

A BREAKTHROUGH IN BATTERY TECHNOLOGY



# PAGlink™

THE COMPLETE DIGITAL BATTERY SYSTEM



LINK MULTIPLE BATTERIES FOR CHARGE OR DISCHARGE



MORE OUTPUTS FOR ACCESSORIES



MOUNTS FOR MORE CAMERAS



BATTERY MANAGEMENT DATA

INTERNATIONAL PATENTS APPLIED FOR



# PAGlink™

## The complete, intelligent battery system for broadcast, video production and digital cinema

**PAGlink is an intelligent, high-power, linking battery system designed for modern intelligent cameras. PAGlink offers:**

- ★ More power for camera set-ups
- ★ More efficient, linked battery charging - an industry first
- ★ More outputs for camera accessories via a PowerHub
- ★ Flight-friendly, UN tested batteries
- ★ Smarter, smaller and lighter V-Mount battery units
- ★ Batteries that can be linked in greater numbers (up to 8) to combine capacities for extended run-times
- ★ Batteries with the ability to sustain high current loads of up to 12A when linked
- ★ Constant power from hot-swapping
- ★ The ability to charge up to 16 batteries from any state of charge, on one charger
- ★ The world's first, single position, multi-battery charger, designed for light travel
- ★ A built-in battery run-time display on all models
- ★ Batteries that are compatible with multiple camera data and viewfinder display systems
- ★ Batteries that provide data for easier battery management, via a small, inexpensive reading device
- ★ Future proof and externally programmable batteries and chargers
- ★ Improved low-temperature battery performance
- ★ Fail-safe electronic battery protection system with protected circuits
- ★ 2 year guarantee with no restrictive conditions
- ★ The best value for money battery system in the industry

### Power for all cameras

PAGlink has been designed to power a wide range of professional cameras and equipment such as shoulder-mounted broadcast cameras, high-end digital cinema set-ups, DSLR and handheld camcorders, as used by broadcasters, hire facilities, production companies, freelancers and cinematographers.

### Link multiples of batteries

PAGlink is a system of smarter, smaller and lighter V-Mount batteries, that incorporate premium grade Lithium-Ion rechargeable cells. It is the only system that allows you to use batteries individually or linked, in multiples (up to 8), for charge or discharge. Linking the batteries combines their capacities, greatly extending camera run-time and allowing a high-current draw of up to 12A, ideal for a camera and multiple accessories. PAGlink batteries incorporate heavy duty contacts, engineered for high-load applications. Three linked batteries, weighing less than 2.2kg, create a single power source of nearly 288 watt-hours. The individual battery units have capacities of 96 watt-hours, enabling them to be legally transported by passenger aircraft without quantity restriction. PAGlink batteries can be linked in any state of charge for charge or discharge. When linked, they form a high-speed network, allowing them to communicate with each other and ensuring that the maximum linked output is kept to safe level.

### More outputs for accessories

PAGlink is the first battery system where power is also available from the battery linking contacts. The power can be accessed via the PAGlink PowerHub and used for a 12V DC camera light, a monitor, audio and transmission accessories. The PowerHub can be positioned between two PAGlink batteries, to maintain the hot-swap feature, or connected to the rear battery, to allow the mounting of an accessory bracket. It provides up to four outputs via D-Tap connectors (other connectors, such as Hirose and 2.1mm are available on request). The interchangeable, plug-in connectors allow you to reposition the output to the left or right side of the camera. A USB module (1 Amp) is incorporated for 5V accessories or charging your smartphone.



PAGlink PowerHub Model 9709 is compact: 83mm wide x 112mm high x 12mm deep (between batteries) and lightweight: 100g.

## PL Micro Charger

The first pocket-sized multi-battery charger



## PL Cube Charger

Charges 16 PAGlink batteries while linked: up to 4 per channel



## Charging versatility

Linked battery charging is an industry first. PAGlink chargers will charge simultaneously, up to 16 PAGlink batteries, from any state of charge. The **PAGlink PL16** (below) charges up to 8 linked batteries on each position. The new **PAGlink Cube** charges 4 batteries on each position. Eight fully-discharged batteries will be fully-charged in less than 12 hours. Now all your batteries can be charged overnight without you having to get up to swap batteries on the charger. The **PAGlink Micro Charger** is the world's smallest, single-position, multi-battery charger and will fully charge two PAGlink batteries in 7 hours. PAGlink batteries can also be charged individually or linked, using any reputable V-Mount Li-Ion charger.



## Run-time indication

All PAGlink batteries feature built-in run-time indication. You can choose between the more convenient numeric display of the PL96T Time Battery, or the 5 LED indicator of the lower-cost e-series PL96e battery. Both show battery capacity as a percentage. When batteries are linked, the display provides run-time for the total of all the batteries, and capacity for the individual packs. The different battery versions can be mixed, enabling you to add the numeric Time Battery display to the lower-cost e-series batteries.

## Viewfinder capacity display

PAGlink is the only battery system that automatically communicates with multiple camera data systems. This enables linked batteries to communicate their collective state of charge for display in the camera viewfinder. The batteries adapt automatically to each system they encounter.

## Electronic protection

PAGlink batteries incorporate PAG's multi-level electronic protection system and have Parylene coated internal circuits to guard against the effects of electrolyte leakage. No other manufacturer goes as far to ensure safety.

## Air transportation

The PAGlink system has been conceived so that you can fly with the high-capacity battery power that you need. The 96 watt-hour PAGlink battery packs have been independently tested in accordance with UN air transport regulations. This means that unlike batteries that have capacities greater than 100 watt-hours, and those that have not been tested, PAGlink batteries can be legally transported on passenger aircraft, to any location, without quantity restriction.



## PAGlink Battery Options:

### PL96T Time Battery

- 96 Watt-Hours, 14.8V 6.5Ah
- V-Mount Li-Ion battery
- Max discharge 8A (12A when linked)
- Numeric run-time and capacity display
- Auto-compatible with multiple camera data systems and viewfinder displays
- Chargers: PL16 (9707), PAGlink Cube (9708), Micro Charger (9710), or Sony chargers
- 133 x 84 x 50mm / 0.73kg



Model 9304

### PL96e Battery

- 96 Watt-Hours, 14.8V 6.5Ah
- V-Mount Li-Ion battery
- Max discharge 8A (12A when linked)
- 5 LED run-time and capacity indicator
- Auto-compatible with multiple camera data systems and viewfinder displays
- Chargers: PL16 (9707), PAGlink Cube (9708), Micro Charger (9710), or Sony chargers
- 133 x 84 x 50mm / 0.73kg



Model 9303

## Comparison of linking battery systems:

	IDX Powerlink HL9	PAGlink PL96e
Capacity	88Wh	96Wh
Current Draw	10A	12A
High-current pin contacts	No	Yes
Run-Time Indication	No	Yes
Viewfinder Display	IDX only	Sony, IDX, Anton-Bauer & Red
Number of batteries that can be linked	2	8
Weight	0.74kg	0.73kg
Dimensions	140 x 85 x 58mm	133 x 84 x 50mm
Charge linked	No	Yes
Replaceable latch	No	Yes

## Numeric Run-Time and Capacity Display

The PL96T Time Battery incorporates a numeric display which, at the press of a button, shows run-time against load.



Two button presses on-load displays run-time in hours and minutes



One button press on or off-load shows remaining capacity as a percentage

When the batteries are linked, run-time is shown for the total of all connected batteries, while capacity is shown for each individual battery.



When the battery is fully charged the display indicates as above



When the battery is fully discharged the display indicates as above

## LED Run-Time and Capacity Indicator

The PL96e battery displays capacity as a percentage (each LED = 20%)  
1 LED flashing = less than 10% of capacity available.



Two button presses on-load activates the time display. The 'HRS' LED flashes twice.



The number of hours is indicated by the number of lit LEDs:  
1 LED = 1 hour.



The 'MINS' LED then flashes twice.



The number of minutes is indicated: 1 LED = 10 mins.

## PAGlink Battery Specifications

### Model No. 9303

PAGlink PL96e Battery

### Model No. 9304

PAGlink PL96T Time Battery

### Cells:

Premium grade, Lithium-Ion, sealed, rechargeable, cylindrical cells.

### Battery Connection:

V-Mount battery connection system.

### Construction:

The casing consists of high-impact polycarbonate injection mouldings. The cells have welded interconnections of low-resistance nickel strap. The batteries are sealed and non user-serviceable.

### Latching Mechanism:

The PAGlink contact block and latching mechanism on the rear of the battery is external, and can be replaced if it becomes damaged.

### Voltage:

14.8V nominal. The battery contains 12 cells connected in series/parallel. Each cell has a nominal voltage of 3.7V.

### Capacity:

Nominal 6.5 ampere-hours (96 watt-hours), with a charge voltage of 4.2V per cell.

### Output Current:

The rated maximum continuous output current for individual batteries is 8 amperes.

The rated maximum continuous output current for linked batteries is 12 amperes.

### PAGlink Connection Feature:

The PAGlink connection uses high-current pin contacts.

It is recommended that no more than 3 batteries are linked for use on-camera, although it is possible to link up to 8 off-camera and for charging.

When linked, PAGlink batteries form a high-speed serial network, allowing the batteries to communicate with each other. They will then report to the camera or charger as one large battery.

The system will automatically select the most suitable batteries for discharge, according to their charge status.

The PAGlink system ensures that the maximum linked output is kept to a safe level.

### Protection:

The battery incorporates the following safety shutdown systems:

- 3 over-current shutdown systems.
- 2 over-voltage shutdown systems.
- 2 under-voltage shutdown systems.
- 3 thermal shutdown systems, including a non resetting thermal fuse.
- All protection circuits within the battery are coated with Parylene to withstand the effects of electrolyte leakage.

### Charging:

PAGlink Batteries can be charged whilst linked using any reputable V-Mount Li-Ion charger. New PAGlink chargers, such as the 2-position PL16 (9707) and 4-position Cube (9708) can charge simultaneously up to 16 batteries from any state of charge. Other suitable chargers include the ultra-compact PAGlink Micro Charger (9710).

Charge times will vary depending on the condition and state of charge of the batteries. Typically, eight fully-discharged batteries will be fully-charged in 12 hours.

### Operating Temperature Range:

PAGlink batteries incorporate precision temperature management, extending low-temperature performance down to -20°C. Optimum discharge efficiency is achieved within the temperature range +10°C to +40°C.

### Viewfinder Information Display

PAGlink supports four battery status standards for the communication of capacity data to the camera viewfinder: SMB (Sony), I<sup>2</sup>C (IDX), reversed SMB (RED) and analogue 0V to 5V (Anton Bauer). The batteries adjust automatically when connected to the camera.

### Dimensions (both models):

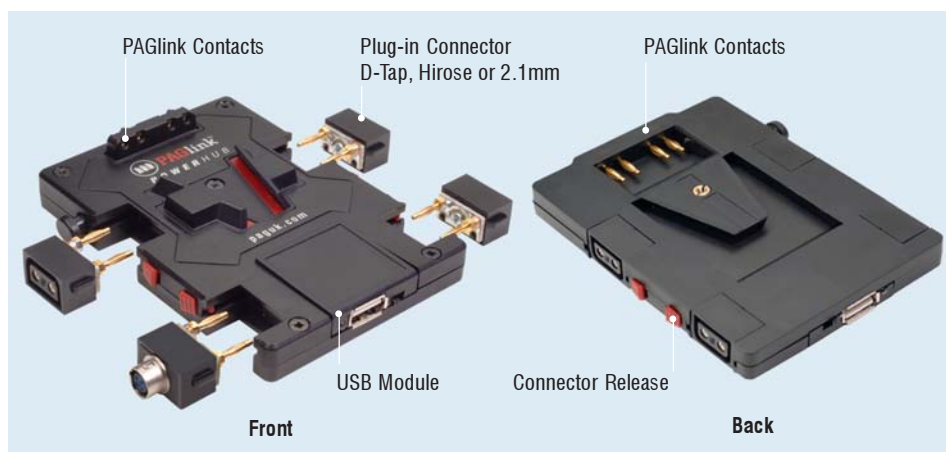
133mm (height) x 84mm (width) x 50mm (depth)

### Weight (both models):

0.726kg



## PAGLINK POWERHUB



- Power up to four 12V camera accessories using PAGlink batteries
- Use between batteries to maintain the battery hot-swap feature or on the rear battery to enable the mounting of an accessory holder
- 4 x D-Tap outputs (the plug-in output connectors are interchangeable with 4-pin Hirose and 2.1mm DC available on request).
- USB module (1 Amp) for charging a smartphone
- 83 x 112 x 18mm / 100g

**Model 9709**

## PAGLINK BATTERY READER



- Reveal data stored in the PAGlink battery's microprocessor, such as:
  - > State of charge, as a percentage
  - > Available capacity in ampere-hours
  - > Cell temperature in degrees Celsius
  - > Number of charge/discharge cycles
  - > Voltage
  - > Full capacity
  - > Date of manufacture
  - > Battery software version

- Manage large battery stocks
- Track battery usage and performance
- Easy-to-understand alphanumeric display
- For use with PAGlink batteries, V-Mount L96T, L96e, L95e and Sony Professional Info Batteries
- 77 x 52 x 28mm / 50g

**Model 9647**

## POWER SOLUTIONS FOR DSLR AND DIGITAL CINEMA CAMERAS



PAG has introduced a new range of V-Mount Plates and D-Tap Power Leads designed to power a wide range of popular cameras using intelligent PAGlink Batteries. The cameras include:

- Blackmagic Digital Cinema
- Canon C100/300/500
- Canon EOS 5D & 7D
- Nikon D800
- Red Epic/Scarlet

The V-Mount Plate assembly is designed to be clamped to the mattebox/camera accessory rails and can be configured vertically or horizontally, above or below, ensuring the best position in relation to the camera display and accessories. There are two PAG V-Mount Plate options: one for use with 15mm rails

**Model 9401**, and one for 19mm rails, **Model 9402**. The V-Mount incorporates a D-Tap output for connection to the camera, using the appropriate PAG D-Tap Power Lead. The lead features a camera specific connector, and can be supplied with an in-line down-converter for those cameras that require a 7.2V to 8.2V power input (contact PAG for details).

A 96Wh PAGlink Battery will run a DSLR all day, or a Blackmagic Cinema camera, that consumes 23W, for more than 4 hours. An additional battery can be linked to double run-time or provide a higher current draw of 12A, to power your camera and accessories simultaneously. The PAGlink PowerHub provides all the outputs you need (see above).