



Inexpensive garage lights from LED strips

by [happydupa](#) on November 16, 2015

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Intro: Inexpensive garage lights from LED strips

Hello all you happy people. Welcome to my first instructable.

This project came about as I recently rebuilt my garage and found myself in need of complete lighting.

I had two main objectives: I wanted bright/even coverage and I wanted to do it as inexpensively as possible.

For a number of reasons I wanted to use all LED lighting for my project but the commercial products were cost prohibitive. At the time of this writing, 4 foot shop lights were going for \$40 and higher. I did some research and before long came across inexpensive lighting strips from China. The strips are sold in 5m lengths (16.5 ft) and can be found on ebay for \$5-7 each. But how to use them?

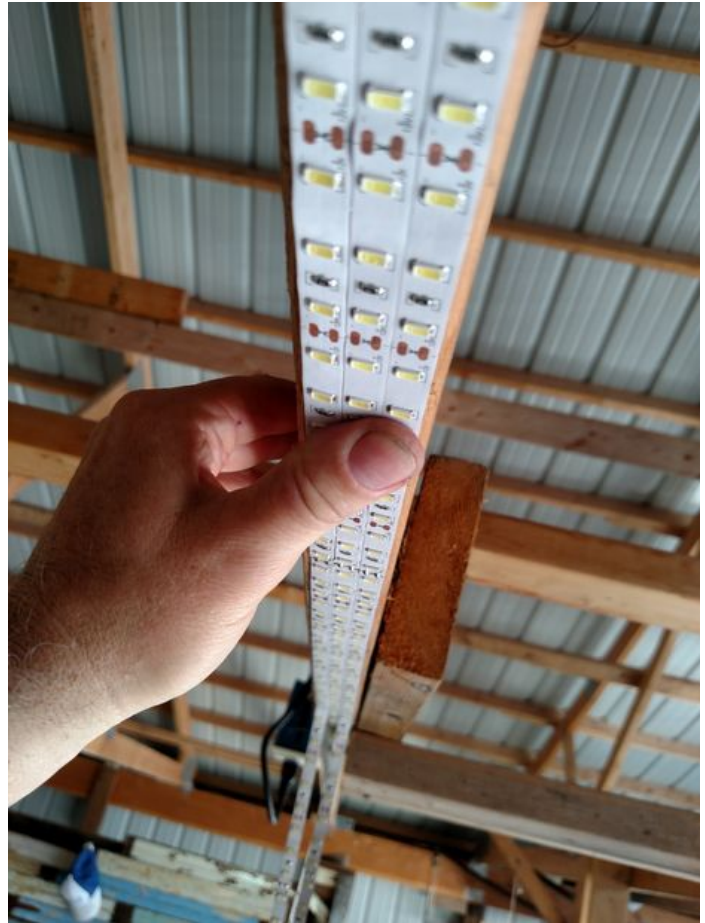
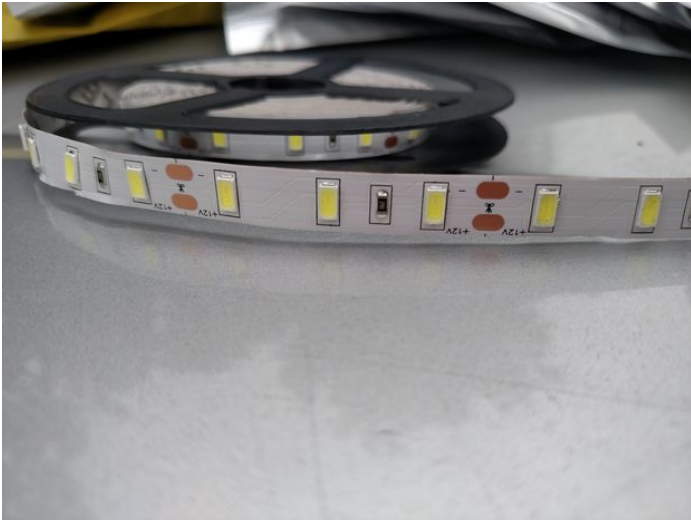
Then I came up with the idea of putting them directly on my trusses. This would give me even lighting throughout and a clean modern look.

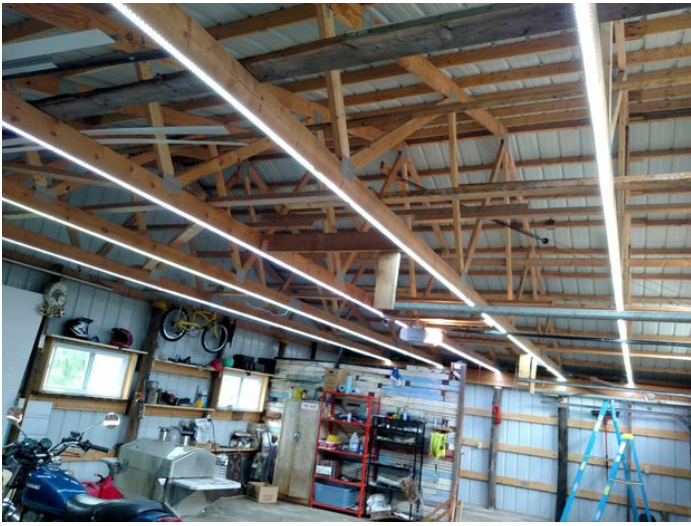
I found that one LED strip wasn't bright enough, so I added a second for more light. This is probably enough for general lighting but I wanted MORE POWER and added a third. Why not at this price right? To give you an idea of the coverage, my garage is 24'x40'. I'm putting lights on 5 trusses and they are 8'6" off the ground.

The other piece of the puzzle is powering the lights. These LED strips run on +12vdc and require an external power source. You can easily buy 12v power supplies but I'm trying to go cheap, right? So I used old discarded PC power supplies. Cost? Free!

You won't need to know electronics for this project but you will need some basic soldering skills.

Let's begin!





Step 1: Prep the trusses

Although the light strips come with adhesive, I found that it wasn't strong enough to support the weight of the lights when mounted facing down. Therefore I needed a better solution. Through trial and error I ended up with Scotch outdoor tape. This stuff is super strong and holds in extreme temperatures. It is 1" wide and works perfectly for attaching three LED strips to a truss.

Grab a ladder and roll the tape along the bottom of the truss. Only roll out as much at a time as you can reach so that the roll doesn't fall to the ground and get dirty. Place the tape directly on the center of the truss.

I used a small roller to securely press the tape onto the truss. I think I bought this roller years ago for sealing the edges of wallpaper. A rolling pin would probably work as well or even better.



Step 2: Add the lights

A note before we begin. I purchased LED lighting from two different sources on ebay. One had power connectors on one end, while the other had power connectors on both ends. Either one will work fine. Roll your LED strips so that the power connectors all line up in the same spot. This will simplify your life when it comes time to connect the power. In other words, if you have the single ended type, don't put one down one way, then another the opposite way.

Peel off some of the protective backing on both the tape and the LEDs. I found it worked best for me to run the center LED strip first then butt the other two along side of it. Do this step anyway you choose. One strip at a time if you like. To save myself going up and down the ladder a hundred times I did it like this:

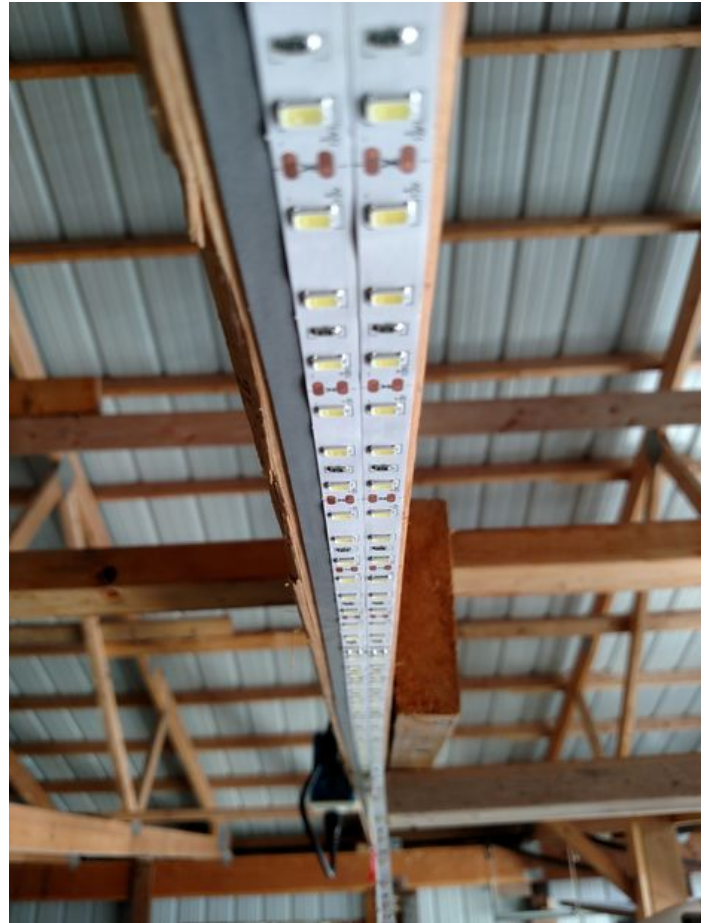
Ran tape down the entire length, using the roller as I went.

Starting at one end I pulled an arms length of tape backing, Then pulled the backing tape off an arms length of the first LED strip and pressed it onto the center of the tape. I followed that by doing the same for the remaining two tapes.

You will now need to firmly press the LED tape into the outdoor tape to ensure a good bond. **Do not use a roller for this step as it may damage the strips.** I tried using the palms of my hands with fairly good success, but the best solution was using pressure from both thumbs.

I repeated this step until I had covered the entire length of the truss.

It's very unlikely that the length of LED strips you bought will fit the truss perfectly. So what do you do? One of the many cool things about these LED strips is that you can easily cut them to length without damaging them. Each strip has little copper pads every few inches where it's safe to cut (and join) strips. Take care to center your cut.





Step 3: Run the power line

Now that the strips are up and looking good, you're probably excited to light them up. Time to run the power lines.

For this step I used 18 ga speaker wire. It was perfect for the job but you could use whatever you like. The wire just has to be able to handle the combined current load of the lights you are sending through it. Not a big concern unless you are running a lot of lights.

This is where you test your wiring skills.

Strip a little insulation off all the leads, then twist them together red to red and black to black. Simple eh? Solder the leads together. I'd strongly suggest you invest in a few pieces of shrink tubing for this project. Makes things tidy.

You could avoid soldering by using wire nuts or crimp-on solderless connectors. I prefer solder for the solid connection.

I used low voltage staples for my runs spaced about 3 ft apart.





Step 4: Make the power connections

It's time to connect your LED strip lighting to the PC power supply. There are a couple of ways you could do this and now is the time to make that decision.

Hardwire: Connect the power leads of the LED strips directly to the PC power supply. This is an okay solution but what happens if you ever need to replace a power supply? You'd have to cut and resolder/crimp a new one in place. There's nothing wrong with this solution. I just choose the next option.

Connectors: Solder a PC power connector on the LED power ends and connect it to the power supply. This way if the power supply dies, you have a quick disconnect. Be up and running again in seconds with minimal hassle

At this point we should talk about the power supply. A PC power supply is not instantly ready to use for our project. We need to make one quick modification for the power supply to turn on when plugged in.

This guy does a pretty good job of converting a PC power supply into a source for your lights. Remember, we're only interested in using the +12 volts.

Once the power supply has been modified and you have your connection on the LED lights, connect the two and plug it in.

Since this was a new lighting installation and my only source of light, I installed switched outlets between my trusses to power the PC power supplies and in turn, the LED strips. Walk in the door, flip the light switch and let there be light!

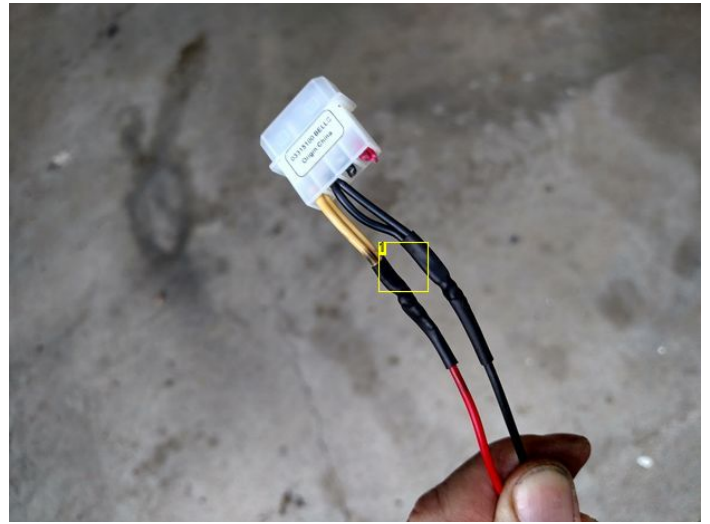


Image Notes

1. Black to Black is obvious. But Red to Yellow? That's because on the PC power supply YELLOW is 12volts.



Image Notes

1. I installed switched outlets between my trusses to power the PC power supplies and in turn, the LED strips.

Image Notes

1. A computer power supply has a ton of cables coming from the inside. Don't let this intimidate you. Out of all those cables, we only need to use one. You can just leave the rest alone. Grab one that looks like this. We're only interested in the Yellow (+12vdc) and the Black (ground) wires.

Step 5: Final thoughts and sources

I'm really happy that this gamble paid off. The lighting is bright, even, and fantastic. I believe I spent maybe a tenth of what a commercial application would have cost.

The LEDs are available in all colors but two flavors of white. Cool white and Warm white. Cool is similar to florescent lighting where Warm is closer to incandescent. I went with all Cool white. While it looks terrific, I think it's slightly too blue. If I were to do it over again I would have gone 2 cool, 1 warm.

They also come in a waterproof version. The non-waterproof ones are a bit cheaper and that's what I used.

I bought two different versions of the lights. The second ones were cheaper but had two small dead spots. Get what you pay for? Regardless, dead spots are not a big problem. They can be easily cut out and replaced.

Even though there is plenty of light, I think it still needs more light directly over the workbenches. I like LOTS of light. But your mileage may vary. I'm going to convert my old shop light into LED using this same method.

One source for lights: <http://goo.gl/WRkh70> They've only been up for a week but seem to work fine.

Just pick one that has free shipping and a good rating. Expect a week or two shipping from China to the US.

You can get them from any of a hundred vendors on ebay. Do a search on: 5M 300LEDs SMD 3528 5050 5630 3014 RGB Flexible LED Strip Lights

If given the option, choose the **5630** non-waterproof variety. At least that's what I used.

Computer Power Supplies: I work in IT and have access to lots of discarded computers. That's exactly what you want. Ask the IT guy at a nearby school, or business or anywhere that's large enough to have an IT staff. Be friendly, bring candy, most likely they'll have a few laying around that they'll give you.

You can also buy one from ebay. Search for: 12v regulated power supply. This one sells for about \$20 <http://goo.gl/v9aR6S>

If you go this route instead of the PC power supply, just connect the red and black wires from your LED lights to the power terminals on the power supply.

The tape I bought from Amazon. I looked at a few China knock-offs on ebay but didn't trust the quality. Go with genuine 3M. <https://goo.gl/F6ODQw>

One last thing. This project is fairly labor intensive. Expect a lot of ladder time!

This was a fun and rewarding project. I hope you find this Instructable useful!

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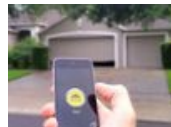
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