LionHeart Operating Instructions V2 (050115)

1 Description

The LionHeart is a single cell Lithium Ion based light that is Microprocessor controlled. All the features are accessed via a single momentary action switch.

There is no mechanical power switch, the momentary action switch and the Microprocessor firmware can put the electronic subsystem into a sleep mode where is consumes <30uA. For extended (year or more) periods of non-use it is recommended to remove the Lithium Ion cell and store it in a dry, cool place.

Only a single Pila™ battery is recommended and approved for use with the LionHeart.

The LionHeart can be user configured to operate in one of two different User Interfaces (UI0 or UI1). The user can change between the two UI's as often as desired.

2 Definitions

- Click – a short, less than 0.3 seconds press and release.
- Press – a longer, greater than 0.3 seconds press and hold.
- Force – an option to always have the light turn on at a specific user selected level.
- UI – User Interface (the LionHeart has a choice of 2 UI's).
- EEPROM – non-volatile memory. Data stored here will remain even if the battery is disconnected.

3 Initial Power Application

When the battery is first installed and the battery tube is screwed into the head assembly and the electrical circuit is completed the LionHeart will light up for a <u>very</u> short moment (might not even be visible with bright ambient lighting). If the switch is pressed when the electrical circuit is first made, the LionHeart will light up in the same way as if the switch had been pressed from off.

4 Initial Shipped Configuration

The LionHeart is shipped preconfigured as follows:

- Autosleep off
- UI0
- Force off
- Autolockout off

5   User Interface 0 (UI0, default) "Continuously" Variable Levels

There are 6 operating modes for UI0. They are described below.

5.1 On/Off Mode

To turn on the light, click the switch. The light will turn on at the previous level or the Force level if Force is enabled.

To turn off the light, click the switch.

5.2 Momentary Mode

To turn on the light in momentary mode, press the switch, the light will turn on at the previous level or the Force level if Force is enabled.

To turn off the light in momentary mode, release the switch.

5.3 Adjustment Mode

To adjust the brightness of the light, turn on the light, then press.

The light will begin adjustment in the dimming direction unless it was already set to the dimmest level. If set at the dimmest level, adjustment will begin in the brightening direction. Release the switch and the light adjustment will cease and the new level will be stored in the EEPROM. Pressing the switch again will start the light adjustment in the opposite direction (the direction toggles each time).

When the light reaches the dimmest or brightest level it will stay there until the switch is released.

5.4 Lockout Mode

To prevent accidental turn on or unintended use the light can be electronically locked out. Lockout can be manually selected each time prior to turning off the light or a menu option (see Sec 7.5) can auto-lockout every time the light is turned off.

To enter lockout, begin with the light on and ensure light is on for at least 1 second. Then click the switch rapidly three times, no more than 0.3 seconds apart. The light will cycle off/on/off and then flash once and then go dim for 2.5 seconds then flash three times. The light is now in lockout mode and can only be turned on again by three clicks spaced no more than 0.3 seconds apart.

5.5 Autosleep Mode

If Autosleep is enabled (see Sec 7.1), the timer will reset and start counting whenever a switch click or press occurs. When 15 minutes goes by without a click or press, the Autosleep function will commence dimming the light. The brightness level will visibly drop after each subsequent minute until the lowest light level is reached. After a total of 60 minutes elapses from the last button action the light will turn itself off.

A press during any time prior to 60 minutes elapsing will return the light to its starting brightness level prior to dimming having started.

To turn off the light, click the switch.

5.6 Force Mode

This mode is selected from the power-on menu (see Sec 7). Force mode overrides the initial turn on brightness level that was set via the Adjustment Mode on the previous turn off. The user can always set a new temporary light level by using the Adjustment mode but it will be overridden the next time the light is turned off and back on. Force mode also sets the Momentary mode light level.

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6   User Interface 1 (UI1, optional) 5 Discrete Levels

There are 6 operating modes for UI1. They are described below.

6.1 On/Off Mode

To turn on the light, click the switch. The light will turn on at the previous level or the Force level if Force is enabled.

To turn off the light, click the switch.

6.2 Adjustment Mode

To adjust the brightness of the light start with the light off, then press the switch.
The light will always turn on at Level 1 (dimmest level) and in the brightening direction. Release the switch at the desired level, and that new level will be stored in the EEPROM. Pressing the switch again (within 1.5 seconds) will start the light adjustment in the opposite direction (the direction toggles each time).
When the light reaches the dimmest or brightest level it will stay there until the switch is released. Once the switch is released for longer than 1.5 seconds no more brightness adjustment is possible without turning off the light and starting the sequence again.

6.3 Latched Full Brightness Mode

With the light turned on, a press will latch to Level 5 (brightest). A second press will unlatch and return the light to the original brightness level.

To turn off the light, click the switch.

6.4 Lockout Mode

To prevent accidental turn on or unintended use the light can be electronically locked out. Lockout can be manually selected each time prior to turning off the light or a menu option (see Sec 7.5) can auto-lockout every time the light is turned off.

To manually enter lockout, begin with the light on and ensure light is on for at least 1 second. Then click the switch rapidly three times, no more than 0.3 seconds apart. The light will cycle off/on/off and then flash once and then go dim for 2.5 seconds then flash three times. The light

is now in lockout mode and can only be turned on again by three clicks spaced no more than 0.3 seconds apart.

6.5 Autosleep Mode

If Autosleep is enabled (see Sec 7.1), the timer will reset and start counting whenever a switch click or press occurs. When 15 minutes goes by without a click or press, the Autosleep function will commence dimming the light. The brightness level will visibly drop after each subsequent minute until the lowest light level is reached. After a total of 60 minutes elapses from the last switch action the light will turn itself off.

A press during any time prior to 60 minutes elapsing will return the light to its starting brightness level prior to dimming having started.

To turn off the light, click the switch.

6.6 Force Mode

This mode is selected from the power-on menu (see Sec 7). Force mode overrides the initial turn on brightness level that was set via the Adjustment Mode on the previous turn off. The user can always set a new temporary light level by using the Adjustment mode during turn on but it will be overridden the next time the light is turned off and back on.

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7   Menu Selection (Configuring the LionHeart)

This section describes how to enter the Menu system and how to change operating options. The changes will be stored in the EEPROM.

To access the Menu, begin with the light on and ensure light is on for at least 1 second. Then click the switch rapidly three times, no more than 0.3 seconds apart. The light will cycle off/on/off and then flash once and then light up dim. The Menu Mode is now active and you can select the Menu you wish to access.

Click the switch from 1 to 4 times (the LED will flash for each click) to select one of the four menu options to change as listed below. If no click occurs within 2.5 seconds lockout is set. If more than 4 clicks are entered, the menu mode is exited, the LED flashes quickly 5 times to indicate a selection error and normal operation of the light commences.

After clicking from 1 to 4 times wait for the LED to light up dim. Then continue as below.

7.1 Zero clicks – times out to Lockout

If no menu is selected (zero clicks), after 2.5 seconds the LED flashes quickly 3 times to indicate Lockout has been set. The LED then turns off and the unit is locked out. To turn it back on requires following the lockout release sequence of three quick clicks as outlined in Sec 5.4 or Sec 6.4.

7.2 One click - Autosleep Enable/Disable

Initially the LED will be dim to indicate Autosleep will be active (i.e. if you don't click, Autosleep will become active). A click will brighten the LED to indicate Autosleep will be inactive. Each click will cycle from active to inactive. When you are happy with the choice, wait 2.5 seconds and the LED will flash once to indicate the selection has been made and the light will then turn off.

7.3 Two clicks – User Interface Selection

Initially the LED will light up dim to indicate User Interface 0 will be active (i.e. if you don't click, UI0 will become active). A click will light the LED up bright to indicate User Interface 1 will be active. Each click will cycle between User Interface 0 and 1. When you are happy with the choice wait and after 2.5 seconds the LED will flash once to indicate the selection has been made and the light will then turn off.

7.4 Three clicks - Force Mode Enable/Adjust/Disable

Initially the LED will dim to indicate Force Level 1 (dimmest) will be active (i.e. if you don't click, Force will become active and set to Level 1). Each click will cycle to the next Force setting. The sequence is:

- Force Level 1 (LED dim)
- Force Level 2 (LED med/low)
- Force Level 3 (LED medium)
- Force Level 4 (LED med/high)
- Force Level 5 (LED brightest)
- Force Disabled (LED is off)

The sequence will cycle through all 6 choices. The LED brightness matches the 5 operating levels of User Interface 1. When you are happy with the choice, wait 2.5 seconds. The LED will flash once to indicate the selection has been made and the light will then turn off.

Force is available in both UI0 and UI1. Even though UI0 has more than 5 levels, the Force Mode only allows a choice of one of 5 equally spaced brightness levels.

7.5 Four clicks – Auto-lockout Enable/Disable

To prevent accidental turn on or unintended use the light can be electronically locked out. Auto-lockout can be enabled so that each time the light is turned off it enters Lockout and requires 3 quick clicks or 2 quick clicks and a press to turn the light back on.

Initially the LED will be dim to indicate Auto-lockout will be active (i.e. if you don't click, Auto-lockout will become active). A click will brighten the LED to indicate Auto-lockout will be inactive. Each click will cycle from active to inactive. When you are happy with the choice, wait 2.5 seconds and the LED will flash once to indicate the selection has been made and the light will then turn off.

7.6 Menu Selection Complete

Once the above menu procedure is complete and the light turns off the new menu selection is immediately active. The light is ready to be used.

Only one menu item can be changed per Menu Selection sequence, i.e. the light turns off after one sequence.