

LED Phase Dimming Driver Manual

Part numbers: 12V Dimming Driver-60 24V Dimming Driver-60

This family of PWM output dimming drivers is compatible with electronic low voltage (ELV) reverse phase dimmers. They are available in 12 or 24 volt DC output versions, both rated for 60W. The PWM output frequency is 200 hertz, providing smooth dimming. These drivers are great for applications where a traditional wall switch or dimmer is desired. Typical applications include LED retrofits and under cabinet lighting installations.

Features

- Connects to a compatible in-wall dimmer and has a 12 or 24V PWM output for LEDs.
- 60 Watt output rating for both 12V and 24V versions.
- Accepts 120V AC input at 50-60Hz.
- 200Hz PWM output.
- 3-year warranty.

Specifications

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|-------------------|------------------------------|
| Part Number | 12V Dimming Driver-60 |
| Dimensions | 2.5" x 11.875" x 1.65" |
| | 64mm x 302mm x 41mm |
| Channels | 1 |
| Input Voltage | 120V AC |
| Output Voltage | 12V DC |
| Max. Current Load | 5A |
| Max. Output Power | 60W |
| PWM Frequency | 200Hz |
| Compatible Dimmer | ELV |

| | |
|-------------------|------------------------------|
| Part Number | 24V Dimming Driver-60 |
| Dimensions | 2.5" x 11.875" x 1.65" |
| | 64mm x 302mm x 41mm |
| Channels | 1 |
| Input Voltage | 120V AC |
| Output Voltage | 24V DC |
| Max. Current Load | 2.5A |
| Max. Output Power | 60W |
| PWM Frequency | 200Hz |
| Compatible Dimmer | ELV |



MOUNTING AND INSTALLATION INSTRUCTIONS

WARNING: The drivers specified here must be installed by a qualified electrician in accordance with the National Electrical Code (NEC) and local building codes. Failure to do so voids the warranty and may result in serious injury or permanent damage to the unit.

Refer to the product label for detailed line and load wiring procedure. For connection, use 12-22 AWG copper wires insulated for a minimum of 90°C rated for 600 V. Use wire connectors suitable for the number and size conductors being connected and applied in accordance with the manufacturer's instructions. There must be at least 20 amp supply side branch current. A disconnect device shall be located in the field wiring.

IMPORTANT SAFETY INSTRUCTIONS

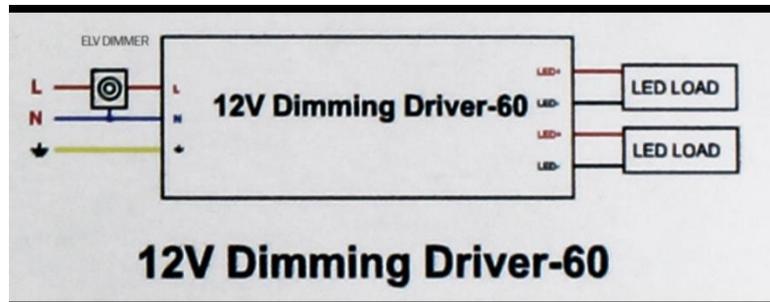
When using electrical products, basic precautions should be practiced including the following:

1. **READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**
2. Read and follow all instructions that are on the product or provided with the product.
3. Reference the National Code, ANSI/NFPA 70, specifically for the installation of wiring and clearances from power and lighting conductors.
4. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
5. **WARNING:** Risk of fire. Installation involves special wiring methods to run wiring through a building structure. Consult a qualified electrician.
6. **WARNING:** Risk of electric shock. Mount the unit at a greater height than 1 foot from the ground surface.

SAVE THESE INSTRUCTIONS-This manual contains important safety and operating instructions for power units.

Wiring Dimming Power Supplies

You will need an ELV reverse phase dimmer to control these dimming supplies. A standard wiring diagram is shown below and is also printed on the top of the drivers themselves.



Note: The wiring diagram is the same for the 24V version

Detailed instructions are included with each of the compatible dimmers. Read and follow these instructions carefully. All recommended ELV dimmers require a neutral wire in the gang box. This must be connected for the dimmer to function properly. Some older construction may not have a neutral wire in the gang box so it may be necessary to pull another wire or choose a different dimming method. Additional dimming supplies may be used. It is recommended to keep the total load at or below 50% of the dimmer's capacity.

These dimming supplies accept a reverse phase-cut signal generated by electronic low voltage (ELV) dimmers. They are not compatible with magnetic low voltage (MLV) or 0-10V dimmers. The driver converts the output from the dimmer into a pulse width modulated (PWM) signal at 12 or 24V DC to drive the LEDs. This kind of output is compatible with standard constant voltage LEDs as well as those with current regulating circuits (CurrentControl). The output frequency is at 200Hz.

Both of the drivers are rated for 60W, but it is recommended to de-rate all power supplies by 20% when designing your lighting system. This accounts for variations in LED power consumption and ensures a long operating life for the driver.

General Wiring instructions:

1. Turn off power at the building's breaker for safety.
2. Wire the dimmer to the building line voltage wiring according to dimmer specific instructions.
3. Connect the line out wire from the dimmer to the "L" terminal on the driver.
4. Connect the neutral wire from the dimmer to the "N" terminal on the driver.
5. Connect earth ground to the ground terminal on the driver.
6. Wire the LED load to the LED + and LED - terminals, making sure to follow the polarity indications on the LEDs. **Always make sure the power supply is the correct voltage for the LEDs you are using before turning on the power.** Applying the incorrect voltage can permanently damage the LEDs.
7. Once all connections are secure, turn the building circuit breaker back on and test.

Dimmer Compatibility

We recommend the following dimmers for the **12V Dimming Driver-60** and **24V Dimming Driver-60**. Always follow the wiring guides included with each dimmer.



Maestro Wireless
[MRF2-6ELV-120-WH](#)



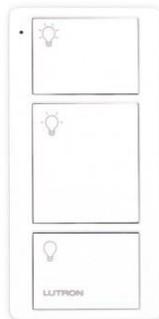
Skylark
[SELV-303P-WH](#)



Diva
[DVELV-303P](#)

Use Electronic Low Voltage (ELV) Dimmers only. Do not use incandescent, Magnetic Low Voltage (MLV) or LED/CFL dimmers. These ELV dimmers require a neutral wire in the gang box.

Use one or more Pico wireless remotes (shown below) in order to utilize the wireless functionality of the Maestro listed above. Pedestals are also available to place on a table or desk.



Lutron Pico Remote
[PJ2-3B-GWH-L01](#)



Lutron Pico Remote
[PJN-3BRL-GWH-L01](#)



Lutron Pico Single Pedestal
[L-PED1-WH](#)



Lutron Pico Double Pedestal
[L-PED2-WH](#)

Dimmer Compatibility Problems

The cosmetics on the front of a dimmer does not show how a dimmer operates. For example, Lutron Diva dimmers all look the same; yet there are many different types of Lutron Diva dimmers: incandescent, 0-10 volt fluorescent, CFL/LED, magnetic and electronic low voltage, to name five. Do not just use any Diva dimmer. Always check device markings and specifications to ensure that it is the correct type for the application.

DO NOT use the following dimmers with this type of driver. They are not compatible and may pose a safety hazard:

- Incandescent dimmers
- 0-10V Dimmers
- LED/CFL dimmers.
- Magnetic dimmers.
- Some home automation systems. The important consideration is how the dimmer output functions. If it is trailing edge (reverse phase) AND designed for capacitive loads, chances are that it will work. But we do not guarantee that it will work. There are thousands of dimmers on the market and we cannot test all.

TESTING a non-approved dimmer:

Wiring should be done by a trained electrician or a person who knows the proper safety precautions. We have given strong guidance above regarding what dimmers to use. If you insist on using a different dimmer, you can send it to Environmental Lights for testing and verification. If you want to try it yourself, remember this:

- Test before installing. Testing the product with just the dimmer, driver and lights before installing reduces complexity and prevents other factors from affecting the test (such as wiring problems within a wall). Always follow proper safety procedures and make sure your dimmer is compatible before you install the driver.
- DO NOT test more than ONE dimming driver at a time. If the dimmer is not compatible with one dimming driver, it will not be compatible with ten of them. **Damaging one driver is much better than damaging all of them.**

The dimming supply can also be configured as a normal non-dimming supply by simply omitting the dimmer. This can be useful for debugging your system, in case you suspect your dimmer may be faulty or incompatible with the supply. You may want to buy a [3-conductor power cord kit](#) for plugging the driver into an outlet and [male mini plugs](#) (20 inch whips) that mate with our ribbon reels and some of our under cabinet lighting connectors.

Troubleshooting

Typical defect rates for these power supplies are low and most issues are related to installation or use. **Wiring should be done by qualified people only. “Qualified” means, among other things, knowing what safety precautions to take to avoid injury.** If you experience issues, double check all wiring and make sure your connections are secure. Please follow these steps carefully if you are still having trouble. Call Environmental Lights if you need assistance.

1. With power off, take the dimmer out of the circuit. Just hook up the primary to the building supply. That removes any dimmer issues. Dimmer defect rates are typically <<1%, but once in a while, we run across a bad one. If your building's power conditioning is poor, or if you are using an inverter (typically used in solar powered homes) you may not be able to use this supply. If your power supply works great connected to the power grid but works poorly connected to your inverter or other local source, you most likely have a power conditioning problem.
2. Take all wiring off the secondary. That removes any installation problems you may have inadvertently created, including low resistance paths, which you will need to fix later.
3. Hook up your lights directly to the secondary on the driver, using proper polarity.
4. Power up. Applying power directly to the primary and wiring directly to your lights (no installation wiring) is the simplest way to turn the lights on.
5. Substitute a similar power supply for the one in question if there is one available. If the problem persists, then it is most likely usage or installation related because the defect rate on these products is very low.
6. The above steps have resolved the majority of problems we have seen. Call Environmental Lights for additional assistance.