

## New Guts, New Glory

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SureFire's new M3LT flashlight, an LED version of its best-selling M3T, takes this popular CombatLight® to new heights.

By Sean P. Egen

**DON'T** call it an upgrade. That's sort of like calling a Shelby Mustang a mere hood-ornament version of a stock Ford model. It brushes too quickly over a whole lot of increased muscle and personality.

Call it a transformation. Or a metamorphosis. Or what it actually is: a complete re-engineering of one of SureFire's most popular CombatLights—the M3T—from the inside out.

The new M3LT CombatLight is a dual-output LED version of SureFire's popular incandescent M3T, with more output and more runtime. Like its predecessor, it features a 2.5" Turbohead bezel for an extended-reach beam, has a rugged aluminum body with SureFire's patented CombatGrip for easy pairing of the light with a handgun, and is compact and light enough to carry in a coat pocket.

But that's about where the similarities end

because, performance-wise, like with Carroll Shelby's Mustang, the M3LT's superior technology kicks up a whole lot of dust. Luckily, its O-ring sealing keeps such debris out and away from its sophisticated electronics.

### Intent To Praise, Not Bury

Let's make one thing perfectly clear: the M3T is an awesome flashlight. I should know; I own one. As part of SureFire's "Special Operations" family of flashlights, it cranks out a far-reaching, blinding beam designed for searching, target identification, and other tactical applications. It comes standard with a lower-output lamp (125 lumens) for tasks where 225 lumens of light is overkill. And it has a built-in shock-isolation system to help keep the lamp's filament or glass window from breaking.

But the tungsten filament in the lamp *will* eventually burn out because it's literally consumed in the process of creating light with an incandescent lamp. Which means every incandescent lamp eventually needs to be replaced, no matter how careful you are with it. And this is where the M3LT's solid-state LED technology represents a giant leap forward.

LEDs have no filament or glass to break, so they don't need replacing. But the knock against LEDs has been that they weren't capable of generating the massive outputs incandescent lamps were. *Weren't*. That's now out the door, thanks to an incredible four-die (diode) LED.

### New Breed Of Emitter

Most LED flashlights use a single-die LED, a solitary chip covered with a clear polymer dome, which tends to peak around the 200-lumen mark. But the M3LT uses a four-die LED capable of generating an incredible 400 lumens of light.

"On a four-die, we have four little squares that are emitters that produce the light," says Dave Wilson, one of the engineers on the SureFire team that created the M3LT. "So, basically, we're quadrupling the output of that LED, because now we have more emitters inside that bubble."

The emitter is only half of the equation in creating a kick-ass beam. The other half is the optic, the thing that actually takes the light and projects it forward, creating the beam's shape and reach in the process. In general, the larger the optic, the tighter the beam, and the farther it reaches into the darkness.

The original M3T's optic is a 2.5" diameter reflector, roughly twice the diameter of the reflectors used in most SureFire flashlights. This extra-large Turbohead reflector, sits behind the lamp and provides the extended reach for which the M3T was designed.

On the M3LT, SureFire engineers decided to use what's called a Total Internal Reflection (TIR) lens—a precision optic made of a clear polymer—instead of a reflector. Because a TIR lens is placed over the LED instead of behind it, no light is lost bouncing off a reflector.

"Instead of having a mirrored surface on the outside of this object, I'm able to shine a light inside," Wilson elaborates. "And, because of its shape, the TIR is able to take that light, and we're able to control how the light bounces and then comes out the top end."

The challenge was to make sure the M3LT provided the same extended-reach beam for which the original M3T was renowned. To accomplish this, the TIR lens on the M3LT had to be the same size as the M3T's reflector—2.5". While many SureFire LED flashlights have sported TIR lenses for years, the company had yet to deal with a lens of this magnitude. The end result was a special Turbohead TIR.

"We were driving the TIR a lot harder than it was originally designed for, but it's performed a lot better than we could've asked for," adds Wilson. "We're getting 400 lumens out of this light on high, which, out of a handheld, is magnificent."

Magnificent may be an understatement. In fact, the only handhelds in SureFire's product line more powerful than the M3LT are the M6® Guardian® and the 10X Dominator®, both of which deliver maximum outputs of

### SureFire M3TL and M3LT-S Specifications

<b>MAX OUTPUT</b>	High: 400 lumens
	Low: 70 lumens
<b>RUNTIME</b>	High: 1.7 hours
	Low: 8.5 hours
<b>WEIGHT</b>	With Batteries: 10.9 ozs.
<b>LENGTH</b>	8.7 inches
<b>BEZEL DIAMETER</b>	2.5 inches
<b>POWER SOURCE:</b>	three 123A lithium





500 lumens and both of which use incandescent lamps. (Which means their lamps need periodic replacing, remember?) But neither of these two incandescents has near the runtime of the M3LT because of its next big selling point— electronic power regulation.

### Power Management

“Power management” may be debatable where you work, but inside the M3LT it’s not up for discussion. That’s because a tiny computer actually monitors the LED and the batteries and controls precisely how much power gets sent to the LED.

“We’re able to do things with that LED that your eyes really cannot pick up. We can drive it a lot harder, and then we can taper the power off, based on reading the battery,” says Wilson. “We’re able to precisely manage how many lumens are being put out.”

The result is two useful tactical-level outputs—70 lumens on low, 400 on high— plus substantially more runtime from a set of batteries. (We define “tactical-level output” as enough light to overwhelm a bad guy’s night-adapted vision.)

How much more? The original M3T runs for about 20 minutes on a set of three 123A lithium batteries (60 minutes with its 125-lumen lamp). The M3LT, on the

other hand, delivers tactical-level output for 1.7 hours on the same three batteries and continues producing useful output levels for almost nine hours. Which means you need to carry fewer spare batteries— and zero spare lamps— in the field.

The one knock against the M3LT is that it can’t be used with night vision devices on stealth missions requiring “invisible” infrared light. This is because white-light LEDs produce negligible amounts of infrared radiation, so placing an IR filter over one doesn’t work like it does when that same filter is placed over an incandescent lamp, which produces a lot of IR radiation. If you need IR illumination to use with NODs, look into a SureFire V2 Vampire™, which generates two levels of both white and IR LED light from the same sealed head— no IR filter required.

Finally, it’s worth mentioning that the M3LT’s Turbohead bezel can be easily removed and attached to a SureFire M900 Vertical Foregrip WeaponLight, converting either of the two weapon-mounted incandescent models into higher-output LED WeaponLights with 400 lumens of far-reaching light.

Just one more check on this light’s versatility checklist. And one more reason it’s bound to be another classic in the SureFire CombatLight line.



## STROBE IT

The new M3LT-S CombatLight® features a high-output tactical strobe light. It’s just one of several SureFire models currently available, or soon to be released, with this tactical-strobe feature. Others include the Z2-S, the AZ2-S, and the UB3T Invictus™.

So, why a strobe? Two words: tactical advantage. If you’ve ever been to a nightclub or rave with a strobe light flashing on and off, or seen either in a movie, you know just how disorienting a strobe can be. Now imagine the same thing, only faster, flashing up to 400 lumens of a focused beam directly into your eyes. You can look away or see spots. Either option provides an operator with a distinct tactical advantage in a situation where the two of you are squaring off.

Of course, it’s possible to strobe any SureFire

flashlight with tailcap switching by pushing its tailcap on and off rapidly. But an electronic strobe does the work for you, giving your thumb a break and allowing you to concentrate on neutralizing your adversary instead of pumping your thumb.

“Normally, we set the strobe to 7 Hertz [cycles per second],” says Willie Hunt, SureFire’s VP of Engineering, “but it’s programmable to some degree, by SureFire, not the consumer.”

He adds that strobe output is set for the light’s maximum brightness, but that the battery typically lasts more than twice as long on strobe as it does when maximum output is on continuously because, “The average load is only half and the battery recovers somewhat between pulses.”

It’s worth noting that people who suffer from photosensitive epilepsy (about .00025 percent of the population) could experience seizures or blackouts triggered by a strobe light, so the feature should only be used in emergency situations. ■