CONTROLS FOR TUNABLE WHITE PRODUCTS

Tunable White (TW) luminaires are controlled by adjusting the intensity of two diodes (one warm and one cool) to provide a specific correlated color temperature (CCT) within the range of the warm and cool diodes (2200K – 4000K, for example). However, it is important to understand that as the intensity of the LEDs is adjusted to reach the desired CCT that there is an effect on the overall CCT as well.

This process is more challenging when TW LEDs that have different color temperature ranges (i.e. 2200K – 4000K and 2700K – 6500K), light outputs and fixture types (i.e. linear and downlights) are used in the same job due the correlation of the two intensities not being intuitive as to what the final CCT or light output will be.

Therefore, control protocols that use two intensity handles (like 0-10V or DMX) are not recommended to control TW luminaires.

Inter-lux provides DALI drivers that are programmed in our factory, to the CCT range and light output of the specific LED engines being used in each product.

Specifically, we supply eldoLED DALI-2 drivers that use an algorithm called LightShape, that precisely selects the CCT mix and the intensity in two separate handles, and the algorithm eliminates the "guessing" to provide a consistent experience among multiple fixtures, regardless of the controller used.

In a typical application, multiple scenes can be programmed into the controllers to achieve any CCT and intensity (allowed within the CCT range), providing the ability to fine-tune the lighting for the appropriate use of the space at any time.

WHAT IS DALI?

DALI (Digital Addressable Lighting Interface) is a control protocol that allows digital control of luminaires with plenty of flexibility to reconfigure dimming zones without rewiring and giving feedback to the control system. This is a great feature of DALI as level of control is not possible with analog solutions like 0-10V control.

DALI vs. DALI-2:
With the original version of DALI, every manufacturer could call their devices DALI compatible without having to go through a certification process.

DALI only allows for control-gear, which is basically telling the driver "what" to do.
To apply the original DALI version-1 mark on LED drivers and fluorescent ballasts, verification of the test results was not required, thus manufacturers could self-declare compliance and apply the DALI mark.

DALI-2 is completely regulated by the DiiA (DALI Illumination Interface Alliance) and guarantees interoperability between different manufacturers.

DALI-2 allows for control gear and control devices, which made possible obtaining feedback from luminaires, occupancy sensors, daylight harvesting sensors, controls, etc. and allowing for programming of complex Lighting Sequence-of-Operations.

For a complete list of available DALI-2 certified devices, see the DiiA website in the link here.

DALI devices that are not listed on the DiiA website and are not marked DALI-2, cannot be considered DALI-2 certified.

A DALI system consists of 3 types of devices: drivers, controllers, and control devices (occupancy sensors, daylight sensors, etc.) or system devices (bus power supplies).
Each DALI-2 subnet can have up to 64x control gear (LED drivers) and 64x control devices (i.e. sensors).

DT6 vs. DT8:
DT6 (Device Type 6) allows for control of brightness on single CCT (i.e. Static White) luminaires. Some DT6 drivers allow for control of Tunable White luminaires using two DALI addresses: one for the CCT and one for the intensity (a "handle" for each, with two DALI addresses, one for each handle).

DT8 (Device Type 8) allows for control of Tunable White luminaires using a single DALI address for both the CCT and the intensity (a "handle" for each, with one DALI address), specifically designed for controlling dynamic LEDs.

DT6 and DT8 devices are wired the same way, the main difference is the number of DALI addresses they require.

DALI-2 DT8 is the most effective control method for Tunable White LEDs, guaranteeing consistent performance across different control manufacturers, with predictability and accuracy in terms of the desired CCT mix and intensity.

Compatible drivers:

Drivers for Tunable White Linear Products (Constant Current)

Inter-lux Code	Driver	PART #	POWER [W]	INPUT VOLTAGE	Vf Range	Current Range [mA]	Dimming Level [min]	Flicker Free	Device Type	DALI Addresses	CA Title 24 (California)
D2DT6	eldoLED DUALdrive 75L-M2A0D	DL75L-M2A0D1	75W	120-277VAC	2-55Vf	150-1400	0.1%	Yes	DALI-2 DT6	2	Yes (DALI-2)
D2DT8	eldoLED DUALdrive 75L-M2A0C	DL75L-M2A0C1	75W	120-277VAC	2-55Vf	150-1400	0.1%	Yes	DALI-2 DT8(Tc)	1	Yes (DALI-2)

Drivers for Tunable White Downlights (Constant Current)

Inter-lux Code	Driver	PART #	OUTPUT POWER [W]	INPUT VOLTAGE (RANGE)	Vf Range	Current Range [mA]	Dimming Level [min]	Flicker Free	Device Type	DALI Addresses	CA Title 24 (California)
D2S	eldoLED DUALdrive 30S-M2Z0D	DL30S-M2Z0D1	30W	120-277VAC	2-42Vf	150-1400	0.1%	Yes	DALI-2 DT6	2	Yes (DALI-2)
D2T	eldoLED DUALdrive 30S-M2Z0C	DL30S-M2Z0C1	30W	120-277VAC	2-42Vf	150-1400	0.1%	Yes	DALI-2 DT8(Tc)	1	Yes (DALI-2)

Compatible controls:

A-WN-D01-RF-xx Lutron Athena wireless node (RF only) (Lutron Athena Processor required)
A-WN-D01-OCC-xx Lutron Athena wireless node with sensor (Lutron Athena Processor required)
QSN-1DALUNV-D / QSN-2DALUNV-D Lutron Energi Savr Node DALI Universal
LQSE-1DAL2-D Lutron HomeWorks DALI-2 Power Module
6511170 Crestron ZUMNET-JBOX-DALI
6513004 Crestron ZUMNET-DIN-DLI
6513036 Crestron DIN-DLI
6503777 Crestron DIN-DALI-2
nPS 80 DALI Acuity Controls
Salvador Series 3000 Casambi

Additional resources (videos):
Using LightShape
Testing the luminaire
Testing With Intensity Meter
Constant vs. Maximized Mode
Designing a luminaire with DALI-2 DT8(Tc) controls