BLF LT1 Manual

Please do these before using!

Unscrew the body and remove the insulation paper!

If you have any questions, please contact us
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The product uses copyrighted code released under the GNU Public License v3 (GPLv3).
To know about the exact source code used in the product, please go to
https://tiny.cc/TKAnduril

Specifications

Emitters: 8 x Samsung LH351D(4 x 5000K 90CRI + 4 x 2700K 90CRI)

Luminous Flux: ca. 700 lm

Firmware: The LT1 uses open source software called Andúril, distributed under the terms of the GPL v3. The source code is available from http://tiny.cc/TKAnduril

User interfaces:

• By default the LT1 is set to use the SMOOTH RAMPING mode. STEPPED RAMPING mode is available if you prefer discrete brightness steps.

• MUGGLE mode simplifies the LT1's UI & features to just on/off and smooth ramping. MUGGLE mode also reduces the maximum output level produced by the LT1 to reduce self heating.

•Electronic LOCKOUT mode keeps the LT1 from being turned on accidentally. LOCKOUT mode also provides a momentary low light when the button is pushed.

Other functions:

•Battery check, sunset, beacon, tactical strobe, party strobe, bike flasher, candlelight, & lightning

storm. See the UI Diagram and the following sections for more details of the features and customizations.

Batteries:

•Four button-top 18650 batteries. Max. length 70 mm. Batteries are not included (except kit version)

•Charging: Integrated DC/DC buck charger via USB-C

•Driver: 5 x 7135 constant current integrated circuits. Low parasitic drain while LT1 is powered off.

Body: Aluminum with HA III anodizing

Switch: Electronic side switch

Ingress rating: Equivalent to IPX7

Weight: approx. 405g without batteries

Size: 68 mm Ø head x 176 mm length

Safety precautions

Use only reputable 18650 cells of known origin. Quality cells, button top type cells. The supported maximum length is 70 mm, max diameter is 19mm.

Connect the coming USBC charging cable and recharge the lantern when the low voltage indication is given by the Lamp (repeated step-downs in light level and eventual shutdown of the light).

The extraordinary energy density that 18650 cells offers also means that hazardous conditions are created when a cell is short-circuited or damaged. Always treat cells with respect and properly dispose of damaged cells.

When running at higher output levels the head of the lantern will heat. This is normal. In warmer ambient conditions this temperature may exceed 50ºC depending on your settings, so please take the necessary precautions when handling the Lamp.

Battery Replacement:

Unscrew the body, and insert battery with the anode side(+) towards the light's head/ LED, and then screw the tail cap back on.

Integrated Charger

The LT1 lantern has a USB-C charging port. Please use a quality cable and USB power adapter with 5V / 2A-3A to charge your LT1. While charging the LT1's switch glows BLUE. It changes to steady BLUE when charging is finished. After you unplug the charging cable, the switch is steady ORANGE which indicate enough power left. LT1 can charges your devices such cellphone via 5V / 2A-3A. When the power left in LT1 is not enough, LT1 stops the output.

Quick Start

After putting a battery in the light and tightening the parts together, the light should quickly blink once to confirm it has power and is now operational.   After that, basic usage is simple:
Click to turn the light on or another click to turn it off.
- Hold the button to change brightness.
- Release and hold again to change brightness the other way.

That is all the user needs to know for basic use, but there are many more modes and features available for people who want more.

Before reading the rest of this manual, it is recommended that users look at the Anduril UI diagram(s), which should be provided along with the flashlight.

Button presses

Button presses are abbreviated using a simple notation:
- 1C: One click.   Press and then quickly release the button.
- 1H: Hold.   Press the button, but keep holding it.
- 2C: Two clicks.   Press and release quickly, twice.
- 2H: Click, hold.   Click two times, but hold the second press.
- 3C: Three clicks.   Press and release quickly, three times.
- 3H: Click, click, hold.   Click three times, but hold the final press.

The same pattern is used with higher numbers too. For example, 10C means ten clicks...   and 10H means ten clicks but hold the final press.
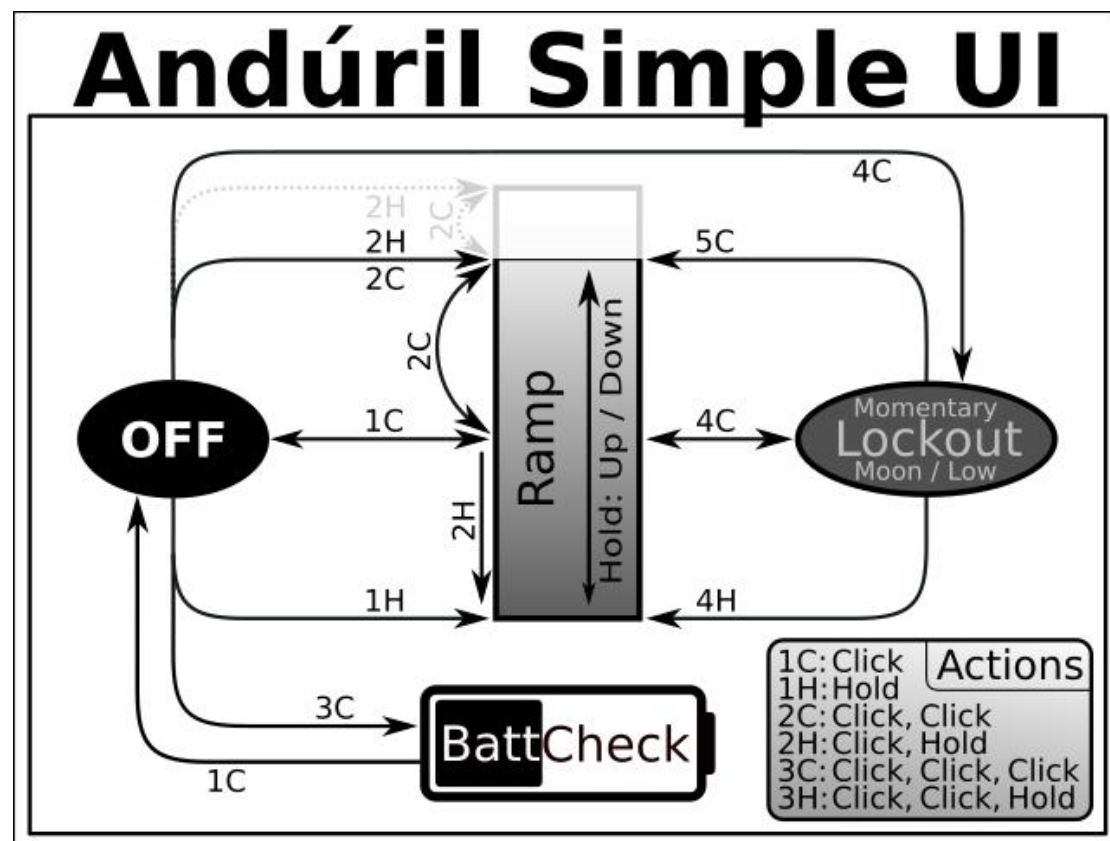
Simple UI

By default, the light uses a simple UI. This is useful if you lend the light to someone else, or if you just don't want to bother with any crazy disco modes.

Simple UI has all the basic functions needed to work as a flashlight, but the minimum and

maximum brightness are limited to make it safer, and any complex or advanced functions are blocked.

Functions available in Simple UI include:
  - 1C: On / off
  - 1H: Ramp up (or down, if button was released less than a second ago)
  - 2H: If light is on : ramp down
        If light is off: momentary high mode
  - 2C: Double click to go to / from highest safe level
  - 4C: Lockout mode.

Some other modes and functions are available too. When the light is off, these are the options:
  - 3C: Battery check mode.   (displays voltage once, then turns off)
  - 4C: Lockout mode.
  - 10H: Switch to Advanced UI.
  - 15C or more: Version check.

In Lockout mode with Simple UI, there are a few functions:
  - 1H: Momentary moon
  - 2H: Momentary low
  - 4C: Unlock and turn on
  - 4H: Unlock and turn on at low level
  - 5C: Unlock and turn on at high level

To **change between Simple UI and Advanced UI**, turn the light off and then
do one of these:
  In Simple UI:
    - 10H: Go to Advanced UI.
  In Advanced UI:
    - 10C: Go to Simple UI.
    - 10H: Configure Simple UI.

If you get lost, or if you want to auto-calibrate the temperature
sensor, do a factory reset.   The process for this is:
  - Loosen body tube
  - Hold button
  - Tighten body tube
  - Keep holding button for about 4s

The light should flicker while getting brighter, then briefly burst to full power. Hold until it reaches full power to do a reset, or let go of the button early to abort.

Advanced UI

Advanced UI has all the advanced functions which are fun to play with but also hard to learn. Please refer the coming UI diagram for better understanding.

Default UI: Smooth ramping

This UI provides smooth dimming of the light output between FLOOR (lowest level) and CEILING (highest level), with an easily accessible 100% TURBO mode.

Switch to STEPPED RAMP: click 3 times while the light is on(If you use 3 clicks from OFF you engage battery check)

Turn the light ON: single-click the button, the LT1 turns ON using the previously used light output level (MEM)

Ramp up&down: hold the button to make it brighter, release button briefly and hold again to make it dimmer.

Turbo: no matter the light is on or off, double click activate Turbo for max brightness.

MOON: press & hold the switch, it turns on at the moonlight(FLOOR level), it makes a subtle "blink" to provide a timing hint if you want to stay there. If you keep holding, it ramps up

Battery check: while light is OFF, triple-click it shows the voltage of battery (3 blinks, a short pause, then 8 blinks would indicate 3.8 V)

Turn OFF: single-click

UI: Stepped ramping

Using this UI the output does not ramp, it steps from one mode to the next using hold. The firmware tries to optimize these steps as equally-spaced on a cube-root curve (considered an ideal mode-spacing by many).

All operations are the same as in smooth ramping Switch to SMOOTH RAMP: when the lamp is ON, Three clicks switch it. (Hint: If you use 3 clicks from OFF you engage battery check)

UI: Momentary mode

5 clicks from OFF to enter Momentary mode

To exit this mode, physically disconnect power (unscrew the light). This mode locks the flashlight into a single-mode interface where the LEDs are only on when the button is held down. It is intended for Morse code and other signaling tasks. Brightness is the last-ramped level, so adjust that before entering momentary mode.

UI: Electronic Lockout

4 clicks form OFF to disable the light, same to re- enable the lamp.

Lockout makes the light safe to carry in a pocket or a bag or anywhere else it might be pressed by accident. Lockout doubles also as a momentary moonlight mode, so the user can do quick tasks without having to unlock the light. It uses the FLOOR of the current ramp.

Blinkies & Strobes

Two groups worth of blinkies are included. To reach Blinkies, do "click click click" from OFF. To

reach Strobes, do "click click hold" from OFF. To change to the next blink use a double-click. These include:

Blinky:

(starts always at battcheck) from OFF: "click click click" to **BattCheck**: Shows the remaining charge in volts and tenths.E.g. 4 blinks, then pause, 1 blink are 4.1 Volt. A "zero" is represented by a very quick blink.

Sunset: Starts at a low level, then slowly dims down to moon for an hour, then shuts off. It is intended for use when going to bed.

Beacon: Beacon mode uses the last ramped level for its brightness. You must adjust the brightness before you turn beacon on. It blinks at a slow speed: Once every N seconds at the last-ramped level. N is configurable in beacon config mode: Click 4 times to enter beacon config mode, wait for the light to stutter, then click to enter the number of seconds per blink. For example, to do a 10-second alpine beacon, click 10 times. (Hint: If you want faster blinks per second use party strobe mode and set it to three blinks per second or more)

TempCheck: Blinks out the current temperature in degrees C. and optionally configure settings for thermal regulation. E.g. 3 blinks, then pause, 4 blink are 34 degrees Celsius. A "zero" is represented by a very quick blink. This number should be pretty close to what a real thermometer says. If not, it would be a good idea to click 4 times to enter thermal config mode, and calibrate the sensor.

Strobes:

(remembers the last-used mode) from OFF: "click click hold" which means click three times, but hold the third click for a moment. To change to the next strobe use a double-click.

To set adjustments you can use:

-Hold: Increase brightness, or strobe faster. (except lightning)

-Click, hold: Reduces brightness, or strobe slower. (except lightning)

Candle mode:

Simulates a flickering candle or fireplace, until you switch it OFF. Or you add timer for 30min: Each triple click adds 30 min including a burn down simulation at the end. Candle mode timer can go for up to 4.5 hour. If you buy diffuser of LT1 separately, you can turn the light into a candle.

Bike flasher:

Steady output with a "stutter" once per second. Designed to be more visible than a normal ramping mode, but otherwise works mostly the same. Adjustable brightness.

Party strobe:

Motion-freezing strobe. Can be used to freeze spinning fans and falling water. Adjustable speed.

Tactical strobe:

Bright, disorienting strobe light. Can be used to irritate people. Adjustable speed, and the duty cycle is always 33%.

Lightning storm mode:

Flashes at random brightness and random speed to simulate lightning strikes during a busy lightning storm. Do not look directly at the flashlight when this mode is running, because it may suddenly go to full power without warning.

Thermal configuration

Look at a thermometer to check the current room temperature. Let us assume it says 21 Celsius. Turn the light off and wait for its temperature to settle to room temperature. Go to TempCheck (from OFF: "Click Click Click" Ascend with double-clicks three times) When you are in TempCheck, then click 4 times to enter thermal config mode, and calibrate the sensor.

Thermal config mode has two settings:

1. Current temperature Calibration. Click once per degree C to calibrate the sensor. For our example, the ambient temperature is 21 C = click 21 times.

2. Temperature limit. This sets the maximum temperature the light can reach before it will start doing thermal regulation to keep itself from overheating. Click once

per degree C above 30. For example, to set the limit to 50 C, click 20 times. The default is 45 C (15 clicks).

Hint: If you don't click, the lamp will leave the value unchanged. The lowest value the user can set is 31 C, by clicking once.

Switch LED

The switch LED can be configured to do different things while the main emitters are off. There is one mode for the regular OFF mode, and another mode for LOCKOUT mode. This allows the user to see at a glance whether the light is locked.

Switch LED modes typically include: Off - Low - High - Blinking

To configure the LEDs, go to the mode you want to configure and then click the button a few times:

  -While flashlight is OFF, 7 clicks to change switch led from Low-High-Blinking-OFF

  - While flashlight is LOCKOUT, 3 clicks to change switch led from Blinking-OFF-Low-High.

The switch LED stays on while the flashlight is on, the switch led goes to High while flashlight goes to higher lumens, the switch led goes to Low while flashlight goes to lower lumens.

Protection Features

Some features which aren't visible on the diagram: Andúril includes low voltage protection (LVP) and thermal regulation. LVP makes the light step down to a lower level when the battery is low, and if the light is already at the lowest level, it shuts itself off.

This activates at 2.8V. LVP adjustments happen suddenly, in large steps.

Thermal regulation attempts to keeps the light from overheating and otherwise adjusts output to stay as close as possible to the user-configured temperature limit. Thermal adjustments happen gradually, in steps so small they are difficult for humans to perceive. It ramps smoothly across 512 internal steps (from 1x7135 to full power) to adjust output while it searches for the highest level it can maintain without overheating.

FAQ

-why the item won't work without plug?

Solution: uncrew the body and remove the round insulating paper, screw back and try click again.
-why the item flashes improperly?
Solution: screw the tube, clean the contacts with clean cloth with alcohol. Screw back tightly again.

Usage and Maintenance:

※ Disassembling the sealed head can cause damage to the light and void the warranty.

※ Sofirn recommends using high-quality batteries. If the flashlight will not be used for an extended period, please remove the battery, or the flashlight might be damaged by the electrolyte leakage or battery explosion.

※ Please unscrew the tail cap one-half turn or take out the battery to prevent accidental activation during storage or transportation.

※ please use cleaning cloth to clean the thread every 6 months, and it will be better to use silicone grease to oil thread.

※ Long-tern usage can result in O-ring wear. To maintain a proper water seal, replace the ring with an approved spare.

※ Periodic cleaning of the battery contacts improves the flashlight's performance as dirty contacts may cause the flashlight to flicker, shine intermittently or even fail to illuminate for the following reasons:
Reason A: The battery needs replacement.
Solution: please replace battery. Please confirm the correct installation Reason B: The threads, PCB board contact or other contacts are dirty.
Solutions: please clean the contact points with a cotton swab soaked in rubbing alcohol.

If the above methods do not work please refer to the warranty policy before contacting your authorized distributor.

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Please contact us if you have any questions.
If your product is defective please contact us for refund or replacement within warranty.

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