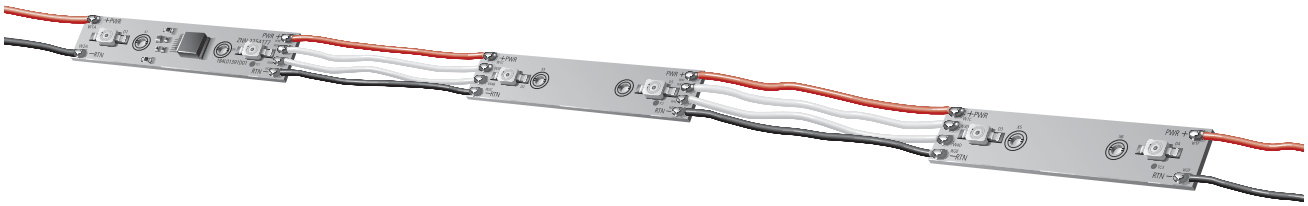
HF²Chain Installation Guide

The OSRAM HF²Chain LED modules powered by OPTOTRONIC® power supplies offer an alternative to neon and fluorescent light sources. The HF²Chain module consists of 18 metal core circuit boards each containing 2 Hi-Flux LEDs separated by flexible jumper wires. The HF²Chain was specifically designed for the sign industry for long life and reduced maintenance operation.



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.

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INSTRUCTIONS

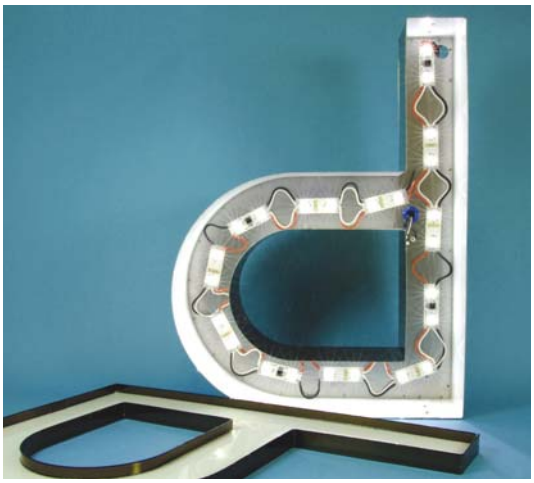
1 Sizing the application

- Use the chart below to estimate the quantity of HF²Chain modules required to replace white neon tubing. In general, 1 foot of the HF²Chain will replace 1 foot of white (30ma) neon. To increase brightness, reduce the spacing between circuit boards or use additional rows of HF²Chain.

NEON					HF²Chain	
Color	lm/ft.*	mAmps	Size (mm)	Length (ft.)	HF²Chain per foot of Neon (ft.)	Minimum Channel Depth (in.)
White	100	30	15	1	1	5
White	170	30	15	1	1.5	5
White	200	60	15	1	2	5
White	275	60	15	1	2.5	5

*lumens/ft. — expected lm/ft. assumes a 70% fixture efficiency

The HF²Chain module will provide uniform illumination of the sign face with a 4" to 6" spacing between rows. A minimum of a 5 inch channel depth is recommended to avoid hot spots.



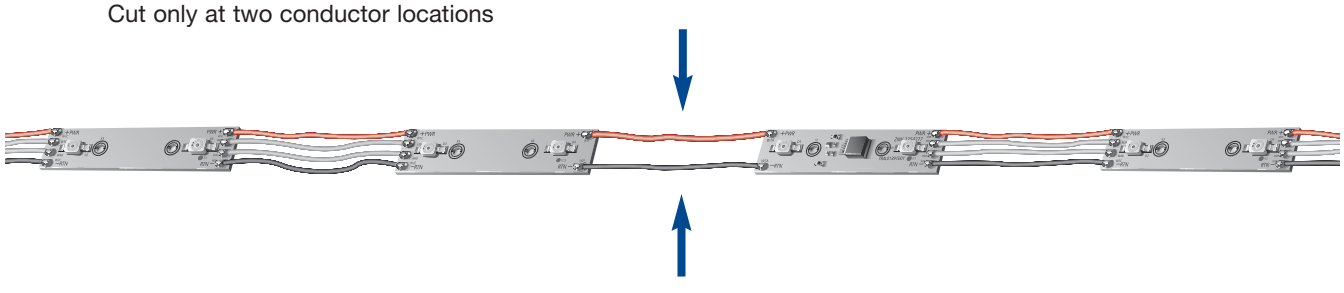
2 Layout

- Space the coupons (circuit boards) evenly throughout the channel letter. Additional sections can be added and the wires can be bent as required to fit the contours of the letter. Do not exceed the power capacity of the power supply.

3 Cutting HF²Chain Module

- The HF²Chain module can be cut to create branch circuits or to reduce the amount of coupons (circuit boards) within a channel letter.
- The HF²Chain module can be cut every 3 circuit boards. See Diagram below. Do not cut less than 3 circuit boards (coupons) as it will render the section of the module inoperable.

Cut only at two conductor locations



4 Connecting HF²Chain Modules

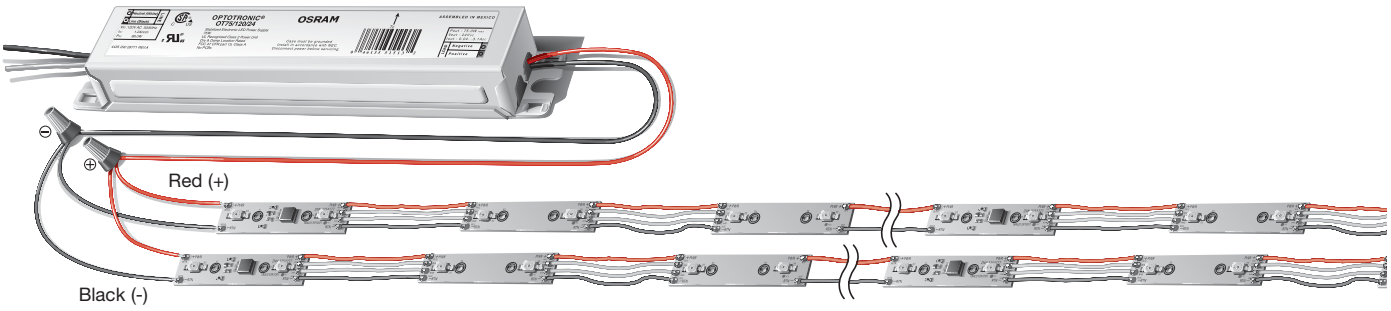
Parallel connection is required for all applications requiring greater than one complete chain (12 feet).
Up to 16 feet of the DRAGONchain module can be powered on the OPTOTRONIC® 75W (24V) power supply.

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.

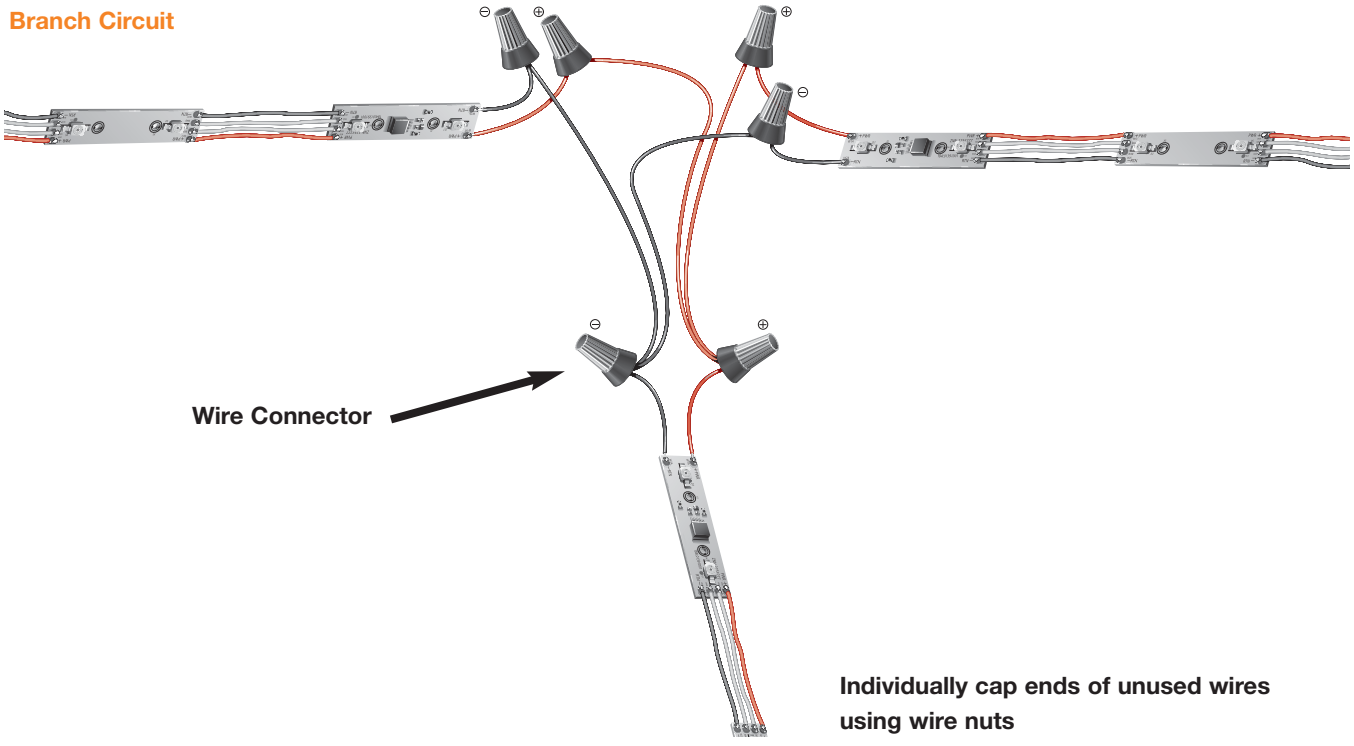
Caution! Disconnect all power to the sign before making electrical connections

Parallel Wiring



Observe Polarity

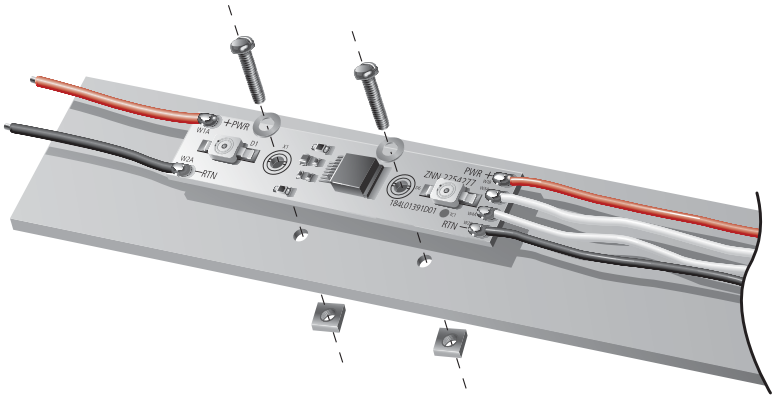
Branch Circuit



Individually cap ends of unused wires using wire nuts

5 Mounting the HF²Chain Module

- The inside surface of the channel letter should be clean and dry. Use of alchohol 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.
- The HF²Chain module is equipped with an adhesive backing for securing the module to the surface prior to using hardware. The mounting tape can not be used to permanently secure the circuit boards to the channel letter.
- Each circuit board is equipped with 9/64" holes for mounting the circuit board to the surface. Mount each circuit board using #4 round head self-tapping screw or machine screw with washer and nut. 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® 24V POWER SUPPLY REMOTE MOUNTING DISTANCE (FT.) FOR HF²Chain MODULES

LED Load Wattage	14 AWG	16 AWG	18 AWG	20 AWG	22 AWG
20	119	75	47	30	19
25	95	60	38	24	15
30	79	50	32	20	13
35	68	43	27	17	11
40	60	38	24	15	9
45	53	33	21	13	8
50	48	30	19	12	8
55	43	27	17	11	7
60	40	25	16	10	6
65	37	23	15	9	6
70	34	21	14	9	6
75	32	20	13	8	5

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.

ACCEPTABLE ENCLOSURES

Enclosure Rating	Definition
Type 1	Enclosures constructed for indoor use provide a degree of protection against falling dirt.
Type 2	Enclosures constructed for indoor use provide a degree of protection against falling dirt and light splashing of liquids.
Type 3	Enclosures constructed for either indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust.
Type 3R	Enclosures constructed for either indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow and remain undamaged by the formation of ice on the enclosure.
Type 3S	Enclosures constructed for either indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and in which the external mechanism(s) remain operable when ice laden.
Type 4	Enclosures constructed for either indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.
Type 4X	Enclosures constructed for either indoor or outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water, and corrosion; and that will be undamaged by the external formation of ice on the enclosure.

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.

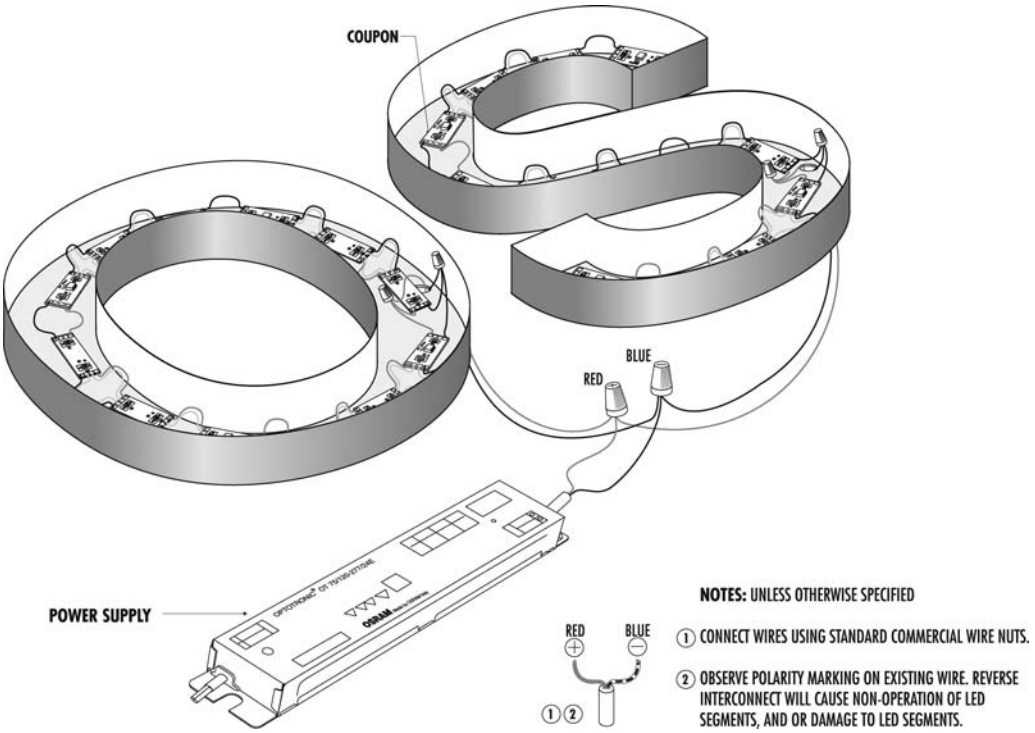
3 Low Voltage Electrical Connections

- Wire nuts are used to secure the power feed leads of the HF²Chain module to the output leads of the power supply. Cap all unused ends of wire with wire nuts. Refer to wiring diagrams from “Connecting HF²Chain Module”.

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 Abbreviation	Color	Power (W)*	Volts (V DC)	Viewing Angle(°)*	Number of LEDs	Color Temp (K)	Luminous Flux (lm)*	Lumens per Foot
70165	HF²Chain/36/W3-865	White	52	24	120	36	6500	1320	110

*All data is related to the entire module. Data reflects statistical mean values. Actual data may differ depending on variances in the manufacturing process.

POWER SUPPLY ORDERING INFORMATION

	OPTOTRONIC® 20W (51512)			OPTOTRONIC 75W (51513, 51514)		
LED Item Number	Max. Length (ft.)	LED Load Watts	No. of Boards	Max. Length (ft.)	LED Load Watts	No. of Boards
70165	4	17	6	16	69	24

Packaging Notes: Case quantity – 10 pcs. Minimum order quantity – 1 pc.
Dimensions – 18.0" L x 41.25" W x 18.25" H

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