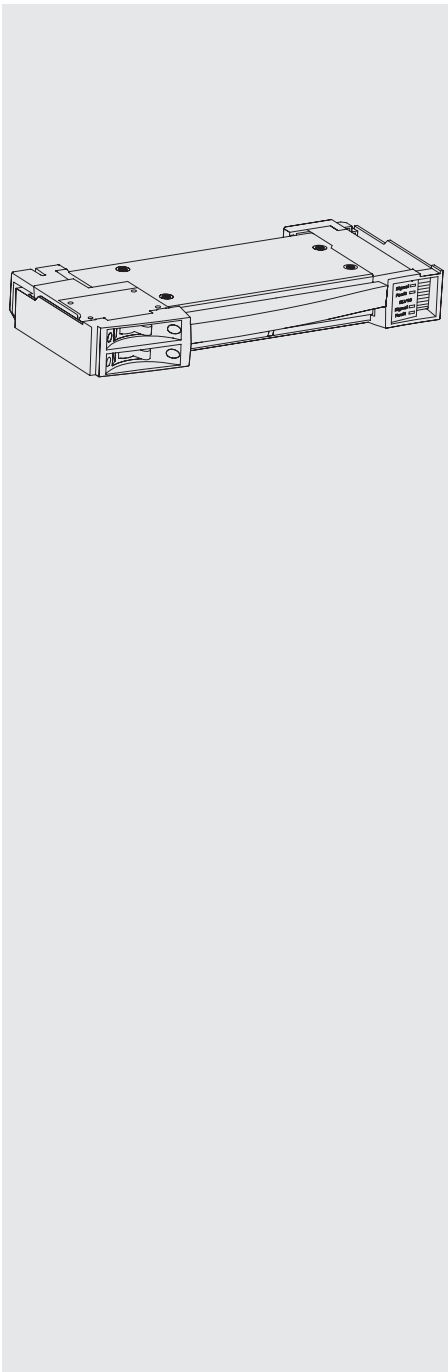




Dimming Technologies: Choosing The Right Dimmer For Your Application

by David North, ETC Technical Service Manager



A few new dimmer modules have been released and offer solutions from ETC for some different loads increasing in popularity. The following document describes the products followed by a chart of what dimming technology to use with which loads.

ELV10, HELV5, AELV5

The ELV line of dimmers is designed specifically and exclusively to dim electronic low voltage transformers (ELVs) and dimmable LED power supplies. These line level dimmers provide a reverse-phase control output with integral overload and short-circuit protection and can fit into DRd and Sensor+ racks while offering two dimmers per module.

MODULE	VOLTAGE	UNISON RACK	SENSOR RACK
ELV10	120	DRd 120	Sensor+ SR and SP
HELV5	240	DRd 240	Sensor+ HSR and HSP
AELV5	277	DRd 277	

The control module of your dimming system will now include the ELV module types with default settings of linear curve with minimum scale voltage of 20V at 120V and 40V at 240/277V. This minimum turn on level improves lamp performance due to limitations of many electronic low voltage transformers' ability to dim well at the bottom end of the curve. Default minimum level is editable and can be made lower or higher depending on your needs.

Most electronic low voltage transformers need a significant load on them to reduce the possibility of flickering at dimmed levels. If, for example, you are using a fixture with a 75W transformer and have installed a 20W lamp, you may not see satisfactory results due to limitations of the transformer. If flickering occurs, start by placing a larger load in the socket to see if the issue abates. A call to the transformer (not fixture) manufacturer may also be wise to verify the load amount needed on the transformer.

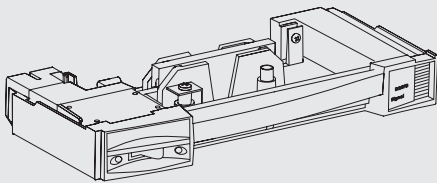
To reiterate, ELV10 line of dimmers from ETC are only for electronic low voltage transformers. For low wattage incandescent loads, please use a D20 module. While information in the past has been spread that D20 dimmers only work with a minimum of 100W or 250W, this is not true.



Dimming Technologies White Paper

The following is a chart showing what module is valid for which load type:

LOAD TYPE	VOLTAGE	DIMMER	NOTES
Incandescent, tungsten	120	D20	
	240	HD20	
	277	AD20	
Neon, cold cathode	120	D20	Use magnetic transformers, not electronic, and high quality gas for best dimming performance.
	240	HD20	
	277	AD20	
Magnetic low voltage	120	D20	
	240	HD20	
	277	AD20	
Electronic low voltage	120	ELV10	Match the lamp wattage to the electronic transformer load rating for best dimming performance.
	240	HELV5	
	277	AELV5	
Dimmable fluorescent, 2-wire	120	D20	
	240	HD20	
	277	AD20	
Dimmable fluorescent, 3-wire	120	D20F	
	240	HD15F	
	277	AD20F	
Dimmable fluorescent, 4-wire	120	D20	Add FLO card for Unison
	240	HD20	
	277	AD20	
Dimmable fluorescent, 2-wire with battery backup	120	D20FB	Each module supports only one circuit of fixtures.
	277	AD20FB	
Dimmable fluorescent, 4-wire with battery backup	120	D20FB	Add FLO card for Unison. Each module supports only one circuit of fixtures.
	277	AD20FB	



D20FB series

For those that have needed a more elegant solution for handling 2-wire and 4-wire fluorescent ballasts with integrated battery backup, the D20FB module series will meet your needs. It is a single density module with one constant hot and a dimmed or switched output both fed from a single circuit breaker in the module.

These are available in 120V and 277V models as the D15FB, D20FB, AD15FB and AD20FB. They will work in Unison DR, Unison DRd, Sensor and Sensor+. If software in your dimming system does not list this module type then you may always select the D20F or AD20F module and it will work correctly.

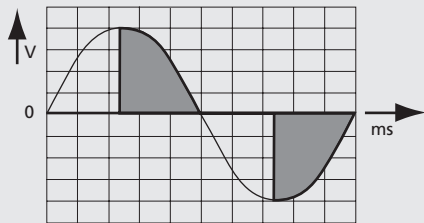
The top lug of the rack slot is constant voltage output for the battery charge and sense line. The bottom lug is dimmable for the 2-wire and switched for 4-wire ballasts. Don't forget to plan for the space needed for the battery wiring as the module is single density.



Dimming Technologies

We are often asked if we can provide forward-phase or reverse-phase, leading-edge or trailing-edge dimming. Truth is that most people don't always know the difference and can sometimes confuse the technology.

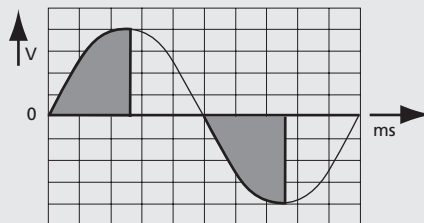
FORWARD PHASE FIRING MODE



Forward-phase control = leading-edge control

This technology is what SCR or triac dimmers offer in addition to transistor dimming running in the prescribed mode. These firing modes are provided by such dimmers as the venerable D20 and AD20 and are used for tungsten, resistive, incandescent, magnetic low voltage, 2-wire fluorescent, neon and cold cathode loads.

REVERSE PHASE FIRING MODE



Reverse-phase control = trailing-edge control

This technology can only be provided by transistor dimmers and also has been called "turn-off" dimming as the dimmer output starts with a sine wave and turns off partway through the waveform. The primary loads to be supported by this technology are electronic low voltage transformers and line voltage LEDs supported by the new line of ELV10 dimmers.

If you wish to have more questions answered in regards to dimming solutions, please contact Electronic Theatre Controls, Inc and speak with Technical Services or Applications Engineering.