

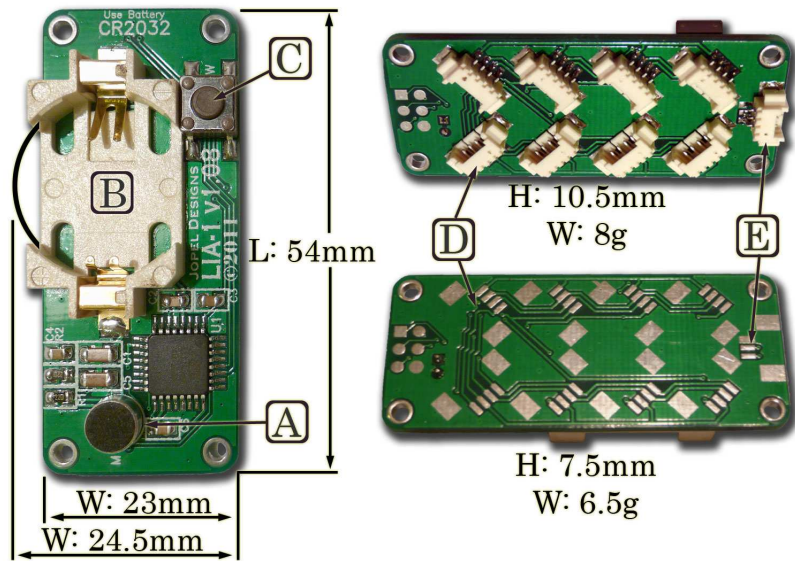
Luminous Interactive Art Series 1, v1.08 User Manual



Parts and Description:

LIA-1 v1.08 is a watch battery powered eight channel LED light engine with sound reaction. It is designed for small size, portability and remote LED placement. The most common use is costume attire and wearable art.

- A. Microphone
- B. Battery Holder
- C. Button
- D. LED Connection
- E. Network Connection



Operation:

On-Off

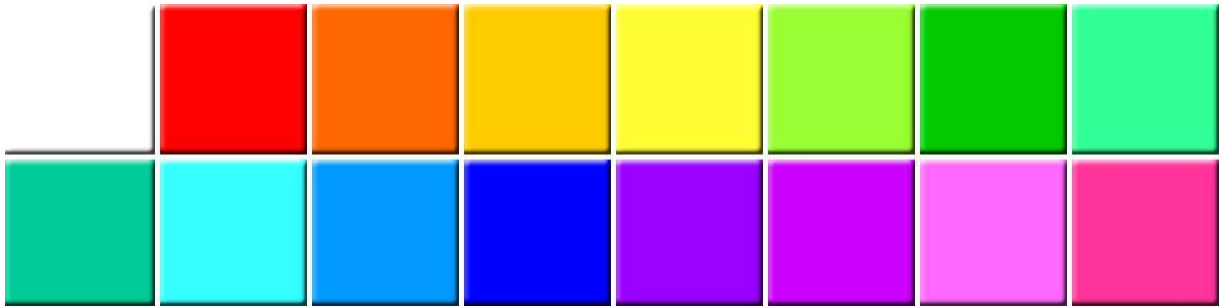
Momentarily press the button to wake LIA from sleep mode. Hold the button down for 3 seconds to enter sleep mode. Remove the battery if LIA is stored more than a few days.

Mode

Momentarily press the button the number of times corresponding to the mode you want the LIA to enter. Each button press will illuminate a light, counting the lights indicates the next mode of operation.

Mode	Description	Button presses
Morph mode	Randomly changing colors and patterns	1
Dance Mode	Sound reaction with random colors and patterns	2
Dim Morph Mode	Reduced brightness morph mode	3
Dim Dance Mode	Reduced brightness dance mode	4

Default Color Palette



Color Programming

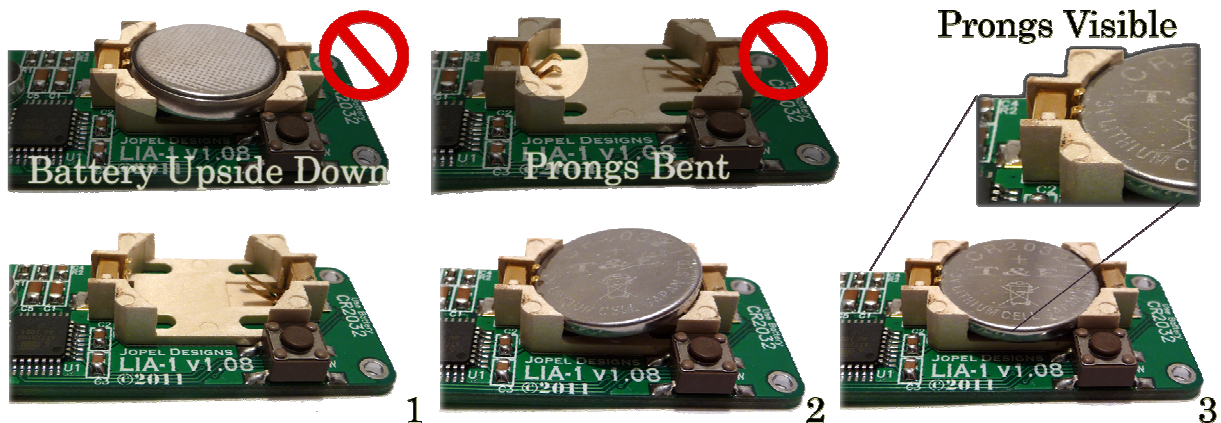
Color Programming allows the user to control the color palette available for random selection. From an ON state, hold the button (10 seconds) until all LED's glow blue, then release. The available color palette will be displayed in a repeating cycle, pausing several seconds on each color. Pressing the button makes the lights go dark indicating the current color has been disabled from the color palette. Programming mode ends when the button is held until all LED's glow blue (5 seconds) or the sequence repeats 3 times without modification. The final color being displayed is not disabled.

Resetting Colors

The full palette is restored by holding the button longer when entering Color Programming mode. Five seconds after the lights glow blue (for programming mode) they will change to red (palette reset). Releasing the button then enters Color Programming Mode.

Batteries:

LIA-1 v1.08 is powered by a CR2032 battery. If the LIA won't wake up, or only glows in red, a new battery is needed. Carefully pry the battery out of the holder and replace it with a new CR2032 battery. Expected battery life is 8-12 hours.



Ordering Options:

Depending on its final use the LIA-1 v1.08 can be configured in various ways when ordering.

Wires:

The length, size, color and flexibility of wire can be specified for each LED.

LEDs:

Many types of LEDs can be specified ranging in size and characteristics. The most common LED used is the clear straw hat (small, bright, wide angle).

LED connections:

Solder

The wires and LED's can come soldered directly to the LIA board. The best option if installation is going to be simple.

Connector

A small connector can be used allowing for easy disconnection of LIA and LEDs. This is the best option if the final product will need to be serviced (cleaning, etc.) or the LED installation is complicated. The connectors are fairly robust for their size, but care must still be taken as they are quite small.

Bare

LED connections can be left empty for soldering later. LEDs and wires can still be ordered as separate pieces. This option saves connector cost while still allowing for a complicated LED installation. With this option the LEDs (with wire leads) can be installed in the final product and the electrical connection to the LIA made in place. This requires some soldering know-how and a fine tip soldering iron.

Multi-board Systems:

Multi board systems (2-10) can be created upon request. To synchronize multiple boards, communication wires are run between each LIA. There is a 'master' LIA and one or more 'slaves'. The 'master' acts identically to a 'stand alone' LIA in every way. In a multi board system the 'master' sets the color and mode of all connected LIA's, but each chooses pattern independently. They work together while maintaining individuality. The network connections have the same ordering options as the LEDs (solder, connector, bare).

Special Software:

All LIA software was developed in house with an emphasis for customization. Special modes, patterns, sequences, colors and behaviors are all possible at minimal cost.

Final Assembly Instructions:

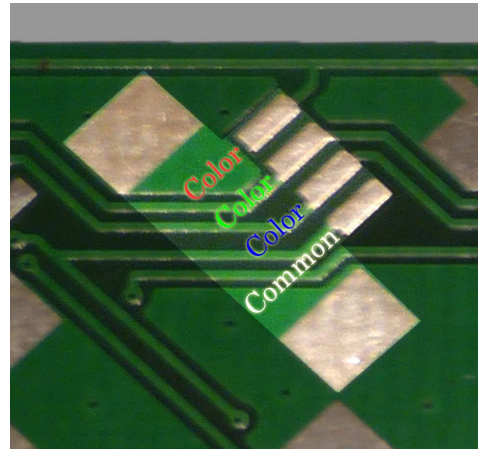
LED Connections:

In the picture to the right is one LED output. It consists of one common connection and three color outputs. All LED outputs are pinned the same way regardless of orientation. Eight outputs are available, any can be left unused.

Care must be given to connect the LED's properly. Every 4-pin RGB LED has an electrical connection for each color and a 'common' anode (+) or cathode (-).

The LIA software includes a hardware configuration routine to program the LED polarity, color connections, and output utilization. Different types of RGB LED's can be used on each output, the only requirement is that all LED's must be the same polarity type (common +/-). The common connection goes to the common pin of the LED and the 3 color connections can be made in any configuration, BUT all need to be connected the same way. All red light elements must be connected to the same position across all LED outputs, etc.

Wires can be any length, but less than 10 feet is best. Each LED consumes mere milliamps of current so the wires can be incredibly small. A 40 gauge wire (smallest in the American wire gauge system) can carry about three times the required current. So, any length or size of wire is acceptable.



Hardware Configuration Routine

LIA-1 v1.08 can easily be configured for LED polarity, color connections, and output utilization. If an LED output has no LED it can be disabled in this routine. Disabling an LED output turns off the output and excludes it in pattern generation. Accurate output configuration is suggested for best results.

To enter the configuration routine:

Start with the battery removed. Hold the button and insert the battery. Hold the button until the lights glow white (10 seconds). Once the button is released the hardware configuration routine starts.

To abort the hardware configuration routine at any time remove the battery. If the sequence is not completed it will begin again automatically the next time the battery is installed. Automatic restart is convenient when a mistake is made or a problem is found. Once this routine is started it must be completed before normal operation can resume.

Routine 1; LED Polarity

The first configuration routine determines the LED polarity. The LED's will all glow the same, changing between 4 different output signal configurations. Two steps will show a blend of colors, two will be a single primary color (R, G, or B). Two will be brighter and two will be dimmer. Press the button when the dim single primary color is displayed.

Routine 2; Output Utilization

This step configures which outputs are enabled. Each LED output will be tested one at a time. The output being tested will light up white. Press the button when you see an LED illuminate. Pressing the button will enable the output and make the light go dim in confirmation. If the output has no LED you will not see

any light. The sequence will automatically move to the next output after a 5 second delay. By not pressing the button the output will be disabled. Do not press the button if there is no LED lit. LED hardware or harness malfunctions may cause an LED not to illuminate.

Routine 3; Color Configuration

The next part of the hardware configuration routine is color configuration. The device will now learn which wires are connected to which LED colors. It assumes that all red LED's use the same wire on every output, and so on. All enabled outputs will begin cycling red, green and blue (in no particular order).

Press the button while **red** is being displayed, the lights will dim confirming the input. Now press the button on **green**, and finally **blue**.

If the wiring is incorrect, different outputs will show different colors at the same time. Verify that all outputs are showing the same color. Also verify that all intended outputs light up.

Routine 4; Final Verification

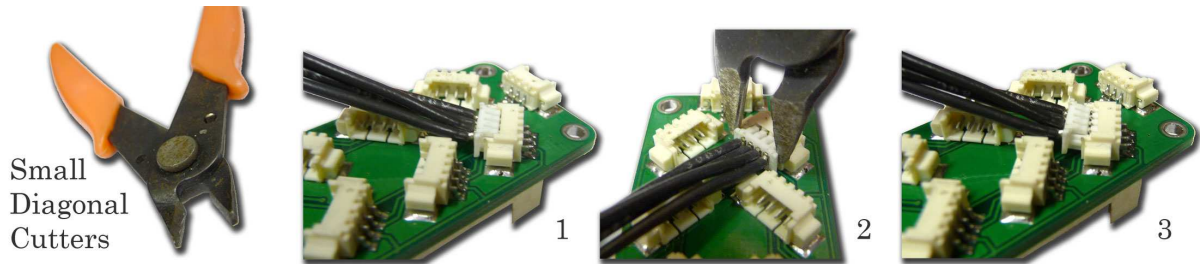
At this point configuration is complete and all that's left is verification. All enabled outputs will begin morphing through a rainbow pattern. This diagnostic routine allows for color comparison of all enabled outputs. All outputs will glow the same color at the same time and will fade thru **red**, **orange**, **yellow**, **green**, **blue**, **purple**, and **repeat**. If any output is wrong (wired differently, damaged, shorted, open) the colors will not display correctly.

If everything looks correct, press the button to complete the hardware configuration routine. The hardware configuration is saved and a marker set to disable the hardware configuration routine from running next time the unit powers on.

Care Instructions:

Unplugging Connectors:

Use a small tool when unplugging any connector, pulling directly on the wires will damage the plug. Jewelers pliers or small diagonal cutters work quite well for this purpose. The first 1mm of travel requires extra force because of a detent designed into the shape of the plug. Use a twisting motion to overcome the detent. Once the detent is passed the plug removes easily.



Cleaning:

LIA can be cleaned. Use high concentration (+70%) rubbing alcohol (isopropyl) on a q-tip or small paint brush to clean the circuit board and connectors. Do not submerge the microphone in liquid. Allow LIA to fully dry before use.

Storage:

When LIA is unused for more than a week remove the battery and store separately.

Support:

For questions, repairs, free software upgrades, and support contact: support@jopeldesigns.com