

## **Technical Notes Covering the application of Various Dimming Technologies used in the Poultry Growout Industry**

Controlling the lighting environments has helped the poultry industry significantly improve production yields. Controlling lighting via dimming was originally initiated by using incandescent lamps which were dimmed through TRIAC Dimmers and later on Cold Cathode fluorescent lamps.

A large majority of current poultry houses are equipped with TRIAC dimmers and the Precision MR3 dimmer is currently being used to control the lighting in the majority of these houses. Subsequently, LED technology was introduced to the Poultry Industry over the last 5 years and offers extremely good ROI's for the growers. Overdrive was one of the first companies to introduce LED technologies to the industry.

There were many limitations for the development of LED bulbs allowing them to operate smoothly and dim down to low levels with TRIAC Dimmers. Overdrive engineers continue to work to improve our LED lamps to provide the best possible products to our customers although the limitations and non-compatibilities with the TRIAC circuitry prevent consistent operations. Bottom line..... TRIAC dimming with LED's continues to create field problems and these triac dimmers should be upgraded to dimmers designed for LED's. **To permanently solve this problem Overdrive designed a new Phase Cut MOSFET dimmer. This dimmer was specifically designed to properly control our DIM LED lamps via our 5 amp per channel and 10 amp per channel dimmer models.** We would like to explain in greater detail.....see below:

TRIAC dimming was introduced in 1960 and primarily used for incandescent and fluorescent lighting circuits. It generates a tangential output voltage waveform where the change in voltage is proportional to the current. Incandescent lighting is a simple resistive load with the relationship between current, voltage, and brightness being linear and direct.

LED lights are vastly different from incandescent lamps. LED lights rely on drive circuits to provide constant current and ensure proper power and voltage. Their interactions with a TRIAC is unpredictable.

When a TRIAC dimmer is used to control LED lights, the following problems may arise:

1. Cannot cut off the current completely, in this case...the lights cannot be totally turned off.
2. Compatibility is questionable..... resulting in lights strobing, flickering at low levels.
3. Difficulty in dimming the lights to low light levels.
4. Potentially some levels of increased lumen depreciation have been observed.

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The Overdrive dimmers – ODMR0205 (5 amp/channel) and the ODMR0210 (10 amp/channel) utilize MOS-FET circuitry not TRIAC circuitry suitable for capacitive loads, like dimmable LED lights. The MOS-FET circuitry allows for smooth dimming curves and flicker free control and operations. The MOS-FET circuitry was specifically designed for operations of 20 amps or less. **MOS-FET has many circuit improvements even over the IGBT circuitry used by some others. Our engineers are also writing a comparison document between MOS-FET and IGBT control.**

Companies using triac circuitry will quickly inform you that the above information is totally accurate. Although no grower wants to change out their dimmers, proper LED dimming cannot be achieved unless an LED designed dimmer is used. Overdrive has replaced, under warranty, countless numbers of our LED's that have experienced unique field issues. Testing has proven that these failures were the result of the triac dimmer circuits non-compatibility. Even though many of these dimmers have controlled LED's for some time.....unique problems still occur. The first item to check should problems occur is what type of dimmer circuitry is being used!

Overdrive Lighting has a network of poultry equipment distributors across the USA. These distributors inventory various Overdrive LED lamps (dim and non-dim) and many are now beginning to inventory our special Mos-Fet LED dimmers. They can quickly order if not in their inventory. **Special pricing has been designed to help with this situation!**