BMS
Ver6.0

User Guide
Rev1

IDX Company, Ltd.

About BMS

・BMS is the sofrware that enables to display the data/ status of the charger and to manage the data of the IDX V-Mount batteries by connecting the charger and PC installed BMS.

・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 Guide**

This Guide does not explain the basic operations of Windows. For the basic operation of Windows OS, 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
Software	BMS Application Software
Charger	ESC-4i ・ VAL-4Si ・ VL-4Si ・ ESC-2i
DB	Database

System requirements

1） **PC OS**   Windows10/11

2） **Charger**   ESC-4i ・ VAL-4Si ・ VL-4Si ・ ESC-2i

3） **IB Digital Batteries**   E-7 ・ E-10 ・ ENDURA ELITE ・ E-HL9
                                     DUO-C98 ・ DUO-C150 ・ DUO-C198
                                     IPL-98 ・ IPL-150
                                     Imicro-98 ・ Imicro-150
                                     DUO-C98P ・ DUO-C150P ・ DUO-C198P
                                     Imicro-50P ・ Imicro-98P ・ Imicro-150P

4） **USB Cable**   USB cable is required to be connected with ESC-4i ・ VAL-4Si ・ VL-4Si and PC

5） **Ethernet cable**   Ethernet cable is required to be connected with ESC-2i and PC.

Installing software

・**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.**

1) Installing software

・**Right-click the downloaded ZIP file and select "Extract All".**

・**Double-click the "setup" icon in the "Setup" folder.**

・**The installation software will be displayed, please follow the instructions.**

2) Installing Driver

・**Right-click the downloaded ZIP file and select "Extract All".**

・**Double-click the "EnduraDriver" icon in the "EnduraDriverSetup" folder.**

・**The installation software will be displayed, please follow the instructions.**

## Connecting the charger (ESC-4i・VAL-4Si・VL-4Si) via USB cable

・**The device driver software will be installed when you connect the PC and charger with a USB cable. Follow the instructions to complete the installation.**

・**Right-Click the Windows logo and select "Device Manager".**

・**Confirm that "Battery Management System" is displayed. If "!" or "?" is displayed, right-click it and delete it, and then install again.**
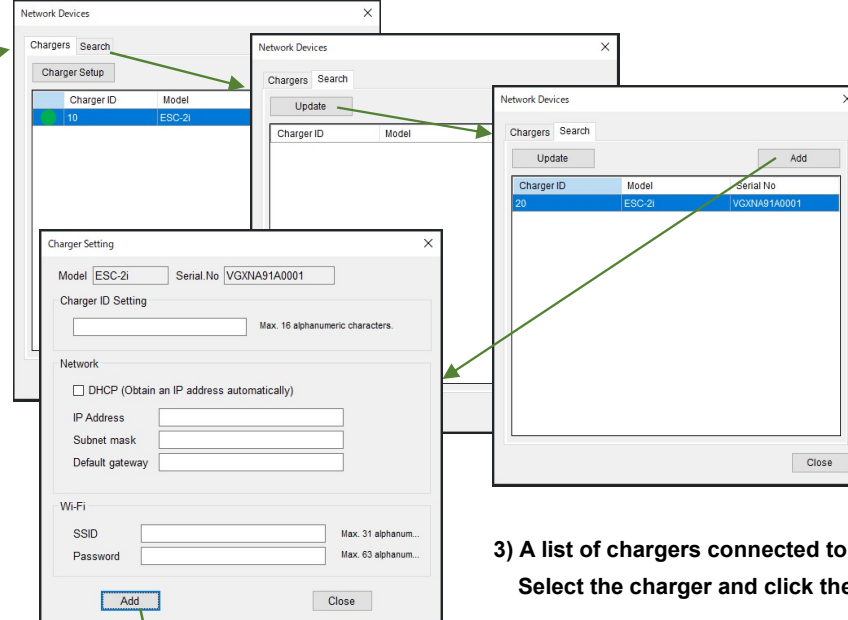
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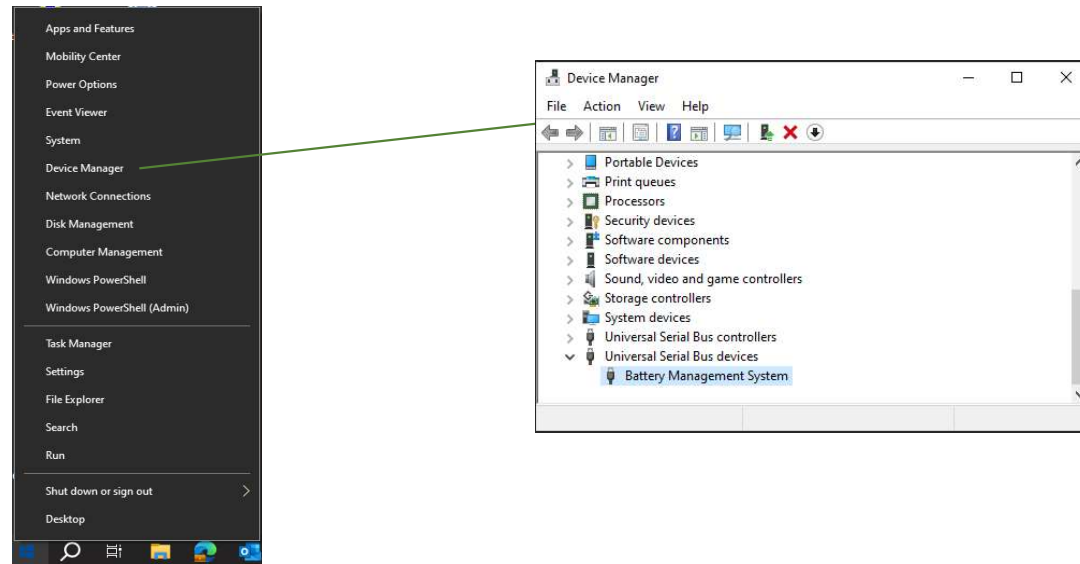
Connecting the ESC-2i via Network

・**Start the BMS, and select the charger to connect.**

・**For initial settings, use the Ethernet cable and Wi-Fi is available after initial settings.**

1) Click the "MENU" and select "Network devices"
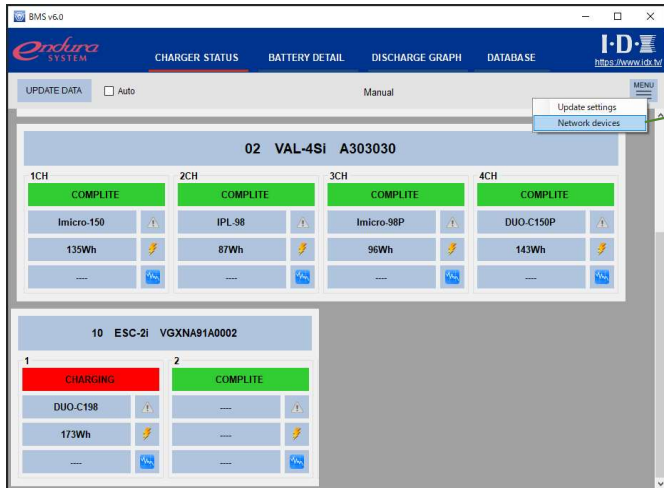
2) Select "Serch"and click "Update"

3) A list of chargers connected to the network will be displayed.
   Select the charger and click the "Add".

4) Set the "Charger ID Setting"、 "Network" and click "Add".

   If you want to connect ESC-2i to the network via Wi-Fi,

   configure the Wi-Fi settings on this page.

5) Click "Close"

6)The screen will update and the added charger will be displayed.

CHARGER STATUS（1/2）

・**Start the BMS software, the CHARGER STATUS screen will be displayed.**

・**Displays the status of the V-mount charger connected to the PC/ basic information of the IB digital battery installed in the charger.**

・**Displayed items vary depending on the battery and charger you are using. Please refer to Appendix A for details.**

Reads data from the charger and updates the display.

Switch between automatic display update/manual update.

Screen switching

Click "MENU", popup menu will be displayed.

Update settings
Network devices

Setting automatic display update/manual update and interval.

Update Setting

◉ Manual Update
○ Auto Update   Interval   5   min   (Range 1-60 min.)

OK   Close

Charger connected to the network (ESC-2i)

Network Devices

Chargers   Search

Charger Setup   Remove

Charger ID	Model	Serial No
20	ESC-2i	VGXNA91A0001
10	ESC-2i	VGXNA91A0002

"Chargers"

Displays a list of registered chargers (ESC-2i).

Charger ID	Model	Serial No
20	ESC-2i	VGXNA91A0001
	ESC-2i	VGXNA91A0002

Active state

Inactive state

Unregister the charger (ESC-2i) selected in the list.

Charger Setting

Model ESC-2i   Serial.No VGXNA91A0001

Charger ID Setting

20   Max. 16 alphanumeric characters.

Network

☐ DHCP (Obtain an IP address automatically)

IP Address
Subnet mask
Default gateway

Wi-Fi

SSID   Max. 31 alphanum...
Password   Max. 63 alphanum...

OK   Close

Close

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CHARGER STATUS   BATTERY DETAIL   DISCHARGE GRAPH   DATABASE

UPDATE DATA   ☐ Auto   Manual   MENU ≡

01   ESC-4i   S025527

1CH	2CH	3CH	4CH
CHARGING	COMPLITE	CHARGING	COMPLITE
E-10	E-HL9	ELITE	E-7
93Wh	67Wh	93Wh	67Wh
00:13	----	00:47	----

02   VAL-4Si   A303030

1CH	2CH	3CH	4CH
COMPLITE	COMPLITE	COMPLITE	CHARGING
Imicro-150	IPL-98	Imicro-98P	DUO-C150P
135Wh	87Wh	96Wh	132Wh
----	----	----	01:21

10   ESC-2i   VGXNA91A0002

1CH	2CH
COMPLITE	COMPLITE

20   ESC-2i   VGXNA91A0001

1CH	2CH
CHARGING	

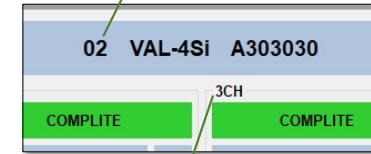**Double-click on the list to display the charger ID and network settings screen.**

CHARGER STATUS（2/2）

Click to display the settings screen
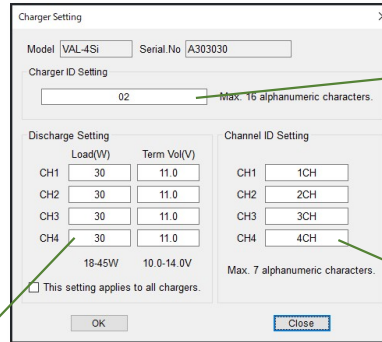
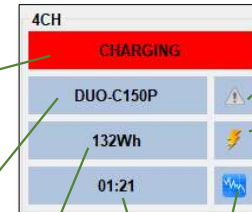**ID can be optionally set.**

ID can be optionally set

Sets the discharge load and discharge end voltage.

Channel status.

Warning sign
（Grey color：No warning）

Start/stop the measurement of the discharge capacity.
If the charger does not have a discharge function/
the battery is not installed,
the display will be greyed out and inoperable.

Switch to the "BATTERY DETAIL"screen

Switch to the "DISCHARGE GRAPH" screen.
If no discharge graph is recorded on the charger, displayed in grey.

Charging status
・WAITING
・CHARGING
・DISCHARGING
・COMPLETE
・BMS WAITING   Waiting for Measurement of discharge capacity.
・BMS CHARGING   Charging in the Measurement of discharge cpacity.
・BMS DISCHARGING   Discharging in the Measurement if discharge capacity.

Current capacity of the battery

During charging, the remaining charge time is displayed.

If not an IB digital battery,
the screen on the right will be displayed
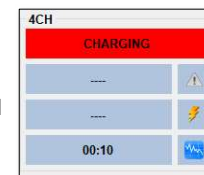
BATTERY DETAIL （1/3）

・When switched from the CHARGER STATUS screen, the battery data/graph data is read from the charger and displayed.

　The graph will be displayed only if the battery installed in the charger and the battery information in the graph data match.

　If the battery data is recorded in the DB, the recorded data will be displayed in a list.

・When switching from the DATABASE screen, a list of data recorded in the DB is displayed.

　Displays the battery data/graph data selected in the list.

・Displayed items vary depending on the battery and charger you are using. Please refer to Appendix A for details.

Click the "RESET" to return the display to its initial state.

Click the "RECORD", the screen on the right will be displayed,
 and the battery/ graph data read from the charger will be recorded in the DB.
Battery model name, serial number, and user ID
can be selected/overwritten from the DB.

Click "MENU", popup menu will be displayed.

Delete the data selected in the DB list.

Set the user ID of the battery installed in the charger.
Only compatible batteries can be set.

If battery data/graph data is displayed via a charger, charger/channel information will be displayed.
When displaying battery data/graph data selected from the DB list, the data recording date is displayed.

Charger/channel information

Data recording date

Calculate the discharge amount from the graph data, and displays the ratio(%) to the rated capacity.
Double-click the graph to switch to the "DISCHARGE GRAPH" screen.

Displays a list of data recorded in the DB.
Only data with matching battery model name/serial number will be displayed.

Battery data

BATTERY DETAIL（2/3）

Click the "Database record" and selcet recorded battery data on "Select battery" screen

Select the checkbox to compare graphs.

・**Compare the graph data recorded in the charger and the graph data recorded in the DB**

・**Compare two graph data recorded in DB**

Displays the ratio of discharge amount compared to the selected graph data(Blue).

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BATTERY DETAIL（3/3）

・ If Batteries/chargers do not support serial data, the DB list will be empty when opening the BATTERY DETAIL screen from the CHARGER STATUS screen.

Click the "Database record" and selcet recorded battery data on "Select battery" screen and then you can compare graph data.

DISCHARGE GRAPH

・Displays the discharge graph recorded in the charger or the discharge graph recorded in the DB.

・Displayed items vary depending on the battery and charger you are using. Please refer to Appendix A for details.

Single discharge graph

Calculate Calculate the discharge amount from the graph data, and displays the ratio to the rated capacity in the bar.

Displays Displays in green, red, and yellow depending on the ratio.

The ratio of the discharge amount compared to the graph data (blue) is displayed in the bar.

Displays in green, red, and yellow depending on the ratio.

Click "MENU", popup menu will be displayed.

Select display items

Printing Graph image

Saving Graph image(PNG)

Saving Graph data(CSV)

Hover the mouse cursor over the discharge curve, time/voltage will be displayed.

Time 02:53 (173min) Voltage=11.0V

Display two discharge graphs

hover the mouse cursor over the discharge curve, discharge time/capacity will be displayed.
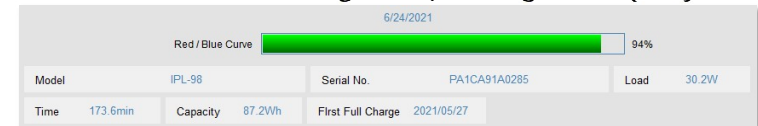
DATABASE

・**Displays a list of the latest battery data recorded in the database.**

・**You can search using various conditions.**

・**Displayed items vary depending on the battery and charger you are using. Please refer to Appendix A for details.**

Clear the search conditions and list display.
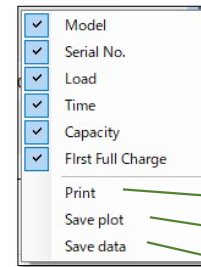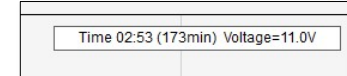
Click the"SEARCH"

Display in the list according to the set search conditions.

If you search without search conditions, all recorded data will be displayed in the list.

Click "MENU", popup menu will be displayed.

Select display of search conditions

Enter the battery model name

and serial number and click "OK" to add it to the DB.

Entering a user ID is optional.

If checked, will be added to the search conditions.

You can edit the model name,

serial number, and user ID of the battery selected in the list.

Delete the battery data selected in the list.

Click the button and select ""And above" or "Below".

DB maintenance

Optimize, Backup, Delete and Restore.

Double-click to switch to the "BATTERY DETAIL" screen.

Appendix A. Battery/Charger table (1/4)

・**Display items when using VAL-4Si**

Battery					BMS															
		Data			CHARGER STATUS / BATTERY DETAIL						DISCHARGE GRAPH					DATABASE				
Model	Comm	Capacity	Serial No.	Recoed	Time to full	Model	Serial No.	Capacity	Record	User ID	Graph	Model	Serial No.	First full charge	Life	Cycles	First full charge	Over discharge	High loads	Len storage
E-7 E-10 E-HL9	IB	✓	✓	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ELITE	IB	✓	✓	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	SB	✓	✓		○						○					(0)		(0)	(0)	
DUO-95 DUO-150	SB	✓			○						○					(0)		(0)	(0)	
DUO-C98 DUO-C150 DUO-C198	IB	✓			○	○		○			○	○			○	(0)		(0)	(0)	
	SB	✓	✓		○						○					(0)		(0)	(0)	
IPL-98 IPL-150	IB	✓	✓	✓	○	○	○1	○	○	○	○	○	○1	○	○	○	○	○	○	○
	SB	✓	✓		○						○					(0)		(0)	(0)	
Imicro-98 Imicro-150	IB	✓	✓		○	○	○1	○			○	○	○1		○	(0)		(0)	(0)	
	SB	✓	✓		○						○					(0)		(0)	(0)	
DUO-C98P DUO-C150P DUO-C198P	IB	✓			○	○		○			○	○			○	(0)		(0)	(0)	
	SB	✓			○						○					(0)		(0)	(0)	
Imicro-50P Imicro-98P Imicro-150P	IB	✓	✓		○	○		○			○	○			○	(0)		(0)	(0)	
	SB	✓	✓		○						○					(0)		(0)	(0)	

○1：They are available since charger firmware version 6.02

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Appendix A. Battery/Charger table (2/4)

・**Display items when using VL-4Si**

| Model | Comm | Battery — Data | | | BMS — CHARGER STATUS / BATTERY DETAIL | | | | | | BMS — DISCHARGE GRAPH | | | | | BMS — DATABASE | | | | |
		Capacity	Serial No.	Recoed	Time to full	Model	Serial No.	Capacity	Record	User ID	Graph	Model	Serial No.	First full charge	Life	Cycles	First full charge	Over discharge	High loads	Len storage
E-7 / E-10 / E-HL9	IB	✓	✓	✓	○	○	○	○	○	○						○	○	○	○	○
ELITE	IB	✓	✓	✓	○	○	○	○	○	○						○	○	○	○	○
ELITE	SB	✓	✓		○											(0)		(0)	(0)	
DUO-95 / DUO-150	SB	✓			○											(0)		(0)	(0)	
DUO-C98 / DUO-C150 / DUO-C198	IB	✓			○	○		○								(0)		(0)	(0)	
DUO-C98 / DUO-C150 / DUO-C198	SB	✓	✓		○											(0)		(0)	(0)	
IPL-98 / IPL-150	IB	✓	✓	✓	○	○	○1	○	○	○						○	○	○	○	○
IPL-98 / IPL-150	SB	✓	✓		○											(0)		(0)	(0)	
Imicro-98 / Imicro-150	IB	✓	✓		○	○	○1	○								(0)		(0)	(0)	
Imicro-98 / Imicro-150	SB	✓	✓		○											(0)		(0)	(0)	
DUO-C98P / DUO-C150P / DUO-C198P	IB	✓			○	○		○								(0)		(0)	(0)	
DUO-C98P / DUO-C150P / DUO-C198P	SB	✓			○											(0)		(0)	(0)	
Imicro-50P / Imicro-98P / Imicro-150P	IB	✓	✓		○	○		○								(0)		(0)	(0)	
Imicro-50P / Imicro-98P / Imicro-150P	SB	✓	✓		○											(0)		(0)	(0)	

○1：**They are available since charger firmware version 6.02**

Appendix A. Battery/Charger table (3/4)

・**Display items when using ESC-4i**

Model	Comm	Data			CHARGER STATUS / BATTERY DETAIL						DISCHARGE GRAPH					DATABASE				
		Capacity	Serial No.	Recoed	Time to full	Model	Serial No.	Capacity	Record	User ID	Graph	Model	Serial No.	First full charge	Life	Cycles	First full charge	Over discharge	High loads	Len storage
E-7 E-10 E-HL9	IB	✓	✓	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ELITE	IB	✓	✓	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	SB	✓	✓		○						○					(0)		(0)	(0)	
DUO-95 DUO-150	SB	✓			○						○					(0)		(0)	(0)	
DUO-C98 DUO-C150 DUO-C198	IB	✓			○	○		○			○	○			○	(0)		(0)	(0)	
	SB	✓	✓		○						○					(0)		(0)	(0)	
IPL-98 IPL-150	IB	✓	✓	✓	○	○		○	○		○			○	○	○	○	○	○	○
	SB	✓	✓		○						○					(0)		(0)	(0)	
Imicro-98 Imicro-150	IB	✓	✓		○	○		○			○	○			○	(0)		(0)	(0)	
	SB	✓	✓		○						○					(0)		(0)	(0)	
DUO-C98P DUO-C150P DUO-C198P	IB	✓			○	○		○			○	○			○	(0)		(0)	(0)	
	SB	✓			○						○					(0)		(0)	(0)	
Imicro-50P Imicro-98P Imicro-150P	IB	✓	✓		○	○		○			○	○			○	(0)		(0)	(0)	
	SB	✓	✓		○						○					(0)		(0)	(0)	

Appendix A. Battery/Charger table (4/4)

・**Display items when using ESC-2i**

Model	Comm	Battery Data			BMS CHARGER STATUS / BATTERY DETAIL						DISCHARGE GRAPH					DATABASE				
		Capacity	Serial No.	Recoed	Time to full	Model	Serial No.	Capacity	Record	User ID	Graph	Model	Serial No.	First full charge	Life	Cycles	First full charge	Over discharge	High loads	Len storage
E-7 E-10 E-HL9	IB	✓	✓	✓		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ELITE	IB	✓	✓	✓		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ELITE	SB	✓	✓		○	○	○	○			○	○	○		○	(0)		(0)	(0)	
DUO-95 DUO-150	SB	✓			○	○		○			○	○			○	(0)		(0)	(0)	
DUO-C98 DUO-C150 DUO-C198	IB	✓				○		○			○	○			○	(0)		(0)	(0)	
DUO-C98 DUO-C150 DUO-C198	SB	✓	✓		○	○	○	○			○	○	○		○	(0)		(0)	(0)	
IPL-98 IPL-150	IB	✓	✓	✓	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IPL-98 IPL-150	SB	✓	✓		○	○	○	○			○	○	○		○	(0)		(0)	(0)	
Imicro-98 Imicro-150	IB	✓	✓		○	○	○	○			○	○	○		○	(0)		(0)	(0)	
Imicro-98 Imicro-150	SB	✓	✓		○	○	○	○			○	○	○		○	(0)		(0)	(0)	
DUO-C98P DUO-C150P DUO-C198P	IB	✓				○		○			○	○			○	(0)		(0)	(0)	
DUO-C98P DUO-C150P DUO-C198P	SB	✓			○	○		○			○	○			○	(0)		(0)	(0)	
Imicro-50P Imicro-98P Imicro-150P	IB	✓	✓		○	○	○	○			○	○	○		○	(0)		(0)	(0)	
Imicro-50P Imicro-98P Imicro-150P	SB	✓	✓		○	○	○	○			○	○	○		○	(0)		(0)	(0)	

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