

Thank you for buying a set of DroidLights.

Before you do ANYTHING...

Please take a moment to read the guidelines and disclaimers at the end of this document!

Now that all of that is out of the way... let's get started!

Upon opening the package, you find that I have assembled the DroidLight kits completely.

If you want to jump ahead and start your lights up, skip ahead to the "CONNECTING TO THE ARDUINO" section. You should be able to immediately plug in the power adaptor, and have lights flickering away. The lights will all pulse for around 5 seconds (or approx.. 3 pulses), and then start cycling through random behaviors.

In the very unlikely event that any of the lights come unplugged from the board during shipping, or, if in the future, you wish to swap out the LEDs for some reason, please skip below to the section labeled "WIRING HARNESS INSTALLATION". I'm making every effort to ensure that the lighting system arrives completely in tact, but things can shift in transit. All I can guarantee is that the lighting system was 100% functional per my specs when I closed up the package.

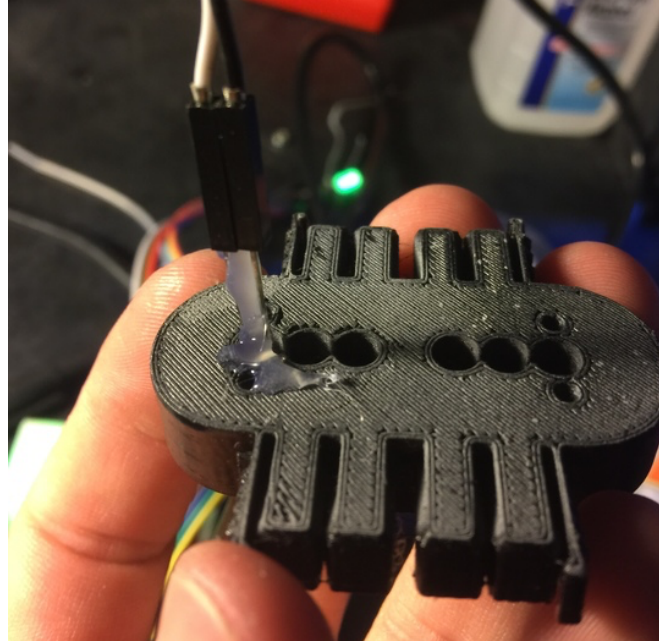
INSTALLING YOUR DROIDLIGHTS

I've printed the LED housings per the specs outlined in the group's documentation... however, it's entirely possible that the printer used for your dome parts is calibrated slightly differently, and the lenses are likely not to fit right out of the box. There are several approaches to making a nice fit, but the one I've found works best is as follows:

1. First, ensure that the dome openings are smooth and free of excess paint/filler/support materials. We're looking for as smooth and square as possible finish inside there. Test the part to see if it fits into the opening (first time through, it likely won't)
2. Lightly sand all four outside edges of the logic housing. I printed these with several shells, so you should be able to sand quite a bit without causing any major issues, but just start with a light sand on each edge.
3. Repeat step 1. That's it really... just slowly wear away the logic housing until the light fits into the opening. You're going for a snug fit. It shouldn't require a great deal of force to push in, but likewise, shouldn't just pop out. You can also carefully round the front face to make the initial insertion easier. But keep in mind, that the lower logic housings are very close to a seam, and there's not a lot of material printed around there... if you force them in, you run the risk of cracking your dome. So shape them appropriately.

4. If you do over-sand, and the lenses no longer stay in, a drop of hot glue should be sufficient to hold it in place.

The single red radar LED is only slightly more complicated to install. For my dome, I hot glued the LED into the back of the radar eye internals, and then fed the wires into the dome through the surround.



If you've glued together your radar eye, or have another issue that prevents you from doing it this way, then you may need to drill out an access hole to feed the radar eye in from the back.

Included in the Dome STL files is a housing for the PSI LED. It's a small disc with an indentation. I recommend printing this piece, and then using hot glue to adhere it to the back of the PSI. Once you've done that, you can simply insert the LED into the opening there.

Finally, the Holoprojector. You should be able to use the included mounting ring and just press fit that into the back of the holoprojector. Again, this is printed to match the recommended settings for the files in the group FAQ, but the piece may need minor adjustment to fit, or a dab of hot glue to stick.

(PS – I recommend hot glue in most of these cases because it holds, but it's not necessarily permanent. LEDs last quite a long time, but not forever. I've used resistors that are slightly larger than necessary in the hopes that the LED will last even longer, but it's entirely possible they will burn out and need to be replaced. Please think twice before supergluing, or otherwise permanently welding the housings to LEDs to your dome.)

WIRING HARNESS INFORMATION

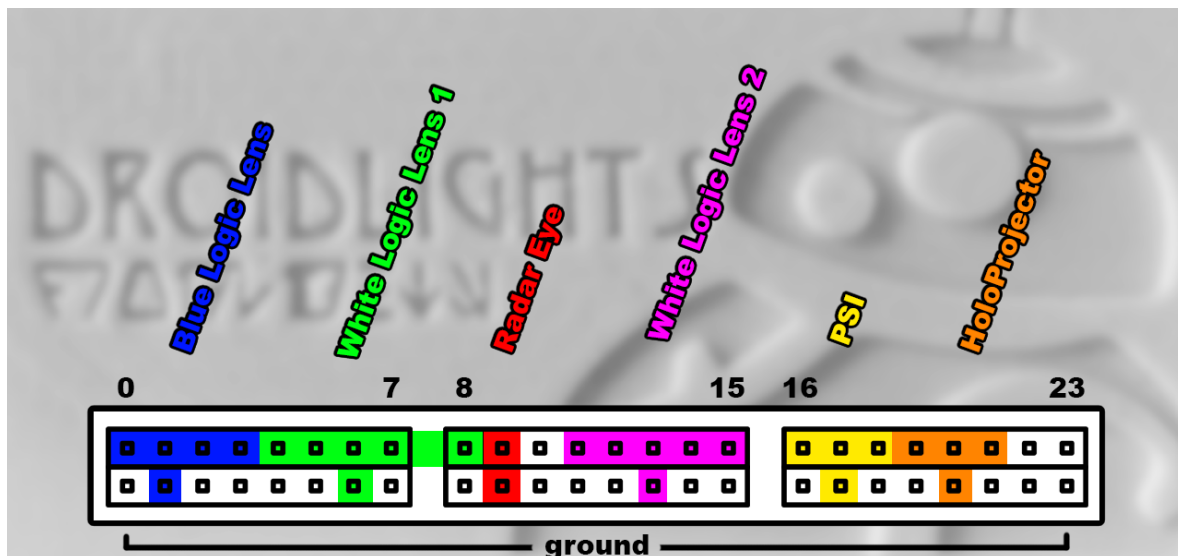
The complete lighting system consists of 6 wiring harnesses.

3 with the LED logic housings (aka, the clear plastic blocks) and 3 that are just LEDs.

They all look similar, but have important differences. In the list below, I will describe how each differs and how they plug in to the DroidLight module. Don't worry TOO much about plugging things in wrong. If you miss a socket with a pin, or don't get the ground pin in, the worst that will happen is one of the lights may not turn on... or may turn on at the wrong time... just unplug, and re-plug.

On to the lights!

Please refer to the image below as you read through the wiring connections.

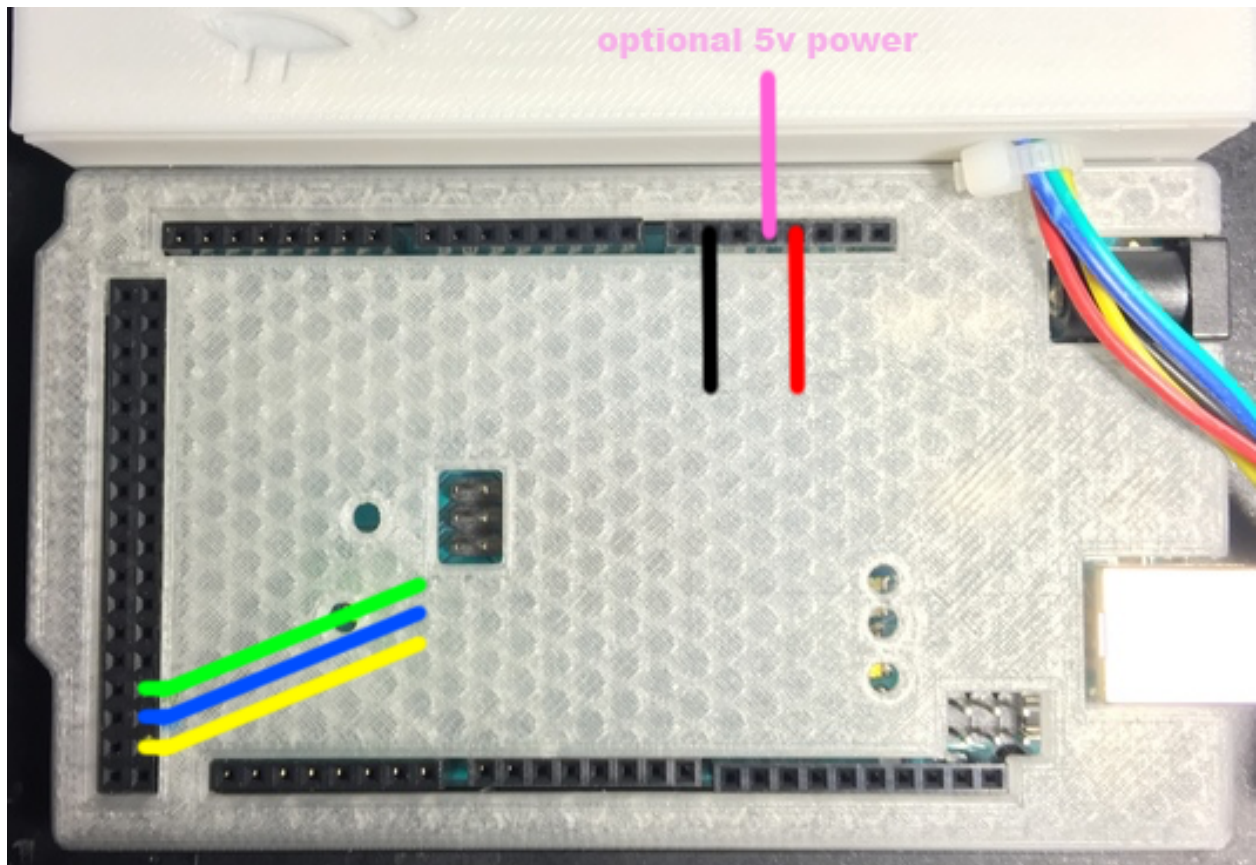


1. Blue Logic Lens – This cluster of lights will go in the Logic hole farthest to the left, if you're looking directly at the radar eye. Notice the plug-end of the harness. You will see four rows of pins along the top, and one lonely pin at the bottom. The top pins are what drive power to the LEDs and the bottom pin is a ground. This harness is marked in blue in the diagram, and goes from position 0 to position 3. (This is all zero-based, to match with the code.)
2. White Logic Lens – There are two of these that are identical in size, but one of them has a different set of pins (insert photo of pins). At the moment, it's not important which group of lights is the top, and which is the bottom when placed into your dome, but it's important that this cluster plugs in second, as marked in green in the diagram. This harness starts at socket 4, and goes to socket 8.

3. Next comes the radar eye LED. This is the one set of wires that has no black wrapping. The white line is the power, and the black(or gray...whichever one isn't white) line is the ground. It plugs in next in series, and is marked in red in the diagram at position 9.
4. Next is the second white LED cluster. This resides either above or below the one identified in step 2. You'll notice that this one has 5 pins right next to each other, with no break. This plugs into the board starting at position 11, and goes all the way to socket 15 (marked in pink on the diagram)
5. Next, we have the two larger single LEDs. In the package, I have placed a white attachment on the end of one of them. The one WITHOUT the white attachment will be the one we use to light the PSI. Insert that into the board starting at position 16 (marked in yellow on the diagram).
6. Finally, the HoloProjector. This is the light with the white ring attachment. This attachment is optional, if you've found another way to mount the LED to the holoprojector, but I hadn't so I created this. Attach this to the board immediately next to the PSI plug, starting at position 19 (marked in orange in the diagram).

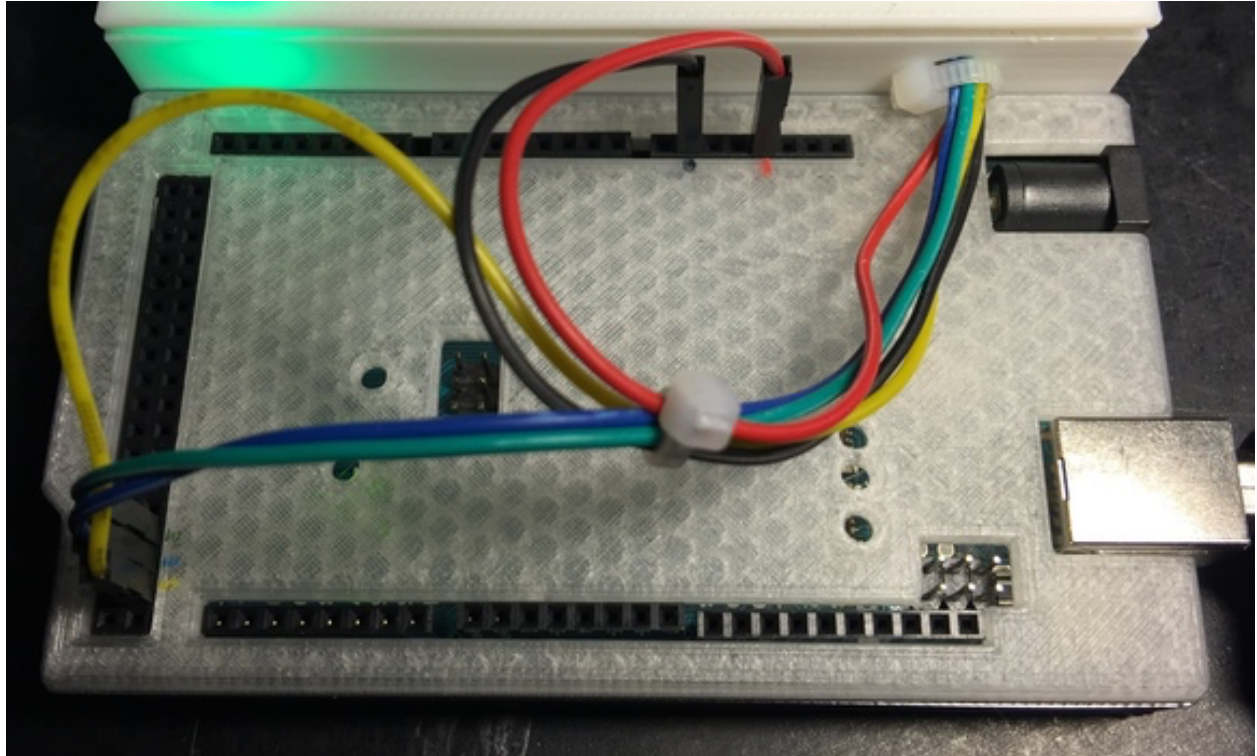
CONNECTING TO THE ARDUINO

All of the lights should now be attached to the board. The next step is to verify that the wires coming out of the light module are connected to the Arduino. I will have disconnected these for shipping, so verify that the wires are connected as follows:



Note: There is an option for the red power wire. The red dot on the enclosure (and in the diagram) is for 3.3v. This is the lower of the two power options for the board. Once you get power running through the board, you may notice that the LEDs aren't as bright as you'd like. The socket immediately to the right of the 3.3v socket (marked on the drawing above in pink, but not marked on the enclosure) is the 5v socket. You CAN use this, and your LEDs will be brighter, but this applies more wear on the module and LEDs, and of course eats up power faster. I've been running my lights on the 5v pin for around a month now with no negative side effects but just be aware.

In general, I make tiny color coded marks on the enclosure for the Arduino to show you where each pin should go. Once you've got them all plugged in, it will look like this:



Once all of the lights have been attached, you're clear to turn everything on! In the package, you'll see a white block USB power brick, and a black cable. Plug the black cable into the Arduino via the port in the housing, using the black cable. Power will instantly be provided to both boards. You should see a colored indicator light on the DroidLight housing, and all of the LEDs should stay lit for a period of 5 seconds. After 5 seconds, the lights should start pulsing slowly, and randomly changing modes!

At this point, if you don't see an indicator light on the DroidLight housing (green in this example), then there is no power getting to the DroidLight board. Double check the wire connections between the DroidLight module and the Arduino.

If you see the board indicator light, but none of your LEDs are lighting... first, reset the Arduino by unplugging power, waiting a few seconds, and plugging it back in.

If you're getting SOME lights on, and other's are not on... unplug and reseal them into the housing. It's important that both the power and ground pins are correctly seated into the sockets. (Note: the position of the ground pin doesn't matter, as long as it's completely in any socket hole in the bottom row).

At this point, all of your lights should be lit, and going nuts! Now it's time to prep your dome and lights for the best fit.

USB POWER SUPPLY:

I selected a USB power supply that I felt had the best combination of weight to capacity. This power supply should be able to power the DroidLights module for several hours without interruption. Feel free to replace this with any other portable USB charging device.

To recharge, use the included USB -> Micro-USB cord, and plug into any USB power source.

Note: The current batch of USB power supplies included have something that looks like a power button on them. Unfortunately, this isn't an actual power button, but it will show you how much power is available in the device, which is handy in its own way. Power to the lights is currently controlled by plugging and unplugging the cable.

SOFTWARE UPDATES:

I will include instructions for software updates as they're made... but in general, these instructions, along with all of the files and reference photos, will be stored in the following GitHub repository:

<https://github.com/squares/BB8>

I will post notices of the software updates to the Facebook page (and the website, once it's set up) and you will be required to download and install any updates applicable to you. Again, instructions will be provided at that time, if you're interested.

QUESTIONS YOU MIGHT ASK:

Why are the plugs in the order they're in? Why is there two spaces between the radar eye plug and the next logic light plug?

This is a combination of the way the code works, the prototyping process, and the position within the dome. The pins are where they need to be for everything to work correctly.

The space next to the radar eye is there purely because the radar eye pin is little. I wanted to give my fat fingers a little extra room to reach in there and put the plug in. Also, it lines the second set of white LEDs up nicely with the edge of that header. 😊

Any other questions? Please reach out via email to strong.s@gmail.com. Send me pictures of your build!

Thanks!
Steve

GUIDELINES AND DISCLAIMERS:

1. Make sure your dome is ready! It's tempting to shove this into an unfinished dome, and while I've done my best to make the DroidLight module robust enough for mild abuse, it's a hand-built piece of electrical equipment, and pulling it in and out of a dome multiple times may lead to something breaking. This product is intended for use in "finished" domes. Use in any other way is totally your responsibility I'm not responsible if you break it.
2. No two printers print exactly the same dimensions, regardless of how well they're calibrated. Don't attempt to force any parts into any openings. Follow the instructions below and aim for a good fit! The LED housings **MUST** be sanded prior to inserting into the openings. You **WILL** break your dome if you shove them in before sanding. I'm not responsible for your dome breaking.
3. Things can shift in transit. I will make every effort to pack this in a way that everything arrives in tact and ready to go, but it's possible a pin might bend in the wiring harness. Double check that each plug has straight pins before you plug them in to the board.
4. I can't be held responsible for any damage to your dome (belongings, house, dogs, children, etc). I've used this system in my own dome for over a month now without issues, but the universe works in mysterious ways and things happen. Again, this is a hand-made piece of electrical equipment, and if it's handled as such, I'm sure you'll enjoy it for a long time. If you mount it to the top of your car and drive through a rain storm... Well... basically, once it leaves my possession, I'm not responsible for it.
5. Feel free to modify the board in any way you'd like! Heads up though, I will try to make myself available for information as time permits, but I won't be able to fix broken boards remotely. If you need me to fix something, you'll have to cover shipping costs both ways, and there will be an hourly rate for repairs.
6. **NOTICE:** There is no warranty on kits. It is your responsibility to install the board. Opened kits cannot be returned. Be careful if you use a battery source that is capable of delivering a lot of current. Contact a professional if you need assistance.
7. One last time, just for good measure: Steve Strong assumes no responsibility for the misuse of this kit.

Thanks for reading all of that!