



SWITCHED OR NON-DIM MODE? AND WHAT ABOUT RELAY MODULES?

ETC often get questions regarding the different uses of dimmers in switched and non-dim modes and where relay modules fit in. Perhaps this is a case of there being too many good options available.

SCR dimmers used as On/Off switches:

Contrary to popular belief, SCR-based dimmers can be used to switch devices on and off. In fact, that is how dimmers work all the time, but the electronics driving the SCRs do not always do this at the zero-cross time of the power waveform and therefore we can run into issues.

Loads such as non-dimmable ballasts and motors do not like dimmed power. Dimming chops the waveform to dim these loads and can cause excessive heat generation, premature lamp failure, or ballast damage. We would like to have remote control of these loads but in such a way that the dimmer output replicates the incoming AC. Cue light systems may even want to be set so that the lamps are either on or off in order to eliminate a false cue signal from a dimmed lamp.

Sensor and Unison electronics allow specific dimmers to be set in such a way that this output replicates the input very well (nearly a pure sine wave) giving you the ability to turn non-dimmable loads on and off from your Unison wall station.

Sensor also allows you a few additional options. Each dimmer can have a defined switch point in the control range referred to as Threshold, whereas Unison has a set Threshold of 50%. There is also a regulated output function, called Non-Dim, which is perfect for switching incandescent loads such as cue lights. If the rack is fed with 130VAC and your cue lights are 120VAC, then use the regulated option in order to eliminate over-voltage lamp failure. This is described later in the article. The regulated output option should not be used with devices that need a sine wave to function properly. Unison Non-Dim is not regulated.

How do I choose between dimmer and relay modules?

Good question. If the load has a power factor that is significantly less than 1, then use a relay module. Again a little theory: SCR-based dimmers require a minimum load, called the “holding current,” to stay on in each half cycle. They also require that voltage and current go to zero at pretty close to the same time every half-cycle. If they don’t, it is possible that the dimmer will turn on but not turn off. That means you have to go flip the circuit breaker to regain control.

A relay module does not care whether the load has a power factor less than 1. That means it is great for high-power ballast switching - or switching any capacitive or inductive load. HID's and moving lights are perfect uses for a relay module, but a mechanical relay does have a somewhat shorter use-life than SCRs. ETC Relay modules are rated for between 200,000 and 5 million operations dependant upon load, can switch up to 10A tungsten, and have a fault current rating of 10,000 AIC. Dimmers, on the other hand, are rated at 100,000 AIC and can switch tungsten loads up to their full breaker rating.

I've chosen my module, but what are all these settings?

Let’s break it down into different product groups.

Unison non-dim: Dimmers and relays will switch from off to full on at 50% control.

Sensor switched: Dimmers and relays will switch from off to full on at the programmed Threshold setting.

Sensor non-dim: Dimmers switch from off to “regulated output” at the programmed Threshold setting. This mode is not available with relay modules.

Now you have better solutions when providing a coordinated remote control load center. The same Unison control station or theatrical console you’ve specified for the majority of the job can be used for any “strange load” application.

Load	Sensor	Sensor settings	Suggested Threshold	Unison
HID's	Relay	Switched	25%	Relay
Moving lights	Relay	Switched	25%	Relay
Cue lights	Dimmer	Non-dim	50%	Dimmer
Fluorescent ballasts	Dimmer	Switched	50%	Dimmer
Motors	Dimmer or relay	Switched	50%	Dimmer or relay