens.

1) Charger status screen

Charger status screen shows up when starts the application. This screen displays the list of chargers connected to the PC.

2) Battery detail screen

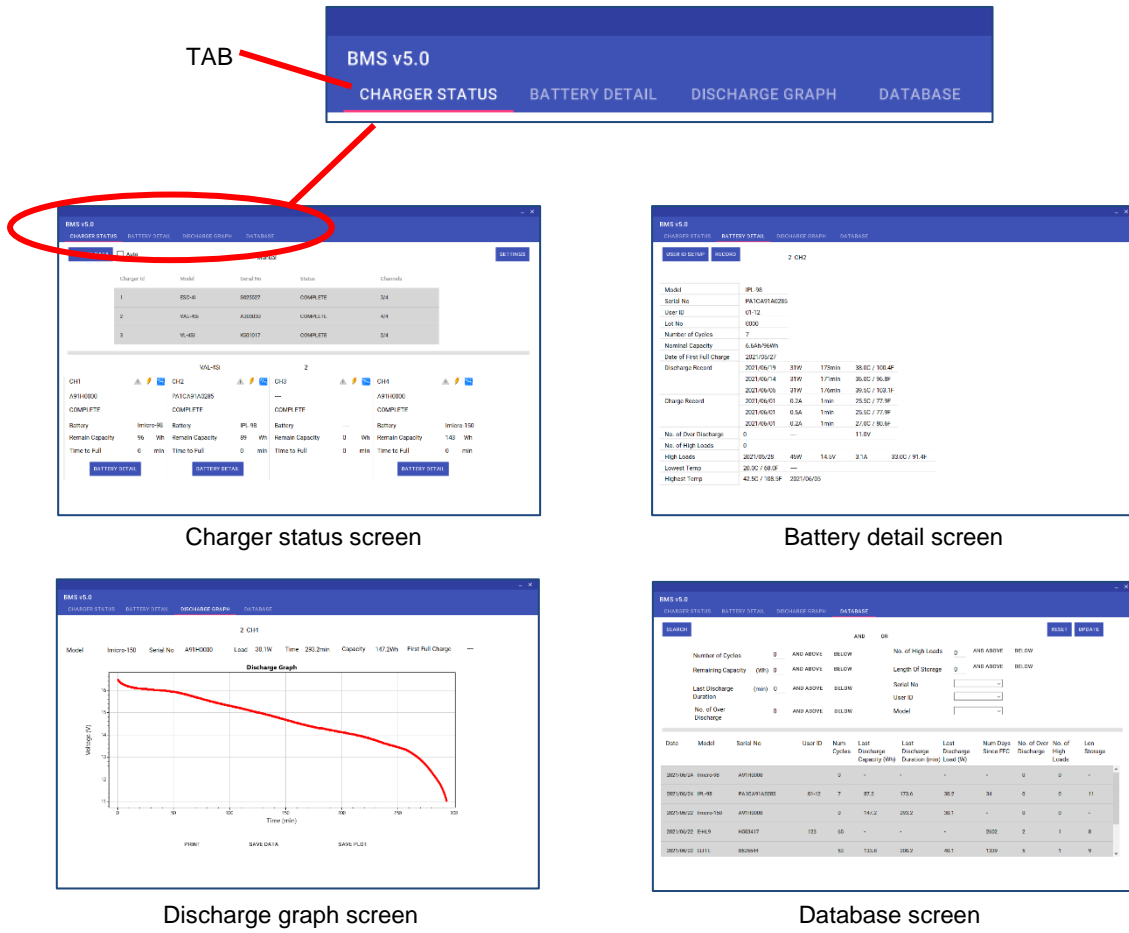
Battery detail screen will be shown by operating the button of the charger status screen. This displays the data of IB Digital Batteries which mounted to the V-Mount channel on the charger.

3) Discharge graph screen

Displays discharge graph by clicking the button of the charger status screen. This displays the battery discharge curve which captured by charger.

4) Database screen

Displays the list of the batteries recorded in the database. Battery data can be searched/ checked in this screen. Also discharge graph(curve) will be shown by selecting a battery data.



Charger status screen

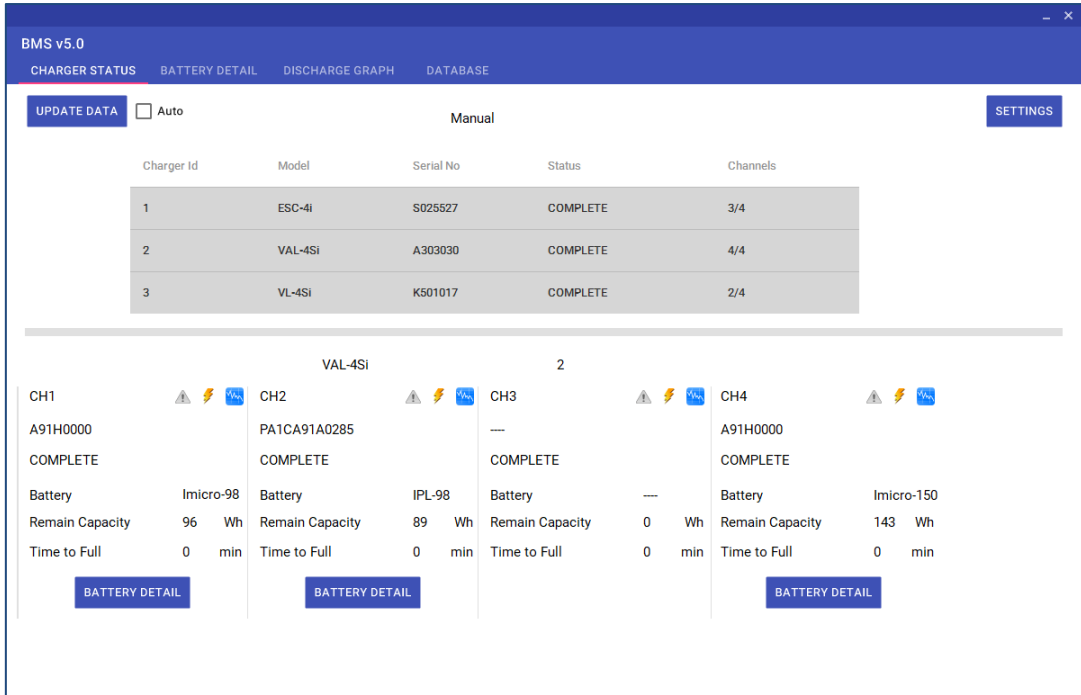
Battery detail screen

Discharge graph screen

Database screen

7.1 Charger status screen

Displays up to four channels basic data and status of IB digital batteries which amounted to the charger.



7.1.1 Data update

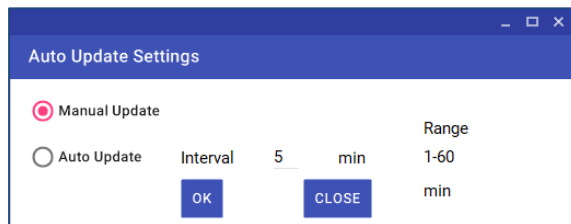
“UPDATE DATA” button enables to refresh the data by reading out new data from charger.

7.1.2 Update setting

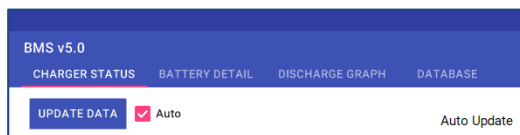
Click “SETTINGS” button and below will be displayed.

Set the status update for automatic or manual mode.

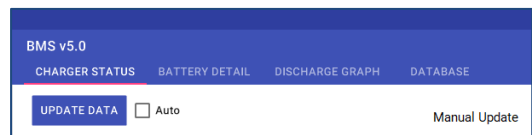
In case of setting automatic update, select “Auto Update” and put the update interval time and then click “OK”.



Automatic or manual mode can be selected from Charger status screen.



Automatic mode



Manual mode

7.1.3 Charger list

Following information about charger will be displayed.

- Charger Id
- Model
- Serial No
- Status
- Channels (Battery quantity/ Channels number)

Click the list and charger’s channel information will be shown.

Also double click the list and then Charger’s setting screen will be displayed. (Details later)

Charger Id	Model	Serial No	Status	Channels
1	ESC-4i	S025527	COMPLETE	3/4
2	VAL-4Si	A303030	COMPLETE	4/4
3	VL-4Si	K501017	COMPLETE	2/4

7.1.4 Channel information

Displays the charger status of selected charger from the list.

VAL-4Si		2	
CH1	⚠ ⚡ 🔋	CH2	⚠ ⚡ 🔋
A91H0000		PA1CA91A0285	
COMPLETE		COMPLETE	
Battery	Imicro-98	Battery	IPL-98
Remain Capacity	96 Wh	Remain Capacity	89 Wh
Time to Full	0 min	Time to Full	0 min
BATTERY DETAIL		BATTERY DETAIL	

Displays Charger’s model name and Charger’s ID at the top of the screen.

Displays charging status of each channel and battery basic information.

IB Digital battery

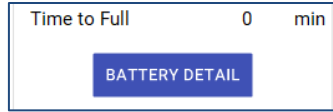
Non-IB Digital

No battery attached

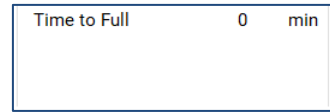
1) Battery detail

Click "BATTERY DETAIL" and the battery information will be displayed. (Details later)

If non batteries/ non-IB batteries attached, "BATTERY DETAIL" will not be displayed.



IB digital battery

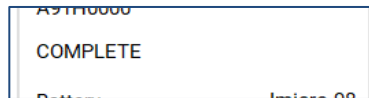


Non-IB digital battery or
or
No battery attached

2) Charging status

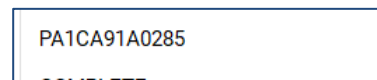
Followings are the status of battery charging condition.

- --- No battery attached
- WAITING Waiting for charging/ Discharging
- CHARGING Charging
- DISCHARGING Discharging
- COMPLETE Charging has been completed
- BMS WAITING Waiting for Measurement of discharge capacity.
- BMS CHARGING Charging in the Measurement of discharge capacity.
- BMS DISCHARGING Discharging in the Measurement of discharge capacity.



3) Battery serial number

If IB digital battery is attached (only in the case that battery and charger support serial number data output), serial number is displayed.



4) Battery model name

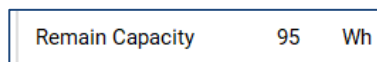
If IB digital battery is attached, the model's name is displayed.



5) Remaining capacity

Remaining capacity will be indicated if IB digital battery is attached.

"0Wh" is displayed if other type of battery is attached.



6) Time to full charge

Remaining charging time will be indicated while in charging state.

“0min” is displayed except charging state.



7) Warning button

Warning button becomes active when detected un-usual cell voltage of the battery.

Warning Dialog will be displayed by clicking this button when it is in active state.

In the normal condition, the button will be grayed out and inoperable.



Warning state



Normal state

8) Discharge capacity measurement button

Measurement of discharge capacity will be performed by clicking start/stop.

This button will be grayed out and inoperable when no battery is mounted.

If charger does not support discharge function, this button will not be displayed.



Operable



Inoperable

9) Discharge graph button

Discharge graph screen will be shown by clicking this button.

Details are described in below.

If charger does not support discharge function, this button will not be displayed.



Discharge graph

Discharge graph is available only in case that battery's model name/ Serial number and the battery data of the battery graph are the same.

7.1.5 Charger setting

Settings the charger.

- Discharge load / Terminate voltage
- Charger ID / Channel ID

Below screen will be shown by double-clicking charger list.

By clicking “OK” button, entered value will be applied.

If select “This setting applies to all chargers”, entered value will be applied on all connected chargers.

Charger Settings

Model VAL-4Si Serial No A303030

Charger ID Setting

2 Max. 16 alphanumeric characters

Discharge Settings

	Load (W)	Term Vol (V)
CH1	30	11.0
CH2	30	11.0
CH3	30	11.0
CH4	30	11.0

15-45W 11.0-14.0V

This setting applies to all chargers

Channel ID Settings

CH1 CH1

CH2 CH2

CH3 CH3

CH4 CH4

Max. 7 alphanumeric characters

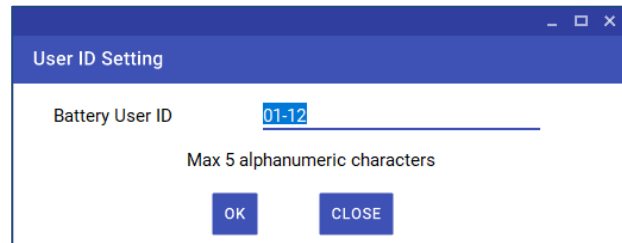
OK CLOSE

7.2.2 User ID setting

Set the User ID for IB Digital Battery.

By clicking "USER ID SETUP" button, following display shows up if the battery supports user ID.

User ID can be entered and memorized in the battery by clicking "OK".



7.2.3 Recording battery data

Battery data will be recorded by clicking "RECORD" button.

Unable to record the data if the serial number is invalid.

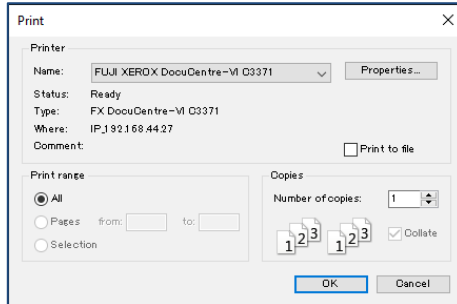
Battery data will be recorded with discharge graph only in case that battery's model name/ Serial number and the battery data of the battery graph are the same.

7.3.2 Printing the discharge graph

Discharge graph can be printed.

By clicking "PRINT" button, following display shows up.

Select the name of printer and click "OK".

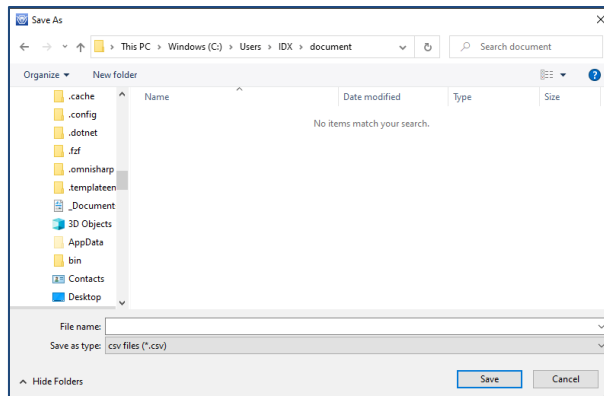


7.3.3 Saving discharge data file

CSV file is also available.

Clicking "SAVE DATA" button, and the following display shows up.

Select the saving destination and enter the name, and then click "Save".



7.3.4 Saving image file

Click "SAVE PLOT" button to save image file.

Same instructions as 7.3.3.

7.4 Database screen

Click “DATABASE” at the top of the screen.

Displays recorded battery data in database after the start up.

The screenshot shows the 'DATABASE' tab in the BMS v5.0 interface. It features a search section with various filters and a table of recorded battery data.

Search Filters:

- Number of Cycles: 0 AND ABOVE BELOW
- Remaining Capacity (Wh): 0 AND ABOVE BELOW
- Last Discharge Duration (min): 0 AND ABOVE BELOW
- No. of Over Discharge: 0 AND ABOVE BELOW
- No. of High Loads: 0 AND ABOVE BELOW
- Length Of Storage: 0 AND ABOVE BELOW
- Serial No: [Dropdown]
- User ID: [Dropdown]
- Model: [Dropdown]

Data Table:

Date	Model	Serial No	User ID	Num Cycles	Last Discharge Capacity (Wh)	Last Discharge Duration (min)	Last Discharge Load (W)	Num Days Since FFC	No. of Over Discharge	No. of High Loads	Len Storage
2021/06/24	Imicro-98	A91H0000		0	-	-	-	-	0	0	-
2021/06/24	IPL-98	PA1CA91A0285	01-12	7	87.2	173.6	30.2	34	0	0	11
2021/06/22	Imicro-150	A91H0000		0	147.2	293.2	30.1	-	0	0	-
2021/06/22	E-HL9	H503417	123	65	-	-	-	2602	2	1	8
2021/06/22	ELITE	B625544		53	133.8	200.2	40.1	1339	5	1	9

7.4.1 Data list

Displays the following information.

- **Model** Displays model name of battery.
- **Serial No** Displays serial number.
- **User ID** Displays user ID.
- **Num Cycles** Displays cycle been charged/discharged.
- **Last Discharge Capacity(Wh)** Displays discharge amount of the graph data.
- **Last Discharge Duration(min)** Displays discharging time of the graph data.
- **Last Discharge Load(W)** Displays average discharge load of the graph data.
- **Num Days FFC** Displays the number of days from first full charge.
- **No. of Over Discharge** Displays the number of over-discharge.
- **No. of High Loads** Displays the number of high-load.
- **Len Storage** Displays the number of days from the last discharge/ charge.

7.4.2 Data searching

Setting the search conditions and click "SEARCH".

Click "RESET" to clear the search conditions.

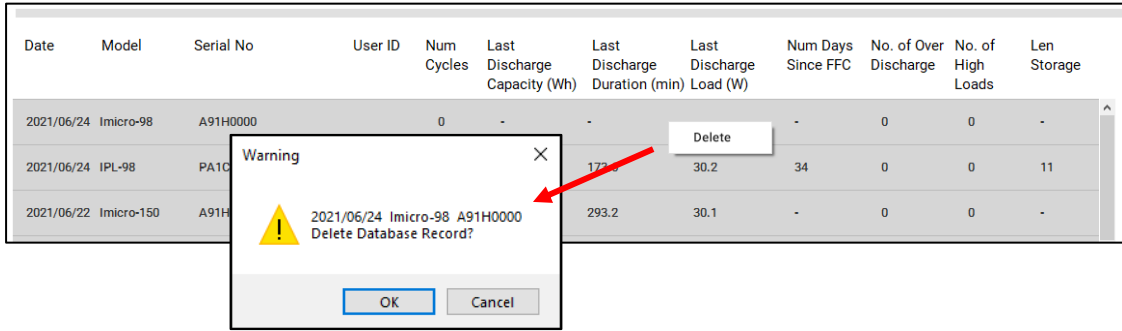
Click "UPDATE" to reset the data list.

Followings are the search conditions.

•AND OR	Searching battery data by using multiple information.
•Number of Cycles	Searching battery data by the number of Cycles
•Remain Capacity	Searching battery data by remaining capacity.
•Last Discharge Duration	Searching battery data by Last Discharge duration
•No. of Over Discharge	Searching battery data by the number of Over Discharge.
•No. of High Loads	Searching battery data by the number of High Load.
•Length of Storage	Searching battery data by the number of days from last use.
•Serial No	Searching battery data with serial number
•User ID	Searching battery data with User ID
•Model	Searching battery data with Model name

7.4.1 Data delete

Select and right click the data list and click “Delete”.

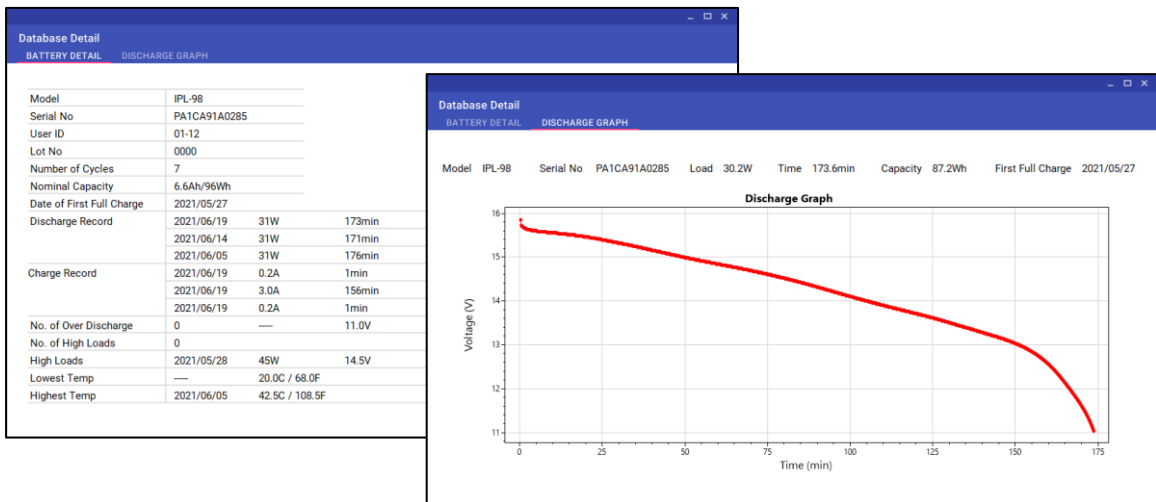


7.4.2 Database detail

Double click the data list and battery data/ discharge graph will be shown.

Almost same contents as battery detail screen and discharge graph screen.

Discharge graph is empty if the discharge graph data is not in the Database.



User Guide for BMS

Published by: IDX Company, Ltd.

Copyright© 2021 IDX Company, Ltd. All rights reserved.

This Users Guide and the product explained herein are protected under all applicable.