

Minimizing Radio Frequency Interference (RFI)

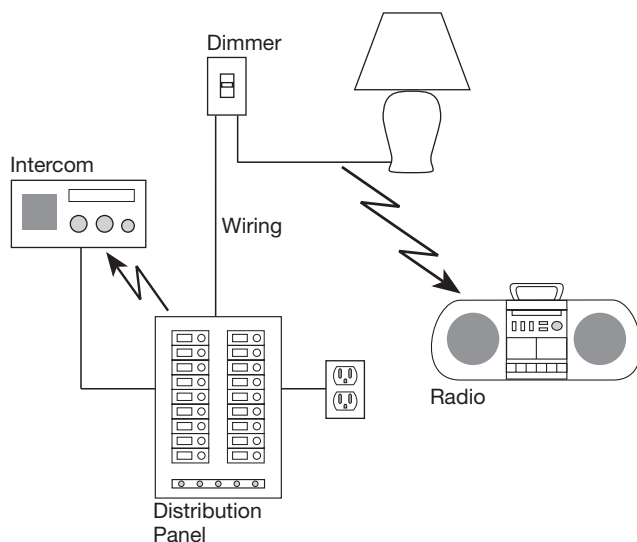
A solid-state dimmer is an electronic switch that rapidly turns the current on and off 120 times per second to achieve the dimming effect. This rapid current switching may cause radio frequency interference (RFI) — an audible buzzing noise — with sensitive audio and radio equipment. Although every Lutron® dimmer contains a filter to suppress RFI, applications with sensitive equipment may require additional filtering. Typical examples of RFI sensitive equipment are AM radios, stereo sound systems, broadcasting equipment, intercom systems, public address systems and wireless telephones. RFI can be transmitted in two ways:

- Radiated
- Conducted

Radiated RFI

All wiring that carries dimmer-controlled current can act as an antenna to radiate RFI into the air waves. Any sensitive equipment that is in close proximity to this wiring can pick up the RFI and generate noise into its system. Also, this could occur if the wiring for sensitive equipment runs along side the wiring for the dimmer.

Example of Radiated RFI



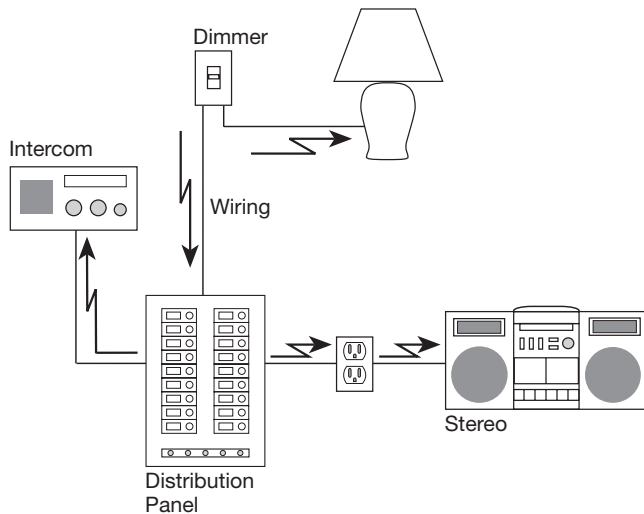
The following are three possible ways to minimize radiated RFI:

- Physically separate the RFI sensitive equipment from the dimmer and dimmer wiring.
- Run dimmer wiring separately in a metal conduit.
- To filter the RFI, use a lamp debuzzing coil (LDC) available from Lutron. See next page for more details.

Conducted RFI

In some cases, RFI is conducted through the building wiring and directly into the AC power supply of the sensitive equipment.

Example of Conducted RFI



Recommendations

Lutron recommends the following methods to avoid RFI.

- Feed sensitive equipment from a circuit without a dimmer on it.
- Add a power-line filter to the sensitive equipment. (Power-line filters may be purchased at most electrical suppliers and distributors.)
- Use shielded wire for all microphones and input cables. Also, use low-impedance balanced microphone cables, because they are less susceptible to interference than high-impedance cables.
- Make sure all equipment is grounded. Connect all shields to ground at one point. Ground lighting fixture metal housings properly.
- To filter the RFI, use a lamp debuzzing coil (LDC) available from Lutron. Refer to the next page.

Note: The suggestions in this application note will help minimize RFI; however, they do not guarantee that RFI will be completely eliminated.

Lamp Debuzzing Coils (LDCs)¹

The most effective way to reduce RFI is to install an LDC into the lighting circuit. When an LDC is wired in series with the dimmer, it slows down the inrush of current during the rapid switching cycle of the dimmer. As the current inrush is slowed down, the effect of RFI on sensitive equipment is reduced.

Lutron has four LDC models available to help reduce RFI. The type of LDC required depends on the total wattage of the lighting load. Listed below are the model numbers and their respective capacities.

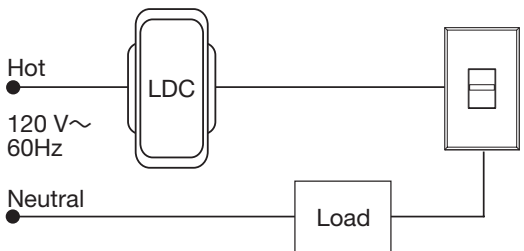
Model	Ratings
CPW0035	100–200 W
CPW0036	200–400 W
CPW0037	400–800 W
CPW1346-OCP	600–1200 W

Note: For loads over 1200 W, call Lutron® Technical Support at 1.800.523.9466

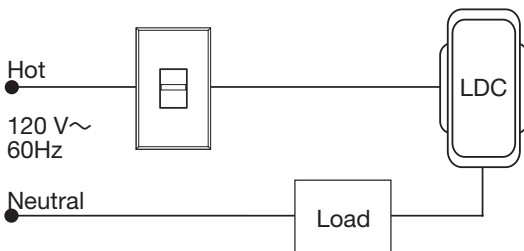
LDC Installation

LDCs may be wired in series with the dimmer on the line side or load side. Each dimmer requires its own LDC. During normal operation, LDCs may make an audible buzz and, therefore, should be mounted in an area where the noise will not be objectionable (e.g., an electrical closet, a basement, or above a drop ceiling). LDCs are designed to easily mount onto a standard 4" x 4" junction box.

Line Side Installation



Load Side Installation



¹ LDCs are not to be used with reverse-phase dimmers

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Lutron Contact Numbers

WORLD HEADQUARTERS USA

Lutron Electronics Co., Inc.
7200 Suter Road
Coopersburg, PA 18036-1299
TEL: +1.610.282.3800
FAX: +1.610.282.1243
Toll-Free: 1.888.LUTRON1
Technical Support: 1.800.523.9466
intsales@lutron.com

EUROPEAN HEADQUARTERS United Kingdom

Lutron EA Ltd.
6 Sovereign Close
London, E1W 3JF United Kingdom
TEL: +44.(0)20.7702.0657
FAX: +44.(0)20.7480.6899
FREEPHONE (UK): 0800.282.107
Technical Support: +44.(0)20.7680.4481
lutronlondon@lutron.com

ASIAN HEADQUARTERS Singapore

Lutron GL Ltd.
15 Hoe Chiang Road
#07-03, Tower 15
Singapore 089316
TEL: +65.6220.4666
FAX: +65.6220.4333
Technical Support: 800.120.4491
lutronsea@lutron.com

North & South America Technical Hotlines

USA, Canada, Caribbean:
1.800.523.9466
Mexico:
+1.888.235.2910
Central/South America:
+1.610.282.6701

Asia Technical Hotlines

Northern China: 10.800.712.1536
Southern China: 10.800.120.1536
Hong Kong: 800.901.849
Indonesia: 001.803.011.3994
Japan: +81.3.5575.8411
Macau: 0800.401
Taiwan: 00.801.137.737
Thailand: 001.800.120.665853
Other Countries: +65.6220.4666