

Thank you for purchasing the PhD-M6 Custom Battery Pack from ATDMS!

The PhD-M6 pack consists of a custom battery carrier designed by Eric Marshall (Odd Mods), and a custom, microprocessor driver designed and programmed by William Quiles (ATDMS). The PhD-M6 pack has the following features: PWM (pulse width modulation) to offer true voltage regulation for incandescent bulbs, soft start, runs from 3x 17670 protected Li-Ion cells (not included), has low voltage detection, and has 4 user-selectable output voltages (via 2-position DIP switches) for various bulb choices. This pack does not require any alteration to the M6. It is literally a drop-in pack. All you do is insert batteries into the side-loading holder (with proper orientation), select the desired voltage setting with the two dip switches, put the corresponding bulb in the head of the M6, and go.

Warnings:

- **For general user safety, prevention of Li-Ion cell, PhD-M6, flashlight damage, personal injury & personal property, you MUST use protected 17670 Li-Ion cells!.** Although the regulator does have reverse battery protection when used with "protected" 17670 LiIon cells, please note the battery polarity markings on the battery carrier for proper operation. The pack will shutdown when the cells are depleted, triggering the individual cell protection circuit. We recommend using AW protected Li-Ion 17670 cells found here: <http://www.cpfmarketplace.com/mp/showthread.php?t=230876>
- **Do not use this pack with bulb setups above 35Watts.**
- **Always use eye protection when changing or handling bulbs. They are under high pressure and can explode.** After inserting bulbs, always clean them with Isopropyl alcohol and let dry.
- This pack has been tested to work only with LiIon cells of LiCo chemistry. It has not been designed to work with any other cell type/chemistry.

Disclaimer:

This is a custom made product, which assumes the user has the necessary knowledge of safe Li-Ion charging procedures and usage. If this PhD-M6 is not used properly, it is possible to explode a bulb, cause a fire, personal injury, damage any part of your flashlight, batteries, this device, or other personal property. While best efforts have been made to provide a safe and quality product, none of the parties involved in making, servicing, or providing this device will be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information from this document, online references, or the products to which the information refers. Any part in this product could fail unexpectedly, so you hereby agree to use this at your own risk, and take all necessary precautions.

SureFire, which manufactures and sells the M6 and respective bulbs is not affiliated or associated in any maner with ATDMS or this custom PhD-M6 product. SureFire does not manufacture, sponsor, warrant, and has no involvement or endorsement of any ATDMS product. The use of any/all SureFire trademarks is strictly for the purpose of identifying the host flashlight for the ATDMS product advertised. All other trademarks, copyrights, graphics, images, text, or other content not owned by ATDMS or any of its related companies that appear with this PhD-M6 are the property of their respective owners, irrespective of any affiliation, or involvement with ATDMS.

PhD-M6 Instructions

Settings:

Your PhD-M6 unique serial number is: _____. Manufacturing date: _____.

The voltage set points for this serialized PhD-M6 pack are:

Level 1 = _____ V_{rms} (Recommended bulbs at the default 5.0V setting: SF N1, WA1218)

Level 2 = _____ V_{rms} (Recommended bulbs at the default 6.8V setting: SF MN16 and MN21, WA1160)

Level 3 = _____ V_{rms} (Recommended bulbs at the default 7.5V setting: SF MN15, N2, MN20, N62)

Level 4 = _____ V_{rms} (Recommended bulbs at the default 10.8V setting: WA1185, IMR-M6, HO-M6R)

(NOTE – If you have custom voltage settings, these recommended bulbs for the default voltage settings might not apply.)

Behavior when cells are almost depleted: _____

Usage & General Information:

- 1) The pack will shutdown when the cells' built-in protection is triggered, so you MUST use protected cells with this pack. In some cases, the individual cell protection circuit will remain shutdown until you recharge the cell. We recommend you have a DMM (Digital Multi-Meter) to test battery voltages regularly.
- 2) The PhD-M6 also has a separate low voltage shutdown set point when the combined 3 cell pack under load is drained down to about 7.5 volts. Turning the light On/Off will not reset this protection. Rather, you must remove and re-insert the batteries to clear this low voltage feature. It is recommended that the cells be recharged at this time. Removing and reinstalling the batteries from the pack always forces a full reset.
- 3) As soon as you put batteries in the PhD-M6, the pack goes into sleep mode, drawing very little current. The pack will come out of sleep as soon as it detects the bulb is now connected, which happens when you close the tailcap or press the tail switch to complete the circuit and turn the M6 on.
- 4) This regulator/driver will NOT work with LED's. It is designed only to work with incandescent bulbs.
- 5) The PhD-M6 pack is of a "buck" type voltage regulator. As such, the loaded battery voltage needs to be higher than the RMS voltage required to drive your bulb choice, before it is able to regulate the output.

For questions please email them to William Quiles: atdms.email@gmail.com

Photographs of Voltage Settings:

Level 1 – OFF–OFF



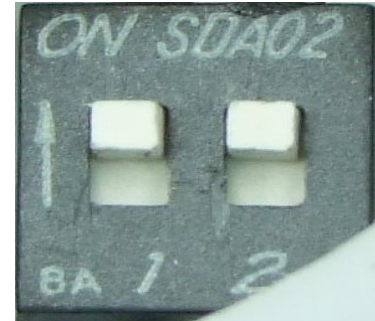
Level 2 – OFF–ON



Level 3 – ON–OFF



Level 4 – ON–ON



Photographs of how to insert batteries:

There is no need to disassemble the battery carrier. Just unscrew the thumb wheel enough to allow the cells to be inserted from the sides (it is a side-loading pack), then screw the thumb wheel tightly, but do not crush the cells! If the thumb wheel does come off, the part of the nut that extends from the plastic goes towards the pack, so that it is flush as shown in the middle picture. Red is "+" or positive, and black is "-" or negative.

