Introduction

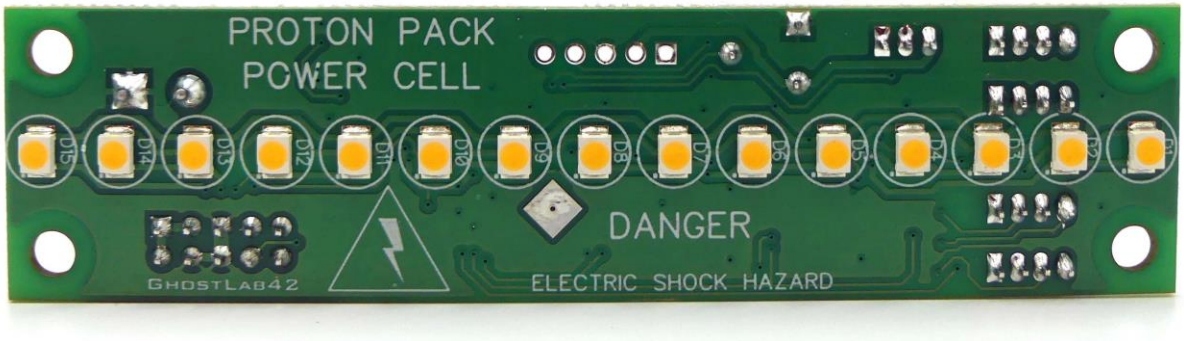
Congratulations on purchasing the Proton Pack: Power Cell and Cyclotron Light Kit that adds some serious lighting effects to your nuclear accelerator!

The Light Kit plugs in directly to the GBFans Sound Board or can be used stand-alone by plugging directly into a battery pack. Movie accurate mode can be activated by rotating a potentiometer (which also controls the speed), turning it further activates a special effects mode that will add unique powercell animation sequences. This Light Kit also receives commands from the GBFans Sound Board, which adds effects like overheating, venting, and the video game modes. So many features packed into one low priced kit.

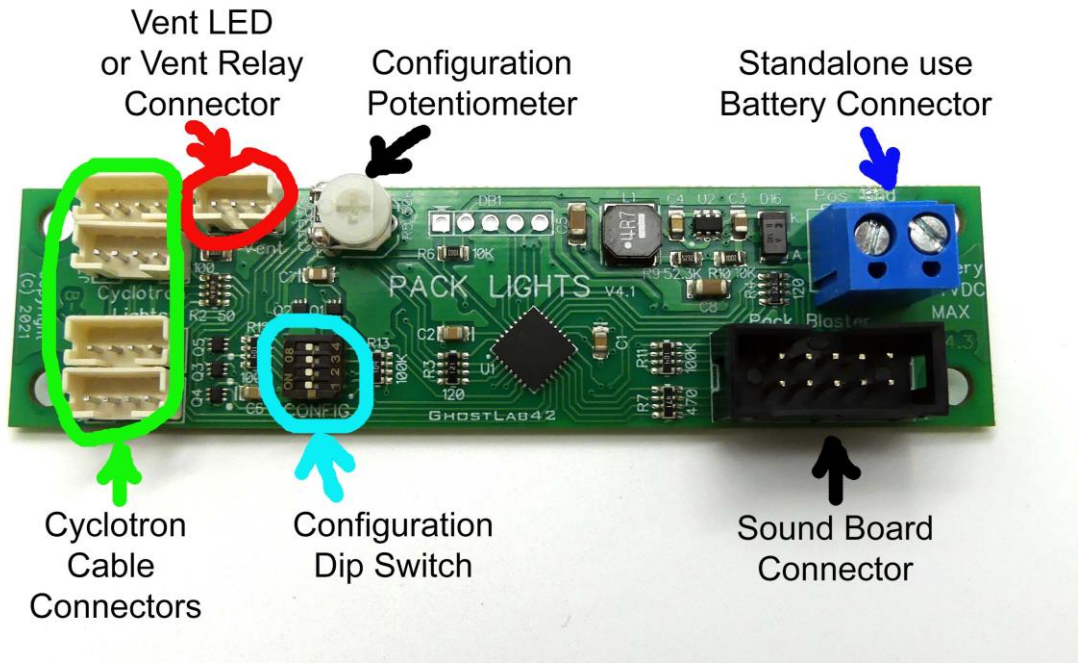
Power Cell and Cyclotron Light Kit features:

- 15 Wide angle white LEDs on the main Power Cell circuit board
- 4 Wide angle RGB LEDs for the cyclotron Lights
- 1 Wide angle White LED for Venting affects
- Works with battery voltages from 9V to 14V
- High efficiency switching power supply for longer battery life
- Easy wiring with a single cable connection for power and control from the GBFans Sound Board
- Easy wiring for stand-alone operation with a separate set of battery connection screw terminals (not used when connected to a GBFans Sound Board)
- Cables are keyed to only go in one direction
- Capable of providing additional light sequences while powering up and down, firing, overheating and venting when controlled by separate switches or a GBFans sound board.

Front:



Back:



Configuration Potentiometer
The Light Kit has a configuration potentiometer on the back of the board to select between four main modes of operation:

1) Firmware Version Display and Cyclotron Test
   (Configuration potentiometer fully counterclockwise)
   a. The Power Cell LEDs will show the firmware version number
   b. The Cyclotron LEDs will show what is on the 4 digital inputs (all on in standalone mode if the Config Dip switches are all ON as shown above)
   c. The White Vent LED will be turned on

2) Movie Accurate Mode
   (Configuration potentiometer counterclockwise right of the range)
   a. Standard powercell sequence
   b. Rotate Counterclockwise for slower or Clockwise for faster sequencing

3) Special Affects Mode
   (Configuration potentiometer clockwise left half of the range)
   a. Unique powercell sequence for each of the 4 pack main modes (Proton, Slime, Stasis, Meson)
   b. Rotate Counterclockwise for slower or Clockwise for faster sequencing

4) Power Cell Test Mode
   (Configuration potentiometer fully clockwise)
   a. All Power Cell LEDs will be steadily on
   b. All Cyclotron and Vent LEDs are off

Configuration Dip Switch
The configuration dip switch (CONFIG) has 4 separate switches to make multiple selections.

The selections are not dynamic, so require either removing and reapplying the battery voltage or going into the Firmware test mode and then back to normal to force the dip switches to be read.

Dip SW #1 is closest to the bottom edge of the board.

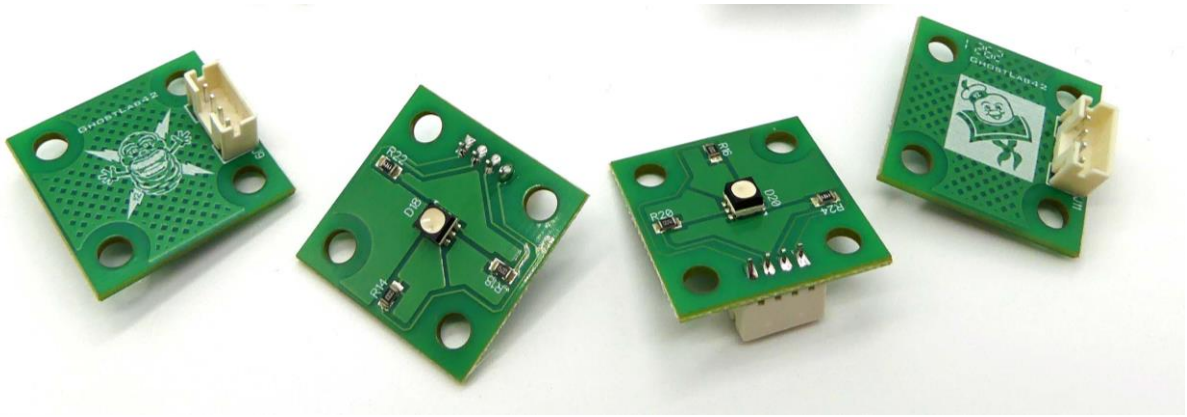
SW #4: Startup sequence selection
- ON – enables a startup sequence
- OFF – disables the startup sequence and will start cycling immediately upon powerup

SW #3 and 2: Cyclotron Fade Rate

Description	**SW #3**	**SW #2**
Slow Fade	ON	ON
Medium Fade	ON	OFF
Fast Fade	OFF	ON
Snap (no fade)	OFF	OFF

SW #1: RED cyclotron color only
- ON – Cyclotrons will always be red, independent of the pack mode
- OFF – Cyclotron can be one of 4 different colors depending on the pack mode
  - RED – Proton
  - GREEN – Slime
  - BLUE – Statis
  - YELLOW – Meson Collider

Cyclotron Boards:
There are four separate cyclotron boards. They may be shipped as a singe set of four that need to be separated. The board is scored on both side to bake them easier to separate. Just use your fingers and apply some pressure on the center of two adjacent cyclotron boards on the opposite side of the LED and that should break the boards apart.

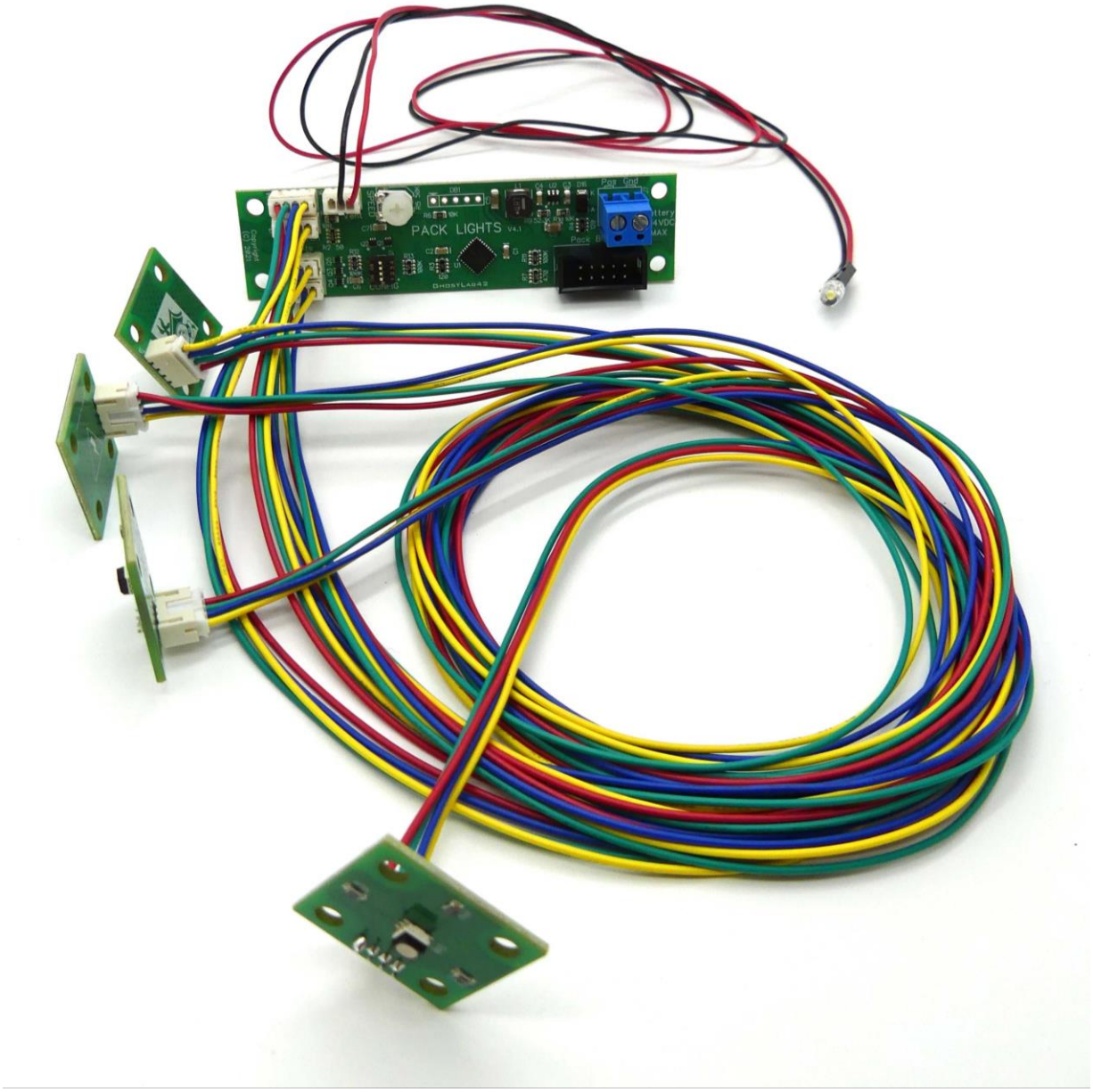


Connecting the Pieces

The Cyclotron LEDs and the Vent LED cable each have separate cables that plug into the connectors on the left-hand side of the powercell board. Connection to the GBFans Sound Board is with the 10-pin connector on the lower right side of the back of the board that uses a grey colored ribbon cable. Only connect the ribbon cable to both the Sound Board and the Light Kit when the Sound Board does not have power.

Since the sound Board supplies power through this same grey colored ribbon cable, no additional connections are needed and the screw terminal power connector is not used.

Here is what the Light Kit looks like with the Cyclotron and Vent LED cables installed:



Standalone Operation

For Standalone operation, the Sound Board grey ribbon cable is not used, but the board must get battery power, so the battery screw terminal connector in the upper right side of the back of the board must be connected to power. Below is shown a 9V battery connector (not included) wired to the screw connections. You may also want to add a power switch for easy on-off control of the Light Kit.

“Pos” is the positive connection and is usually Red or marked with “+”, “Pos” or “Positive”.

“Gnd” is the negative connection and is usually Black or marked with “-“, “Neg”, “Negative” or “Ground”.

Do not connect to a battery that is greater than 14VDC. This could damage both this board and the battery.

The Cyclotron LEDs and the Vent LED each have separate cables that plug into the connectors on the left side of the back of the board.

Advanced Standalone Operation

For those adventurous enough to hack up a cable and connect their own wires and switches, the Standalone mode has some additional capabilities. You could also wire in the battery connections so you do not need to use the screw terminal to connect power.

The Standalone mode does support up to four additional switch connections wired directly to the Sound Board cable:

1) PowerUp/Down toggle switch
    a. Enables a power up sequence (if the configuration allows) when the switch is open
    b. Enables a power down sequence when the switch is closed
    c. If power is applied and the switch is closed, the board waits for the switch to be opened
2) Fire momentary switch
    a. Will cause the sequence to speed up when the switch is closed
    b. Will slow back down to the normal sequence speed when the switch is open
3) Vent momentary switch (or toggle)
    a. Vent sequence when the switch is closed
4) Pack Switch momentary switch (or toggle)
    a. The pack mode is changed when the switch is closed
    b. Cycles between the four pack modes
    c. Also cycles between the four Cyclotron colors when the optional Cyclotron TVG board and RGB color LEDs are attached

You can cut off one end of a Sound Board grey cable. The ends are slightly different, so even though either end could be cut off, plug in the cable to the Light Kit and make sure the cable is coming out in the desired direction (I like the direction of away from the board) and cut off the other end. Unused wire ends should be covered so they do not accidentally short on something.

The inputs are all single ended and the switches would need to share a common ground signal (one of the 3 “Gnd” signals in the cable) and just short the selected input to Gnd. If this does not make sense, don’t try this advanced operation mode!

Sound Board Connector and Grey Ribbon cable Pinout:

1: +VBattery (7VDC to 14VDC), connected to “Pos” Standalone use Battery Connector
2: +VBattery (7VDC to 14VDC) , connected to “Pos” Standalone use Battery Connector
3: +VBattery (7VDC to 14VDC) , connected to “Pos” Standalone use Battery Connector
4: GND, connected to “Gnd” Standalone use Battery Connector
5: GND, connected to “Gnd” Standalone use Battery Connector
6: GND, connected to “Gnd” Standalone use Battery Connector
7: Pack Change (Gnd = Change), has a weak 10K to 100KΩ pullup to +5VDC
8: Vent (Gnd = Vent), has a weak 10K to 100KΩ pullup to +5VDC
9: Fire (Gnd = Fire), has a weak 10K to 100KΩ pullup to +5VDC
10: PowerUp/Down (Gnd = PowerDown), has a weak 10K to 100KΩ pullup to +5VDC