Introduction

Ozone LED Driver stands for an extremely flexible LED Driver, Designed for fast and easy configuration.

This Application Note "AN3_Ozone Setting" illustrates the setting options of the Ozone LED driver in order to allow a fast and easy setting, performed by the lamp manufacturer and /or installer.

An external dedicated and portable programming tool (available as optional, ordering code: RSOZ070-PTOOL), permits to customize different Ozone LED driver key parameters. This guarantees extreme flexibility during final products (lamps) production process, because all OEMs will be able to directly personalize their products during the production process, avoiding managing different LED driver models and their stocking inventory.

In addition to the several benefits that this feature allows during the production process, it permits also to operate directly in the lamp installation field, avoiding wasting of time due to product's replacement.

Ozone Programming Tool

The battery powered unit (see Figure 1), is a user friendly remote programmer that permits the user to manage the following settings:

- Output Constant Current Setting
- Light Fade Time Setting
- DALI communication enabling/disabling.
- PWM dimming enabling/disabling.

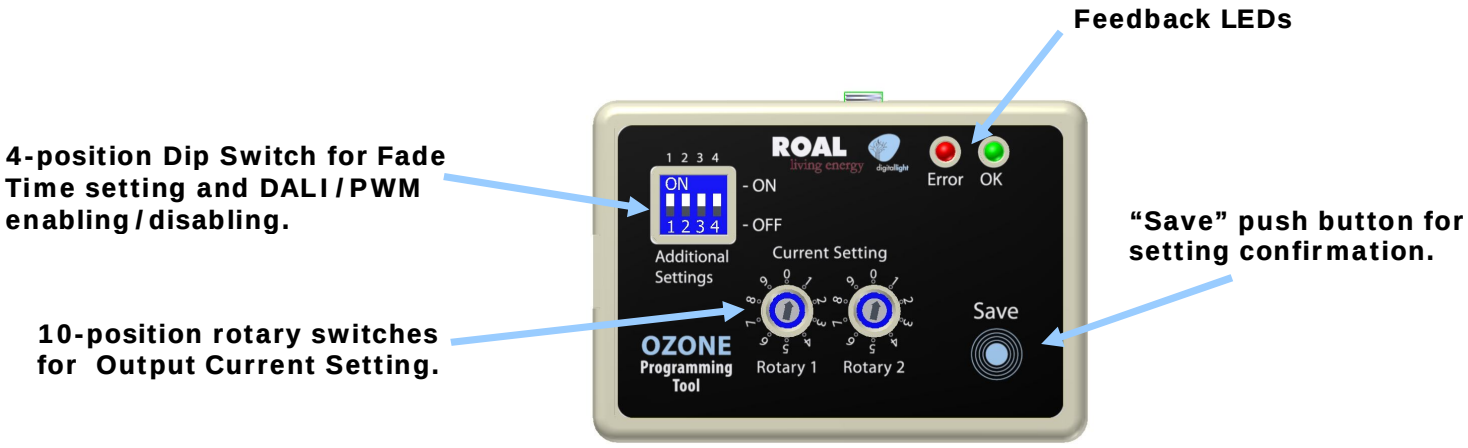


Figure 1: Ozone Programming Tool (Code RSOZ070-PTOOL)

Programming Connections

The Ozone programming tool is easily connectable with Ozone LED driver by the 3-wire cable (Figure 2). The cable is included in the Code RSOZ070-PTOOL)
The three programming wires are selectable by coloured collars near the metal end terminal.
Follow the connection table below for a correct programming connections correspondence, between programming wires and Ozone output connector pins involved.

Programming Wire	Ozone OUTPUT connector pin
RED collar wire	Ts
BLACK wire	RTN
WHITE collar wire	0-10V Dimm

Table 1: Ext. programming tool connections correspondence

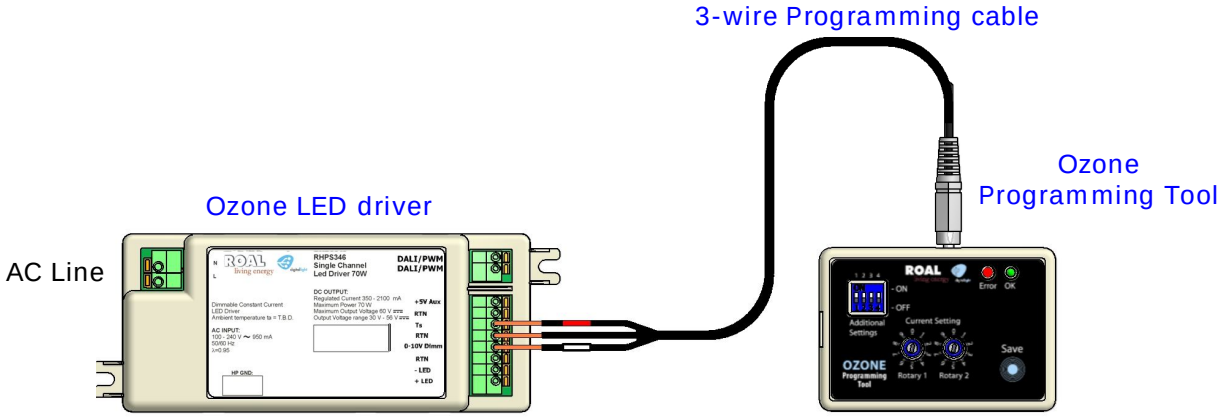


Figure 2: Ozone Programming Tool connection

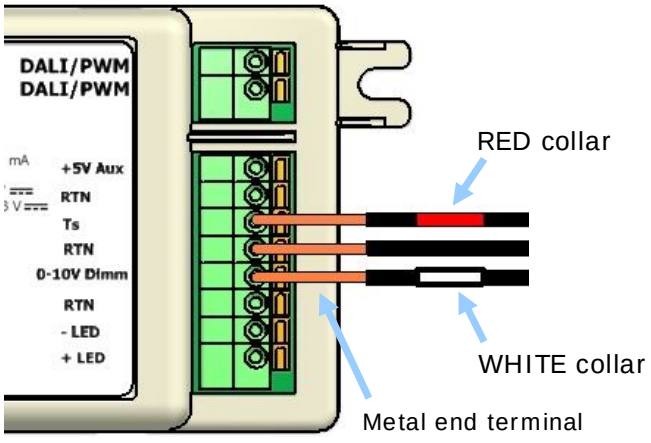


Figure 3: Programming wires connection to the LED Driver

Dip-switch settings (Fading, DALI, Dimming)

The 4-position dip-switch on the remote programming tool permits to set the light fade time in addition to DALI/PWM enabling/disabling.

Follow the dip-switch settings combination table (Table 2) below to select the requested configuration.
Each switch can stand in ON or OFF position, the combination of the four switches positions determines the product configuration as reported in the table.

ON

OFF

Sw. 1	Sw.2	Fade time (s)
OFF	**OFF**	**0,0**
ON	OFF	2,0
OFF	ON	5,0
ON	ON	10,0
Switch 3		**DALI/PWM**
OFF		**DALI enabled; PWM disabled**
ON		DALI disabled; PWM enabled
Switch 4		**Factory reserved**

Blue = factory preset values.

Table 2: Dip-switch settings combinations

Fade Time: Required time (in seconds) to raise linearly the output LED current from 0A (OFF state) to the nominal set current (Iset) and vice versa.
Fade Time will also affect the 0-10V linear dimming function (see "AN2_Ozone Temperature Sense & 0-10V dimming" for details).

Example: Considering a 10sec. fade time: if the user dims the output current down from 100%Iset to 50%Iset, the transition time will be 5sec.

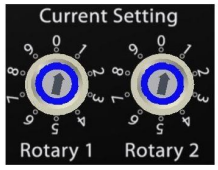
NOTE: When DALI is enabled, the fade time value can also be set by the DALI user interface. In case of DALI and 0-10V dimming being used simultaneously (to avoid) with different fade time values, the DALI fade time will affect the DALI PWM dimming and the fade time set by programming tool will affect the linear dimming. The two fade times set will be active together.

Rotary switches settings (output constant current)

By combining the two 10-way rotary switches positions, it is possible to set the output constant current value. A very wide output current range of values, from 350mA to 2100mA, can be selected in 50mA steps, for a 70W total maximum output power. See the table below to select the right rotary switches positions corresponding to the required output current.

		RSOZ070-35-Full		RSOZ070-60-Full		RSOZ070-120-Full		RSOZ070-200-Full	
Output Current Set (Iset)	Rotary Position	Vout min	Vout max	Vout min	Vout max	Vout min	Vout max	Vout min	Vout max
mA	R1 - R2	Vdc	Vdc	Vdc	Vdc	Vdc	Vdc	Vdc	Vdc
350	0-0			30	56	60	115	120	195,0
400	0-1			30	56	60	115	120	175,0
450	0-2			30	56	60	115	120	155,6
500	0-3			30	56	60	115	120	140,0
550	0-4			30	56	60	115	120	127,3
600	0-5			30	56	60	115		
650	0-6			30	56	60	107.7		
700	0-7			30	56	60	100		
750	0-8			30	56	60	93.3		
800	0-9			30	56	60	87.5		
850	1-0			30	56	60	82.4		
900	1-1			30	56	60	77.8		
950	1-2			30	56	60	73.7		
1000	1-3	20	33	30	56	60	70.0		
1050	1-4	20	33	30	56	60	66.7		
1100	1-5	20	33	30	56	60	63.6		
1150	1-6	20	33	30	56				
1200	1-7	20	33	30	56				
1250	1-8	20	33	30	56				
1300	1-9	20	33	30	53.8				
1350	2-0	20	33	30	51.9				
1400	2-1	20	33	30	50.0				
1450	2-2	20	33	30	48.3				
1500	2-3	20	33	30	46.7				
1550	2-4	20	33	30	45.2				
1600	2-5	20	33	30	43.8				
1650	2-6	20	33	30	42.4				
1700	2-7	20	33	30	41.2				
1750	2-8	20	33	30	40.0				
1800	2-9	20	33	30	38.9				
1850	3-0	20	33	30	37.8				
1900	3-1	20	33	30	36.8				
1950	3-2	20	33	30	35.9				
2000	3-3	20	33	30	35.0				
2050	3-4	20	33	30	34.1				
2100	3-5	20	33	30	33.3				

Table 3: Output current setting table



Important Note:

The maximum allowed 70W output power must not be exceeded under any condition.

Highlighted values in the table are the factory preset output current values, which correspond to the maximum output voltage value allowed for each Ozone model.
For any higher output current value, the corresponding output voltage range will be proportionally reduced in order not to exceed the 70W maximum output power, as shown in this table.

Eu and RoW

ROAL Electronics S.p.A
Via Jesina 56/A
60022 – Castelfidardo (AN) - Italy
Tel:+39 071 721461

www.roallivingenergy.com

North America

ROAL Electronics USA, Inc.
701, Main St. Suite 405
Stroudsburg, PA18360
Phone: + 1 570 421 5750
Fax: +1 570 421 5687

2150	3-6	20	32,6	
2200	3-7	20	31,8	
2250	3-8	20	31,1	
2300	3-9	20	30,4	
2350	4-0	20	29,8	
2400	4-1	20	29,2	
2450	4-2	20	28,6	
2500	4-3	20	28,0	
2550	4-4	20	27,5	
2600	4-5	20	26,9	

Programming operations sequence

Run the following 10-step sequence for Ozone LED driver programming, using the "RSOZ070-PTOOL" external programming tool.

1. If connected, unplug AC power from the Ozone input AC connector.
2. If connected, unplug all wires from the secondary connectors (DALI, LED board, +5Vaux, Ts).
3. Connect the 3-wire cable of the external programming tool to the Ozone output connector, as shown in Figure 2 and 3.
4. Reconnect the AC power to the Ozone input AC connector.
5. Select and run the correct Dip-switch settings combinations according to Table 2.
6. Choose the output Constant Current value and place the correspondent rotary switches positions, according to Table 3.
7. Press "Save" push button.
8. Verify the feedback green LED blinks (2 fast blinks followed by 1 longer blink).
9. Verify that the error red LED remains OFF after the green LED blinking.
10. First disconnect the AC cable and then the 3-wire programming cable from the Ozone output connector.

Now the new settings are installed and they will be active at the next Ozone power-on.

WARNINGS:

If the error red LED turns-on after the two green LED fast blinks, it means that the programming operation failed.
In this case, repeat the programming sequence from the beginning paying particular attention to wires connections and rotary switches combination.

Any rotary switches combination not shown in Table 3 must be considered as not allowed.

Additional red LED fast blinks after the programming phase, indicate a low battery level.

Ozone Toolset Software

The Ozone microcontroller based technology permits to implement additional features that have a main rule especially in outdoor lighting applications.

The optional programmable functions are:

1. *Driver general hardware settings (PWM, DALI, current settings)*
2. *Adjustable Dimmer function*
3. *Constant Light function*

These features can be programmed and stored in the Ozone Programming Tool by connecting it to a laptop with a USB cable, and using the dedicated Ozone Toolset Software (provided with the Ozone Programming Tool).

See "UM1_Ozone Toolset Software Manual" for further details.

Warranty

ROAL Electronics S.p.A. (ROAL) warrants the Ozone Programming Tool (Code RSOZ070-PTOOL) against defects in materials and workmanship under normal use by the original purchaser for one hundred eighty (180) days after the date of purchase. ROAL makes no other express warranties.

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Mechanical dimensions and battery replacement

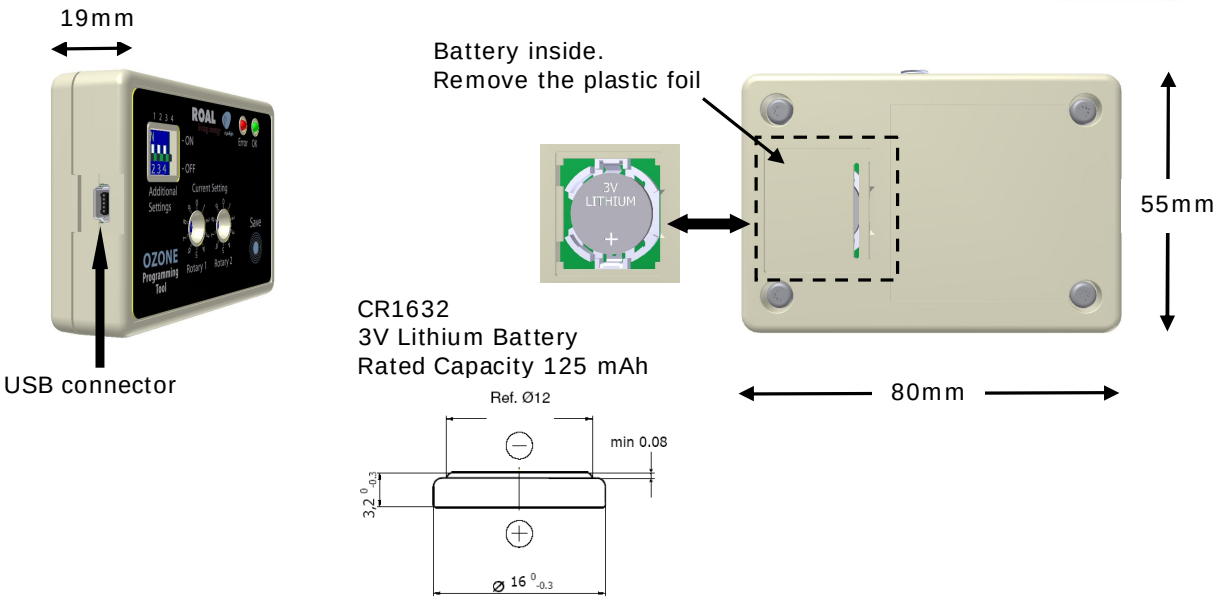

Figure 4: Mechanical Dimensions and battery replacement

Eu and RoW

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www.roallivingenergy.com

North America

ROAL Electronics USA, Inc.
701, Main St. Suite 405
Stroudsburg, PA18360
Phone: + 1 570 421 5750
Fax: +1 570 421 5687