Simple 4 Blinkie

The heart of this blinkie is a tiny chip imbedded each of the four LEDs.

When power is applied, the chip tells the LED to turn on and off.

By building this blinkie, we hope you have a lot of fun, as well as learn how easy it is to assemble and solder a circuit, as well as gain a desire to learn more!

First, open up the kit and review the contents. Looking from left to right, and top to bottom there should be the following parts:

Contents:
- Four LEDs
- Circuit board
- Power switch
- Four 100 ohm (**brown**, **black**, **brown**) resistors

The board itself will have the battery clips already soldered. Batteries are also provided.
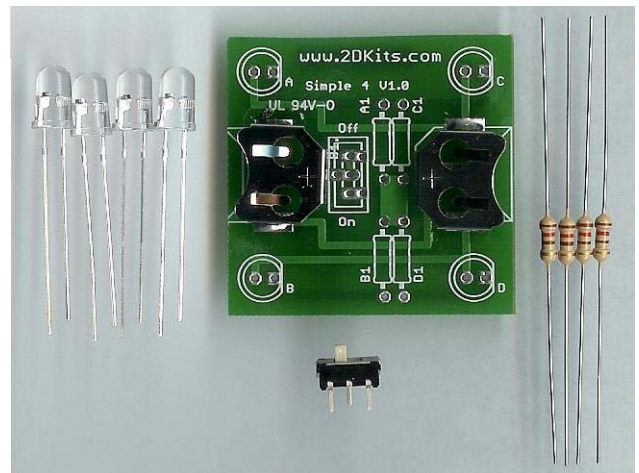
Got everything to start? If not, give us a shout. Also, since we pre-solder the battery clips, sometimes the switch gets hidden under the battery clips. First, a few words on soldering…

Soldering Hints

Soldering is not like gluing; the solder forms an alloy with the metals to be connected that creates a stable electrical path and a certain amount of mechanical attachment. For the small connections on this project, a 25 or 30 watt soldering iron works well. Rosin core solder is used – the acid core solder sold for plumbing would eat your components in a short time.

Here's how to make a good joint:

- Prepare the joint. Bend the component lead slightly after it passes through the printed circuit board (this helps hold it in place while soldering).

- Prepare the tool. The soldering iron should be up to temperature. Clean the tip by quickly brushing it against a damp sponge or cloth. Melt a little solder (a 2mm length) onto the tip so it's shiny. This is called "tinning". The solder coating helps conduct heat from the tip to the joint.

- Place the tip in contact with the component lead and the printed circuit board pad.

- Place the solder against the joint directly opposite the tool. It should melt within 2 seconds, and flow around the joint. If it takes longer than that, you're not getting enough heat into the joint.

- Keep the soldering iron in place until the solder flows freely and completely covers the joint. If the heat is removed too soon, the solder will tend to "ball up" and not stick well to the conductors. The solder joint should look "wetted", with concave shapes.

- Let the joint cool without movement at room temperature. This usually takes only a few seconds.

- If a joint is moved before it cools, it will take on a dull, satin look that is characteristic of a cold solder joint. A cold solder joint is fragile and conducts poorly – reheat the joint until the solder flows freely, and hold it still until it cools.

- Keep the tip of the soldering iron clean. Wipe off flux and excess solder regularly in the damp sponge or cloth, and re-tin if needed.

Assembly

First, orient the board horizontally and so the silk screening shows. If you see lots of little white letters, symbols, and the battery clips are on either side, you are ready to begin. As each group of parts is inserted, you will flip the board over and solder them in from the non-printed side.

1. Insert each LEDs into the board. **Orientation is important** for LEDs. Remember: **Short lead, square pad. Long lead, round pad.** On the board, they are labeled A, B, C, and D. Flip the board over and solder each lead.

2. Insert the power switch into the board. Flip the board over and solder each lead.

3. Insert each resistor into the board. Flip the board over and solder each lead. On the board, they are labeled A1, B1, C1, and D1.

4. The batteries are inserted so the "+" on the battery is facing up. Turn on the board! Enjoy.
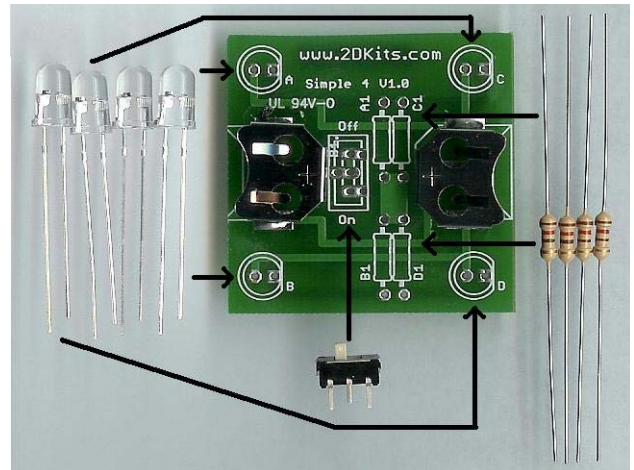
Troubleshooting

If the LEDs don't flash, then you'll need to do a little troubleshooting to finish your project. The following steps should isolate most problems.

- Recheck your solder connections. 80% of all problems are traced to this. Cold solder joints and broken joints will cause erratic performance or failure. Reheat any questionable solder connections until they flow and look shiny and secure.

- Check for bits of solder, wire ends, or other foreign matter which may be lodged in the wiring.

- Batteries incorrectly inserted. The "+" side of the battery should always be inserted facing up.

- Bad part – it does happen. In the hundreds of boards assembled, we've seen two or three parts fail.