I·D·X

endura SYSTEM

ENDURA-ELITE
Rechargeable Battery Pack

Instruction Manual

ENDURA-ELITE
Instruction Manual

IDX Technology thanks you for choosing the ENDURA-ELITE rechargeable Lithium Ion (Li-ion) Battery and is sure that you will benefit from its unique features. The ENDURA-ELITE is a new type battery pack with "Power Cartridges (PC-14)" inserted into the housing (BH-2), the Power Cartridges are rechargeable Li-ion batteries. Please use this instruction manual to best maximize and safely use your ENDURA-ELITE. If you have any additional questions, please contact the appropriate IDX office or visit our website **www.idx.tv**
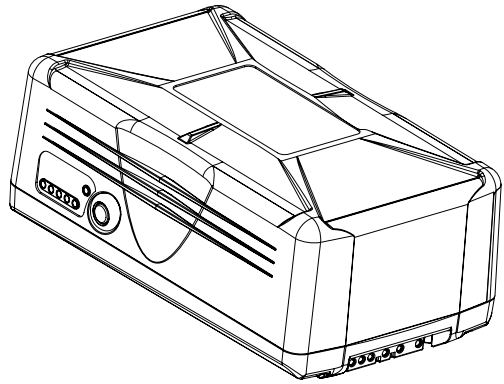

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Caution

● Do not subject the Power Cartridges to extreme impact, pressure or place objects across the terminals that could cause a short.
● Do not throw the pack in fire or attempt to burn it.
● Do not immerse in water. Keep the battery pack dry and away from excessively dry or humid environments.
● Do not attempt to open or break apart the Power Cartridges.
● Stop charging immediately if the charging does not complete within the designated time.
● Store the packs under cool and dry conditions.
● Always keep the connectors clean.
● Do not insert any foreign objects into the housing. Only insert Power Cartridges as specified in this manual.
● Do not store the ENDURA-ELITE for excessive period with only one Power Cartridge inserted.

Features

● The ENDURA-ELITE is a battery pack using a pair of Power Cartridges providing a high capacity of 136Wh and a maximum discharge rate of 110W, giving prolonged battery run times even when powering equipment with high power consumption.
● At the end of their usable cycle life, PC-14 Power Cartridges can be replaced. Replacement PC-14 Power Cartridges can be used with existing BH-2 housing.
● More accurate remaining capacity confirmation by built-in ten step LED Display.
● Alarm Function (Error Display) if Power Cartridges are inserted wrongly.. Two Power Cartridges must to be used in the same paired serial number combination.
   Caution: Discharge or Charge is not possible when different serial number Power Cartridge combinations are used.
● Low Voltage Discharge Stop Function to prevent discharging beyond over-discharge electronic range.
● When one or both Power Cartridges are taken out and transported separately the ENDURA-ELITE is compliant with the hazardous goods regulations for Li-ion Air Transportation.
● Compatible with the IDX i-Trax Battery Management System (BMS) through its internal CPU.
● Built-in SM-bus mode.

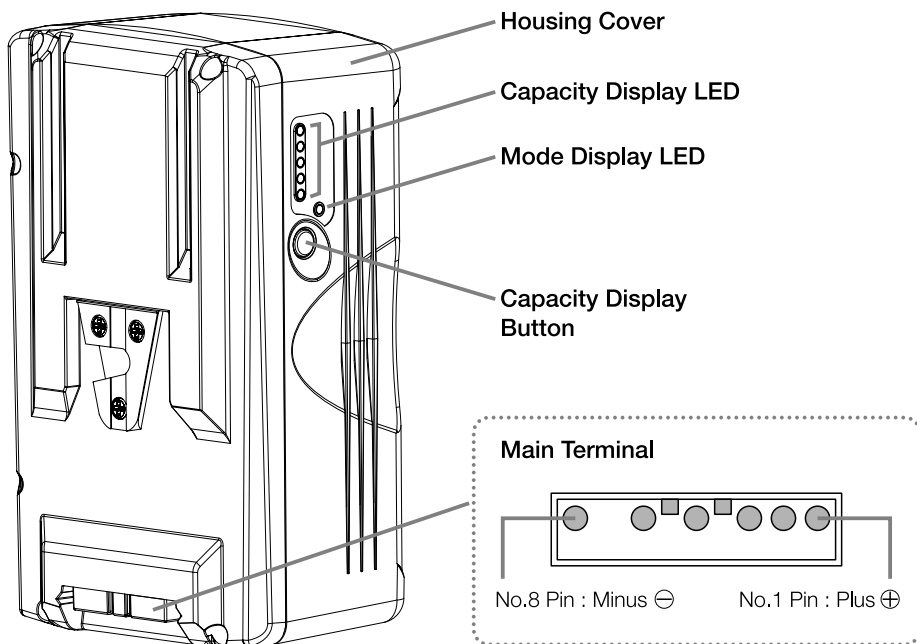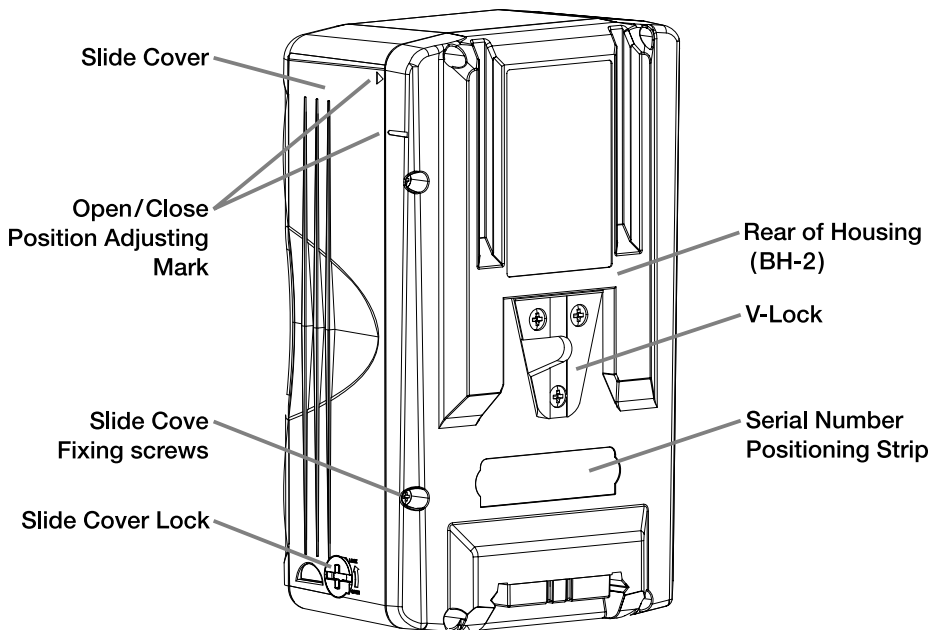## Specifications　(when Power Cartridges PC-14 are inserted)

● Cell Chemistry　　　　　　　: Li-ion
● Maximum Voltage　　　　　　: 16.8V
● Nominal Voltage　　　　　　 : 14.8V
● Nominal Capacity　　　　　　: 9.2Ah
● Maximum Discharge Current　: 9.2A
● Maximum Discharge Load　　 : 110W (at ambient temperature 40℃)
● Maximum Current Tolerance　 : 10A
● Discharge Termination Voltage　: 12.0V (Factory Standard Preset)
● Battery Protection Function　 : Over-charge Protection, Over-discharge Protection,
　　　　　　　　　　　　　　　　　Over-current Protection, Temperature Protection (built into
　　　　　　　　　　　　　　　　　individual Power Cartridges), Low Voltage Discharge Cut-
　　　　　　　　　　　　　　　　　off Function is preset at 12.0V
● Ambient Temperature　　　　 : To charge　　0〜40℃ (10〜30℃ recommended)
　　　　　　　　　　　　　　　　　To discharge　-20〜50℃ (10〜40℃ recommended)
　　　　　　　　　　　　　　　　　Storage　　　 0〜20℃ recommended
　　　　　　　　　　　　　　　　　　　　　　　　-20〜60℃ (within a month)
　　　　　　　　　　　　　　　　　　　　　　　　-20〜40℃ (within 3 months)
　　　　　　　　　　　　　　　　　　　　　　　　-20〜20℃ (within a year)
● Dimension　　　　　　　　　 : Approx. 100(W)✕170(H)✕70(D) mm
　　　　　　　　　　　　　　　　　Approx. 3.94(W)✕6.69(H)✕2.76(D) inches
● Weight　　　　　　　　　　　 : Approx. 1.25 kg / Approx. 2.75 lbs

Product Overview

Slide Cover

Open/Close Position Adjusting Mark

Slide Cove Fixing screws

Slide Cover Lock

Rear of Housing (BH-2)

V-Lock

Serial Number Positioning Strip

Housing Cover

Capacity Display LED

Mode Display LED

Capacity Display Button

Main Terminal

No.8 Pin : Minus ⊖   No.1 Pin : Plus ⊕

Charging ENDURA-ELITE

● The ENDURA-ELITE can only be charged while two Power Cartridges are in the Housing. It is not possible to charge one Power Cartridge alone.
● Use only IDX chargers with Li-ion battery charging capability. The ENDURA-ELITE can be charged on all IDX Li-ion capable chargers (except the ET-8 Tower charger). Refer to the specific charger instruction manual for charging procedure.
● Charge times vary depending on charge current and battery status. Refer to the charger's instruction manual or contact your IDX dealer or appropriate IDX office.
● The ENDURA-ELITE should be charged in an ambient temperature range of 0～40˚C but for optimal battery performance 10～30˚C is recommended.
● If the battery is charged at a temperature of 0˚C and below or at 50˚C and above, the protection function operates and charging stops to avoid cell deterioration. Before the charge resumes, batteries should be returned to the recommended temperature range (10～30˚C).

Discharging ENDURA-ELITE

● The maximum continuous discharge load applied to a ENDURA-ELITE is 110W (maximum discharge current 9.2A). Do not discharge if a load exceeds 110W. Before use, confirm the maximum power consumption of the equipment used does not exceed 110W. A load above 110W may activate the internal protection circuit and the battery performance will deteriorate.
● Battery discharge capabilities are reduced in extreme low / high temperature environments. Operating times may shorten depending on the load of the equipment used. This is most noticeable with older, heavily used batteries. Discharge at ambient temperature of 10～40˚C is recommended.
● The normal usable voltage range of a Li-ion battery under load is 13.0～14.5V. At the end of discharge and below 13.0V the battery voltage drops sharply. For optimal use, it is recommended to set a battery voltage alarm at 13.5～13.0V in older camera menus that use voltage based warnings.
● Power Cartridges discharge down to 12.0V but excessive low discharge accelerates deterioration of the battery life. To extend the Power Cartridges' life cycle, it is recommended to stop discharging at 12.0V or above.

Operating Instructions

The ENDURA-ELITE is a battery pack using a pair of Power Cartridges. Insert the same serial number Power Cartridges into the housing as one pair. The serial number is located at the position shown in the illustration right.

Serial Number

A600104

Caution : **The pack cannot be discharged with different serial number combinations.**
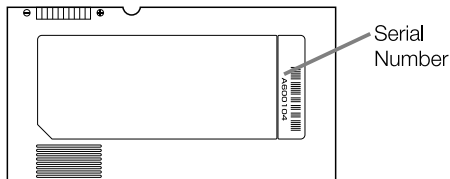
1. Insert Power Cartridges into the housing

❶ Remove the two Slide Cover Fixing Screws from the Rear of Housing (BH-2).

❷ Turn the Slide Cover Lock on the bottom of Slide Cover to the "Open" position to release the lock.

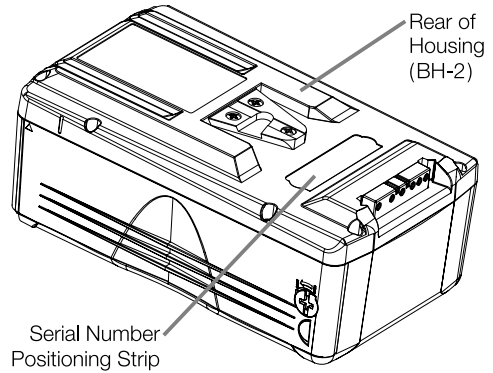❸ Slide the Slide Cover to the lower position till it stops and remove it by lifting off.

❶ 'Positive' Screwdriver

Slide Cover Fixing Screw

Rear of Housing (BH-2)

Slide Cover

❸

❷ LOCK OPEN → LOCK OPEN

❷ Slide Cover Lock
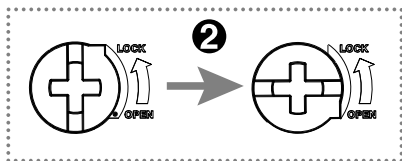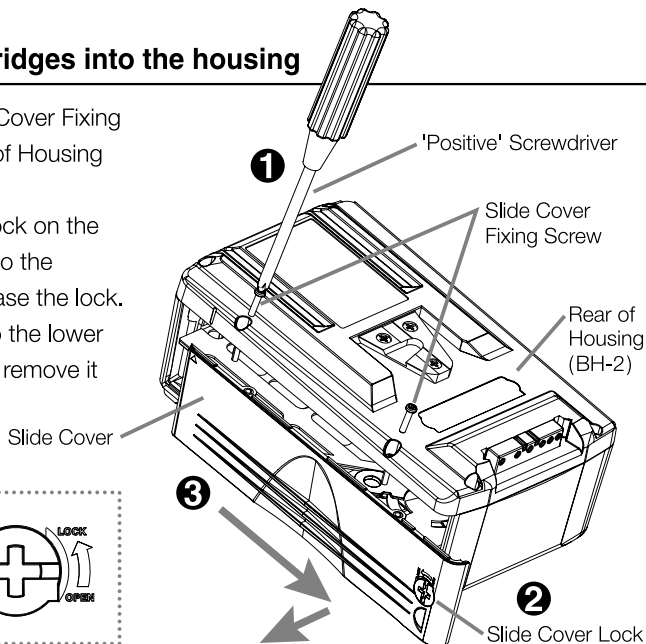
❹ Insert Power Cartridges into Slot 1 and 2 until they stop. Power Cartridge positions are interchangeable.

Outer Position : Slot 2

Partition

Inner Position : Slot 1
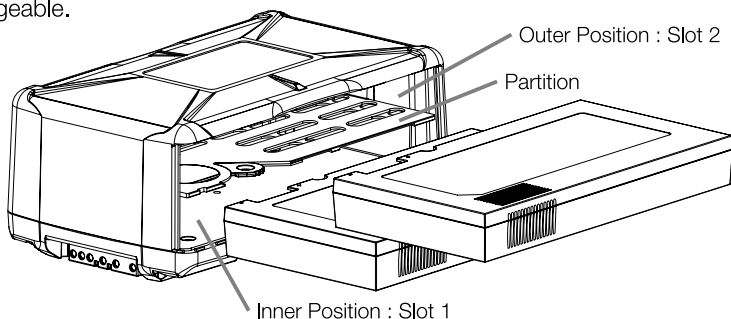
❺ Position the serial number label (included with the Power Cartridges) onto the rear of the housing (see the illustration right). Before inserting Power Cartridges into the housing always confirm that the serial number of the Power Cartridges match that of the housing.

Caution 1 : The ELITE battery pack will not charge or discharge if different serial number Power Cartridges are used and a warning LED code will show.

Caution 2 : When inserting a replacement pair of Power Cartridges into a used housing, please refer to the ENDURA-ELITE instruction manual and follow new cartridge registration procedure.

Rear of Housing (BH-2)

Serial Number Positioning Strip

❻ Align the Slide Cover to the Open/Close Position Adjusting Mark and close by sliding it upwards. Turn the Slide Cover Lock to the "Lock" position.
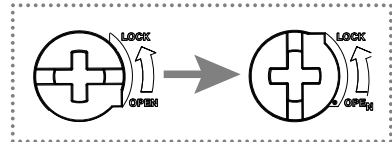
2. When Power Cartridges are inserted for the first time:

When Power Cartridges are inserted into the housing for the first time, the Capacity Display LED and the Mode Display LED show the following initial status.

❶ Mode Display LED is off, the Capacity Display center LED 60% area flashes for 2.5 seconds (showing initial setting mode).

❷ If the LED is off, push the Capacity Display Button to confirm.

❸ If the Mode Display LED is flashing red, there is an error and the Capacity Display LED shows the error detail. Check if the Power Cartridges are correctly inserted.

100%
80
60
40
20
CAPACITY
MODE

Capacity Display LED

Mode Display LED

Capacity Display Button
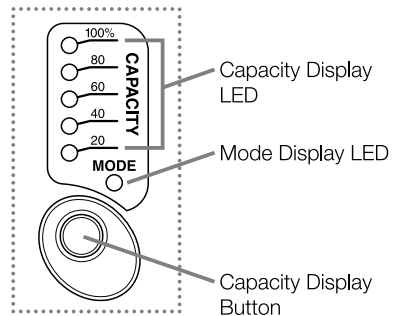
For the error contents, refer "Error Display" and "Error Code" section. When fully charging the Capacity Display LED shows 100% and the Mode Display LED lights Green.

3. To remove Power Cartridges from the housing

❶ Remove the two Slide Cover Fixing Screws from the Rear of Housing. Unlock by turning the Slide Cover Lock on the Housing Slide Cover to the "OPEN" position. Slide the Slide Cover to the lower position till it stops and remove it by lifting off.

❷ Turn the Release Tab on the Partition and pull it forward.

❸ Pull Slot 2 with the Release Tab and remove the Power Cartridge.

❹ Remove the Power Cartridge from Slot 1.

❷

Release Tab

Power Cartridge in Slot 2

❸

Power Cartridge in Slot 1

❹
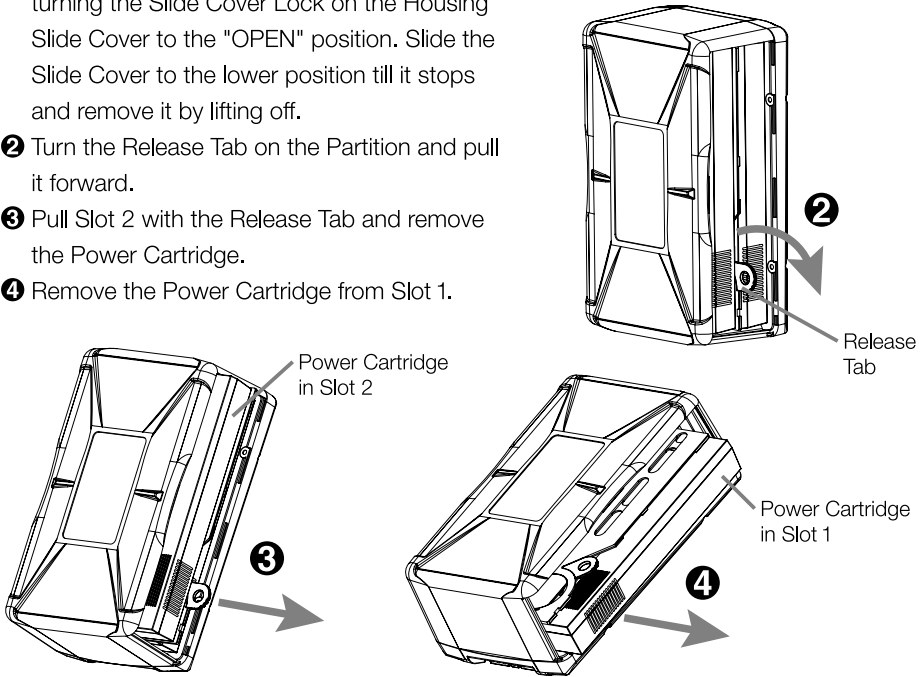
4. Exchange Power Cartridges

Exchange Power Cartridges when the capacity is reduced. A pair of Power Cartridges must be exchanged at the same time.

❶ Remove both Power Cartridges. (Refer 3)

❷ Remove old serial number labels and replace with new ones on the rear of Housing.

❸ Insert the new Power Cartridges into the slots. (Refer 1)

❹ The Mode Display LED flashes red and 80% of the Capacity Display LED flashes and displays an error.

❺ Press the Capacity Display Button for more than 10 seconds to make the initial setting.

Caution : Once the initial setting is complete, previous BMS data is erased and returns to the initial value.

❻ Charge fully.

Rear of Housing (BH-2)

Serial Number Positioning Strip
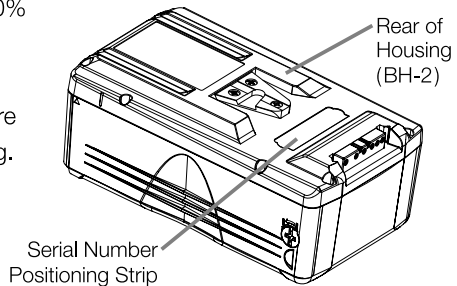
5. Low Voltage Discharge Cut-Off Function

The ENDURA-ELITE is shipped with the 12.0V Low Voltage Discharge Cut-off Function activated as a factory preset. This prevents cell deterioration by stopping discharge at 12.0V when the EDNURA-ELITE is used with equipment that does not have its own automatic low voltage stop function.

**To deactivate Low Voltage Discharge Cut-Off Function:**

❶ Open the Slide Cover and remove both Power Cartridges.

❷ Turn the Switch attached to the PCB Cover to "**R**" position.

❸ Reinsert the Power Cartridges and the Slide Cover.

Caution : If the Low Voltage Discharge Cut-off Function is deactivated and the battery is repeatedly discharged beyond 12.0V cell deterioration will accelerate.

PCB Cover

Switch
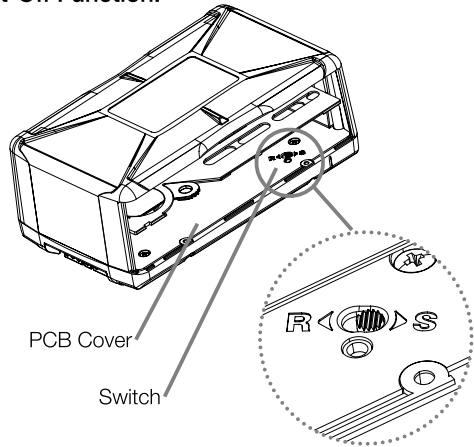
LED Display

Remaining battery capacity is shown via built-in ten step, five LED capacity status indicator. The Mode Display LED indicates battery pack conditions such as normal operation, error and function setting.

Capacity Display LED

Mode Display LED

Capacity Display Button
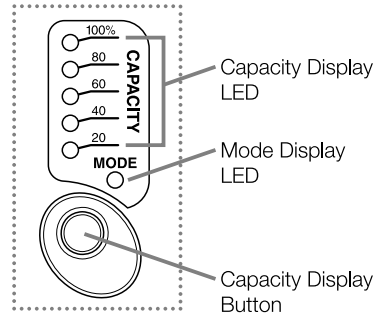
1. Current Capacity Display

When the Capacity Display Button is pressed, the Capacity Display LED indicates the remaining capacity for approx. 2.5 seconds. It also displays when the discharge current is detected.

Solid Green ●   Flashing Green ☼

LED	Factory Preset	100~90%	89~80%	79~70%	69~60%	59~50%	49~40%	39~30%	29~20%	19~10%	9~0%
100%		●	☼								
80%		●	●	●	☼						
60%	☼	●	●	●	●	●	☼				
40%		●	●	●	●	●	●	●	☼		
20%		●	●	●	●	●	●	●	●	●	☼
Mode		●	●	●	●	●	●	●	●	●	●

2. LED display during charge

Capacity Display LED lights while the pack is being charged and capacity status can be checked. The Mode Display LED does not light up.

Solid Green ●

LED	100~80%	79~60%	59~40%	39~20%	19~0%
100%	●				
80%	●	●			
60%	●	●	●		
40%	●	●	●	●	
20%	●	●	●	●	●

When the pack is fully charged the LED lights go off, even if the pack is still connected to the charger.
For capacity confirmation, press the Capacity Display Button.

3. Mode Display

Standard display and errors are shown by different colours on the Mode Display LED.

	Factory Preset Mode	When the Low Voltage Discharge Cut-off Function is deactivated
Normal Operation	● Solid Green	☼☼ Flashing Green / Red (alternate)
Error	● Solid Red	● Solid Red

4. Error Display

Error contents are displayed on Mode Display LED and Capacity Display LED.

Solid Green ●   Solid Red ●

Mode Display LED	Capacity Display LED					Error Code
	20%	40%	60%	80%	100%	
●		●				Err 1
●			●			Err 2
●				●		Err 3
●					●	Err 4

LEDs are displayed when any error is detected or when the Capacity Display Button is pressed. Error display is automatically turned off after 120 seconds, however it can be turned off anytime manually by pressing the button for more than 10 seconds while the error is displayed. However, if the display is turned off while the error status is still valid, the error display will be redisplayed for approx. 2.5 seconds after pressing the button.
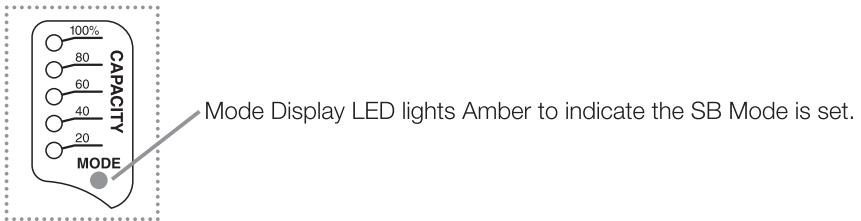
Data Communications Function

There are Standard and SB modes in the Communications function. The SB Mode is the common standard method used for smart batteries (SM Bus) in laptop PCs.

1. Change to SB Mode

❶ Press and hold the Capacity Display Button.

Capacity Display LED lights Green (2.5 seconds) and then lights go off (2.5 seconds).

Mode Display LED lights Green (standard mode).

After 5 seconds the Mode Display LED flashes Amber.
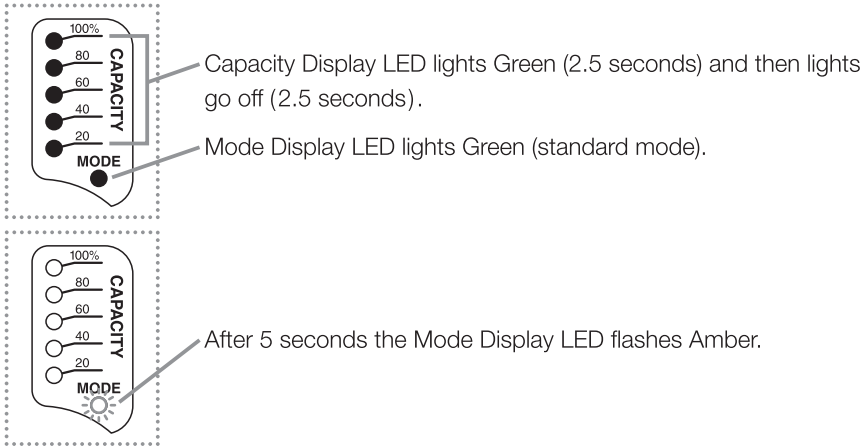
❷ With the flashing active, tap the Capacity Display Button once to initiate the SB Mode.

Mode Display LED lights Amber to indicate the SB Mode is set.

If the Mode Display LED does not flash Amber after 5 seconds the change is cancelled. To return to the standard mode, repeat ❶ and ❷ above. Mode Display LED turns from Amber to Green.

2. Confirming SB Mode

The Mode Display LED lights Amber when the Capacity Display Button is pressed. However, Remaining Capacity Display, Capacity Display during charge and Error Display LED display are the same as the Standard Mode.

Storing ENDURA-ELITE

● Battery deterioration is accelerated the higher the ambient temperature and the longer the storage period is. 20°C or below is recommended when the battery is stored for longer than a month.
● Do not store or leave the battery in a place with a temperature 60°C or above.
● To store the battery pack for a long period the battery should be charged up to 20% of capacity and left in this condition.
● If the pack is stored for a long period in discharged condition, the cell may deteriorate faster due to over-discharging. Check the charge status periodically and keep the 20% capacity condition.

Life Cycle

● The life cycle of the battery reduces with frequency of use and the application of the high loads.
● Life Cycle is also reduced if used and stored under high temperature, or if stored in fully charged condition for extended periods.

Li-ion Battery Air Transport Compliance (ICAO)

PC-14 Power Cartridges are suitable for transport by air as not-restricted articles under the regulations of the International Air Transport Association (IATA), the International Civil Aviation Organisation (ICAO) and the United Nations (UN).

Caution : The pack cannot be transported if two Power Cartridges remain in the Housing (BH-2). One or both Power Cartridge(s) must be removed prior to air transportation.

IDX confirms that PC-14 Power Cartridges contain:
1. An aggregate equivalent lithium content of less than 8g and that,
2. Each cell is of a type proved to meet the requirements of each test of the UN Manual of Tests and Criteria Part III, subsection 38.3.

ICAO & IATA Regulations for Air Transportation as Non-Hazardous articles.
(IATA DGR Regs / 49th Edition)

[A] Section 4.4 Goods acceptable as Cargo
Special Provisions for Transport (Provision A45) Lithium cells and batteries offered for transport are not subject to the provisions of these Regulations if they meet the following:
(b) For a Lithium-Ion battery, the aggregate lithium-equivalent content is not more than 8g.
(c) Each cell or battery is of a type proved to meet the requirements of each test of the UN Manual of Tests and Criteria Part III, subsection 38.3.
(d) Batteries are separated and packed so as to prevent short circuit.
(e) No more than 12 Lithium-Ion battery packs are transported in one single package.

[B] Section 2.3.5.10 Goods acceptable as Carry-on
There are limitations on Lithium-Ion battery packs, which can be taken on aircraft as carry-on. These limitations apply only to battery packs with an aggregate equivalent lithium content of more than 8g. All IDX Lithium-Ion Battery Packs contain an aggregate equivalent lithium content of less than 8g. Therefore the PC-14 Power Cartridges are not subject to these limitations and, when individually protected against short circuit, may be carried as carry-on subject to no quantity limitation.

Error Codes

	Error Codes will be displayed when	Error Corrections
Err 1	If the Voltage difference between the two inserted Power Cartridges is abnormally large.	Charge the battery pack. By charging the pack, it may recover the voltage difference. If the problem still continues after charging, it is possible that one or both Power Cartridges are damaged, exchange them with new ones.
Err 2	If only one power cartridge is inserted. Two Power Cartridges serial numbers are different. Cannot recognize the Power Cartridges.	Confirm the same serial numbers of the Power Cartridges are the same and they have been inserted correctly.
Err 3	If the two Power Cartridges serial numbers are different from the ones which are registered with the housing.	Insert the Power Cartridge with the same serial number as the label put on the rear of Housing. If new Power Cartridges are being exchanged, release the error and do the initial setting.
Err 4	If the cell temperature during charge is -20°C or below, or 60°C or above.	Charge after the battery is back at a normal temperature. If a cold battery is suddenly warmed, the moisture may cause circuit damage. If the battery temperatures abnormally rise during charge immediately stop charging.

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RoHS Compliant

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