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Application note — Astronomical clock

eldoLED drivers to which this application note applies include:

12-48VDC LED drivers	120-277VAC LED drivers
ECOdrive DC 15D, 30D, 45D POWERdrive DC 45D, 90D, 180D LINEARdrive 100D, 180D, 720D	POWERdrive 106 LINEARdrive 100

eldoLED 12-48VDC and 120-277VAC LED drivers featuring 'Ext in' (external input) connectors allow the connection of an astronomical clock. You can include an astronomical clock as an integral part of your application to create automated light response triggered by preset times or sunrise/sunset for maximum energy and operational efficiency.

This application note lists information on:

- **how to configure the driver for use with an astronomical clock**
- **wiring diagram detailing the connection of an astronomical clock to your eldoLED driver**
- **how to use the TOOLbox and TOOLbox PC software to design a light output profile**

Application: astronomical clock functioning as switch input

Outdoor signage displays illuminated by LEDs can be controlled via an astronomical clock that triggers the change in light output levels. For instance, you may want a signage display to have a very low level light output (5%) during daytime hours, and to be full on during night time. The trigger for the LED driver to change between low and high level light output is given by the astronomical clock.

Daytime hours: 5% light output

Nighttime hours: 100% light output

Driver configuration

Via the driver's 3-button user interface, prepare the driver for the connection with the astronomical clock as switch input, and set the driver's operation mode to Show:

1. Simultaneously press M and +. This will activate the setup menu.

2. Press M a number of times to go through the various setup items until you reach "EXP INP" (external input).

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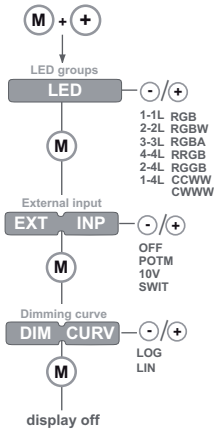
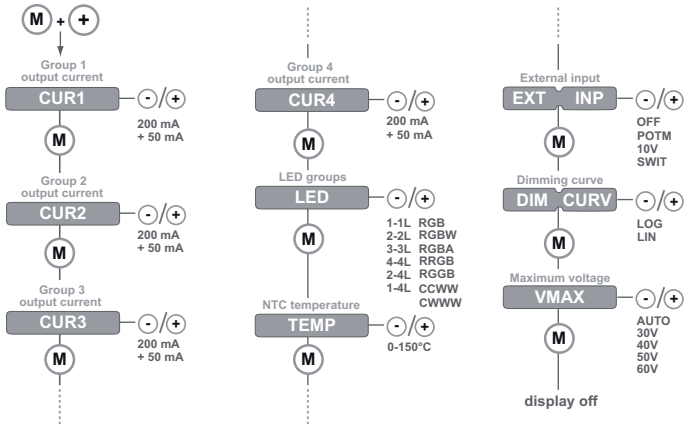
Below, some sample setup menus are depicted. For the LINEARdrive 180D, for example, pressing the M button once will get you to the EXT INP menu item, for the POWERdrive 180D you need to press the M button six times. Refer to the Menu Structure quick start guide for your driver for more information (www.eldoled.com/quickstartguide).



Setup menu for LINEARdrive 180D



Setup menu for POWERdrive 180D

3. At “EXP INP”, press + or - until the display shows “SWIT” (switch; this is the astronomical clock) and press M to save the setting.

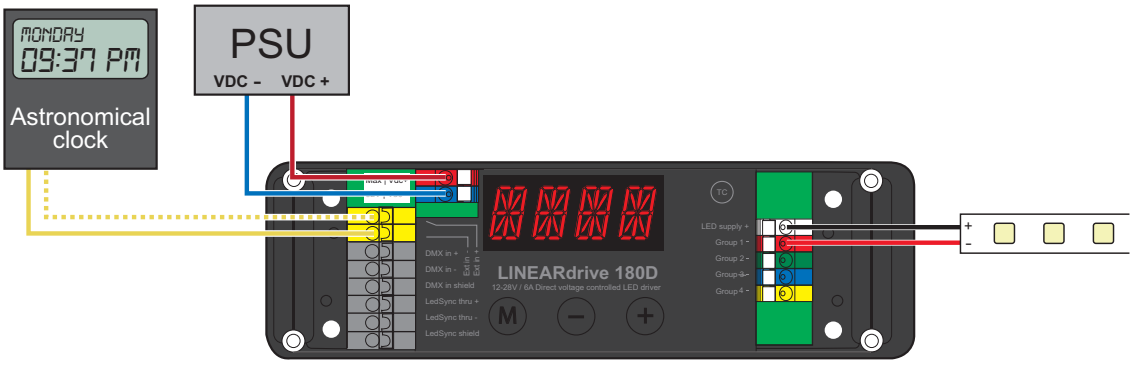
4. Refrain from pressing the menu buttons until the display turns off.

5. Press M for 5 seconds to set the mode of operation. Select “SHOW” by pressing the + or - button and press M to save the settings.

Wiring diagram

The diagram below shows the astronomical clock directly connected to the driver’s ‘Ext in’ connectors, and the PSU (power supply unit) connected to the driver’s VDC+ and VDC- connectors.

In this setup, the astronomical clock triggers the LED driver to change the light output. *When* the light output is changed, is decided by the astronomical clock; you can determine *how* the light output is changed by creating a show sequence in ShowMaster and uploading it to the driver.



Connecting astronomical clock to LED driver

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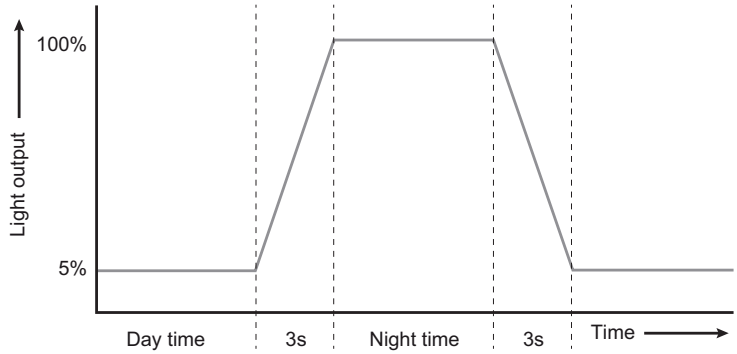
Defining light output timing

Using the ShowMaster functionality of the TOOLbox PC software you can design show sequences that reflect the timing for your application's increase and decrease of light output.

For instance, you may want the driver to increase the light output at a certain preset time to 100% in 3 seconds time and to decrease it back to 5% again at another preset time.

Create your own timing scheme according to the requirements of the lighting application. Based on the timings of your application, you will be creating show sequences for the driver (see 'Creating and uploading show sequences').



Creating and uploading show sequences

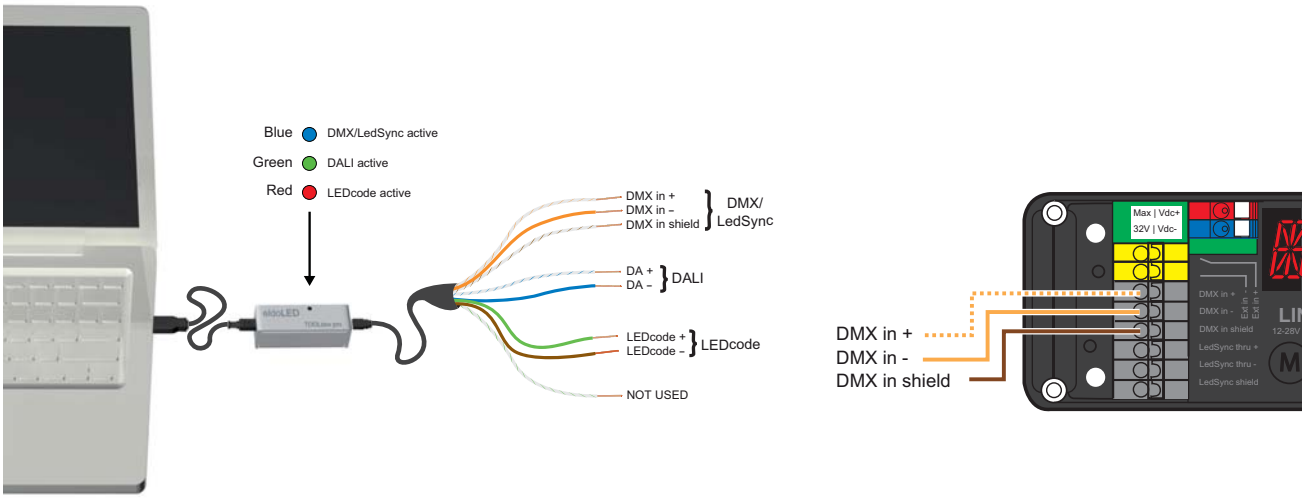
To configure the driver for the required actions, you need to

1. Download the TOOLbox PC software from www.eldoled.com/software and install it on your PC as described in the TOOLbox PC software user manual at www.eldoled.com/userguide.

2. Connect the driver to a TOOLbox, and connect the TOOLbox to the PC on which you have installed the TOOLbox PC software. A UTP cable and USB-to-miniUSB cable are supplied with the TOOLbox.

   Use the USB cable to connect the TOOLbox to the PC.

   Use the UTP cable to connect the TOOLbox to the driver.
   Cut off one of the cable's RJ45 connectors and strip 4 cm / 2 inch of insulation material off the cable end. Then, select the orange/white, orange and brown wire and apply a 9mm strip length. Connect the UTP cable's orange/white wire to the driver's DMX in+ connector, the orange wire to the DMX in- connector, and the brown wire to the DMX shield connector.



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3. Start the TOOLbox PC software and in the ShowMaster tab, define the show sequences:

   Show 1 represents the required light output during day time, when there's sufficient daylight to see and read the display:

Scene	Red	Green	Blue	White	Scene time	Fade time
1	5%	5%	5%	5%	1s	3s

   Show 2 represents the required light output during night time, when there's not sufficient daylight to see and read the display:

Scene	Red	Green	Blue	White	Scene time	Fade time
1	100%	100%	100%	100%	10s	3s

4. Still in the ShowMaster tab, upload the show sequences to the driver.

5. Change to the Config tab and make the following changes:
   - set parameter 1 "Show index" to 1 (show 1)
   - set parameter 5 "Show running or stopped" to 0 (running)
   - set parameter 6 "Switch: mode" to 1 (start alternative show)
   - set parameter 8 "Switch: alternate show" to 2 (show 2)

Europe, Rest of World
eldoLED Europe bv
Luchthavenweg 18a
NL-5657 EB Eindhoven
The Netherlands
T: +31 40 2054050
F: +31 40 2054058

North America
eldoLED America, Inc.
1762 Technology Drive #226
San Jose, CA 95110
USA
T: +1 408 451-9333
F: +1 408 451-9335

Sales support US/Canada: nasales@eldoled.com
Sales support Rest of the World: sales@eldoled.com

Other documentation and support
Visit www.eldoled.com/support for further documentation such as quick start guides, wiring diagrams, tech sheets and 3D IGES files.

Warranty
eldoLED represents and warrants that for a period of 3 (three) years, as of the date of invoice, Products materially meet the specifications and specifically agreed upon quality, both as stated in the applicable datasheet and/or written design-in specifications, or as stated in writing otherwise by eldoLED, provided that these specifications are explicitly designated by eldoLED as "warranted specifications".
For the complete warranty text, visit www.eldoled.com/terms.

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