

**PL16 & PL16+
CHARGERS**
**V-MOUNT &
GOLD MOUNT**
USER GUIDE



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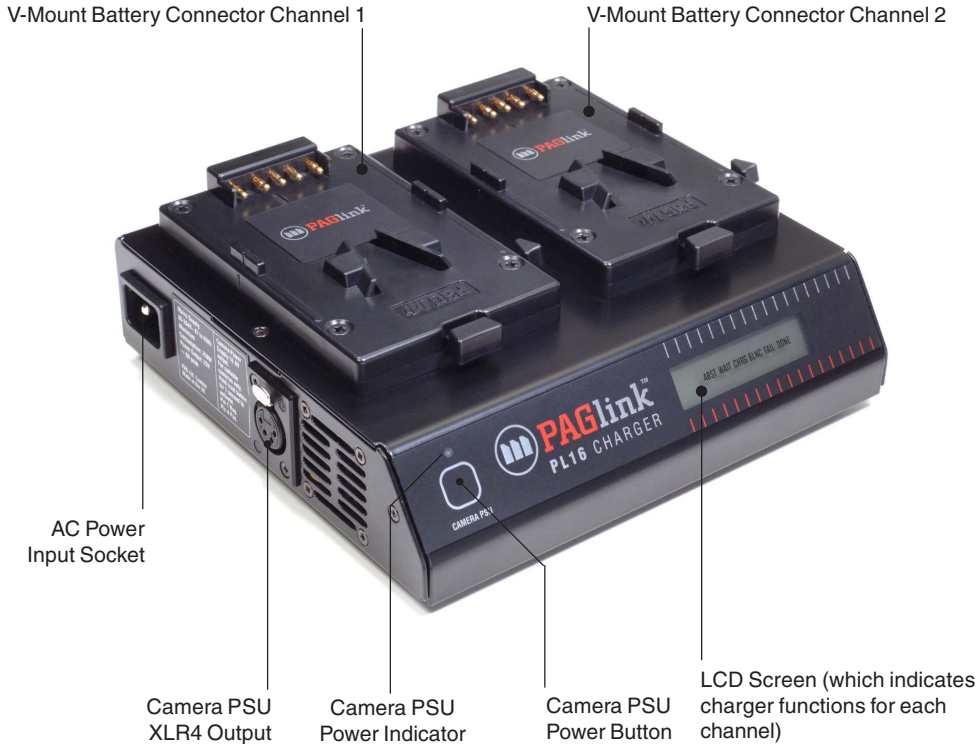
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*Thank you for choosing the PAG PL16 Charger.
Please read the important safety information
and instructions before using your charger.*

Section	Page
1 Key Features	4
2 Safety Information	5
3 Specifications	7
4 Operating Instructions	9
5 Servicing	12
6 Compliance	13
7 FAQ	14
8 Warranty	15

1. Key Features



The charger shown is:

Model 9707 PL16 Charger

- 2 x V-Mount battery connectors
- Camera Power Supply

Other models feature the following variations:

Model 9707A PL16 Charger

- 2 x Gold Mount battery connectors
- Camera Power Supply

Model 9711 PL16+ Charger

- 4 x V-Mount battery connectors

Model 9711A PL16+ Charger

- 4 x Gold-Mount battery connectors

Patents Apply: paguk.com/patents

2. Safety Information

- 2.1 Incorrect treatment of the PL16 Charger could present a safety hazard. Please read these important safety and operating instructions before using the charger.

WARNING:



Do not connect to an AC supply that exceeds the voltage specification of the unit (100-265V, 50/60Hz).

Use only to charge batteries listed in 'Specification 3.2'.

Do not short the contact pins with any metal object.

Do not immerse the unit in water, or expose it to rain or moisture.

Do not attempt to open the casing for servicing or repair. Refer all repairs to qualified servicing personnel (see 'Servicing').

Do not subject the unit to extreme physical impact or pressure.

Protect the power cable from damage.

Ensure that the ventilation slots are not obstructed during use.

This unit must be earthed.

Unplug the unit during lightning storms and when it is not in use.

If the unit appears damaged, or does not function correctly, seek advice from an authorised PAG service centre (see 'Servicing') or from support@paguk.com

CAUTION:



This unit is intended for indoor use only.

Do not expose the unit to extremely high temperatures.

Use only the power cable supplied with this unit, or a cable that conforms to the voltage/ampere rating and safety regulations for the applicable country.

Do not use the unit in excessively dry or humid environments. Disconnect the unit from the power source if you notice any abnormal smell or change in appearance to the outer casing.



ELECTRIC SHOCK: This symbol appears where the information relates to the risk of electric shock.



WARNING: This symbol appears where the information relates to an issue of personal safety.

3. Specifications

3.1 Chargers covered by these instructions:

9707	PAGlink PL16	V-Mount	2 charging positions
9707A	PAGlink PL16	Gold Mount	2 charging positions
9711	PAGlink PL16+	V-Mount	4 charging positions
9711A	PAGlink PL16+	Gold Mount	4 charging positions

3.2 Range of Batteries Charged:

9707 PL16 & 9711 PL16+ V-Mount Chargers:

- Parallel charging, individually or linked:
PAGlink PL96 Batteries (Models 9303 & 9304).
PAGlink PL150 Batteries (Models 9308 & 9309).
Mini PAGlink MPL50 Batteries (Model 8141).
Mini PAGlink MPL99 Batteries (Models 8241 & 8242).

- Parallel charging, individually:
PAG L90 Slim Battery (Model 9307V)
Sony V-Mount Li-Ion Batteries

9707A PL16 & 9711A PL16+ Gold Mount Chargers:

- Parallel charging, individually or linked:
PAGlink PL94 Batteries (Model 9306).
PAGlink PL150 Batteries (Model 9313).
Mini PAGlink MPL50 Batteries (Model 7141).

Mini PAGlink MPL99 Batteries (Models 7241 & 7242).

- Parallel charging, individually:
PAG L96 Batteries (Models 9310A & 9305A)

3.3 Main Charge Programs:

Li-Ion Intelligent Parallel Charging program: maximum output 6A at 16.8V (100W approx.). V-Mount Models only: PAG ACS Ni-MH sequential charge program, output 3A.

3.4 PAGlink Charging:

Up to 8 PAGlink or 10 Mini PAGlink batteries can be charged on each position, when linked. Batteries can be of any rated capacity and in any state of charge. The most discharged batteries will be given priority. Fully charged batteries stop accepting charge automatically and independently. Batteries may be left on the charger when fully-charged and will be maintained in a ready-for-use condition.

3.5 Recovery Charge Program:

A battery that will not accept charge, and is indicated as ABST on the charger display, can be given a Recovery Charge, initiated by two presses of the front panel button on PL16 Chargers (Models 9707 & 9707A). Normal charging will follow after a few seconds. Recovery Charge will be applied automatically in the case of PL16+ chargers (Models 9711 & 9711A). Additionally, all chargers will recover automatically a Li-Ion battery where the output has been shut down.

3. Specifications

3.6 Self Test Program:

The internal microcomputer constantly monitors the battery under charge, as well as the operation of the charger's own functions, which will be shut down to a safe condition should any of the tests fail.

3.7 Mains Input:

100V to 265V AC. Frequency 50-60 Hz. Maximum consumption 220W.

3.8 Output Protection:

The charger is protected against short circuit and excess battery voltage.

3.9 AC Mains Failure Protection:

Should mains failure occur during a charging program, or whilst the charger is connected, it will shut down to a safe condition.

3.10 User Interface:

The charge status of each PAGlink battery is indicated by its own display. The different stages of the charging process are indicated for each channel on the charger's LCD screen. The charger is fully automatic in operation.

3.11 Operating Temperature Range:

0°C to +40°C (+32°F to +104°F).

3.12 Overall Dimensions:

Model 9707 PL16 V-Mount:		
Width	Length	Depth
210mm (8.3")	190mm (7.5")	75mm (3.0")
Model 9707A PL16 Gold Mount:		
Width	Length	Depth
220mm (8.6")	190mm (7.5")	75mm (3.0")
Model 9711 PL16+ V-Mount:		
Width	Length	Depth
210mm (8.3")	315mm (12.4")	75mm (3.0")
Model 9707A PL16 Gold Mount:		
Width	Length	Depth
220mm (8.6")	315mm (12.4")	75mm (3.0")

3.13 Weight:

Model 9707 PL16 V-Mount	1.4kg	3lbs
Model 9707A PL16 Gold Mount	1.4kg	3lbs
Model 9711 PL16+ V-Mount	1.6kg	3.5lbs
Model 9707A PL16 Gold Mount	1.6kg	3.5lbs

3. Specifications

3.14 Typical Battery Charging Times:

The charge times given (hh:mm) are from fully-discharged to fully-charged. Charge times will be less if the batteries are only partially discharged, and will vary depending on the condition of the batteries.

Total:	Configuration	50Wh	99Wh	150Wh
1	1	01:15	02:30	03:45
2	1/1	01:30	03:00	04:30
4	2/2 or 1/1/1/1	03:00	06:00	09:00
6	3/3 or 2/2/1/1	04:45	09:30	14:15
8	4/4 or 2/2/2/2	06:00	11:45	18:00
16	8/8 or 4/4/4/4	12:00	24:00	36:00
32	8/8/8/8	24:00	48:00	72:00

The current is shared between charging channels. To fast-charge an individual battery in the fastest time it is best to connect only that battery to the charger.

As Li-Ion batteries near full charge, the charge current is reduced. The final 10% therefore takes longer than at any other stage of the process. Customers can remove the battery at 90% charged to reduce the overall charge time significantly.

3.15 Camera Power Supply (Models 9707 & 9707A only):

Suitable for powering cameras that can accept a 16.8V input.

3.16 Operation:

The camera power supply function is operated by pressing and holding the Camera PSU button on the charger's front panel for 1 second. Charging is suspended whilst the power supply is in use.

3.17 Output:

16.8V DC. Maximum current 5.5A (90W).

3.18 Output Connector:

XLR4F connector (Pin 1 Neg, Pin 4 Pos).

4. Operating Instructions

- 4.1 PAGlink PL16 Chargers are fitted with an AC input socket conforming to CEE22 (IEC socket). AC supply connection to the charger should be made using the lead supplied with the equipment.
- 4.2 PAGlink PL16 Chargers have been designed for use on AC supplies worldwide, and automatically accept supplies in the range 100V to 265V. AC supply frequency must be in the range 50-60Hz.
- 4.3 **IMPORTANT:** Note Section 4.17 Supply Failure. PAGlink PL16 Chargers may be disconnected from the supply at any time in complete safety and without damage to the charger or any batteries connected.
- 4.4 Connect the charger to a suitable supply using the standard lead. The red LCD screen will illuminate and display the software version.
- 4.5 On power-up, the charger will automatically run a self test program.
- 4.6 With no batteries connected, the display will indicate 'ABST' on each channel:

A red LCD display showing the software version. The top line displays '1>' followed by a downward-pointing triangle and the text 'ABST WAIT CHRG BLNC FAIL DONE'. The bottom line displays '2>' followed by an upward-pointing triangle.

PL16 Display

A red LCD display showing 'ABST' on all four channels. The top line displays '1> ABST 2> ABST'. The bottom line displays '3> ABST 4> ABST'.

PL16+ Display

- 4.7 Before connecting a battery to the charger ensure that the battery is not in **sleep mode** by pressing the battery display button twice, so that the battery display illuminates. Mini PAGlink batteries will exit **ship mode** automatically when you connect them to a powered-up charger, or link them to an active battery.

When batteries are connected, charging will commence automatically and the charger display will indicate 'CHRG' on the appropriate channels:

A red LCD display showing 'ABST' on all four channels. The top line displays '1>' followed by a downward-pointing triangle and the text 'ABST WAIT CHRG BLNC FAIL DONE'. The bottom line displays '2>' followed by an upward-pointing triangle.

PL16 Display

A red LCD display showing 'CHRG' on all four channels. The top line displays '1) CHRG 2) CHRG'. The bottom line displays '3) CHRG 4) CHRG'.

PL16+ Display

- 4.8 Up to **8 PAGlink Batteries** or **10 Mini PAGlink Batteries** per channel may be charged. Batteries can be of any rated capacity and in any state of charge. The charge status of each PAGlink battery is indicated by its own display. The most-discharged batteries will be given priority until all the batteries are in a similar state of charge (within 20%). The batteries will then fully-charge simultaneously, making the most efficient use of the current available. Fully-charged batteries stop accepting charge automatically and independently. For the short term, fully-charged batteries can be left connected to the charger until they are needed.

4. Operating Instructions

- 4.9** The charger display will indicate 'DONE' when all the batteries connected to that channel have received as much charge as they can safely accept:



```
1> ▾
  ABST WAIT CHRG BLNC FAIL DONE
2> ▲
```

PL16 Display



```
1) DONE 2) DONE
3) DONE 4) DONE
```

PL16+ Display

- 4.10** As Li-Ion batteries near the end of charge, the charge current is reduced. This is perfectly normal for the 'constant voltage' phase of the charge cycle.
- 4.11** Batteries may be removed, and others connected at any time, without affecting the operation of the charger.
- 4.12** The charger will continue to monitor the status of all charging channels. It will not attempt to charge batteries which the charger indicates are 'DONE' or faulty (indicated as 'FAIL'). When there are no batteries connected the charger display will indicate 'ABST':



```
1> ▾
  ABST WAIT CHRG BLNC FAIL DONE
2> ▲
```

PL16 Display



```
1) FAIL 2) CHRG
3) DONE 4) PBST
```

PL16+ Display

If a new battery is connected to the free channel, the charging sequence will be initiated automatically. The order in which batteries are connected is therefore immaterial; the charger will ensure that all batteries are charged in as short a time as possible.

- 4.13** If the charger detects a faulty battery while the charging program is running, the display will show 'FAIL'. This could be caused by one of several conditions, such as a very old or damaged battery, a short circuit battery, or an excessively high or low voltage battery.
- 4.14** The charger will not recognise the connection of a battery which has a voltage substantially outside of its range, or one of unsuitable chemistry type.
- 4.15** If the internal protection circuit of a PAG or Sony Li-Ion battery should turn-off, for any reason, the battery display will not operate, and there will be no voltage at the battery terminals. The PL16 incorporates a Recovery Charge program which will automatically turn the protection circuit back on again.
- 4.16** If the charger should detect a fault during operation, it will shut down to a safe condition. See Section 5.4 'Servicing'.
- 4.17** If the AC mains power fails during operation, the charger will shut-down safely; no damage will occur to either the charger or the batteries. When the mains power is restored the charger will default to the main charge program.

4. Operating Instructions

- 4.18** PL16 Chargers, Models 9707 & 9707A, feature a built-in **Camera Power Supply** that enables you to power your camera from an AC mains supply, using the charger. Connection to the camera can be made using an XLR4 male to female lead.

The power supply is operated by holding in the button on the charger's front panel for 1 second. The blue LED above the button will light to indicate that the power supply is in operation. When the camera power supply is in use, charging is suspended.

The output of the camera power supply is 16.8V DC. The maximum current is 5.5A (90W).

5. Servicing

- 5.1 WARNING:** To reduce the risk of electric shock, do not attempt any servicing or repairs unless you are qualified to do so. Refer all servicing or repairs to qualified servicing personnel. The charger contains advanced electronics that do not require periodic maintenance. Consequently there are no user-serviceable parts inside.
- 5.2** Qualified electronics engineers who wish to gain access to internal assemblies should note that parts of the power circuit retain a high voltage even after the power supply has been disconnected. Wait for a period of five minutes following disconnection before commencing disassembly, and be aware of charged capacitors.
- 5.3** When the charger is correctly connected to an AC supply and the display is not functioning, it may be that a supply fuse has become open circuit. Equipment for use in the UK is supplied with a standard AC power lead, complete with a moulded, fused plug. If this fuse has become open circuit **IT SHOULD ONLY BE REPLACED BY ANOTHER OF THE CORRECT RATING.** If the replacement of the fuse fails to correct the above symptoms, do not attempt further fuse replacement, it is likely that a fault has developed. Contact your nearest authorised PAG Service Centre:

United Kingdom and Rest of the World:

PAG Ltd. Epsom Downs Metro Centre, Units 9 & 10, Waterfield,
Tadworth, Surrey KT20 5LR, UK
T: +44 (0) 20 8543 3131, E: support@paguk.com

The Americas:

PAG America, 18 Center Street, Ramsey, NJ 07446, USA
T: +1 631 300 8215, E: sales@pagamerica.com

- 5.4** The chargers feature a fail-safe shutdown mode. In the unlikely event of an internal malfunction, an error message will be displayed on the screen. This could be the result of any number of undesirable situations from which the system is protecting itself, such as the obstruction of ventilation slots, causing inadequate cooling, or the microcomputer's detection of an internal fault. In these cases the charger should be disconnected from the supply, any obstruction of the air vent system removed, and the unit allowed to cool before reconnecting to the supply. Should the charger re-enter the fail-safe shutdown mode, more detailed investigation is required. Make a note of the error message and seek advice from your nearest authorised PAG Service Centre.
- 5.5** Unqualified personnel should not attempt further investigation (see paragraph 5.1 above). Any such interference would invalidate the guarantee and could cause more damage than the original fault.
- 5.6** For technical information contact an authorised PAG Service Centre or email **support@paguk.com**

6. Compliance

- 6.1** PAG PL16 chargers are designed to comply with electrical safety standards: BS EN 60065 and UL1564.
- 6.2** PAG PL16 chargers conform with the following European directives and harmonized European standards:

Applicable EU Directives:
EMC Directive 2004/108/EC
Low-Voltage Directive 2014/35/EU
CE Marking Directive 89/336/EEC

Harmonised Standards Applied (Generic):
BS EN 6001-6-3:2007 +A1:2011
EN 61000-6-1

Product Specific:
EN 55032 Class A
BS EN 61000-4-2:2009
BS EN 60335-1:2012 +A13:2017
IEC 60335-1:2010 +AMD1:2013 +AMD2:2016 CSV

Restrictions of Hazardous Materials in Electronics:
EU Directive 2011/65/EU
EU Directive 2015/863

- 6.3** PAG PL16 chargers comply with the limits for Class B digital devices relevant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful

interference when equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency and, if not installed in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

NOTE: These declarations shall cease to be valid if modifications are made to the products without the approval of PAG Ltd. UK.



7. Frequently Asked Questions

7.1 How many batteries can I stack on a PL16 charger?

Up to 8 PAGlink batteries or 10 Mini PAGlink batteries can be stacked for charging on each position. If too many batteries are connected, no current will be delivered.

Gold Mount PAGlink batteries can be linked to Gold Mount Mini PAGlink batteries for charging, but the equivalent V-Mount models cannot. This is because the linking contacts are in a different position.

7.2 Why are the battery displays 'off' on one of the stacks, even though the PL16 indicates that they are charging?

When you add a battery (or a stack of batteries) to the second charging position, shortly after adding batteries to the first, the charger will indicate that it is charging, but the battery displays will not be lit. It will take approximately one minute until the battery displays on the second channel light up, because the charger is still analysing the first channel during that period.

7.3 Will the batteries at the top of the stack be charged first?

The most discharged batteries will receive current first, until all the batteries have a similar state of charge (within 20%), when they will all receive current. The batteries will reach full-charge simultaneously.

7.4 What is the most efficient way to charge batteries that have vastly different states of charge?

If you have 4 batteries that are, for example, 15%, 25%, 70% and 75% charged, they will charge faster and more efficiently if the 15% and 25% are on one stack, and the 70% and 75% are on the other.

7.5 What is the best way to get 1 battery charged fast?

To charge a single battery in the fastest time it is best to connect only that battery to the charger; that way it will receive all the charging current.

7.6 The PL16 Charger display is showing "I-CURRENT V. HIGH SAFE SHUTDOWN". What does this mean?

The charger has experienced an internal current that is too high. Turn-off the charger, leave it for a few minutes, and then turn it back on. If it repeats the message then please contact PAG support by email support@paguk.com or return the charger to a PAG authorised service centre.

8. Warranty

- 8.1** Notwithstanding any provision of any agreement the following warranty is exclusive: PAG Limited warranties each PL16 charger it manufactures to be free of defects in material and workmanship, under normal use and service, from the date of purchase, for the period indicated below:



All PL16 & PL16+ Models

This warranty extends only to the original purchaser. This warranty shall not apply to fuses or any product or parts which have been subject to misuse, neglect, accident or abnormal conditions of operation.

- 8.2** In the event of failure of a product covered by this warranty, PAG Limited will repair and calibrate equipment returned to an authorised service facility within the period of the warranty, provided the warrantor's examination discloses to its satisfaction the product was defective.

The warrantor may, at its option, replace the product in lieu of repair. With regard to any equipment returned within this period, said repairs or replacements will be made without charge. If the failure has been caused by misuse, neglect, accident or abnormal conditions of operation, repairs will be billed at a nominal cost. In

such a case, an estimate will be submitted before work is started, if requested.

- 8.3** The foregoing warranty is in lieu of all other warranties, express or implied, including but not limited to any implied warranty or merchantability, fitness or adequacy for any particular purpose or use. PAG Limited shall not be liable for any special, incidental, or consequential damages, whether in contract, tort, or otherwise.