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How To Create a Large LED Light Installation

For safety reasons and because of the nature of LED light fixture design, LED Strip Lights and Light Bars have recommended limitations for the length of run. But it's relatively easy to make a safe but effective large LED installation by keeping the following things in mind.

1) Observe run limits for your LED fixture.
On the last page of this guide, you'll find a table with the **run** limits of feet and fixtures for Diode's strips lights and light bars. Observing run limits will result in a safer installation, and help prolong the life of the lights. (Although 12V LEDs can operate in a range of about 10V to 14V, less or more voltage will drastically reduce the life of the bulbs, and cause them to be dimmer than normal.)

A "**run**" is defined as a section of strip or group of fixtures that are running continuously from a single power source.

2) Don't overdrive a 12V power source.
Although a 36 Watt Plug-In Adapter can power 50 Watts of strip light, doing so will cause the adapter to overheat, which can create a fire. For this reason--and because LED fixtures draw slightly more power than the sum of their bulbs--we recommend using 80% of a power supply's capacity.

The **wire gauge** indicates the thickness of a wire. A lower number is heavier, and a higher number is lighter.

3) Use the right amount of power and the right gauge wires to avoid voltage drop.
The **wire gauge** of 12V power wires and **parallel run** wires is also a factor in large installations. When lighting is at a certain distance from its power source, something called **voltage drop** occurs.

See Page 2 for an example of a **parallel run**.

"**Voltage drop**" is the gradual diminishing of voltage along the length of the wire as electricity travels away from a power source. Voltage drop happens when a light or appliance is located far from the power source.

You can avoid voltage drop by using a **voltage drop calculator**, which helps you find the right wire gauge based on the number of fixtures in your installation, how they are spaced, and the distance between the power source and the fixtures. Consult your local fire code for additional information about permissible limits on home or commercial electrical wiring.

We recommend these **voltage drop calculators** of the many available online:

www.nooutage.com/vdrop.htm

www.csgnetwork.com/voltagedropcalc.html

4) Supply sufficient power.
Another way to get power to a distant fixture is to use a power supply with a higher wattage than necessary. Supplying more power at the source means more will reach the fixture after traveling through the wires. In general, for optimum performance we recommend that a driver not be loaded to more than 80% of its full capacity.

5) Get creative!
Fortunately, there are several ways to install LED lights in large installations that are safe and efficient, just by placing power supplies and using additional wiring. In the next pages, we've made **wiring diagrams** that give examples of how to make large installations.

Our example **wiring diagrams** use strip lighting, but the same layout ideas apply to light bars and module lights.

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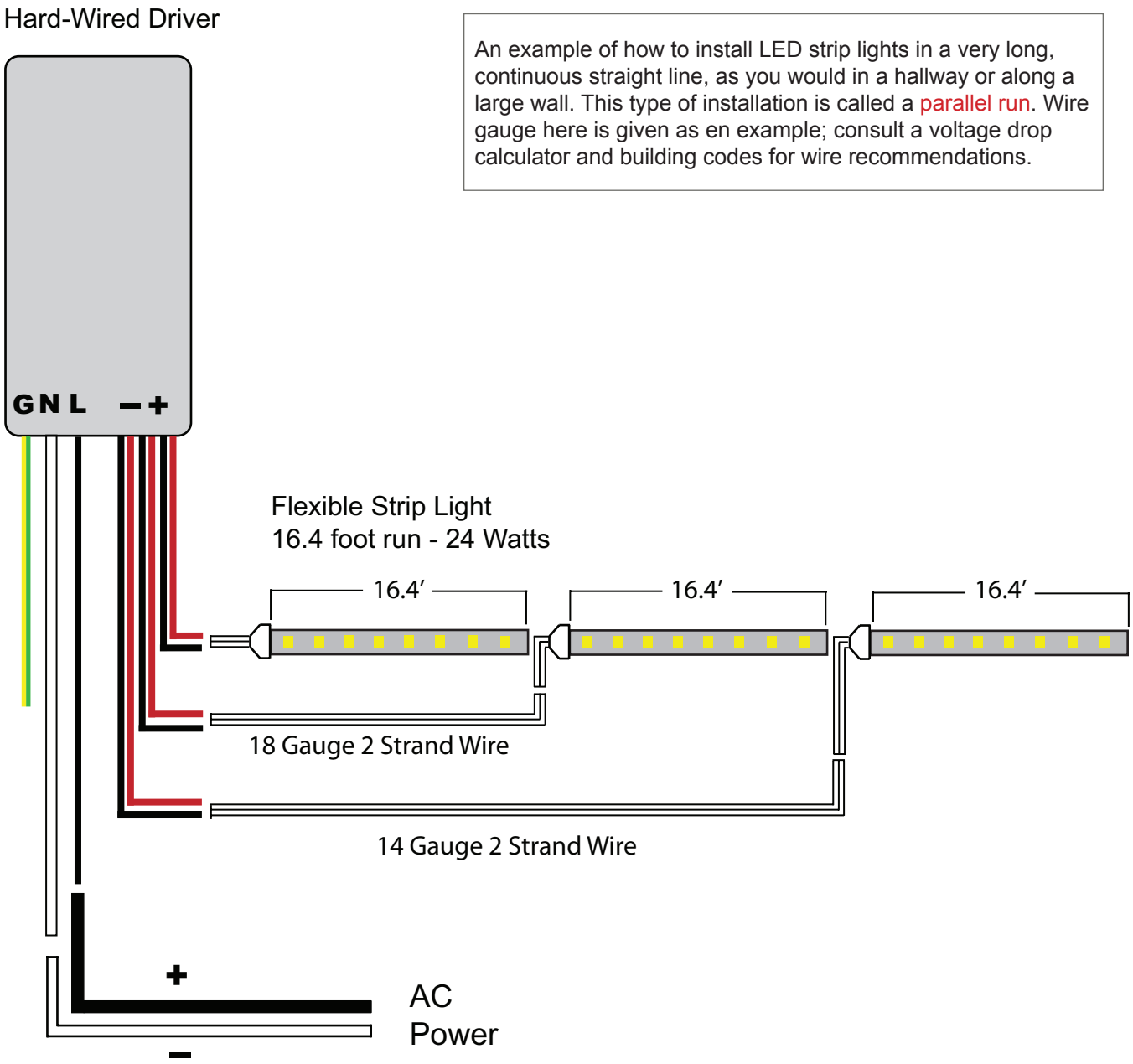
An example of how to install LED strip lights in a very long, continuous straight line, as you would in a hallway or along a large wall. This type of installation is called a parallel run. Wire gauge here is given as en example; consult a voltage drop calculator and building codes for wire recommendations.



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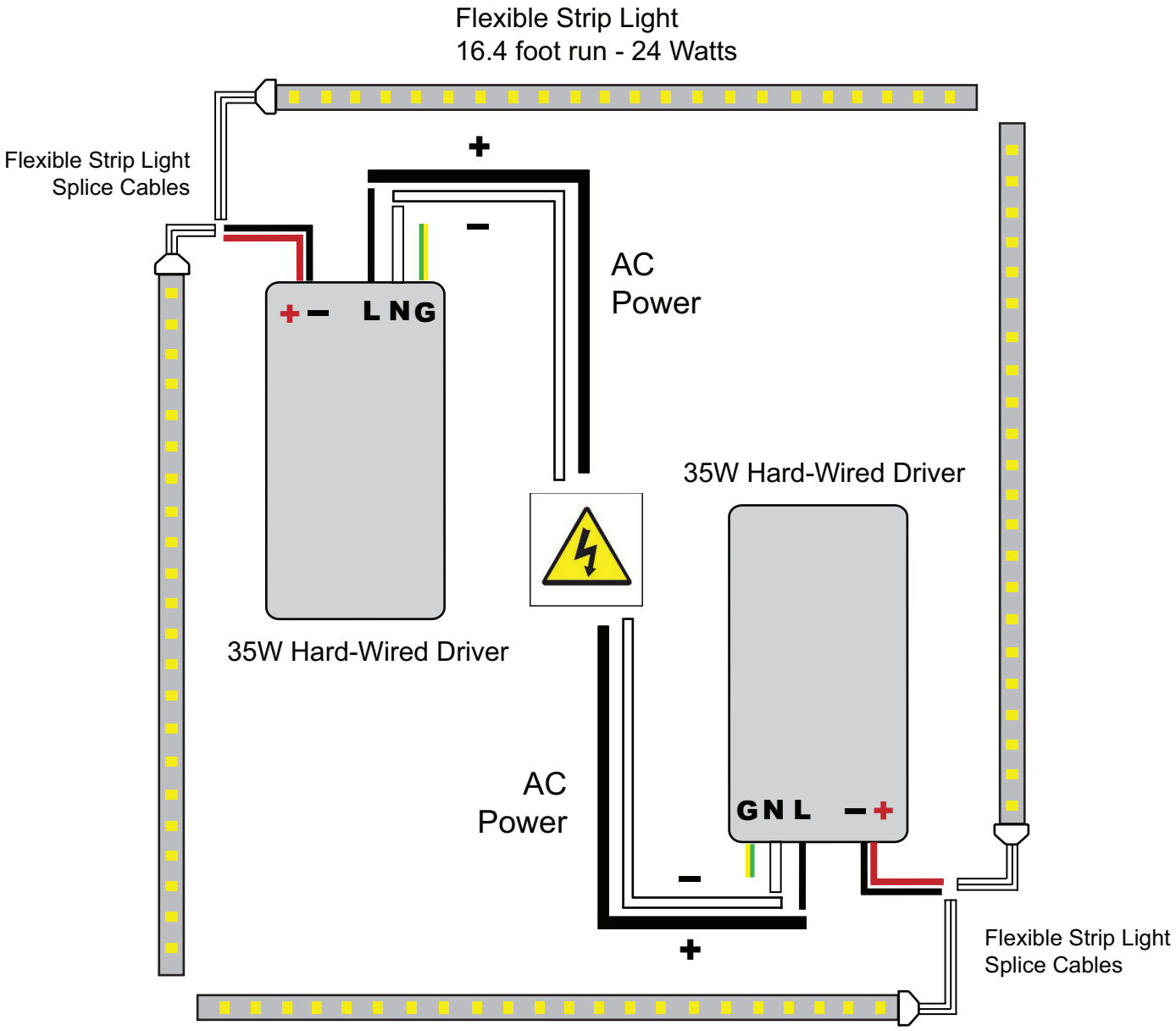
An example of how to install LED strip lights in a large room. Note the two ways of powering multiple sections of strip with one source:

1) Placing the power source in the middle of two runs, with runs going in opposite directions
2) Placing the power sources at opposite ends of the two sections so that the runs join seamlessly in a corner.



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Run Limits for Diode LED's Strip Lights and Light Bars.

Length / Unit	Product Name	Power per Unit	LEDs per Unit	Max. Run / Daisy-Chain Length	Wire Gauge in Fixture
foot	FLUID VIEW Strip Light	1.44W	18	16.4 ft / 5m	#22 AWG
foot	FLUID VIEW Waterproof Strip Light	1.44W	18	18 ft / 5.5m	#22 AWG
foot	FLUID VIEW Waterproof RGB Strip Light	2.16W	9	18 ft / 5.5m	#22 AWG
foot	FLUID VIEW RGB Strip Light	2.16W	9	16.4 ft / 5m	#22 AWG
foot	BLAZE High Output Strip Light	2.88W	36	16.4 ft / 5m	#22 AWG
12"	CASCADE Light Bar	3.6W	15	10 Bars	#22 AWG
23.8"	CASCADE Light Bar	7.2W	30	5 Bars	#22 AWG
6.25"	SUNRISE LED Light Bar	0.72W	9	15 Bars	#22 AWG
10.25"	SUNRISE LED Light Bar	1.2W	15	10 Bars	#22 AWG
12.25"	SUNRISE LED Light Bar	1.44W	18	9 Bars	#22 AWG
20.1"	SUNRISE LED Light Bar	2.4W	30	7 Bars	#22 AWG
24"	SUNRISE LED Light Bar	2.8W	36	5 Bars	#22 AWG
8.9"	TRUE FOCUS Tube Light	1.44W	6	11 Bars	#22 AWG
13"	TRUE FOCUS Tube Light	2.16W	9	8 Bars	#22 AWG
19.9"	TRUE FOCUS Tube Light	3.6W	15	7 Bars	#22 AWG
8.9"	TRUE FOCUS RGB Tube Light	1.44W	6	12 Bars	#22 AWG
19.9"	TRUE FOCUS RGB Tube Light	3.6W	15	7 Bars	#22 AWG
10"	REFRACT Light Bar	4.7W	4	20 Bars	#22 AWG
15"	REFRACT Light Bar	7W	6	14 Bars	#22 AWG
20"	REFRACT Light Bar	9W	8	11 Bars	#22 AWG
30"	REFRACT Light Bar	14W	12	7 Bars	#22 AWG
40"	REFRACT Light Bar	18W	16	5 Bars	#22 AWG
5.9"	ARRAY Linkable Light Bar	1.65	6	24 Bars	n/a
11.8"	ARRAY Linkable Light Bar	3.3W	12	12 Bars	n/a
23.6"	ARRAY Linkable Light Bar	6.6W	24	6 Bars	n/a