

Batteries: Ultra²[®]/Shadow[™]



PowerCube™ batteries and rotating mount

The PowerCube™ batteries are 6.0 Ah, 14.8V. Please read the literature that comes with each battery and charger for details.



Generally we use the battery in pairs, generating (nominally) 29.6VDC. It's best to use batteries that are roughly equally charged. Both batteries power the 14.4 volt DC to DC converter nestled between the batteries.



The on-off switch has two positions, 12 and 24 volts. In the 12 V position, only the rear battery is connected and the DC-DC converter is disconnected. For a lightweight, 14 volt running rig, you might want to remove the forward battery, and/or use one Endura-7 battery. (Use two 7's for a lightweight 24 volt rig).



Paralleling the batteries for 12v

For use with the Panavision® Genesis® (a 12 volt, high amp draw camera), it's

possible to change a jumper so that both batteries provide power to the camera.

Remove four screws that hold the forward battery mount.



Normally, the red stripe wire is connected to the other red stripe wire (for 24 volts and 14 volts via the converter or 12 volts via the rear battery). Carefully pull apart the connectors, and pull out the solid red wire. Connect the solid red wire to the red stripe wire. This will connect the two batteries in parallel and disconnect the converter from the circuit. 24 volts is not possible with only two batteries in this mode.

However, if you also want 24 volts in this 12 volt/parallel mode, a third PowerCube™ battery can be added via an accessory IDX battery plate and special plug for the auxiliary power connector.



The LEDs on the battery mount will blink when the low battery threshold is reached. For the Ultra²®, this feature will only work when FLG/Volmeter box is installed (see Section F). The circuit breakers in battery mount are the standard automotive type.

The battery mount pivots approximately 180° to facilitate static and dynamic balancing, and for inertial control. Pivoting the battery all the way down will enable it to get closer to the sled, reducing pan inertia and/or helping to balance very heavy cameras. Pan inertia is maximized with the batteries horizontal and the battery rods fully extended.

Discharge rate

As your Lithium-Ion PowerCube™ batteries are used, the voltage drops at a fairly regular rate. However, the sample 30 watt discharge chart shows some interesting information. Hot off the charger, a single battery will read 16.8 volts, but within a minute drops to 16.1 volt when under load. This is normal, and not a cause for concern or an indication of a weak battery.

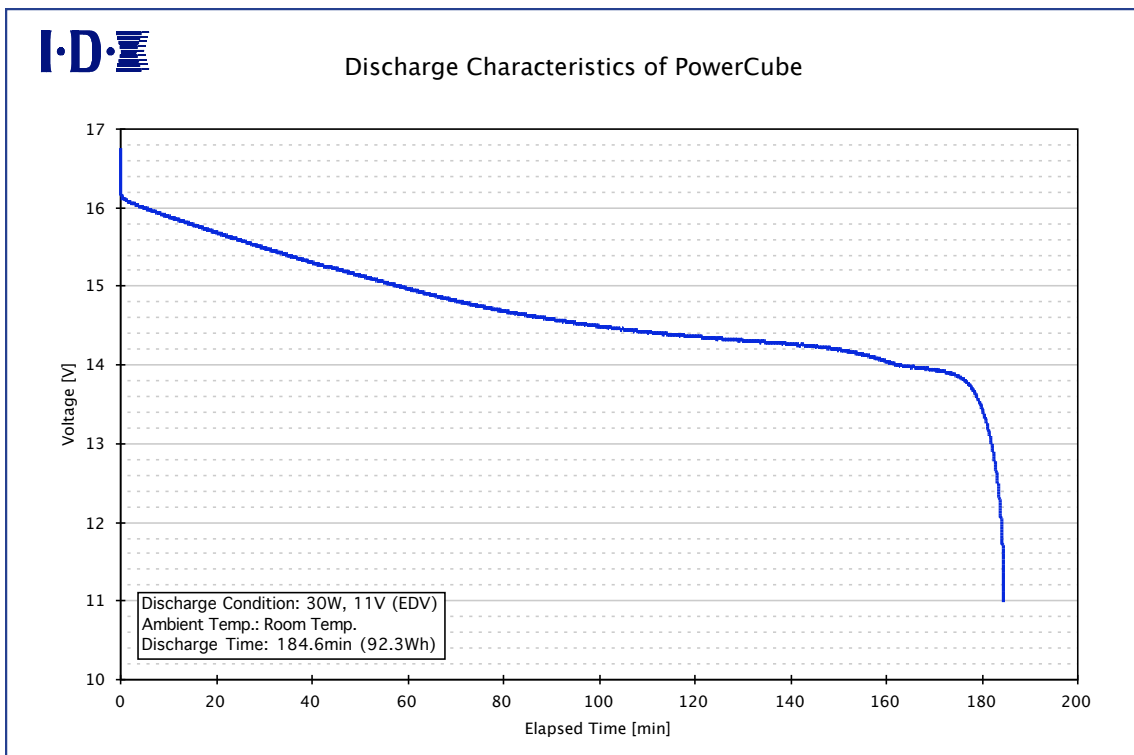
At the 30 watt discharge rate, the battery voltage drops slowly for about 3 hours from 16.1 volts to the “knee” voltage of 13.8 volts – slightly faster at the upper

end, and more slowly as the battery is discharged. When the voltage reaches 13.8 volts, the voltage drops off very quickly to 11 volts (within 8 minutes). The batteries have a self-limiting cut-off of 11 volts.

Based on this discharge curve, we suggest you set the battery warning at 13.8 volts if your total load is about 30 watts and 8 minutes is enough warning time.

If you are working with 24 volt film cameras, where the load changes when the camera runs, you might set the battery warning higher, to 28.2 or more volts for the two batteries in series, again depending on the load, how much warning you need, etc. If the voltage drops below 26 volts when the camera is not running, you will not get any appreciable run time with most 35mm, 24 volt film cameras. To set the battery warning level, see the electronics section of this manual.

When running electrically noisy, or high current draw cameras or accessories, low voltage indicators may briefly appear. Voltage sag due to the large loads or excessive noise spikes on the power lines may surpass the threshold settings.



Charging your batteries

There is no memory effect with Lithium-Ion batteries. There is also no need to deep discharge your batteries to improve their response. Charging a completely discharged battery (11 volts) to fully charged (at 16.8 volts) with a 3.0 amp charge takes about 2 hours and 40 minutes, but the battery reaches 80% of a full charge (at about 16.5 volts) in just over 90 minutes. The last 20% of the charge cycle takes over an hour.

We suggest that if you have the time, fully charge your batteries. If you are in a hurry, however, charge them only for an hour and a half or less, as an 80% charge of these batteries is still a lot of watt-hours, and typically you are using two of them. Also don't discharge them much below 13.8 volts if possible.

If you have two of the IDX VL-4S chargers, split the batteries equally between the chargers. Although all batteries are charged simultaneously, with one, two, or three batteries on the charger, the charge current is 3.0 amps per battery. When the fourth battery is added to the charger, the charge current for each battery drops to 2.3 amps, which will increase the time it takes to charge each battery.

A word about 12 and 24 volts as used in the manual: 12 and 24 volts typically refer to the nominal voltages required by cameras and accessories, but the voltage range accepted by the device might be 10 to 16 volts or 20 to 34 volts. Each camera or accessory has its own range of useful voltages.

Different battery chemistries and numbers of cells typically result in nominal battery voltages of 14.4 or 14.8 volts, or with two batteries in series, 28.8 or 29.6 volts. The actual voltage in a battery might be from 11 to 17 volts, depending on charge and battery type. Nominal battery voltages are always higher than the nominal required by the device, so that when the battery is almost depleted, it still has more voltage than that required by the device.

Some "12 volt" connectors on the sled may have a regulated (fixed) output of 12 to 14.4 volts, regardless of the voltage of the batteries at any given moment.



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