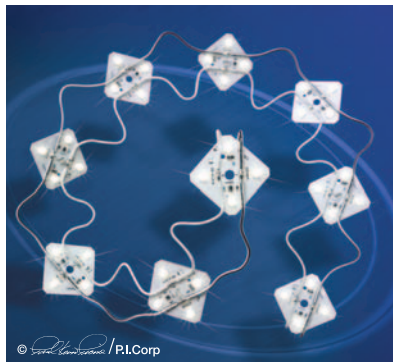
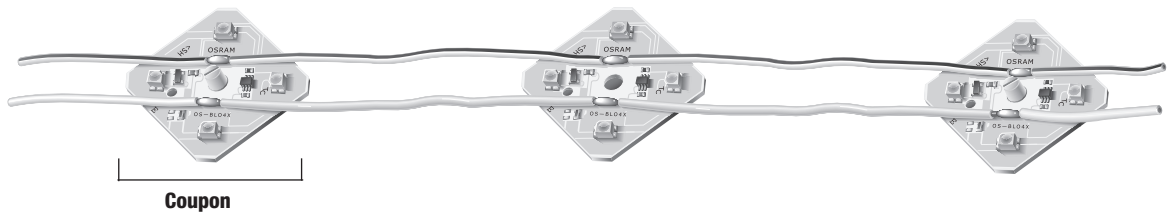


BACKlight 2G BL04 Installation Guide

OSRAM SYLVANIA BACKlight 2G BL04 modules powered by OPTOTRONIC® LED power supplies form a system designed for backlighting channel letters and both are listed in the UL Sign Accessories Manual (SAM). BL04 is available on reels that contain 2 modules in a chain-like structure. Each module has 30 circuit boards containing 4 LEDs connected by flexible jumper wires for a total of 120 LEDs.



BACKlight 2G BL04 LED modules are a safer and longer life alternative to traditional neon lighting. In comparison to neon, the BL04 system provides excellent color and brightness and can be easily installed into channel letters for extremely low maintenance operation.

Adjusting the spacing between the circuit boards, also referred to as coupon, can easily control the brightness and uniformity of the sign face. The rugged BL04 modules may be mounted and shipped pre-assembled in channel letters without fear of breakage.

INSTRUCTIONS

WARNING: ONLY QUALIFIED PERSONNEL SHOULD PERFORM INSTALLATION.

TO AVOID ELECTRICAL SHOCK OR COMPONENT DAMAGE, DISCONNECT POWER BEFORE ATTEMPTING INSTALLATION OF THE POWER SUPPLIES AND/OR MODULES.

Failure to install the power supplies and/or LED modules in accordance with the National Electric Code (NEC), all applicable Federal, State and local electric codes as well as the specific Underwriter's Laboratories (UL) safety standards for the installation, location and application may cause serious personal injury, death, property damage and/or product malfunction.

These instructions are guidelines for installation of OSRAM LED modules and power supplies. Installation requirements may vary depending on the application. Licensed electricians should provide all installation services for connection of both primary and secondary (input/output) of the power supplies.

1 Sizing the application

- Use the chart below to estimate the quantity of BL04 modules required for replacing neon tubing.

Example:

Acrylic	Install Depth	LED Color	Neon Color	% Brightness to NEON		
				Single Stroke	Double Stroke	Triple Stroke
Blue 2051	5	Blue	Blue	16	30	46
Blue 2114	5	Blue	White	50	100	150
Blue 2051	5	W2-865	White	30	60	90
White 7328	5	W2-865	White	35	70	100
Green 2030	5	W2-865	White	30	60	90
Green 2030	5	Green	Green	20	40	60
Green 2108	5	Green	Green	20	40	60

The above brightness comparisons assume a single stroke on NEON. Standard Neon 30mAmp, 15mm tube.

In the above example, a double stroke of White BL04 LED module will replace a single stroke of White NEON with a 70% brightness level. If necessary, reduce the spacing between the coupons or add additional modules to achieve the desired brightness level.



2 Layout

- Space the coupons evenly throughout the channel letter. Additional modules can be added or wires can be cut as required to fit the contours of the letter. Do not exceed the power capacity of the power supply.

Example: from the below chart, up to 20 feet of the white BL04 module can be operated with a single 50W power supply.

Example:

OPTOTRONIC Power Supplies

Item Number	Ordering Description	Color	OPTOTRONIC 25W			OPTOTRONIC 50W		
			Maximum Length (ft.)	LED Load Watts	No. of Reels	Maximum Length (ft.)	LED Load Watts	No. of reels
70173	BACKlight2G/BL04ST/W2-865	White	10	25	0.6	20	48	1.3
70172	BACKlight2G/525/BL04ST/T2	Green	12	24	0.8	25	50	1.6
70171	BACKlight2G/470/BL04ST/B1	Blue	12	24	0.8	25	50	1.6

Note: Maximum length for a fully extended module. Derate the LED load for exterior or remote mount applications.

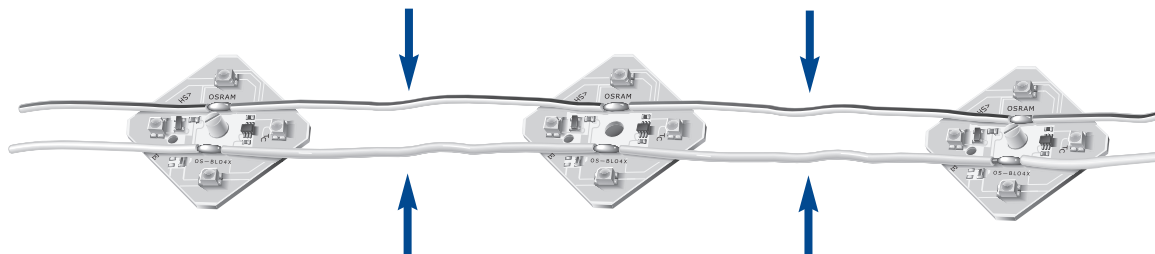
Note: Each reel contains 2 modules.

3 Cutting BACKlight 2G BL04 Modules

- The BL04 module can be cut to create branch circuits or to reduce the amount of coupons within a channel letter.
- **White, Blue & Green** – the coupons are connected electrically in parallel. The flexible wires may be cut and each of the coupons is independently functional. See illustration below.

White, Blue & Green

Cut conductors between coupons



4 Connecting BACKlight 2G BL04 Modules

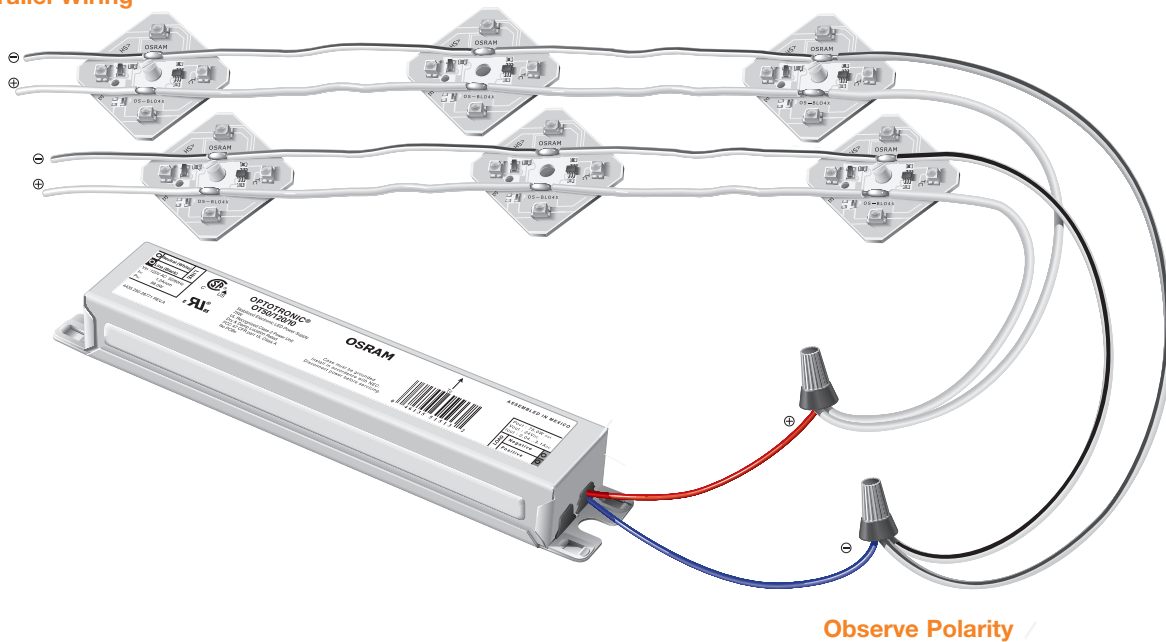
Parallel connection is required for all applications requiring greater than 1 chain (8 ft.) in length.

Do not exceed the maximum load capacity of the power supply. Derate the maximum LED load for remote mounting or exterior applications. Refer to application note LED026 – Determining the maximum LED load on a constant voltage power supply.

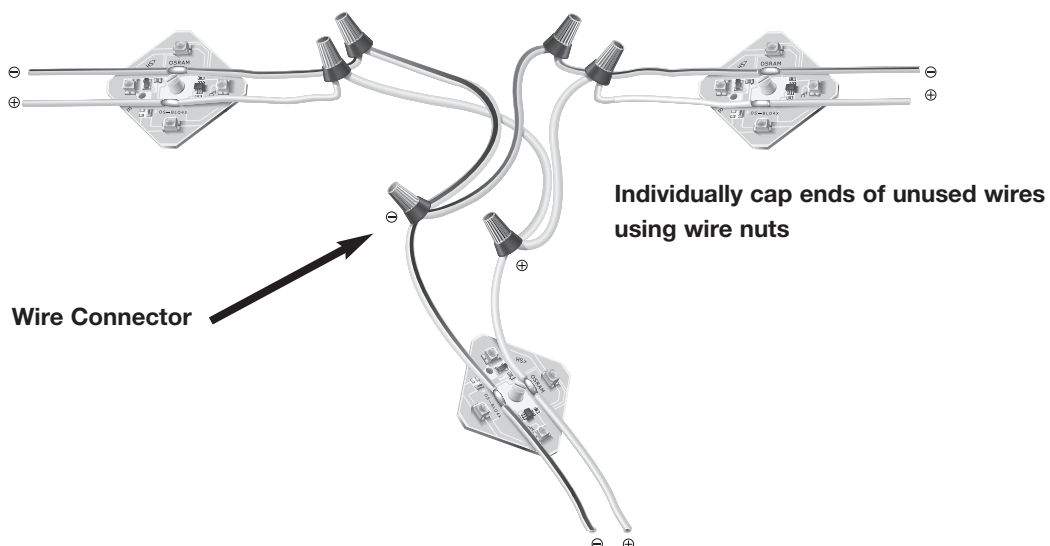
The following factors must be considered when determining the maximum LED load for the power supply: wire gauge, wire length, power supply, ambient temperature and controls.

Caution! Disconnect all power to the sign before making electrical connections

Parallel Wiring



Branch Circuit





5 Mounting the BACKlight 2G BL04

- The inside surface of the channel letter should be clean and dry. Use of alcohol or oil free solvent is recommended.
- Remove all neon tubing, tube supports, transformers and hardware. Dispose of neon and/or transformers according to local and federal regulations. Removal of neon is optional as the circuit board can be directly mounted onto it by use of UV resistant tie wraps.
- The LED module is equipped with a self-adhesive foam backed tape for easy installation. Remove adhesive backing from the BL04 coupon and apply it to the clean surface. Apply pressure until the circuit board (coupon) is securely mounted to the surface.
- Mounting of the BL04 module may also be performed with screws (#4 round head screws & washer) by using 5/32" (4mm) holes in the circuit board. Care should be taken to ensure not to over torque the mounting screws and damage the circuit board.

Power Supply Installation

Caution! Disconnect all power to the sign before making electrical connections

The power supply should be located within close proximity of the module for optimal load distribution. For remote mounting please refer to the following chart as well as the power supply specifications for the limitations on the individual power supplies.

RECOMMENDED MAXIMUM OPTOTRONIC 10V POWER SUPPLY REMOTE MOUNTING DISTANCE (ft) FOR BACKLIGHT MODULES

LED Load Wattage	14 AWG	16 AWG	18 AWG	20 AWG	22 AWG
20	52	33	21	13	8
25	42	26	17	11	7
30	35	22	14	9	6
35	30	19	12	8	5
40	26	16	10	7	4
45	23	15	9	6	4
50	21	13	8	5	3

*The maximum remote mounting distance for OPTOTRONIC power supplies is specified in the power supply data sheets. Although it is possible to exceed these distances, the installer and/or end user must take precautions to prevent and/or test the effects of EMI (electromagnetic interference).

INSTRUCTIONS

1 Location Rating

- **OPTOTRONIC Dry & Damp location** rated power supply must be installed in an appropriate NEMA enclosure or inside a channel letter.
- **OPTOTRONIC Dry location** rated power supply must be installed inside a NEMA 1 rated enclosure or inside a channel letter.
- Follow all appropriate UL, NEC and local code requirements.

2 AC Power Voltage Wiring

- Secure the power supply inside the electrical enclosure. Connect AC supply leads to the power supply input with twist style wire connectors or push in style connectors.

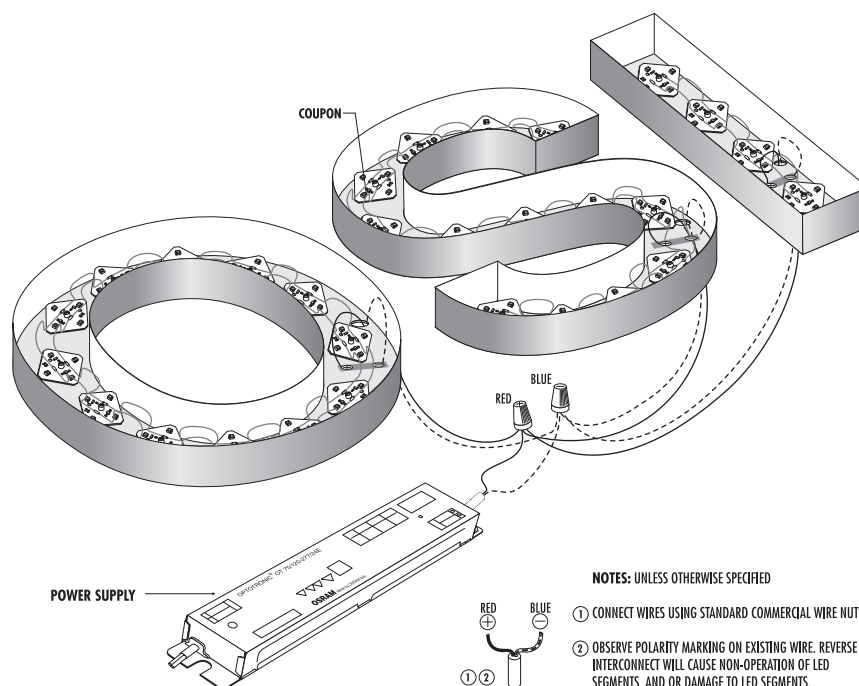
3 Low Voltage Electrical Connections

- Wire nuts are used to secure the power feed leads of the BACKlight modules to the output leads of the power supply. Cap all unused ends of wire with wire nuts.

4 Verify Polarity

- After all wire routing is complete and the lighting modules are connected to the power supply, verify the polarity of all electrical connections. The connections from power supply to the module must be positive to positive and negative to negative. Reverse polarity connections may damage the LEDs and void the product warranty.

The installation must be performed in accordance with national and local electrical codes and are subject to acceptance by the local authority.



ORDERING AND SPECIFICATION INFORMATION*

Item Number	Ordering Description	Color	Reel Length (ft)	Coupon Spacing (in.)	Watts/ Reel	Watts (ft)	LED Load Volts	Current	Viewing Angle	No. of LEDs (Reel)	LEDs (ft)	Wavelength Color temp	Luminous Flux (lm)	Lm/ ft
70173	BACKlight2G/BL04ST/W2-865	White	15.8	3.2	38	2.4	10.5	3.6	120	240	15	6500K	520	33
70172	BACKlight2G/525/BL04ST/T2	Green	15.8	3.2	32	2.0	10.5	3.0	120	240	15	525	430	27
70171	BACKlight2G/470/BL04ST/B1	Blue	15.8	3.2	32	2.0	10.5	3.0	120	240	15	470	100	6

OPTOTRONIC® 10V LED Power Supplies (DC Output)

POWER SUPPLY ORDERING INFORMATION

Item Number	Description	Nominal Input Voltage (VAC)	Nominal Input Current (Amps)	Output Voltage (VDC)	Min. Output Power (W)	Max. Output Power (W)	Max. Line Ripple (V)	Remote Mounting (ft)	Compatible with OT DIM	Compatible with OT RGB Controls	Location Rating
51500	OT6/100-240/10COS	100-240	0.150@120V 0.050@240V	10.5±0.5	0.2	6	±0.4V	26	YES	YES	Dry
51505	OT25/120/10	120	0.26@120V	10.5±1.0	3	25	±1.1V	10	NO	NO	Dry
51508	OT50/120/10	120	0.52@120V	10.5±1.0	10	50	±1.1V	8	NO	NO	Dry+Damp
51509	OT50/120-277/10E	120-277	0.51@120V 0.22@277V	10.8-11.5	0.6	50	±0.5V	32	YES	YES	Dry+Damp

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