

## **EnvironmentalLights.com LED Drivers (Non-Dimmable)**



Environmental Lights provides only the highest quality LEDs with the best light output and color rendering on the market, but LEDs are only as good as the driver that powers them. We have tested our products rigorously to ensure that your LEDs will last a long time.

This document describes our non-dimming line of adapters. We have fine dimming drivers, and they are larger and more expensive than non-dimming drivers. Do not use the drivers described in this document with primary side (phase) dimmers.

LEDs are constant current devices, but if one doesn't know the load in advance because the lights are cuttable or extendable, one must achieve constant current by using a constant voltage source and dividing the voltage over several LEDs and a resistor or current control device in each cut segment. One can only use a constant current source if the load is fixed by design and not changeable in the field. All the drivers discussed in this note are constant voltage drivers.

### Features

- Available in 12 or 24 volts DC output (constant voltage.)
- Accepts 100-240 volts AC input (or broader range), 50-60 Hertz, auto-sensing.
- Energy-efficient: it consumes almost no power in the no-load state.
- UL and CE.
- Adapters use 2.1mm inside diameter male barrel plugs compatible with our standard 2.1mm ID female barrel plugs.

### Applications

Suitable for small projects using our LED strip lighting, modules and certain under cabinet bars.

## Power Adapters

These universal power adapters require minimal wiring and are ideal for small projects. The 60W and 100W adapters are available with plugs for North America, Europe, United Kingdom/Hong Kong, Australia/New Zealand/Argentina.



24 Watt Adapter



60 Watt Adapter



100 Watt Adapter

## Specifications

Part No.	Driver-24-12-NA	Driver-24-24-NA	Driver-60-12	Driver-60-24	Driver-100-12
Rated Output Power (W)	24	24	60	60	100
Output Voltage (VDC)	12	24	12	24	12
Output Current (A)	2	1	5	2.5	8.3
Input Voltage (VAC)	100-240	100-240	100-240	100-240	100-240
Length (mm)	95	95	127	127	165
Width (mm)	48	48	53	53	62
Height (mm)	55	55	34	34	41
Length (in)	3.74	3.74	5	5	6.5
Width (in)	1.89	1.89	2.1	2.1	2.45
Height (in)	2.17	2.17	1.35	1.35	1.6
Input Cord (ft)	N/A	N/A	5	5	5
Output Cord (ft)	6	6	6	6	4
Warranty (years)	1	1	1	1	1

## System Design Guidelines for Power Supplies

We generally recommend using a power supply rated for at least 20% higher wattage than the lighting (6/5 of estimated actual power consumption). These numbers are conservative, since additional margin for error is built into the ratings of the power supplies themselves. Using a more powerful driver than you need is not a problem for the components and will actually extend the operational life of the power supply.

**This is very important. We get questions about it every day. There are two limits you need to keep in mind:**

1. How much load can you put on each driver?
2. How much wire and lighting can you drive in one branch without making a home run to the driver? The answer is generally one “unit of sale,” which is a reel or set of modules.

**They are very different concepts.** Examples:

1. **How much load can you put on each driver?**

Let's say you put 5 reels of 24-watt regular strip on a 60-watt driver. You don't violate #2 above, but you do violate #1. The driver is not big enough and your installation won't work. You need a more powerful driver.

2. **How much wire and lighting can you drive in one branch without making a home run to the driver?**

Let's say you have a 150-watt driver and you connect 50 feet (about 3 reels) of regular strip lights in a single line. You don't violate #1-your driver is large enough (150 >> 24 watts x 3 reels.) You do exceed the branch length limit of 16-20 feet, so after 20 feet your lights will become ever dimmer. In an RGB installation, they will be the wrong color and appear to respond strangely to the controller. Worst of all, the section of strip light closest to the driver will be forced to carry more current than it is designed for. This will cause it to run hot and fail prematurely. Shorten your branches by making home runs to the driver or controller.

Or, let's say you want to put the same 3 reels of regular strip light at the end of a 50 foot run of 18 gauge wire. Using 12 volts, 18 gauge, 6 amps load and 50 feet, we calculate you'll drop 3.95 volts. If you power your head end with 8 volts, it will barely light. At the tail end of each reel, it will probably be dark. You need thicker wire or a shorter run. Put the driver closer to the lights, if you can. Using a higher wattage driver won't help with this problem. You could adjust the driver voltage up to compensate for the drop, but very few drivers allow enough adjustment to accomplish that, plus if you have any lights closer to the driver, you run the risk of burning them out with excessive voltage (and, therefore, current.)

Use thicker wire, make more home runs and move your drivers closer to the lights.

## Frequently Asked Questions

### **Q: What wire should I use between my power supply and my LEDs?**

A: The required wire gauge depends on length and power consumption. Call us at 1-888-880-1880 with the details of your project and a qualified sales engineer will calculate the wire gauge that you need.

### **Q: Where should I put the power supply?**

A: Drivers must be placed in a well-ventilated area so they do not overheat. If you are using a standard non-waterproof driver outdoors, use a NEMA enclosure that keeps water out and maintains good airflow.

### **Q: Does the power supply include a cord?**

A: No cord is included unless specified in the title.

## Appendix

In order to understand the technical descriptions and applications please make sure you are familiar with the following terms:

**Driver:** Converts Alternating Current (AC) voltage from your building (“line” or “mains” voltage) to Direct Current (DC) for your LEDs. A driver is a specific type of power supply that converts AC to DC voltage.

**Converter:** Converts DC voltage to DC voltage. On the primary side, the voltage may vary widely, such as in a vehicle system, where voltage typically ranges from 10 to 14 volts. Most linear LEDs do not have voltage protection, so you should use a converter to “tame” a wild voltage. Our 12 volt DC converters, for example, convert a voltage between about 10 and 18 volts DC to 12 volts DC. Converters are also power supplies, but we usually call them “converters,” not power supplies.

**Transformer:** Converts AC to a different AC voltage. An example is a 10:1 step down transformer used in landscape lighting in the U.S., which converts 120 VAC to 12 VAC. LEDs are DC devices and generally are not designed to operate on AC, so we don’t sell many transformers. Notable exceptions to the rule include 12 VAC track lighting and 12 VAC landscape lighting. In the case of track lighting, most MR16 LED bulbs we sell are designed to accept 12 VAC from the luminaire’s transformer or 12 VDC from some driver. In the case of landscape lighting, we DO sell transformers, and they’re really good ones.

- Inverter:** Converts DC to AC. Inverters are found in vehicles and solar-powered installations and are typically used to allow one to operate traditional mains voltage lighting or appliances “off grid.” We sell a small 75 watt inverter to operate traditional 120 VAC LED Christmas lights on an DC power source, such as a vehicle. The inverter plugs into the cigarette lighter and allows you to plug Christmas light strands into it.
- Universal:** Drivers that operate on “universal” voltage will accept any of the line voltages commonly found in the world, typically ranging from 100 to 240 VAC. Some of our drivers operate on 277 VAC, found in commercial installations in North America. If you intend to use 277 VAC, be sure you select a compatible driver. We indicate the acceptable input voltage range on our website and later in this document.
- Plug shape:** We sell different power cords that are compatible with plugs for North America, and will soon offer them for Europe, United Kingdom/Hong Kong, Australia/New Zealand/Argentina.
- Primary:** Input side, typically connected to AC power.
- Secondary:** Output side, typically connected to the LED load or LED controller.
- PFC:** Power factor correction is a feature that helps to simplify a complex load. With a complex AC load, the current draw does not follow the voltage because the load is capacitive and/or inductive. Power factor is the cosine of the phase angle between voltage and current. If the current is out of sync with the voltage, you will need more apparent AC power to run the device. The tradeoff is that active PFC consumes extra power in order to make the reactive load look more like a resistive load. Therefore, it will only save money on a very large infrastructure.
- DIN:** Deutsches Institut für Normung, the German Institute for Standardization. “DIN rail” refers to the drawer slides used in equipment cabinets, where some of our drivers are installed. DIN mounting plates are available for some drivers.