

Overview: The MiniLIGHT is a high-performance flashlight that can be programmed for one of three operating modes. It can use ~3V CR123A batteries, or rechargeable ~4V 16340 Li-ion batteries that have a button top (not flat top batteries).

Set operating mode: Turn off the light. Disconnect the battery, then hold both buttons and reconnect it. Release the buttons when you see the red and white lights flashing rapidly. Wait for a single white blink, then press the red button: once for EDC, twice for Momentary, and three times for Basic Clicky. A second white blink marks the end of the input window. Then the light will blink the new operating mode back in red and white.

Common functions: (Available in all operating modes)

Red light on/off.....Single red button press (red just has one brightness level)

Random Strobe.....Quickly press white-red-white sequence

Blink out battery voltage.....Press and hold both red and white buttons at the same time till the red light blinks out battery voltage. Ex: 3.5V = three red blinks, pause, five red blinks

Lockout.....quickly press the red button five times. Two white blinks confirm it is locked. Five quick presses of the red button unlocks and, again, two white blinks confirm.

EDC unique operation:

White light on/off in last brightness level.....Single white button press (turns red light off if it was on)

Set white brightness level.....White button hold, then release on desired brightness level

Turn on in dimmest white setting.....Hold the white button and release when the white light comes on

Turn on highest steady-state white setting.....Double click white button

Li-ion overdrive.....Double click white button, then hold white button

Momentary unique operation:

Momentary white light.....Press and hold the white button

White on continuously.....Double click the white button

Basic Clicky unique operation:

Cycle through modes.....White button press. The loop order is: white 1, white 2, white 3, white 4, white 5, white 6, white 7, white 8, white 9, beacon, SOS, (Repeat)

Turn off white light.....Press and hold white button from any mode

Battery-removal note: Hold position one hand to catch the battery and with the other hand, use your wrist to accelerate the MiniLIGHT and battery, then stop the light while the battery breaks free of the magnet and comes out in your first hand. Hitting the light against your hand or a surface does not work well. It may take a few attempts, but you will only have to figure it out once.

MiniLIGHT SPECIFICATIONS

Light Output Specs		
	Output (Lumens)	Runtime (hours)
High	150	1.5
Med	60	5.5
Low	15	23.5
Overdrive (Li-ion only)	300	20 second bursts
Random strobe	150 (pulsed)	4
SOS	15	65 hours
Beacon	150 (pulsed)	290

Other specs	
Dimensions (inches)	2.53 x 1.11 x 0.875
Weight -empty (grams)	32
Weight -with CR123A (grams)	49
Water resistance (Ingress Protection Rating)	IPX7
Drop resistance (meters)	1

Features

CREE XM-L2 U3 LED for 150 Lm output continuous and over 300 Lm in a momentary "Overdrive" mode

- Light output remains constant till battery depleted
- Hotspot with flood beam pattern
- Ultra lightweight polymer construction
- Multi-fuel: 1X CR123A lithium cell, or 1X rechargeable 16340 li-ion (sometimes called RCR123A)
- Magnet for quick attachment to pic rail accessory or to nearby steel items
- Programmable for three modes of operation (Every Day Carry, Momentary, and Reverse Clicky)
- Intuitive operation with two button interface
- Large button controls white light.
- Dedicated red button for night vision preservation
- Separate circuit for red leds for redundancy
- Able to tailstand for area illumination
- High-efficiency electronics for extended runtime using current-control for the light.
- Extremely low standby current drain
- Random strobe, SOS, and beacon outputs

MiniLIGHT FULL INSTRUCTIONS

A Note from Our Engineers

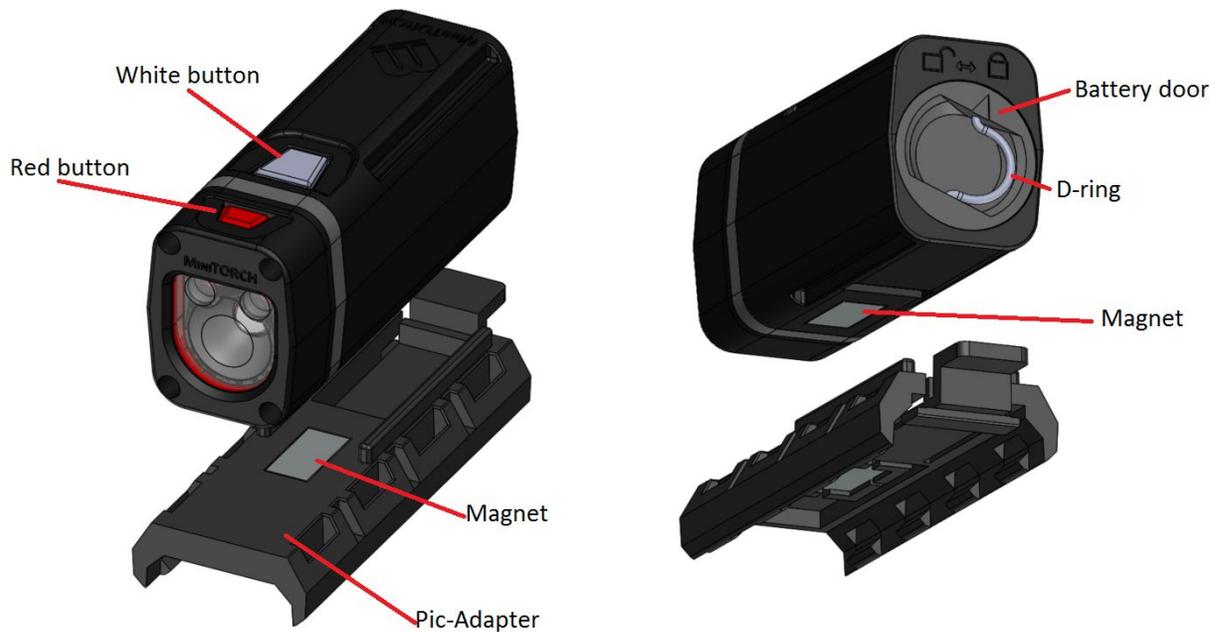
Before shipping your light, we ran it through several tests to make sure that it was operating as it should. These tests include: leakage current when off, white light intensity, red light intensity, voltage measurement accuracy, temperature measurement accuracy, and current draw for each on-state.

Please read these instructions! They will help you get the most out of your flashlight and answer many common questions.

MiniLIGHT Overview

The MiniLIGHT is a high-performance flashlight that can be powered by a single CR123A primary cell, or a rechargeable 16340 cell. The MiniLIGHT has three operating to choose from, depending on the intended use of the flashlight. These selectable operating modes allow for a wide range of functions without the usual clutter.

Hardware overview



The MiniLIGHT has a high-power white LED, two red LEDs, and two corresponding buttons. The MiniLIGHT's primary light-emitting diode (LED) is CREE's XM-L2 (U3) which is coupled with a total

internal refraction (TIR) optic. The MiniLIGHT has two CREE, high-efficiency, red LEDs for preserving dark-adapted vision.

The smaller, red button generally controls the red light while the larger button controls the white light. The larger button will be referred to as the “white button” since it controls the white light, even though it is grey in color. Both buttons can be used for special input sequences that control functions such as strobe, or lockout.

The MiniLIGHT includes a high-strength Neodymium magnet for attaching the flashlight to a quick-connect pic rail adapter (Pic-Adapter). This magnet can also be used to attach the light to steel objects.

Battery type

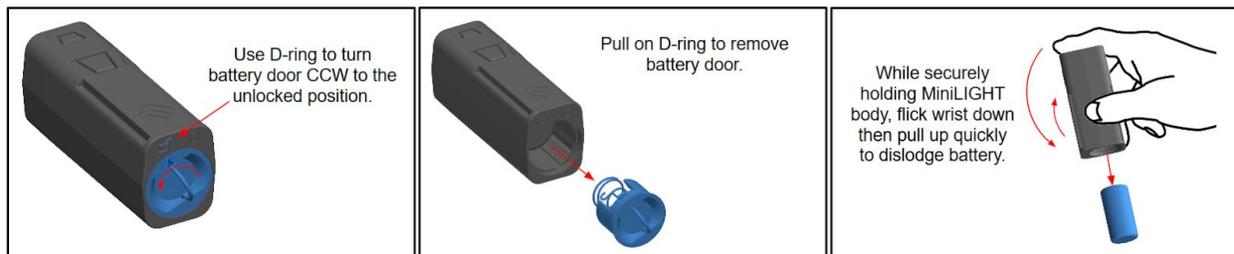
The MiniLIGHT can use a ~3V primary cell, or two types of ~4V Li-ion rechargeable batteries. The higher voltage of the Li-ion batteries allows for an “Overdrive” mode where, for a short period of time, the light can output over 300 Lm. Because of the difference in capabilities, the MiniLIGHT must know what kind of battery is installed. If the battery voltage is above 3.3V on startup, the MiniLIGHT will set itself to Li-ion mode, otherwise the MiniLIGHT will set itself to CR123A mode.

Switching battery types

If you are changing the type of battery from CR123A to Li-ion, or the other way, check that the new battery has been correctly identified. The MiniLIGHT checks the battery type on power-up, but **because of the MiniLIGHT’s extremely low leakage current when turned off, it needs to have its battery removed for at least 30 seconds to be sure that the internal capacitors have been discharged all the way.** The battery type is retested whenever the “Blink-out battery type and voltage” feature is used. So, if you don’t want to wait for the capacitors to discharge, simply hold down the red and then white buttons till the battery type is flashed, and the device will be set to the new battery type. Confirm one red flash for CR123A and two for Li-ion.

If a Li-ion cell is used with a voltage of 3.3V or less the light will incorrectly identify it as a CR123A and disable the overdrive modes. We consider this acceptable because a Li-ion cell with that low of voltage is nearly discharged and would only be able to support the high current draw of the overdrive modes for a short period of time, if at all.

Battery installation and removal



The MiniLIGHT’s battery compartment is accessed by flipping up the d-ring and turning the battery door so that its arrow points to the “open lock” graphic on the body. The battery door completes the circuit

from the negative terminal of the battery to the main circuit board. The battery door is keyed so that it can only go in one way, however, with enough force, this feature can be defeated. If you have to force the battery door in, check that you have the orientation correct; the arrow on the battery door should be pointing towards the “open lock” graphic.

The battery is inserted with the positive terminal forwards. The MiniLIGHT can use ~3V CR123A batteries, or rechargeable ~4V 16340 Li-ion batteries that have a button top (not flat top batteries).

When a battery is inserted, the magnet will pull it in. Once in, the battery is held in place by the magnet and will not come out with gravity alone. To remove the battery, hold position one hand to catch the battery and with the other hand, use your wrist to accelerate the MiniLIGHT and battery, then stop the light while the battery breaks free of the magnet and comes out in your first hand. Hitting the light against your hand or a surface does not work well because the deceleration is not long enough for the battery to escape the magnet’s pull. It may take a few attempts, but you will only have to figure it out once.

Operating modes

The MiniLIGHT has three operating modes:

- **EDC** (Every Day Carry), for general operation with shortcuts to common functions
- **Momentary**, for simple max-output operation
- **Basic Clicky**, for simple access to many functions through a single loop

To set the operating mode, first turn off the flashlight. Then disconnect the battery by rotating the battery door. Hold both buttons and reconnect the battery. The red and white lights will begin to rapidly flash. Let go of the buttons. Then wait for a single flash of the white light. Once you see that flash, press the red button once for EDC, twice for Momentary, or three times for Basic Clicky. If the light gets an invalid input, it will default to EDC. A few seconds later, the white light will flash again

EDC

The general operation of EDC mode is that a press of the white button turns on the white light in one of three brightness settings, whichever was used last. Once the white light is on, holding the white button cycles through the three brightness levels starting with low, than medium, and ending on max. Simply release the white button when you get to the desired brightness level.

The red button turns off the white light (if it was on) and turns on the red light. There is just one brightness level for the red light.

EDC special functions:

Dim-on

At times, you may want the white light come on in the dimmest mode regardless of what brightness setting was used previously. From the off-state, hold the white button till the light comes on in the dimmest mode and release. If you would like one of the other brightness levels, continue holding the white button till that level is reached.

Max-on

To have the white light come on in the brightest steady-state setting, from the off state, simple double click the white button.

Overdrive

When using Li-ion batteries, it is possible to run the light at a higher-than-max level for short periods of time; this is called overdrive. To enable overdrive, from the off-state, double click the white button to put the flashlight in Max-on, then hold the white button till the light output increases. The light remains in Overdrive while you continue to hold the white button. When you release the white button, the light dims to the “Max” level. After about 20 seconds, the overdrive mode times out and the light dims to the “Max” level. You can re-enable overdrive, but we do not recommend using overdrive in a back-to-back continuous manner as this can trip the thermal protection or possible damage your flashlight.

Momentary

Momentary is the simplest operating mode. Pushing-and-holding the white button turns on the white light in the brightest possible setting (Over 300 Lm Overdrive for Li-ion and 150 Lm for CR123A). Releasing the white button turns off the light. Double clicking the white button turns the white light on in the maximum continuous setting (150 Lm for both battery types)

The red button turns off the white light (if it was on) and turns on the red light. There is just one brightness level for the red light.

Basic Clicky

Think of basic clicky as a big loop of functions starting with the dimmest white light, going up eight more levels, then beacon, and finally SOS (then back to the dimmest white). Short presses of the white button advance through the loop and a long hold of the white button turns the light off.

The red button turns off the white light (if it was on) and turns on the red light. There is just one brightness level for the red light.

Common special functions

These special functions are common to all of the operating modes.

Strobe

Starting in the off-state, a triple-white press input sequence enables the random strobe function.

The strobe flashes between 10 and 20 Hz at the highest possible intensity, creating a very disorienting effect. With fresh Li-ion batteries, the flash is at over 300 Lm Lm for 1 minute and then it drops down to 150 Lm. If a CR123A is used, the flash starts at 150 Lm and will continue at that level till the battery can no longer support the current draw.

Blink-out battery voltage

You can determine the battery's voltage by first turning off your flashlight. Then press-and-hold both the red and white buttons. After about 2 seconds, the red light will blink the number of volts, then wait, then blink the number of hundreds of millivolts. So, if the battery is at 3.5 V, you would see three red blinks, then a pause, then five more red blinks.

Lockout

You can lock your flashlight so that accidental button presses cannot turn it on accidentally and drain the battery. From the off-state, press the red button five times in quick succession, then you will see two white flashes, and the flashlight will be locked. When locked, the flashlight does not respond to button presses except for a quick flash of the red leds; this state is remembered across power-cycles so disconnecting the battery will not re-enable the flashlight. To re-enable the flashlight, simply press the red button 5 times in rapid succession, just like you did to lock it. Then you will see two white flashes and the flashlight is unlocked.

LED choice and binning

Currently, the XM-L2 LED is the highest-performing, commercially available, single-die LED. CREE tests each LED individually and assigns them to a "bin" depending on their light output. The MiniLIGHT uses the U3 designated parts, which is the highest efficiency bin for the XM-L2.

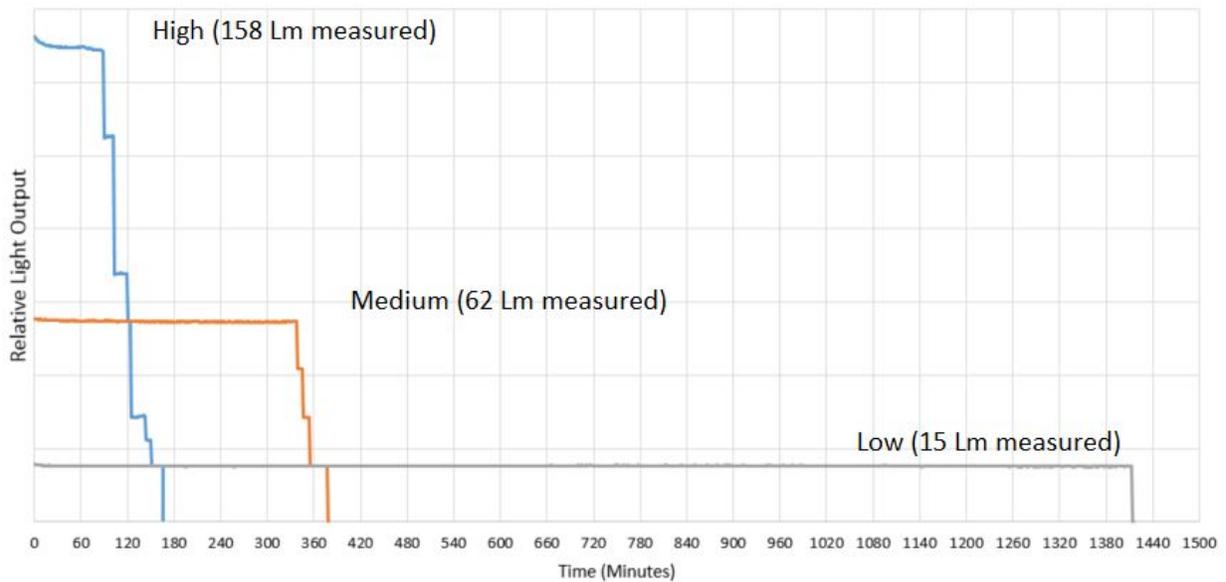
Source:

<http://www.cree.com/LED-Components-and-Modules/Products/XLamp/Discrete-Directional/XLamp-XM-L2>

Light output for deeply discharged batteries

As the battery is discharged, at some point it will no longer have enough voltage at its terminals for the flashlight to operate. If this happens when the white light is active, the device will drop the power output of the white light and restart operation. You will probably notice the light go out and then turn back on at a slightly lower power level. If you have another battery handy, not would be a good time to swap it in. See the discharge curves below to get some idea of how the light level drops off for the different power levels.

Light123A Discharge with CR123A cell



The 158, 62, and 15 Lumens were measured by a third party using a calibrated light sphere. The runtime tests were done in-house using a less sophisticated setup.

Off-state current draw

Though each light is tested, we cannot be sure about the conditions the battery will be used in and cannot guarantee a battery storage life. Storing the flashlight at elevated temperatures will cause higher discharge rates in the off-state. Li-ion cells are useful for frequently used lights because they are rechargeable. However, Li-ion cells have a higher self-discharge rate than the CR123As. So, if the flashlight is going to be an infrequently used backup, then we recommend using CR123As.

Warranty

30-day money back guarantee: If you do not like the device or it will not suit your intentions just ship it back to us undamaged within 30 days from purchase date and we will refund the device cost to you once inspected for damage and cleared. Shipping costs will not be refunded.

2-year manufacturer warranty: If the device arrives damaged or becomes inoperable within a 2 year time period due to a manufactures defect, just ship the unit back to us and we will fix the issue or replace the unit at no cost. The buyer will not be charged any additional shipping costs other than that with initial purchase if exchanging/returning a device with manufacturer defects within 2 years of purchase date. If returned device is damaged due to user error, no refund or additional shipping costs will be covered.

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