

# NFLS-x Series Flexible LED Flexible Light Strip

## Primary Features

- Non-weatherproof flexible LED adhesive light strip series featuring 1-chip 3528SMD LEDs, in 3-LED segments.
- Available in 5 meter (197 in), 1 meter (39 in) and 1/2 meter (19.5 in) lengths with copper, black, or white finish.
- 12VDC operation.

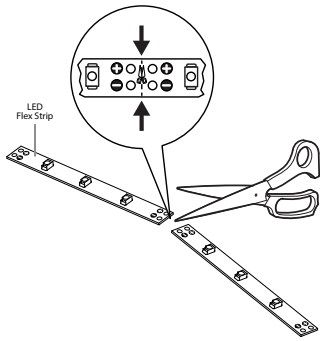
## Applications

- Back Lighting
- Cove Lighting
- Task Lighting
- Display Case Lighting
- Retail Lighting
- Sign Illumination
- Accent Decor Lighting
- Under Cabinet Lighting
- Automotive Accent Lighting

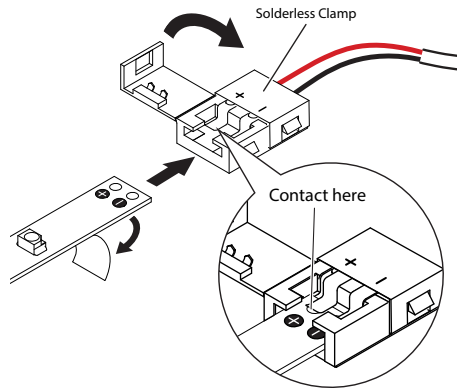
## Simple Connection Steps

LED Light Strips offer an easy and highly effective way to provide the utmost in efficient, attractive accent lighting in a variety of settings and applications. Here's how LED Light Strips can be readied for mounting in three easy steps:

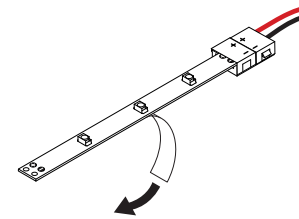
1. Cut along the light strip tape wherever a dashed line divides two sets of positive and negative connection points.



Peel away a portion of the light strip adhesive backing at one end. With the solderless clamp open, slide the strip end all the way into the solderless clamp. Close the hinged clamp.



Remove the remaining adhesive backing and attach the light strip to the desired surface.



Note: Polarity symbols should match on each component.

## SAFETY TIPS

### LED Light Strip Handling:

- Do not stare directly into LED lights when illuminated.
- Always disconnect power supply before cutting/connecting LED Light Strips.
- Do not expose LED Light Strips` to direct or indirect moisture.
- Do not crimp light strip tape, attempt to bend light strips width-wise, or length-wise to a radius less than 15mm.

### Power Supply:

- Do not connect LED Light Strips directly to 120V AC power. This kit requires an UL Listed Class 2 12 VDC power supply.
- Apply power to test LED Light Strips before mounting.
- Do not connect more than one 16.5' section of light strips to the included power supply. Overloading the included power supply may cause overheating, shorting, and possibly fire.

## Installation Planning

Flexible LED Light Strips are highly versatile and can provide a superior lighting solution in a variety of applications. To maximize the lighting benefits of LED Light Strips, a few planning/design steps are recommended as the first phase in the installation process.

Some general questions to ask in determining which installation design best suits your lighting needs are:

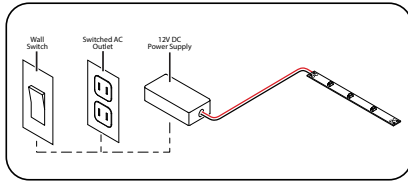
- Where will your power supply be located?
- How will you switch your LED lighting on and off?
- What is the best layout configuration for your installation?
- How will you run your wiring to your LED strip lighting?



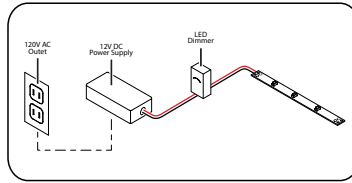
Flexible LED Light Strips are designed to provide indirect, accent-style lighting. Be sure to install your LED lighting out of direct sight.

## Connection, Switch and Powering Options

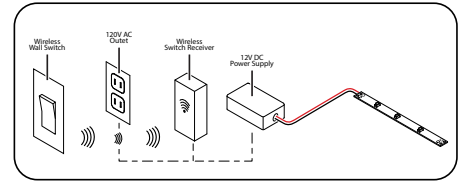
The information and illustrations below offer recommendations for choosing a general design for your application.



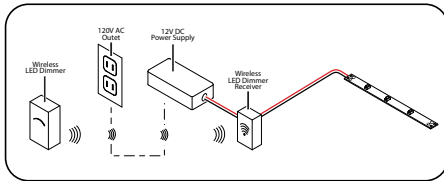
① Light strip On/Off is controlled by a wall mounted switch.



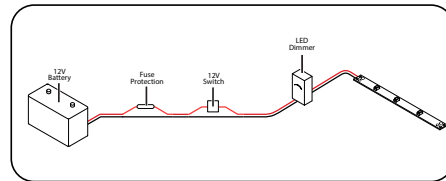
② Light strip On/Off/Brightness is controlled by an LED dimmer.



③ Light strip On/Off is controlled by a wireless wall switch and signal receiver.



④ Light strip On/Off/Brightness is controlled by a wireless LED dimmer and signal receiver.



⑤ Light strip is powered directly by a 12V battery, for applications like boats, RV's, etc.

## Wiring Considerations

Important factors to consider when designing your lighting system are:

- The total lighting wattage your installation will require.
- The length and size of wiring needed to connect LED light strips to the power supply.

Use the chart below as a reference to minimize voltage drop.

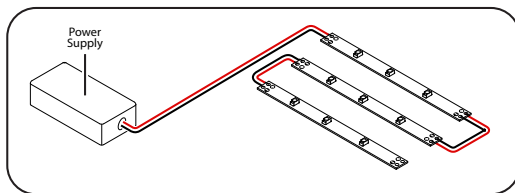
## Voltage Drop

Voltage drop is the normal loss of voltage that occurs as power flows along a wire connection in low voltage systems, and increases as the length of a wire connection is increased. Wire length and thickness as well as total light wattage influence the amount of voltage drop.

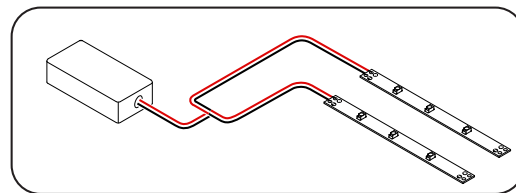
Recommended Maximum Wire Lengths - Power Supply to Light Strips

22 AWG Wire		18 AWG Wire	
Light Strip (Length in Ft.)	Wire Length (Max Length in Ft.)	Light Strip (Length in Ft.)	Wire Length (Max Length in Ft.)
12	10	12	20
24	8	24	16
36	6	36	12
48	4	48	8

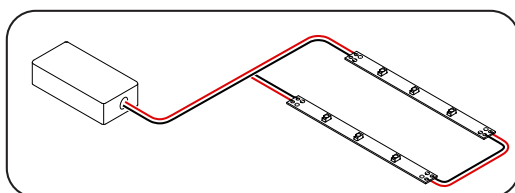
## Layout Options



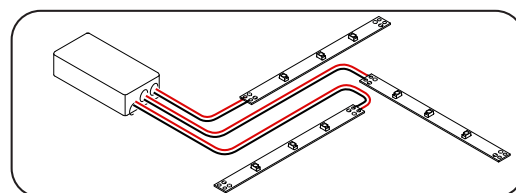
① Light strips are powered in a continuous "Straight" run. Strips that are furthest from the power supply are more likely to exhibit voltage drop.



② Light strips are powered from a spliced "Centerfeed" connection. This type of layout tends to produce more consistent brightness and color between strips.



③ Light strips are powered from a single looped "Loop-back" connection, which also produces more consistent results. Often used for room perimeter and cove



④ In the "Array" option, light strip "legs" are individually powered. Total wattage should be determined so as not to overload power supply.

## Power Supply Options (for Straight Run and Centerfeed/Loop Back Layouts)

LED Light Strip power requirements are based on several factors, including the light strip layout and the length limitations of light strip-type lighting. Refer to the guide below for choosing a power supply. It is recommended to choose a power supply option in excess of your needs, since LED Light Strips cannot be overloaded. UL Listed Class 2 power supply required.

The LED power requirements below are based on 100% full power brightness levels and do not represent every possible installation scenario.

Maximum Length of LED Light Strip Based on Layout Type and Power Supply		
Power Supply	Straight Run	Center Feed / Loop Back
6 Watt	3.3 ft (1.0m)	Not recommended
15 Watt	10.5 ft (3.2m)	9.0 ft (2.75m)
30 Watt	24.0 ft (7.3m)*	20.0 ft (6.0m)
60 Watt	24.0 ft (7.3m)*	48.0 ft (14.6m)

\*These are the maximum recommendable strip lengths in straight run configurations. Longer lengths are typically subject to voltage drop.

## Power Supply Options (for Array Layouts)

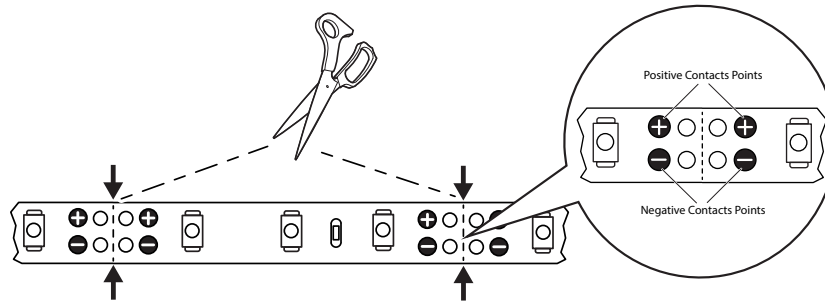
The total watts used in an array layout depend on the wattage requirement of each array “leg” and overall voltage drop within your connection wires. A leg can be a single LED strip or series of strips connected end-to-end.

Calculate the wattage for each leg by multiplying watts per foot by the length of LED lighting in the leg. Include only the lengths of LED tape in your calculation, not the connecting wires. Add each leg’s wattage requirement together, and referring to the chart below, determine the total watts needed to power your array and select the appropriate power supply.

Length of leg (LED tape light only)	1 to 5 ft.	6 to 10 ft.	11 to 15 ft.
Watts used per foot	1.8 watts/ft.	1.6 watts/ft	1.4 watts/ft

## Cutting, Connecting and Wiring

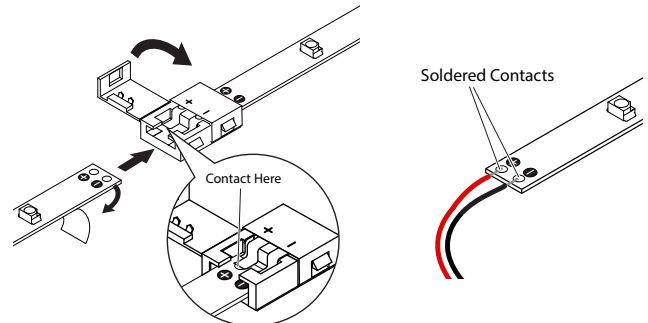
LED Light Strips can be cut in 5cm lengths, each containing 3 LEDs. Lengths are marked at cutting intervals by lines lying between sets of soldering points, as indicated in the illustration below.



## Using Solderless Clamps/Soldering

There are multiple options for connecting LED Light Strips. The procedure at right illustrates how to connect strips using solderless clamps.

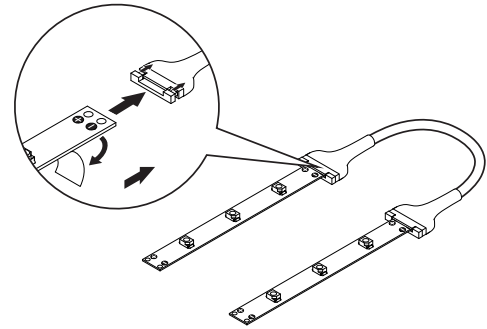
Though solderless clamping is generally easier to perform than soldering contacts, in some circumstances, soldering contacts may be necessary. For procedures such as soldering and splicing, it is recommended that you are already familiar with basic wiring skills.



## Using Light Strip Interconnects

Another option for quick, easy and flexible connection between LED Light Strips is the Light Strip Interconnect, shown at right.

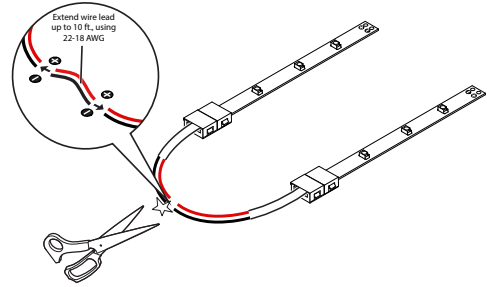
Interconnects are a useful option in applications where you want to easily join light strips over separated surfaces, such as between kitchen cabinets.



## Lengthening Wiring

For longer wiring needs between LED Light Strips, another option is to splice in longer lengths of wiring between two solderless clamps, as shown at right.

Wiring lengths can be increased up to 10 ft., using 22-18 AWG wiring.



## Installation

### Mounting Options

Once you have determined your final mounting position, clean the surface to assure the self-adhesive backing will adhere properly. The mounting surface needs to be smooth, dry, and free from oils and waxes. Although LED Light Strips can be installed in curved and irregular spaces, avoid sharp bends or bending on the solder joints as you could damage the light strip. If an LED is inadvertently damaged and fails to light, the remaining LEDs will continue to operate.

### Important

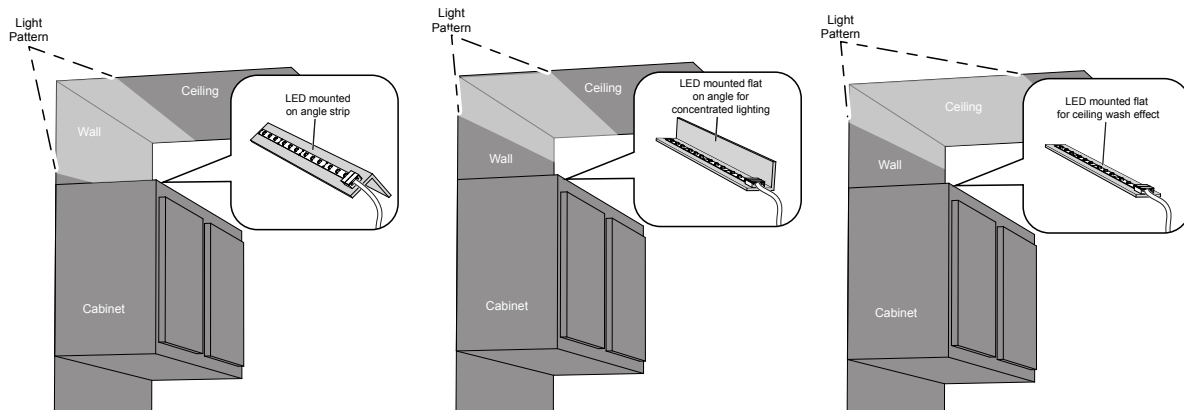
The backing tape on LED Light Strips is coated with a strong adhesive that is intended for a single application only. Apply only when a lighting location is fully determined.

### Mounting Options

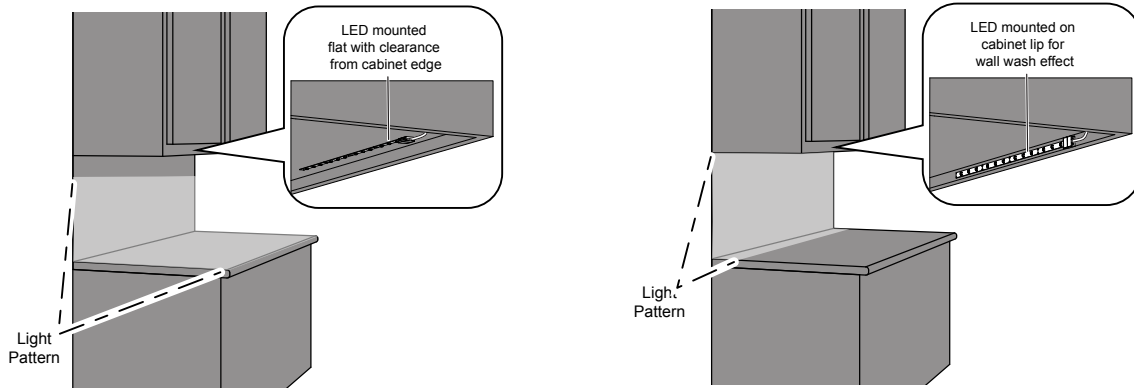
Once you have chosen a lighting configuration and finished making necessary connections, installing Light Strips can be as simple as applying them to the desired surface. However, it is recommended to first try different installation options to achieve the most attractive results from your lighting system.

Below, some typical installation techniques for different applications are represented with some general guidelines to observe.

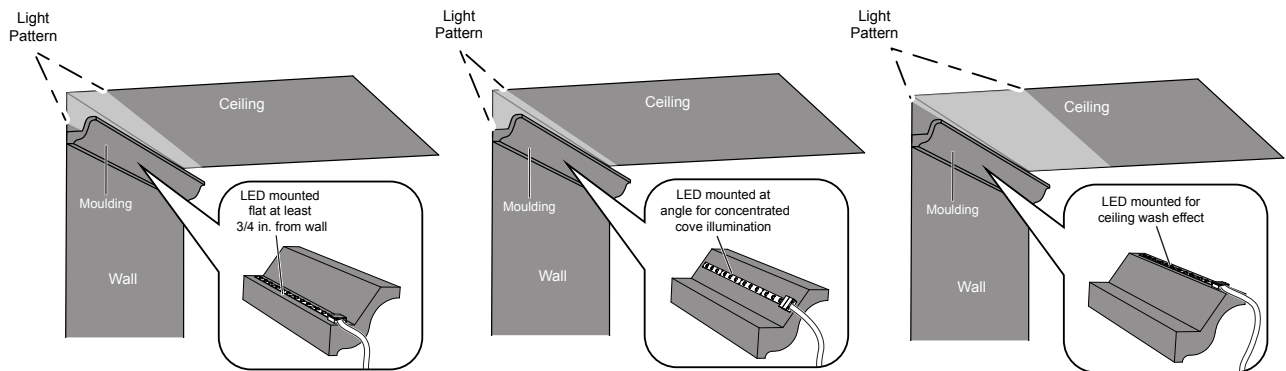
## Over Cabinet Lighting



## Cove /Crown Molding Lighting



## Cove /Crown Molding Lighting



## Troubleshooting

### Tape light strip does not light

- Make sure your power supply is turned on and receiving power.
- Confirm you have maintained correct polarity (+ to + and - to -) when joining LED Light Strips as well as when connecting to the 12V power supply.
- Check all tape light connections and any switch or dimmer connections from the power supply to the LED Light Strips. Consider testing with a multimeter to ensure light strip is receiving 12V power.

### Only part of the LED tape light strip is lit

- Check connections to the part of the Light Strip that is not lit.
- Confirm you have maintained correct polarity (+ to + and - to -) when joining LED Light Strips as well as when connecting to the 12V power supply.
- If only 1 LED series is out, cut out and remove the damaged 3-LED group and splice together LED Light Strips or replace with new 3-LED section.

### LED tape lights blink on, then go off

- Your power supply is not adequate for the length of LED Light Strips you are powering. Install a higher wattage power supply or reduce watts used by shortening the lengths of your LED Light Strips.

### LEDs farthest from the power supply are noticeably dimmer

- This is the result of voltage drop. Decrease the length of the 12V power feed wires or use thicker power feed wires between the 12V power supply and the lighting strips.
- Use shorter lengths of LED Light Strips. Refer to layout options in these guidelines. Consider a different layout.

