Light Valve Manual

Welcome to the miniature world of LED lighting! Whether a first-time or long-time electronics enthusiast, our goal is to make lighting your projects simple, painless, and fun!

The *Light Valve* functions as both a smooth dimmer and as a valve for other PowerCookie Boards devices, such as a *Ditto*, *Morsel*, or another *Light Valve*, all controlled by a high quality ergonomic knob. As many devices may be "chained" to it as desired, providing easy expandability and hierarchies of brightness control.

This manual explains how to use the *Light Valve*. It also explains how to connect the *Light Valve* with power sources and one LED.

How to Use...

The Light Valve works as a "chain controller" in the PowerCookie Boards ecosystem, that is, any devices "chained" to its *chained control output* (**CCOut**) will receive the same signal. This allows the *Light Valve* to function two ways: as a dimmer and as a valve.

...As a Dimmer

Chain devices only by the **CCOut**, and leave the **CCIn** unconnected. The knob controls the brightness of all devices in the connected chain.

...As a Valve

Connect a source signal to the *chained control input* (**CCIn**). After this signal is scaled by the control knob, the result is passed to the **CCOut**. Source signals may come from other *Light Valve*'s **CCOut**, or other PowerCookie Boards devices, such as a *Morsel*'s *LED port*.

To connect (or "chain") devices together, match up the **G/5V/CC** pins of each device together using a "chaining" wire available from PowerCookie Boards, or using a standard servo extension cable (Female-Female).

How to Connect Power

PowerCookie Boards does not sell power sources for our boards due to the ubiquity of USB. You may already own one of the following:

- Micro USB adapter (such as cell phone chargers)
- Another PowerCookie Board device to "chain" to this one
- Battery pack with 3xAA or 3xAAA batteries

Caution: Using a micro USB adapter and a battery pack at the same time may cause surge currents that damage the board, the battery or the adapter.

Micro USB power

Whether from a standard or quick-charge adapter, or from a USB battery pack, the micro USB power option is easiest to connect. (*Note: the micro USB connector is designed upside-down on the board.*)

"Chained" power

A *Light Valve* may share power through the **G/5V/CC** pins from any other PowerCookie Boards device, through any side, passing the power along to other devices. The limit to how many devices may be "chained" together depends on lighting and cable lengths used. If LED's start appearing dim along the chain, additional power must be added further down the chain.

Battery pack

From the battery pack, the positive side (typically red) must connect to the **5V** pin of the *Light Valve*. The negative side (typically black) must connect to the **G** pin.

Caution: ***Do not reverse the 5V and G connections.*** *While the Light Valve can withstand such an error, other devices connected by* ***G/5V/CC*** *pins may not.*

Caution: ***Do not*** *use battery packs that* ***exceed 5.99V*** *fully charged.*

How to Connect one LED

The *Light Valve* is intended to be a controller for many lights, but for test purposes or very simple requirements, a single LED may be connected instead. Most LED's work with the *Light Valve*, including 3V resistorless LED's (micro, 3mm, 5mm, etc) and inline resistor LED's designed to operate between 4-24V. Compound LED's, such as 12 Volt LED strips or LED's with other circuits will not work.

To attach one LED, a *Coupler* and a *Chaining wire* or servo extension cable (female-female) are needed. The wires plug into the **CCout** pin and the **5V** pin. Through the *Coupler*, the **5V** connects to the positive side of the LED, known as the *anode*. This is typically red when wired, or the longer lead if bare. The **CCout** connects to the negative side of the LED, known as the *cathode*. If the LED doesn't light, the connection may be reversed.

Avoid connecting the **G** pin or touching the micro USB casing to the LED cathode as that may damage the LED.

Technical Specifications

Dimensions with G/5V/CC pins: 50mm x 15.8mm
Height: 24mm, 30mm with knob
Operating Voltage: 2.4 - 5.99 Volts
Maximum USB current for other boards: 2 Amps
Operating Current (no LED's attached): 3mA (0.003 Amps)
Minimum plastic spacers; top side (for mounting behind a panel): 4mm; bottom side(for mounting above a surface): 2mm.