Owner's Manual for the
Fire~Fly 3 flashlight
From Spark Illuminations

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Thank you!

Thank you for purchasing a Fire~Fly 3 flashlight from Spark Illuminations. You have purchased a light that is very compact, yet extremely bright. This light is made of premium materials, with the highest quality of manufacturing available. It is machined on highly precise CNC lathes, so that very tight tolerances are held - this gives it the best fit and finish available today.

Our Philosophy:

The Fire~Fly 3 is designed and intended to be with you every day – right there for you whenever you need a little more light to see what you are doing, or a lot more light to see where you are going. You never need to worry about where you left it – it’s in your pocket or purse, or on your keychain.

At Spark Illuminations, we use the best materials, designs and workmanship. We take pride in our design and manufacturing, and we want you to be proud to carry our products.

Key features of the Fire~Fly 3 Flashlight:

- Very compact design – fits pocket or purse
- Very bright output that is white, not yellow/orange like traditional flashlights
- Light weight
- Simple, reliable and easy to use
- Very scratch-resistant Type 3 hard anodized finish – looks good for a long time
- Multiple light levels (dimming), with user-settable low/high level, strobing frequency
- Water-resistant (O-ring seals at all openings)
- User-serviceable, modular design – CAD-designed and CNC-machined
- Ultra-clear glass lens – transmits 99% of light emitted and is very scratch-resistant
- Top quality materials used throughout – high-grade copper, aerospace aluminum

The Fire- Fly 3 flashlight is one of the finest flashlights in the world, with many premium qualities and features. The Fire- Fly 3 is very tough and durable. The body and bezel are made of high-grade aircraft aluminum (7075T6), which has nearly the strength of steel, yet one-third the weight. Accidental drops and falls will result in no (or minimal) damage to the case of the light.

The light source is a Luxeon III® high-powered LED emitter, which, since it is solid-state, has no filament to break or burn out. The anticipated lifespan of the Luxeon III® emitter is at least 50,000 hours of on-time (about 5.7 years constantly on), so that in normal use it will never have to be replaced.

The Fire-Fly 3 is rechargeable, which means it is nearly free to use. No need to worry about consuming expensive single-use batteries, nor about polluting the environment with the used cells. With a second battery ready, you can have continuous light, as the spent cell is recharged. The Nano® charger is tiny, and is
compatible with power worldwide, so it’s easy to keep a spare cell ready to go. (Spare cells are available separately.)

The Fire-Fly 3 may be used with a standard, non-rechargeable CR123 cell, but this does not give the best performance. Using the CR123 cell will not give full (max) brightness, but if necessary it can provide sufficient light for some time.

**Special precautions:**

The Fire-Fly 3 is a high-performance light. There are some things to note about the light that may be unfamiliar to the newcomer:

**Warning:** The light will get hot! Due to the high power of the light, when in **max** mode, and to a lesser extent in **high** mode, the light will heat up. **This is normal,** and means that the heatsinking designed into the light is working properly. The Luxeon III® emitter needs to be kept under a certain maximum temperature, and the heatsinking conducts the heat away from the emitter to allow this to happen. **For best performance of the light,** and comfort to the user, hold the light in the hand while using it in **max** mode. The hand provides additional cooling, and keeps the overall light temperature lower. **When picking the light up after it has been on unattended for some time, be careful of the heat.**

**Caution:** Limit use of **max** mode to 30-45 seconds. Due to the heat produced, and the strain that **max** mode places on the battery, it is best to minimize use of **max** mode. **High** mode is usually sufficient for most situations that require a lot of light, and extends the runtime of the charge in the battery.

**Caution:** Use only the battery supplied with the light or exact replacements. The battery used in the Fire-Fly 3 flashlight is a high-performance unit. The battery is a protected Lithium-Ion cell (type RCR123). This means that the voltage it produces is higher than a standard non-rechargeable lithium cell (CR123 cell), so it should not be used to replace a CR123 cell in other applications – it can damage them.

**Warning:** The RCR123 cell must not be overcharged, over-discharged, or short-circuited. While the cell included with this flashlight contains a protective circuit to prevent any of these conditions, it is best to avoid these conditions altogether. The Fire-Fly 3 driver circuit is designed to prevent over-discharge of the cell, and the included Nano charger prevents over-charging of the cell. Under normal usage conditions, the user does not need to be concerned about these conditions. For best safety, do not use an unprotected Lithium-Ion battery in the Fire-Fly 3. **Use of an unprotected cell in the Fire-Fly 3 will void the warranty.**

**Warning:** General safety concerns with Lithium-Ion (Li-Ion) cells:

- do not overcharge
- do not over-discharge – this shortens the lifespan of the cell
- do not short-circuit cell
- do not allow cell to get wet
- do not heat or dispose of in fire (can cause explosion)
- do not puncture cell
- recycle battery where proper facilities exist
Important: Keep the battery topped up. Expected lifespan of the Lithium-ion cell is 300 or more full recharges. It is better to recharge more often, rather than to use all of the battery’s charge before recharging. The self-discharge of the Lithium-Ion battery when not in use is 1%-2% per month. That means, even though it has not been used, the charge in the battery will diminish over time. With limited use of the Fire-Fly 3, expect to recharge the cell about once per month. Heavier usage may require charging once or twice weekly for best results.

NEVER use a battery or combination of batteries with a voltage higher than approximately 5.5V with the stock FLuPIC module. To use higher voltages, a different electronics module is required. These can be purchased separately on special order. Please contact us for further information.

Replacement Parts:

If any parts ever need to be replaced, the Fire-Fly 3 is modular, so that the emitter and electronics can be easily removed and replaced. Due to the design of the Fire-Fly 3, the light is easily user-serviceable (a rare choice in today’s manufacturing world!). Any parts that are damaged or broken are available as replacements. Heatsinks are available separately if you want to build your own custom module (with your choice of emitter and driver boards). We can also build modules with your choice of board and emitter. Please contact us for further information.
Using your **Fire-Fly 3**: 

*Operating the Fire-Fly 3:* 

To use the flashlight, simply turn the head clockwise (tightening motion) until the light comes on. *Do not over tighten the head, as it can crush or damage the battery relatively easily.* Turn the light off by turning the head counter-clockwise (loosening /unscrewing motion).

*Changing Modes:* 

To change to a different mode, turn the light off and back on quickly (in less than 800msec (0.8 seconds)). The light will change to the next mode in the User Interface (UI) each time the light is rapidly turned off and on. If the light remains in a particular mode for more than 0.8 seconds, it will give a quick blink to show that it is now too late to change the mode. Once turned off after this, the light will return to the first mode in the UI. Please see *Figure 1* for a clear picture of how the UIs function.

In each UI (except for UI3), the light will begin in mode 1, then progress to mode 2, and so on sequentially. In UI3, the light will start at mode 1 or mode 2, whichever was last used.

*Setting Brightness Levels:* 

When setting User-set brightness, please keep in mind that there are 20 levels of brightness to choose from. These begin at dimmest for level 1, and go to brightest at level 20. The default levels from the factory are **Low** = level 3, and **High** = level 15. We feel these choices will provide a good separation of **Low** and **High** brightnesses, but users can easily change the levels to suit their own needs. When setting the brightness, the light will start at dimmest level and ramp up to the brightest level. Turning the light off at the desired brightness level will lock in that setting.

*Switching User Interfaces (UIs):* 

When switching from one UI to the next, first advance to the “change UI” setting. While in this mode, the light will flash once for UI1, twice for UI2, etc. Turning off the light between the flashes will place the Fire-Fly 3 into the last mode flashed. For example, turning the light off after 3 flashes will leave the light in UI3.

*Important:* When the charge in the battery is depleted, the light will shut off abruptly. This means the protective circuit has activated to prevent the battery from over-discharging. Waiting a few minutes and using the **low** mode will extend the amount of runtime, as the battery will recover slightly when it is given a chance to rest. However, it is best for the battery to be recharged at this time, rather than trying to extend the runtime in this way. **Overall number of recharges can be reduced if the cell is depleted fully before recharging.**
**Charging your battery in the Nano® charger:**

Charging the cell is simple:

- unscrew the **Fire-Fly 3** head from the body completely
- remove the cell from the body
- place the cell in the charger, carefully observing polarity
- unfold the prongs from the back of the charger
- plug the charger into an electrical outlet.

The LED in the charger will light up in red to show the charger is charging, and will turn green when the charging is complete. Unplug the charger from the outlet, and remove the cell from the charger. *Store the charger with the prongs folded to avoid damage to them.*

To replace the cell in the light, simply drop it negative (flat end) first into the body, then replace the head by screwing it into place.

**Note:** When the cell is charged, the material inside it expands. This means that if the cell seems a tight fit in the flashlight immediately after charging, it will reduce in diameter with use, so that it will come out readily when it is discharged. This is normal behaviour with a battery of this type.

**Ordering custom UIs:**

If the default UIs do not meet your specific needs, you can order a custom UI. The modes can be in any sequence. The modes include **low, high, max, strobe, SOS, set userbrightness, set strobe frequency,** and **no light.** There are a maximum of seven selectable modes per UI. The “switching to other UI” mode is always the last mode in the UI, and is additional to the seven selectable modes.

Ordering a custom UI can be done by sending an email to **Spark Illuminations** at [ordering@sparkilluminations.com](mailto:ordering@sparkilluminations.com), with your choice of modes and the order in which you want them. Please send a Paypal payment of $12.00US to cover the cost of the modification, including return shipping for your light after it is reprogrammed.

Your light should be sent to us at the **Contacting Us** address below.
**Warranty:**

This **Fire-Fly 3** flashlight is guaranteed to be free of defects in material and workmanship for five (5) years from date of purchase. Any defects in materials or workmanship occurring during this period will be repaired or replaced, at the choice of **Spark Illuminations**. Any replacements required during this period will be done with a part of equal or greater value, if an exact replacement part is not available.

*Exclusions from this warranty:*

- finish (anodizing)
- glass lens due to breakage
- O-ring seals, due to their consumable nature.

**Important: Repairs required due to abuse or neglect are not covered by this warranty.**

To obtain warranty service, return the flashlight to **Spark Illuminations** at the **Contacting Us** address below.

Return shipping by Airmail postal service will be paid for by **Spark Illuminations**.

**Contacting Us:**

Mailing address:

**Spark Illuminations**  
45 Dalbeattie Avenue  
Toronto ON  
CANADA M9N 2Y6

Phone:  416-525-4327  (10am-7pm EST, Monday-Friday)  
Email:  info@sparkilluminations.com  
Website:  http://www.sparkilluminations.com

**Technical help:**

Email tech-help@sparkilluminations.com, or call 416-525-4327 between 10am-7pm EST, Monday to Friday.
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User Mode 1 (Default)
- Low Brightness Level (User Settable 1-20)
  - Off in < 800ms
- High Brightness Level (User Settable 1-20)
  - Off in < 800ms
- Max Brightness
  - Off in < 800ms
- Nothing (Led Off)
  - Off in < 800ms
- Set Mode
  - 1 Flash – Mode 1
  - ... 5 Flashes – Mode 5

User Mode 2
- Low Brightness Level (User Settable 1-20)
  - Off in < 800ms
- High Brightness Level (User Settable 1-20)
  - Off in < 800ms
- Strobe (10 hz)
  - Off in < 800ms
- SOS
  - Off in < 800ms
- Set User Brightness
  - 1 Flash – Set Low Level
  - 2 Flash – Set High Level
  - Off in < 800ms
- Nothing (Led Off)
  - Off in < 800ms
- Nothing (Led Off)
  - Off in < 800ms
- Set Mode
  - 1 Flash – Mode 1
  - ... 5 Flashes – Mode 5

User Mode 3
- Low Brightness Level/High Brightness Level (User Settable 1-20)
  - Off in < 800ms
- High Brightness Level/High Brightness Level (User Settable 1-20)
  - Off in < 800ms
- Strobe (10 hz)
  - Off in < 800ms
- SOS
  - Off in < 800ms
- Set User Brightness
  - 1 Flash – Set Low Level
  - 2 Flash – Set High Level
  - Off in < 800ms
- Nothing (Led Off)
  - Off in < 800ms
- Nothing (Led Off)
  - Off in < 800ms
- Set Mode
  - 1 Flash – Mode 1
  - ... 5 Flashes – Mode 5

Note:
1. Although the states are labeled Low Brightness Level and High Brightness Level, it is conceivable that the user sets Low brighter than High
2. When in Set User Brightness, the led will flash once signifying the user is going to set the Low brightness and then flash twice for High
3. When in Set Mode, the led will flash once, twice, three times. If the user turns off the light after the flashes, the corresponding mode will be set
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User Mode 4

Low Brightness Level  
(User Settable 1-20)
- Off in < 800ms

High Brightness Level  
(User Settable 1-20)
- Off in < 800ms

Max Brightness
- Off in < 800ms

Strobe  
(10 Hz)
- Off in < 800ms

SOS
- Off in < 800ms

Set User Brightness  
(1 Flash = Set Low Level  
2 Flash = Set High Level)
- Off in < 800ms

Nothing  
(Led Off)
- Off in < 800ms

Set Mode  
(1 Flash = Mode 1  
...  
5 Flashes = Mode 5)
- Off in < 800ms

User Mode 5  
(Tactical)

Strobe  
(10 Hz)
- Off in < 800ms

Max Brightness
- Off in < 800ms

High Brightness Level  
(User Settable 1-20)
- Off in < 800ms

Low Brightness Level  
(User Settable 1-20)
- Off in < 800ms

Nothing  
(Led Off)
- Off in < 800ms

Set Strobe  
(2 Flashes = Strobe from 4 hertz to 15 hertz every 1 second)
- Off in < 800ms

Set Mode  
(1 Flash = Mode 1  
2 Flash = Mode 2  
3 Flash = Mode 3)
- Off in < 800ms

Note:
1. Although the states are labeled Low Brightness Level and High Brightness Level, it is conceivable that the user sets Low Brighter than High
2. When in Set User Brightness, the led will flash once signifying the user is going to set the Low brightness and then flash twice for High
3. When in Set Mode, the led will flash once, twice, three times. If the user turns off the light after the flashes, the corresponding mode will be set