

IPL-98 / IPL-150

Li-ion V-Mount Battery *PowerLink*



Instruction Manual

Lithium Ion



Thank you for purchasing the IPL-98 / IPL-150 Li-ion V-Mount Battery. Prior to using the IPL-98 / IPL-150, we strongly recommend reading this Instruction Manual on how to best use the IPL-98 / IPL-150. Please keep this manual for your reference. If you have any additional questions, please contact your local IDX office listed at the end of this manual.

Caution for safety use

Improper handling of this Li-ion battery may result in smoke, heat, fire, explosion or leakage as well as cause performance degradation or failure. Please be sure to observe the following precautions.

⚠ DANGER

May cause sudden serious injury and death.

- Charge with IDX battery charger only.
- Use with professional video cameras or other video equipment. Please contact IDX for more information.
- Do not short the contact pins with any metal object. Do not carry or store with metal equipment.
- Do not expose to heat and never throw the battery in a fire.
- Do not immerse in water. Keep the battery dry and away from excessively dry or humid environments.
- Do not leave the battery exposed to excessive heat such as in a car or directly under the sun light. Do not use outside of specified temperature ranges.
- Do not solder on the contact pins directly.
- Do not attempt to open the outer casing or break apart the battery.
- Do not subject the unit to extreme physical impact or pressure, or place any object across the terminals that could cause it to short.
- Do not pierce or drill into the outer casing of the unit.
- Do not attempt to use the battery if damaged.
- Do not use the battery in a corrosive environment. Damages occur from salt water, seawater, acid, alkali, corrosive gas, etc.
- Risk of explosion if battery cells are replaced by an incorrect type.

⚠ WARNING

May cause serious injury and death.

- Please note that the outside casing becomes hot when the battery is discharged in high temperatures or with high loads.
- Stop charging immediately if the battery fails to charge within the designated time. Refer to charger manuals for charge times.
- Do not use if the battery displays unusual characteristics (odd odor, discoloration, etc.) when in use, during charge or in storage.
- Keep away from fire if the battery leaks fluid or has an unusual smell.
- In case of leakage immediately wash your hands and face thoroughly with clean water and contact your IDX representative for further instructions.
- Immediately seek medical attention if battery fluid gets into contact with your eyes.

⚠ CAUTION

May cause injury or damage other equipment.

- Follow instructions on charging and discharging.
- Store in cool and dry conditions.
- During long periods of inactivity, please remove the battery from the equipment.
- Do not use, store or place the battery in an electrostatic area.
- Always keep the connectors clean.

⚠ Important

● Before using for the first time after purchase, be sure to fully charge it before use.

During the first charge, if charging is stopped before full charge, when the check button is pressed, the center of the INDICATOR LEDs flash. After full charge, it will action capacity level check.

● When this battery pack is not used for more than 10 days, the output is automatically turned off. Please press the check button to activate before use.

● PowerLink should only be implemented with IDX V-Mount batteries.

Never connect accessories (AC-100, A-NH2E, etc) or other manufacturer's batteries.

● When not in use, please keep the battery isolated and not linked to another battery.

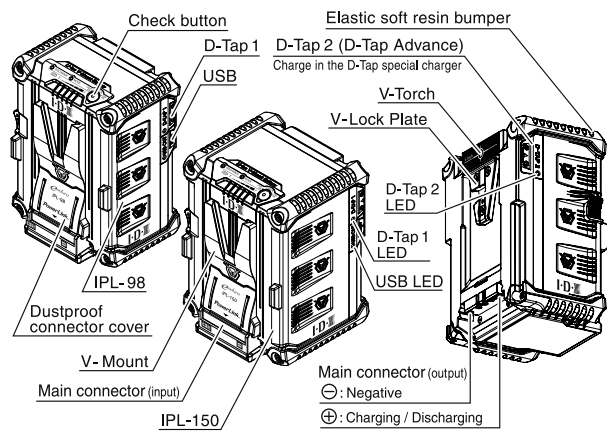
● For long-term storage, please store with about 30~40% of capacity (with 2 LEDs) and recommend for re-charging every two months.

Features

- Light weight, compact, high performance Li-ion battery with a durable design.
- High quality and reliable Li-ion cell.
- PowerLink up to four IPL-98/IPL-150 batteries or IDX made V-mount battery and use it as a large capacity battery. IPL batteries can be stacked charged with the dedicated charger (VL-2000S). **[Refer to PowerLink]**※
- IPL battery has a digital communication function, depending on the video camera. It can display the battery capacity in % or remaining time in the viewfinder. **[Refer to Digi-View/Communication setting]**※
- Battery Management System (abbreviated name BMS) is built in to facilitate operation and management of the battery. **[Battery Management System]**※
- When the check button is pressed or discharging started, the remaining capacity will be displayed in 10 stages (10% increments) for 2.5 seconds by 5 indicator LEDs. Also, during charging, capacity will be displayed in 5 stages. **[Refer to Capacity display LEDs]**※
- Two DC output connectors for peripheral equipment. D-Tap 2 is compatible with charging. **[D-Tap]**※
- USB power output for charging a portable device. **[USB]**※
- Equipped with V-Torch(LED Light) for universal purpose. (light for approx. ten seconds) **[V-Torch]**※
- When the discharge power approaches the maximum discharge power, it is possible to stop the output of D-Tap/USB and prioritize the output of the main connector. **[Refer to Accessory cutoff]**※
- Battery cells are protected and isolated by an internal honeycomb structure which adds strength to the enclosure which is equipped with elastic soft resin bumpers at the four corners to protect against impacts.

※Mark : Please refer to each section for more detailed information.

Parts Description



Protection circuitry

- There are four types of protection circuits to ensure the battery is protected from Over-charge, Over-discharge, Over-current and Thermal protection. If the fuse is blown, the battery is no longer operable. Please do not exceed maximum discharge power/current.
- When temperature of inside of the battery reaches 176°F(80°C), battery stops discharging automatically. Discharge will restart when the inside temperature becomes 140°F(60°C) or less.
- Please charge the battery soon after the over-discharge protection is activated. The battery may become unusable, if left without charging.
- When the maximum discharge power/current is exceeded, the output of the battery stops, and when the check button is pushed, the INDICATOR LEDs flash. To deactivate the protection state, remove the battery from the equipment and wait for 60 seconds, then press the check button for 3 seconds or more.

Charging

- Only charge with IDX lithium ion charger and refrain from charging with third party chargers. Please refer to the charger manual for charging method information.
- Estimated charging times may vary depending on the charger and condition of the battery. Refer to our website for more details.
- The ambient temperature range for charging is 32~104°F(0~40°C); however, 50~86°F(10~30°C) is recommended for optimizing the charging performance. When the battery is charged in temperature 32°F(0°C) or below, it may not fully charge, even if the designated charge time has elapsed.
- Charging outside of the recommended temperature range can accelerate cell deterioration.
- Lithium ion batteries have a slight self discharge; therefore, IDX recommends to charge prior to use.
- Cannot be charged using with C-NP2E, C-VAL2E.

CAUTION The policy of IDX is to value safety above all other considerations and for this reason, the IPL batteries cannot be charged when the internal temperature of the batteries is below 32°F(0°C) or over 104°F(40°C). During use the internal temperature of all batteries rise. IDX monitor this temperature in the IPL batteries and if it is found to exceed 104°F(40°C) a protection circuit will trigger an error message on an IDX charger should charging be attempted whilst the battery is in this over temperature state. The error sign will cease once the battery is back within the correct temperature range and charging will resume.

※ If the internal temperature of the battery below 32°F(0°C) or exceeds 104°F(40°C), when the battery capacity check button is pressed, the remaining capacity will be displayed with LEDs. After that all LEDs will flash. This alarm will be cancelled if it reaches chargeable temperature.

Charge prohibited alarm by temperature

CHECK BUTTON	INDICATOR LED E ● ● ● ● F	Display / Operation
2.5sec	● ● ● ● ●	Remaining capacity display Temperature alarm
	● Light ○ Off ✨ Flashing	

Table below indicates approximate time for battery on load to reset following over temperature alarm. [Ambient Temperature : approx. 86°F(30°C)]

IPL-98		IPL-150	
Discharge load power	Approximate time	Discharge load power	Approximate time
30W Discharge	30 Minutes	30W Discharge	25 Minutes
35W Discharge	35 Minutes	35W Discharge	35 Minutes
120W Discharge	45 Minutes	120W Discharge	45 Minutes

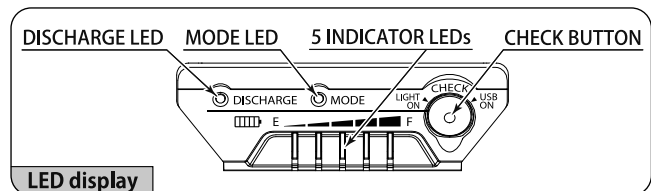
Discharging

- Please check that the total power consumption from the main, the two D-Taps and the USB connectors is less than the battery's maximum discharge power. If it exceeds the maximum discharge power, the safety protection function may be activated causing it to stop discharging and it may cause damage to the battery. If the fuse is blown due to an over load, the battery won't recover.
- The battery life may diminish if high loads are applied frequently.
- Battery run-time may reduce when used in extreme high and low temperatures. IDX highly recommends use of the battery in ambient temperatures of 50~104°F (10~40°C).
- The battery will automatically stop discharging when the voltage reaches 11V. To extend battery life, IDX recommends stopping use before the battery reaches 12V. When using PowerLink, discharge moves forward to the next linked battery when the rear battery voltage drops.
- Microwave transmitters with 5W outputs or more should be kept as far away from the battery as possible. High power transmitters may disrupt or stop the supply of power.
- Please be sure to remove the battery from the device after use. If a battery is left mounted on a device that has large standby power, the battery's residual capacity will become lower and the over-discharge protection may be activated.
- Please do not use the batteries connected in series. This may cause damage.
- When the battery voltage is low due to discharge, pressing the check button will flash the middle and right LEDs after the remaining capacity display. The alarm will be released if the battery voltage rises due to charging.

Alarm indicating battery voltage low

CHECK BUTTON	INDICATOR LED E ● ● ● ● F	Display / Operation
2.5sec	● ○ ○ ○ ○	Remaining capacity display Low voltage alarm
	○ Off ✨ Flashing	

Capacity display LEDs



- With 5 INDICATOR LEDs, the current capacity is displayed in 10 steps when discharging and 5 steps when charging.
- When the check button is pushed, it is displayed for 2.5 seconds according to the remaining capacity by lighting / flashing in the order of E ⇨ F as shown below.

Capacity	Display	E	●	●	●	F
0% ~ 9%		●				
10% ~ 19%		●				
20% ~ 29%		●	●			
30% ~ 39%		●	●			
40% ~ 49%		●	●	●		
50% ~ 59%		●	●	●		
60% ~ 69%		●	●	●	●	
70% ~ 79%		●	●	●	●	
80% ~ 89%		●	●	●	●	●
90% ~ 100%		●	●	●	●	●

● Light ✨ Flashing

- While charging the following 5-step display.

Capacity	Display	E	●	●	●	F
0% ~ 19%		●				
20% ~ 39%		●	●			
40% ~ 59%		●	●	●		
60% ~ 99%		●	●	●	●	
100%		●	●	●	●	●

Check button operation

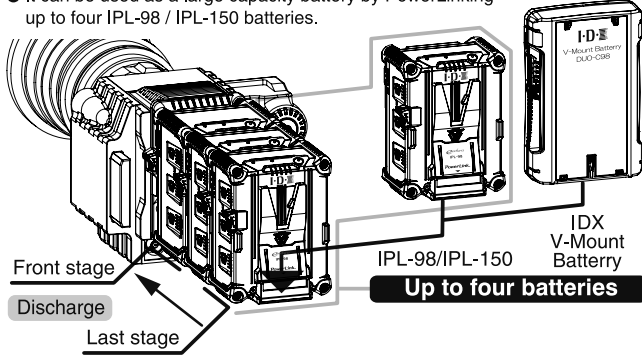
- The check button operates the remaining capacity display / USB ON / communication mode switching / accessory cutoff function switching operation.

CHECK BUTTON	INDICATOR LED E . . . F	MODE LED	Display / Operation
↓	○ ○ ● ○ ○	●	If the initial charge is not completed, press the check button and the center of the INDICATOR LEDs flashes
↓	● ● ● ○ ○	●	Display of remaining capacity for 2.5 seconds
↓	○ ○ ○ ○ ○	○	Press and hold the check button for 3 seconds or more to turn on USB
↓	● ● ● ● ●	○	
↓	○ ○ ○ ○ ○	○	
↓	○ ○ ○ ○ ○	○	Press and hold the check button for 6 seconds or longer, release the check button while the MODE LED is blinking and press again to switch the communication mode (SB: Orange / IB: Green)
↓	○ ○ ○ ○ ○	●	
↓	○ ○ ○ ○ ○	○	Press and hold the check button for more than 9 seconds, release the check button while the LED indicator is light or flashing, and press again to switch accessory cutoff function (● Light: Enable / ● Flashing: Disable)
↓	○ ● ● ● ●	○	
↓	○ ● ● ● ●	○	

● Light ○ Off ● Flashing

PowerLink

- It can be used as a large capacity battery by PowerLinking up to four IPL-98 / IPL-150 batteries.



- It is possible to replace the last linked battery without interrupting power supply even during discharging to connected equipment.
- It can also use the IDX made V-mount battery other than IPL-98/IPL-150 at the last stage of the PowerLink. PowerLink possible batteries are the following models.

Digital battery (with data communication)	Analogue battery (without data communication)
DUO-C198 DUO-C150 DUO-C98 DUO-150 DUO-95 ELITE E-HL9	CUE-D300 CUE-D150 CUE-D95 DUO-C190 DUO-C95 E-HL10DS CUE-D75 E-HL9S ELITE-S

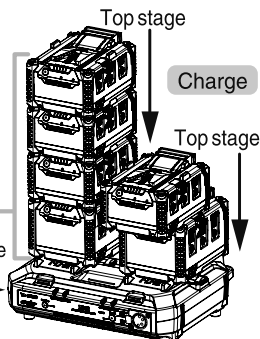
If PowerLinking an analog battery, the INDICATOR LEDs of IPL battery lights once. If PowerLinking a digital battery, the INDICATOR LEDs on the IPL battery flashes twice.

- Discharge is done from the last linked battery and when its remaining capacity drops, it switches to the next battery. If the last stage is an IDX V-mount analogue battery or when the load of the connected equipment is large, it may discharge from batteries other than the last stage.

- IPL batteries can be stack charged with the dedicated charger (VL-2000S). The stacked batteries are charged sequentially from the top down.

Charging up to four batteries per channel

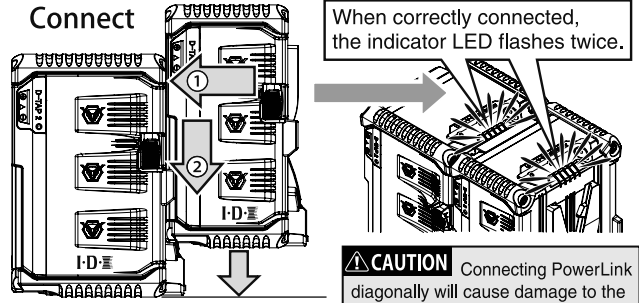
Bottom stage



IDX lithium ion charger VL-2000S

PowerLink | How to connect and disconnect

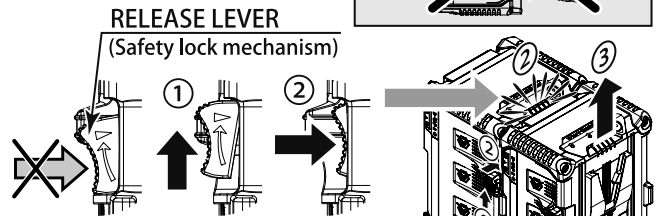
Connect



- When using PowerLink, slide in the vertical down direction with the batteries in close contact with each other until the "click" sound.

CAUTION Connecting PowerLink diagonally will cause damage to the connector terminals. Please be sure to link correctly in a vertical direction.

Disconnect



- To disconnect, Push the release lever upwards and inwards (then indicator LEDs will flash and rear stage unlocks) and then move the battery vertically upwards.

PowerLink | RELEASE LEVER (Safety lock mechanism)

- The IPL adopts a release lever with a safety lock mechanism to prevent the release lever from being unintentionally pushed causing an accidental separation.

CAUTION

- Please be careful when carrying a number of linked batteries.

Multiple linked batteries being heavier may cause injury or damage if dropped.

Falling / Handle with care

Please do not apply excessive force.

CAUTION

- If PowerLinked batteries are installed on equipment or if excessive force is applied when exchanging the battery at the last stage with PowerLink, it could lead to breakage of the mounting plate of the equipment, so please handle with care.

Please do not apply excessive force.

D-Tap

- Two D-Taps power output terminals are available.
- The maximum power output is 80W.
※Please make sure the maximum discharge load is not exceeded.
- The output voltage is unregulated battery voltage. (11~16.8V)
- D-Tap output can be used for IDX portable lights and monitors.
- Please do not use D-Tap connectors while charging the battery through the main connector. If you use D-Tap connectors while charging the battery through the main connector, it may cause a charging error or damage to the charger.
- You can charge the battery through the D-Tap2 connector only by using the IDX D-Tap charger. Please do not charge the battery through the D-Tap2 connector while charging the battery through the main connector. It may cause a charging error or damage to the charger.
- At the start of discharge with D-Tap1/D-Tap2, each LED will light for 2.5 seconds.
- When the check button is pushed, if the LED of each D-Tap1/D-Tap2 is light, it is usable. If protection is activated and it cannot output, the LED will not light. To release the protection, press and hold the check button for 3 seconds or longer or charge it.

Release the protection

CHECK BUTTON	INDICATOR LED				Display / Operation
	E	•	•	F	
3sec or more	●	○	●	○	Capacity display Release the protection

● Light ○ Off ☼ Flashing

CAUTION Please make sure to check the ⊕ ⊖ polarity of D-Tap connector prior to plug-in.



Please confirm the shape of connector and ⊕ ⊖ polarity of plug side prior to connect with receptacle. Please do not force it when felt it is difficulty.

USB

- USB connector for power supply. (DC:5V/2.3A)
- USB connector is A type. (USB Cable should be A type as well)
- To activate the USB power output, push and hold the CHECK button for more than 3 seconds.
- USB power will turn off automatically 30 minute after the USB cable is removed.
- Do not draw power from USB while charging as it may interrupt charging, cause a charger error, or damage the charger.
- This terminal does not provide data, only power.
- USB is only for 5V output. Do not apply voltage from the outside.
- At the start of discharge the LED will light for 2.5 seconds.
- When the check button is pushed, if the LED of USB is illuminated, it can be used. If protection is activated and it cannot output, the LED will not light. To release the protection, press and hold the check button for 3 seconds or longer or charge it.

Release the protection

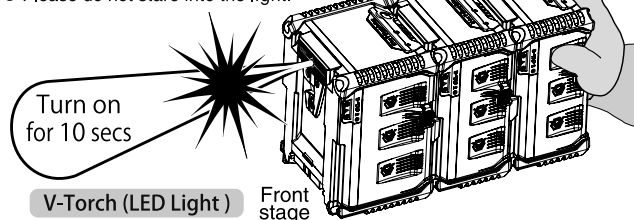
CHECK BUTTON	INDICATOR LED				Display / Operation
	E	•	•	F	
3sec or more	●	○	●	○	Capacity display Release the protection

● Light ○ Off ☼ Flashing

When an abnormal voltage is detected, the LED flash and the output turns off.

V-Torch (LED Light)

- Embedded LED (on rear side) will turn on when the capacity CHECK button is pressed two times in a row. Ten seconds later, the LED will automatically turn off.
- It can also be turned off manually by pressing the button two times in a row.
- When the check button is pressed twice in PowerLink, the LED of the IPL battery at the front lights up.
- Please do not stare into the light.



V-Torch (LED Light)

Front stage

DISCHARGE LED

- The DISCHARGE LED will light for 2.5 seconds at the start of discharge.
- When the check button is pressed during discharging, the DISCHARGE LED will light for 2.5 seconds.
- During PowerLink discharge, pressing the check button of any IPL battery lights the DISCHARGE LED of the discharging battery for 2.5 seconds.

Communication setting / MODE LED

- The SB communication function can be activated by pressing and holding the Battery capacity display LEDs check button. By activating the mode, the battery data can be read out from SMBus compliant equipment. Please refrain from using SB mode with equipment not compatible with SMBus protocol; Sudden power failure may occur due to communication failure.
- Two Configurable modes are:
 - SB mode: The battery can communicate with SMBus compliant equipment.
 - IB mode: The battery communicates with equipment using IDX's BMS compliant protocol.
- ※ The battery's default setting is IB mode.
- When the check button is pressed, the mode can be confirmed by the display color of the MODE LED.
 - SB mode: Orange
 - IB mode: Green
- How to switch modes
Press and hold the check button for more than 6 seconds. Since the MODE LED flashes after the remaining capacity and USB ON indication, release the check button while blinking and press the again to switch the mode.
- Mode switching cannot be performed whilst communicating with equipment.

Digi-View

- Some camcorders can display the remaining capacity % (percent) in the viewfinder using digital data. When used with these video cameras, it displays the remaining capacity very accurately.
- In PowerLink, the total value of all battery capacities is output as 100%.

Battery Management System

- The IPL battery has a built-in microprocessor which monitors and records data such as remaining capacity and charge/discharge cycles. This digital data can be read by using specific chargers and/or Battery Management System (BMS).
- The BMS data can be used to manage the batteries condition.

Accessory cutoff (main output priority setting)

- The accessory cutoff is a function when the discharge power approaches the maximum allowed. It stops the output of D-Tap1 / D-Tap2 / USB to prioritize the output to the main connector.
- When output stops from the D-Tap1 / D-Tap2 / USB by the accessory cutoff function, it is possible to reverse the cutoff by the check button or charging.

Release the protection

CHECK BUTTON	INDICATOR LED				Display / Operation
	E	•	•	F	
3sec or more	●	○	●	○	Capacity display Release the cutoff

● Light ○ Off ☼ Flashing

- It is disabled at the factory setting (no accessory cutoff). Refer to "Check button operation" for setting change.
- Function can only be used on PowerLink IPL battery.
If batteries other than IPL are installed as the last stage, it is not possible to stop the accessory output of that battery.

Specifications

		IPL-98	IPL-150
Cell chemistry		Li-ion	
Nominal voltage		DC14.4V	
Capacity ※1		6.6Ah/96Wh	9.9Ah/143Wh
Charge voltage		DC16.8V	
Charge current		3.3A	4.95A
Maximum discharge rate ※2	≤25°C	120W/7.1A (16.8V) 10.9A (11V)	120W/7.1A (16.8V) 10.9A (11V)
	≤35°C	100W/6.0A (16.8V) 9.1A (11V)	105W/6.3A (16.8V) 9.5A (11V)
	≤45°C	80W/4.8A (16.8V) 7.3A (11V)	95W/5.7A (16.8V) 8.6A (11V)
Maximum discharge current ※2	≤25°C	10.5A	11.3A
	≤35°C	8.5A	10.0A
	≤45°C	6.0A	7.5A
D-Tap ※3	Unregulated battery voltage		
	80W/4.8A (16.8V)~7.3A (11V) (per D-Tap)		
USB ※3	Output voltage : DC5V		
	Maximum load : 2.3A		
	Connector type : USB Type-A(Receptacles)		
	Auto power off : 30 minutes after detection of less than 50mA		
End voltage		11.0V	
Battery protection circuit		Over-charge, Over-discharge, Over-current, Thermal protection	
Ambient temperature		Charge : 32~104°F(0~40°C) [50~86°F(10~30°C) recommended]	
		Discharge : -4~113°F(-20~45°C) [50~104°F (10~40°C) recommended]	
		Storage : -4~122°F (-20~50°C) (less than 1 month)	
Dimensions	mm	89(W)×119(H)×70(D)	89(W)×119(H)×85(D)
	Inches	3.49(W)×4.67(H)×2.75(D)	3.49(W)×4.67(H)×3.35(D)
Weight	g	approx. 745	approx. 970
	lbs	approx. 1.64	approx. 2.14

※1 : Measured capacity of battery is a minimum rating at 68°F(20°C).

※2 : Maximum load is the sum of D-Tap x 2, USB and Camera loads.

※3 : When the accessory cutoff function is enabled, the output may be stopped even if the wattage / current is less than specified value.

Storing

- Store in cool and dry conditions.
- Do not store or leave in temperatures of 122°F(50°C) or above.
- Deterioration of battery performance will be accelerated when the battery is stored at a high ambient temperature and/or stored for a long period without use.

Life cycle

- Life may vary depending on frequency of use, storage and operating temperature environment.
- Life will be reduced if frequently used with high load applications.
- Life is also reduced if stored in fully charged and /or empty conditions for extended periods.

Compensation for recorded content

Recorded content cannot be compensated for if recording or playback is disabled due to a malfunction of the battery pack or other devices.

Battery recycle

This Li-ion battery can be recycled. Please follow the regulations in your country or contact your local IDX office for further details.

Li-ion Battery Air transport Compliance

The Air transport regulations for the lithium-ion batteries will be revised regularly, so please check our website before transporting the battery.
(<http://idxtek.com/lithium-ion-transportation/>)

Emblem



Oriental hornet

Scientific Name: *Vespa orientalis*



In 2010, a university research team discovered that Oriental hornets take sunlight and convert it into energy. For this reason, unlike other hornets, oriental hornets are active during the daytime when the sunshine is strongest. Research on the process of generating electricity using body tissue will be a great starting point for future bio-solar power generation.

IDX will always pursue future possibilities by expressing the Oriental hornet as our emblem. IDX take inspiration from this wonderful creature and the research team that discovered it.



Design and specifications are subject to change without notice.

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