



Filthy Edna 2 – Monkey Manual



Edna2 Overview

Edna2 caving lamp has been designed for 'wet caving' including submersion (not diving).

Edna2 has one main LED, with **semi focused flood** LED. The lamp has **4 light settings** (on the main LED). It also has a separate **moon mode** LED (white smd LED) for maximum run time, and **battery charge level indication** (smd LED blinks 1-5 times).

As standard, the Edna2 caving lamp operates from an individual **unprotected 18650** battery. The battery holder has electronic protection built in, but other arrangements including protected cells can be accommodated (for further information see www.littlemonkeycaving.co.uk). Batteries can be removed from battery box for charging in a proprietary 18650 battery charger, or can be charged using the Edna battery holder in conjunction with our Nora micro USB charger (available separately).

Edna2 Operation

Edna2 is operated by the easy press sealed switch on the top rear of the lamp body. In normal operation, the switch can be operated in two distinct ways, **<short push>** or a **<long push>** (push and hold).

The available light settings are in a continuous forward loop, **1 to 4**, and **off**. Each of the settings can be selected in turn, by pressing the switch **<short push>**.

The **factory default light settings** are;

1. **low** (70 lumen, 30 hours) - smaller cave passages
2. **med** (170 lumen, 10 hours) - general progression around cave
3. **high** (320 lumen, 5 hours) - progression in large passages
4. **max** (1000 lumen, 1 hours) - having a good look around !!
5. **off** (effectively zero battery consumption)

(max regulated light outputs, & approx. run times based on single **3400mAh** 18650 battery)

In order to avoid cycling through subsequent light settings, Edna2 can be **turned off** from any setting with a long switch press **<long push>**.

Note - when initially connected to the battery pack, Edna2 will turn on in moon mode (separate white SMD LED). The next press of the switch (short or long) **<push>** will turn the lamp off, and the smd LED will indicate battery charge level.

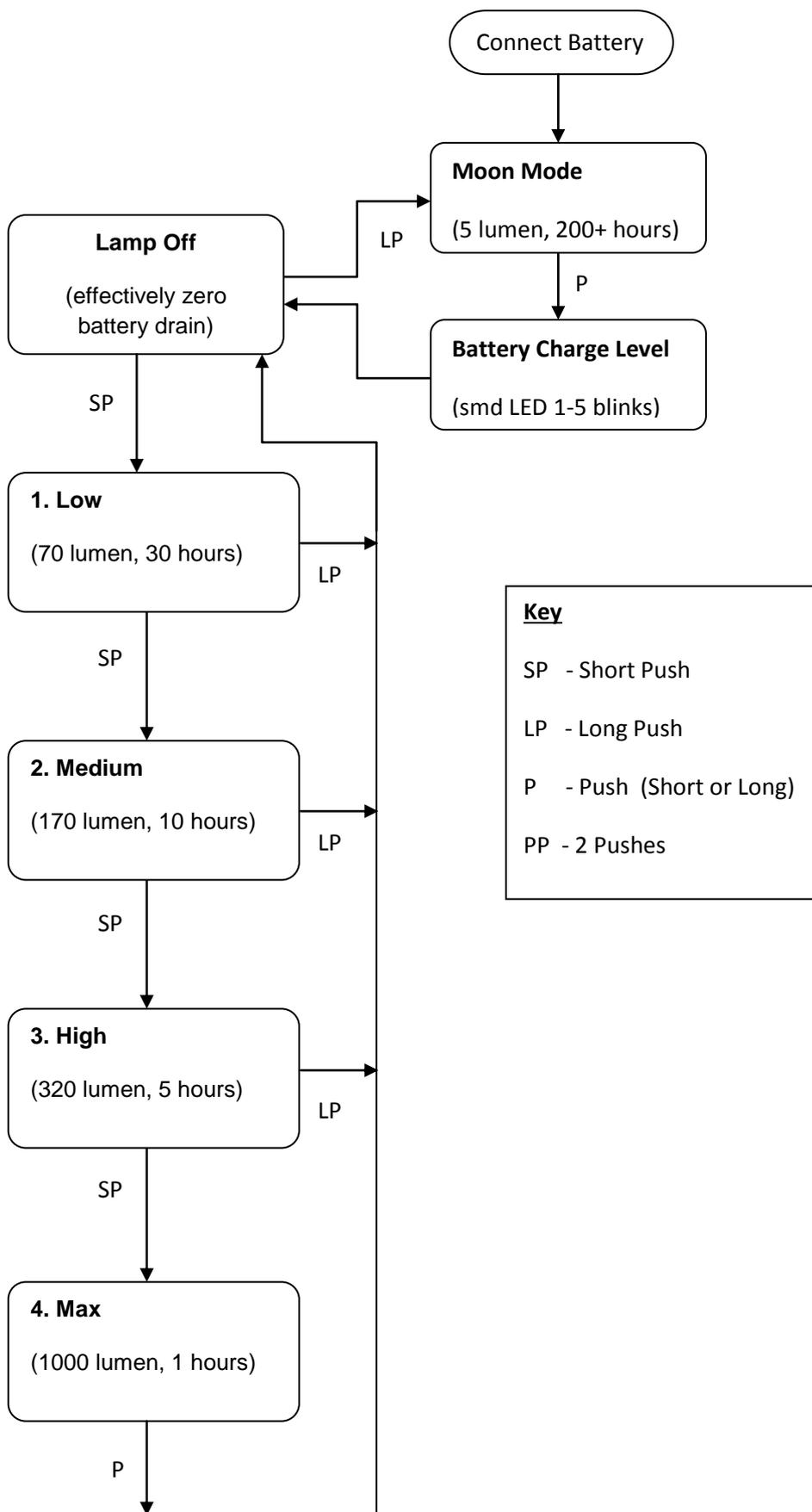
Edna2 has effectively zero battery consumption when switched off, so there is no particular requirement to disconnect batteries. However it is always best practice to do so when not in use for more than a few days.

Moon Mode LED and Battery Charge Level Indicator

Moon mode is provided by a separate white smd LED, providing **very low** light (approx. 5 lumen) for ultimate duration (200+ hours). Well suited to underground camp, expedition, small passage caving, and emergency. Moon mode can be selected by a long switch press **<long push>** from lamp **off** setting.

The next press of the switch (short or long) **<push>** will turn the lamp back off. At this point the white smd LED will display level of battery charge by blinking 1 to 5 times. 5 blinks indicates fully charged and 1 blink very flat, for li-ion batteries. The light is visible underground, on the back of your hand, such that battery condition can be determined without removing your helmet.

Edna2 Operation Flow Chart



Low Battery Charge Level Indication

If battery charge is getting low, then Edna2 will automatically blink the main LEDs to indicate this, a few seconds after a new setting has been selected. Following this brief warning, operation will continue as normal with reducing light output as battery is now quite low, and the indicator LED will blink (not visible with helmet on) at 1 second intervals. Edna2 has been configured to deliver a low light from fundamentally flat battery packs for some time, therefore minimizing the risk of being left without light. However, at this point you might consider using a lower light setting, or changing battery.

Ultimately, the Edna2 will restrict illumination to moon mode, and li-ion batteries will shut down at a set low voltage level (typically around 2.7v) to prevent damage. In event of battery protection circuitry failure, Edna2 incorporates an additional layer of protection to ensure that batteries will not be over discharged

Thermal Management

While operating, Edna2 continually monitors lamp temperature. If lamp gets too hot then main LEDs will blink and the power will be reduced to allow lamp to cool. White smd indicator LED will blink (not visible with helmet on) at 1 second intervals while under thermal regulation. Lamp function is not locked, and simply changing light setting will restore full operation, though be aware that unless a lower light setting is used for a few minutes in order to provide time for the lamp to cool, then thermal management may quickly reactivate. In reality, you are probably only likely to see this if running continuously for extended periods, using high settings and in warm environments; as the Edna2 provides a very effective heat sink.

Edna2 Fitting Guidance

Edna2 is designed to be helmet mounted. Fitting is fairly intuitive. The standard alloy lamp bracket requires 3 holes drilled in the front of the helmet (4.5mm). When drilling, take care not to damage cradle etc, on inside of helmet. The lamp bracket can be used as a template. Position of lamp bracket is personal preference, and helmet type dependant. If possible, position lamp high enough to avoid interference with peripheral vision. Orientate lamp and mark position of lamp bracket central fixing hole, drill helmet, and attach bracket to helmet. M4 stainless steel hex screws & lock nuts are provided for this. Mark other 2 bracket holes, twist bracket to one side (or remove completely) and drill helmet. When fixing bracket to helmet, nuts should be on the outside. The extending arms of the alloy lamp bracket will need to be adjusted to suit lamp and accommodate curved helmet profile. They can be bent carefully by hand as required.

The Edna2 battery box can be attached with shock cord (suggested 4mm) or two cable ties. This will require up to 4 suitably positioned holes drilled in helmet, depending on preferred fixing method and helmet design..

The lamp can now be fitted to the lamp bracket. Nora has been designed for cable to run inside the helmet, , though many arrangements are possible. The lamp housing and cable can typically be threaded under the rim of the helmet, behind the cradle inside the helmet and back and out at the front of the helmet, though many arrangements are possible

The lamp is fitted to the bracket with 2 off M5 cap head screws. The M5 stainless spring washers fit between the screw heads and the bracket, the M5 stainless washers fit between the bracket and the lamp body. Orientate lamp to desired angle and lock up both screws, using 4mm allen key. To maintain good water integrity, high viscosity silicone grease can be used on battery box O ring and front window O ring.

The battery box is opened at the opposite end to the cable gland. Battery and lamp connectors are polarized so correct polarity is ensured. Battery connections should be made outside of the box, and battery pack orientated in battery box, with wires and connectors typically orientated down inside wall of box (opposite side to cable entry). Take reasonable care when fitting battery in order that wires do not get trapped / damaged, and individual batteries are orientated correctly in Nora battery holders. The battery holder has li-ion protection circuitry. Take care not to damage this. The cable gland end of the battery holder can be opened for service / maintenance purposes.

The Modification of Helmets for Caving

By necessity helmets have to be modified in order that they can effectively be used for caving or adapted to suit the requirements of a particular task within the caving environment. Invariably holes will need to be drilled in the shell so that lamp brackets or reserve lamps can be fitted. Cavers drill helmets; as they principally use these to mount lamps and protect from light bumps.

If holes are drilled in sensible positions and kept to a minimum they are unlikely to have an adverse effect on the overall strength or protection offered by the helmet shell, but obviously this can't be guaranteed. Drilling holes into a helmet shell technically invalidates its certification as Personal Protective Equipment (PPE) and may have an adverse effect on the amount of protection provided by it, so anyone who modifies or uses a modified helmet must be aware of, and fully accept, the potential incurred risks of the modification beforehand and during subsequent use.

Li-ion Batteries

Knowing some fundamentals li-ion batteries will help to ensure that you maximise the life of your cells. While li-ion batteries are fairly robust, they are potentially susceptible to damage particularly from severe impact, temperature and water ingress. Our lamps have been designed to best protect the battery, while maintaining a practical helmet mounted solution for underground use. If carrying spare batteries, take care to avoid severe impact and water as they will potentially break. A hard case waterproof container is probably advisable.

We do not take responsibility for injury to persons or damage to property from cells or chargers. These should be used and charged under supervision, stored safely, appropriately maintained and correctly disposed of if there is any suspicion that they have been damaged or are defective.

Battery Charging

Although the charging algorithm for li-ion cells is relatively complex, this is typically sorted out by the charger and battery protection circuitry. Consequently, chargers are invariably simple plug in and go solutions. Red light charging, green light fully charged, with automatic charging shut off. Li-ion batteries can be part discharged or part charged without consequence. There is fundamentally no rapid high current charge option for li-ion cells (though they will reach 80% charge fairly quickly). Although charging is automatically shut off on completion, it is always advisable to disconnect battery packs from chargers when charging has finished.

Battery Storage

The capacity of li-ion batteries is reduced with age. The chemical process that relates to this is accelerated with increased temperature and charge level. To realise maximum battery life, cell packs should be stored around half charge and in a cool and dry environment (around 15 degC, do not freeze). Under no circumstances should battery packs be left discharged for an extended period, in order to avoid self discharge below 2.5v and permanent damage.

Battery Compatibility

Edna2 operates from **3.7v li-ion**, and is not compatible with high voltage li-ion battery arrangements, typically ranging from 7.4v to 14.8v, connection to which could result in damage. Always ensure correct battery polarity, to avoid potential damage to lamp.

Li-ion Battery Summary

- Avoid getting batteries wet
- Avoid severe impact. Do not puncture.
- Store batteries somewhere cool, around 15 degrees C
- Store batteries part charged, around 50% is good
- Do not store batteries discharged (as deep self discharge will kill them)
- Do not store batteries connected to lamp
- Use a Little Monkey charger, or a suitable equivalent
- Keep a watch on general battery condition (avoid damage to leads and connector)
- Do not use or charge a potentially damaged battery
- Dispose of dead battery packs at suitable recycling facility
- Do not short circuit or reverse polarity batteries
- Keep away from children and monkeys

High Power LEDs

Edna2 lamps use high power LEDs which are fairly bright! Do not look at LEDs in operation. Eye injury can result. Be especially careful of this when programming light settings. Do not shine you light into other people's eyes, particularly at close range. For more information, see Cree website.

Warranty

Edna2 has a standard 1 year warranty against defects in material and manufacture. If your product or accessories fails to operate to specification during the Warranty period we will arrange for your product to be repaired or at our discretion replaced. This warranty is subject to reasonable wear and tear (in our opinion) and correct use and maintenance of the product as applicable. We will not provide warranty repair / replacement if the problem, in our opinion, resulted from use outside the product specification, modifications or alterations, incorrect connection, operation or fitting where applicable, external damage due to accident, impact/ abrasion, poor storage, poor maintenance, use of non approved parts, wear and tear parts (e.g. front window). We will always endeavour to keep any costs due to damage to an absolute minimum.

Edna2 has been designed for 'wet caving' including submersion (not diving), operating effectively in a hostile environment, i.e. caves, and be as robust / reliable / practical as possible for this purpose. As a consequence it will get battered and while we appreciate that it is entirely feasible to break things occasionally, any such damage is beyond the scope of the product warranty. Expect to pay for any damage related repairs. We advise against pressure washing or rough submerged washing where it could be possible to force moisture past the switch seal. If water, even the smallest amount is forced in to the lamp, you will note condensation behind front window when lamp is operated. If you notice this, then remove front window (with hex key provided) and run on a medium setting to warm lamp and burn off moisture, before reassembling.

Disclaimer

Caving is not without risks. We would not presume to tell you how to kit up and use your equipment. What we will say is that the Edna2 is not, and should not be considered as, Personal Protective Equipment (PPE). How you interpret any guidance that we give on the use of our products and how you use our equipment is entirely at your own risk. Caving is a rigorous activity that is harsh on equipment. Edna2 has been designed to be safe, robust and best withstand the demands of caving, while remaining practical as a tool for this purpose. This does not mean that it cannot be broken. Lights can fail without warning, and we take no responsibility for any consequence of this. Always carry a reliable and accessible independent backup light source for any light crucial activity / function. Good caving practice is your own responsibility. We do not take responsibility for any accident, injury, liability or cost, to yourself or that you may cause to anyone else, or to any property. This applies to caving or any other function for which you choose to use and place reliance upon our product. We are aware that our lights are often used for cave diving. Information relating to the scope of this activity will be published on the little monkey website.

Please note that you personally assume full responsibility for the risk of property damage, bodily injury or death which may occur from the use of this product in any manor whatsoever. If you are not able, or not in a position to, assume this responsibility, or take the risk, then do not use this product. We are not responsible for the consequences (direct, indirect or accidental) or any other type of damage befalling or resulting from the use of this product. If you are not entirely comfortable with the above, then do not purchase or use any of our products.

About Us

Edna is designed and manufactured by us, trading as Customduo. We are based in Cheddar, in the Mendip Hills, a significant UK caving region. To contact us or view latest version of Edna2 manual, product guidance and terms & conditions, please visit website **www.littlemonkeycaving.co.uk**