

Ultra thin and flexible, RibbonFlex Pro Custom Color RGB LED Tape Light is easy to install in straight, curved and irregular spaces – offering virtually limitless design and installation possibilities. With red, green and blue LED chipsets, RGB LED lighting can produce a near endless array of colors, plus shades of white, making it exceptionally versatile for creative accent lighting.

Please read completely before installing.

These guidelines will help you to understand how LED tape lighting can be configured, cut to size, connected, and installed so you can successfully design your own project-specific LED lighting layout.

Installing tape lighting is an easy DIY project, however, basic wiring skills such as stripping, splicing, extending, and connecting wires are required.

This RGB LED tape lighting requires a 12V DC power supply and an RGB color controller, available separately. An RGB LED Signal Repeater may be required for longer length runs over 32 feet.

For help and advice with installations and to learn more about how to install larger RGB application projects email support@armacostlighting.com.

IMPORTANT

- When making any connections or cutting the RGB LED tape light, make sure all power is disconnected. A short circuit will occur if any of the energized White, Red, Green, or Blue wires come in contact with each other which can permanently damage your RGB color controller.
- Never connect tape light directly to 120-volt household power
- Do not power LED tape while coiled on reel, as the LEDs will overheat. The mounting surface will act as a heat sink to dissipate heat
- Do not stare directly into the LED lights when illuminated
- Never connect more than one power supply or color controller to a run of LED lighting
- Always use the +12V/G/R/B indicators printed on the tape light to maintain polarity and correct color sequencing
- Do not install this product in areas that are susceptible to direct exposure to the elements
- Use only insulated staples, plastic ties, or wire support clips to secure cords and wires
- Route and secure wires so they will not be pinched or damaged
- Use properly certified CL2 or better cabling for wire runs inside walls
- Do not install Class 2 low voltage wiring in the same runs as AC main power. If AC and low voltage wires cross, keep them at 90-degree angles

All wiring must be in accordance with national and local electrical codes, low voltage Class 2 circuit. If you are unclear as to how to install and wire this product, contact a qualified professional.

Planning

RibbonFlex Pro RGB LED lighting is designed for indirect lighting applications. The LEDs themselves are not intended to be seen directly by the eye. Every installation is unique and the illumination effects are personal preference. Installation location, wall colors, mounting angle, and the light's reflection off of walls, surfaces and objects will affect the final lighting appearance. Subtle adjustments to the positioning and angle of the LED tape can greatly impact the overall lighting effect.

Installation considerations

- Where will you locate your power supply and RGB controller?
- How will you switch your LED lighting on and off?
- What is the best layout configuration for your installation?
- What are the best ways to mount the tape lighting?
- How will you cut, connect, and conceal the wires to your lighting?

Choose an RGB color controller

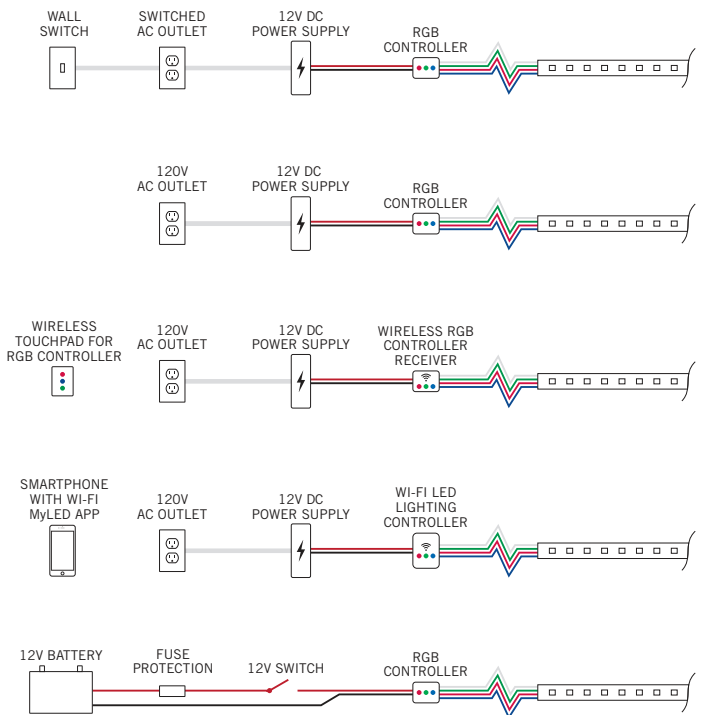
A color controller is required for RibbonFlex Pro RGB LED lighting. RGB color controllers blend the red, green, and blue light from the LED chipsets allowing you to create custom colors and color-changing effects. The color controller will also work as a dimmer and function as an on/off switch. A wireless wall switch is also available. For current product information on RGB color controllers, visit armacostlighting.com.

Choose a power supply

Power supplies come in various sizes with different wattages and are often referred to as transformers, AC/DC adaptors, or LED drivers. RibbonFlex Pro LED tape operates on low voltage and requires a power supply to convert 120-volt household AC power to 12-volt DC power.

- Never connect RibbonFlex LED Tape Lighting directly to 120-volt household power
- Only use RibbonFlex with Armacost Lighting approved LED drivers and power supplies. Using other power supplies will void warranty

TYPICAL CONNECTION SCENARIOS



Interior RV and boat applications can be powered directly by 12V battery

Power supply location and voltage drop

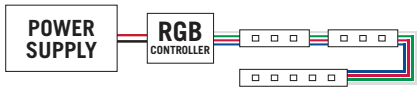
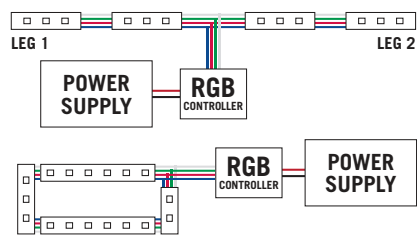
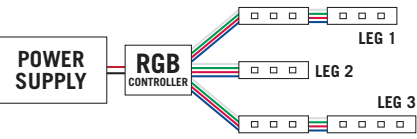
The shorter the wire is between the power supply, the RGB controller and the tape lighting, the brighter and more consistent the color will be – do not coil extra wire. If the RGB LEDs farthest from the power supply appear dim or you see a color shift, it is due to voltage drop. Voltage drop only becomes undesirable if you notice the brightness or color in one area of your lighting is objectionably different than in another area. As a practical approach, test your LED lighting prior to final installation. If voltage drop appears to be an issue use heavier gauge wire, power tape light from both ends, or use shorter length of lighting (see Typical Configurations).

To learn more, visit armacostlighting.com/installation for an easy-to-use online voltage drop calculator.

Power supply size

Determining your wattage requirements

RGB LED tape lighting power requirements are stated in watts, and are based on several factors, including your design configuration. LED tape strips can be installed in series (strips connected or wired end-to-end) or in parallel (multiple legs of LED strips or series of strips wired directly to a single power supply).

TYPICAL CONFIGURATIONS	
<p>Straight Run</p> <p>Only one end of the LED strip is powered. Multiple strips can be connected in a series for a continuous run. When set at 100% cool bright white, RGB LEDs farther away from the color controller may color shift to a warmer white.</p> 	
<p>Center Feed / Loop Back</p> <p>Either power two equal legs of tape lighting from the center or loop back and power both ends of the LED tape. These configurations will produce more consistent brightness and color over the length of the strip. A loop back is excellent for room perimeter tray ceiling or cove lighting.</p> 	
<p>Array</p> <p>An array uses two or more legs of various lengths wired to an RGB controller in a parallel connection. You will need to calculate total wattage used in an array to guard against overloading the power supply.</p> 	

Choosing a higher wattage power supply does not necessarily mean you can run longer lengths of LED lighting, however, it will allow for more lighting legs in overall design. Exceeding the lengths in the following chart will cause LEDs farthest from the power supply to color shift when at 100% full bright white. Using a higher wattage power supply will not reduce the effect of voltage drop.

Maximum recommended tape length Model RF5050030-V2RGB, 30 RGB LEDs per meter	
Straight run configuration	10 meters (32.8 ft) – will use approximately 40 watts
Center feed configuration	20 meters (65.6 ft) – will use approximately 80 watts
Array configuration	Varies based on layout and max wattage of power supply

For larger installations, install an Armacost Lighting RGB Signal Amplifier with an additional power supply, or use several wireless or WiFi RGB controllers with separate power supplies in the same area, all paired to the same operating channel and controlled by a remote touchpad or smartphone. To learn more, visit armacostlighting.com/RGB.

Calculate the total wattage in your LED lighting system design

1. Use the following chart to determine the watts used in each leg of lighting. A straight run is considered one leg. A center feed is two equal lengths of lighting. An array can have many legs. As a best practice use the next longer length on the chart to determine approximate wattage per leg. Be sure to include only the lengths of LED tape in your calculation. Do not include the connecting wires.
2. Add together the watts used for each leg of lighting to get total watts used in your lighting layout. Note that watts shown in the chart represent the approximate watts used when your color RGB LEDs are set at full bright white. White light uses more energy than colors.

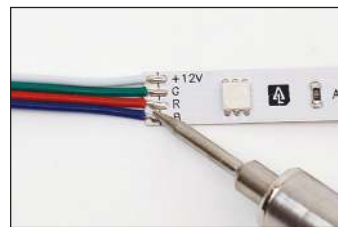
Approximate watts used per meter at 100% bright white RibbonFlex Pro Model RF5050030-V2RGB – 30 LEDs per meter										
Meters	0.5	1	2	3	4	5	6	7	8	10
Feet	1.6	3.3	6.6	9.8	13	16.4	19.7	23	26.2	32.8
Watts used	4	8	15	21	25	29	32	35	38	40

- Watts used is the power consumed by your LED lighting system, not the watt rating of a power supply.
- Always choose a power supply rated greater than your needs.
- The watts used, as shown, are based on 100% full brightness white light. Color changing or dimming of RGB LED lighting will use less power and extend the life of LEDs.
- Due to voltage drop, longer lengths of LED tape will use fewer watts per meter than shorter lengths.
- To accurately measure watts used by your LED lighting system, use a multimeter. Watts is calculated by multiplying volts by amps used in your LED system. To learn how to measure watts with a multimeter, visit armacostlighting.com/multimeter.

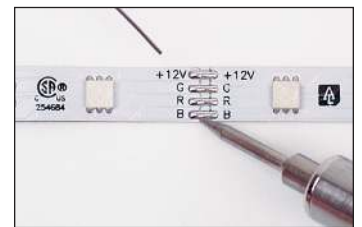
Cutting, connecting and wiring

There are two methods for connecting power wires and splicing together two pieces of LED tape lighting: soldering or using Armacost Lighting SureLock Connectors.

Soldering is a sure method for making strong, reliable electrical connections. For tips on how to solder RibbonFlex Pro, visit armacostlighting.com/installation.



Wire Lead Connection



Splice Connection

Soldered connections are required for marine and RV applications due to vehicle movement and vibrations.

Always connect RGB power wires to your tape lighting before removing the 3M tape backing and installing.

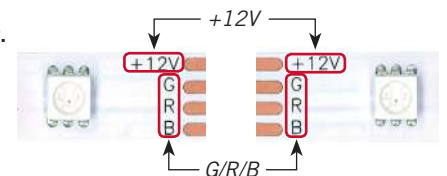
How to cut tape light

This RGB tape light model can be cut every 3 LEDs, or about every 4 in. Whether you are soldering wires or using connectors, cut the LED tape with scissors directly in the center of the copper pad as shown in position "A" below. You can also cut the tape at position "B," however, do not use connectors on soldered tape light joints, you can solder wires at these joints.



Always maintain same RGB wire polarity when connecting.

Use the +12V/G/R/B indicators printed on the RGB tape light to maintain the same polarity and correct color sequencing.



Using SureLock™ Connectors

SureLock Wire Lead Connectors are used for going around corners or, when cut in half, to create two power leads or jumper cables to bridge gaps in order to get tape lighting to other areas.



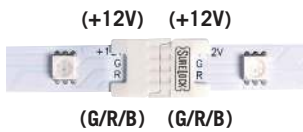
To increase the wire length between two LED strips, simply cut the connector wire in two, and splice in the length of wire needed. 18 gauge or heavier wire is generally recommended. Do not coil excess wire; shorter lengths and thicker wire will mean less voltage drop and higher brightness.



Be sure all wire splice connections are secure and sealed. Options include soldering, electrical tape, crimp connectors, terminal blocks, wire nuts, etc.

SureLock Splice Connectors

SureLock Splice Connectors are used to join two tape light strips, creating a continuous run of lighting.

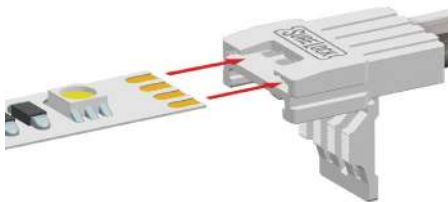


If the +12V/G/R/B marks do not line up, flip the tape strip and use the opposite end for proper +12V/G/R/B alignment.

Installing SureLock Connectors

SureLock Connectors – both the wire lead and splice models – connect to the copper pads on cut sections of LED tape light. Connect to clean copper pads. Do not use connectors on soldered joints.

- Carefully peel back a small section of the 3M® adhesive tape paper backing – remove only the paper, not the adhesive underneath.
- With the connector in an upright position (logo facing up), carefully insert the LED tape into the channel grooves, as shown below.



- Use a gentle, side-to-side motion while inserting to make sure the tape light is seated fully inside the connector.
- Once the lighting is seated, push to close and securely lock the pressure pad door. If needed, put the tape and connector upside down on a hard surface and use a flat head screwdriver to close and lock the door in place.



Once tape is fully inside connector, close and lock pressure pad door.

Use a flat head screwdriver to securely lock door if necessary.

Follow the same basic instructions when using SureLock Splice Connectors.

To view an online video tutorial, visit armacostlighting.com/surelock.

Surface preparation and installation

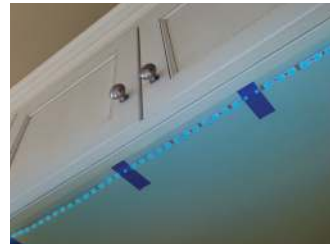
Before removing the 3M paper backing, test the LED strip in the space you intend to light. Once the paper backing is removed and the lighting is fully installed, you cannot reposition or move the LED tape light to another location. The tape may not stick securely.

Do not power LED tape while coiled on reel, as the LEDs will overheat. It is normal for the tape to feel warm to the touch when holding it. Once installed, the mounting surface will act as a heat sink to dissipate heat.

Power the LED tape light and temporarily hold or tape into position with painter's tape – do not remove the 3M paper backing. Do not stare directly into the LEDs.

Try various angles and positions to get the desired level of illumination and lighting appearance. If the LEDs create undesirable bright spots on walls or reflections, reposition the tape light strip farther away from surfaces or try a different mounting angle.

See placement options for under cabinet lighting on page 4.



Going around corners

Although LED tape lighting is thin and flexible, it is not designed to make sideways or lateral bends and turns, which can damage the lighting. Use a SureLock Connector to go around corners or create soft bends with a loop that will make the tape lighting change direction sideways.

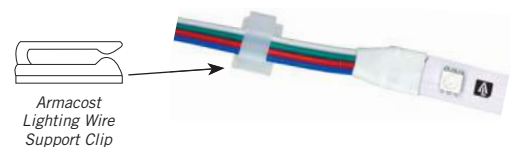


Using a SureLock Wire Lead Connector to make a corner turn



Use loop bend technique for coves and above cabinet installations

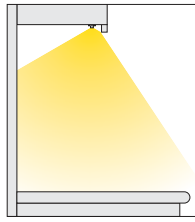
- Mounting surfaces should be smooth, clean, completely dry, dust free and above 60°F (15 °C) before installing/sticking the LED tape strip in place. Thoroughly clean all mounting surfaces with isopropyl alcohol. Do not use common rubbing alcohol and household cleaners, which may leave behind residues.
- For best adhesion, lightly sand the surface where you will mount the tape lighting with fine grit sandpaper (150-300 grit). Sand in a circular motion rather than straight-line motion.
- When installing on painted surfaces, paint should be fully cured based on manufacturer's cure time.
- Be careful not to peel off the 3M adhesive from LED strip; just remove the tan paper backing.
- 3M sticky back tape requires pressure to activate the adhesive. Working from one end to the other, firmly press the tape down with your fingers, taking care not to press on the individual LEDs.
- Support power wire leads, especially when mounting under cabinets and shelves.



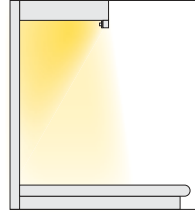
Armacost Lighting Wire Support Clip

Placement options for under cabinet lighting

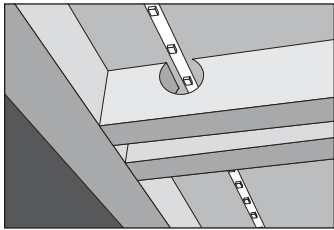
For maximum light output, mount the LED tape towards the front of the cabinet with LEDs facing down. To focus light on the work surface and also light your backsplash, position the tape light an inch or two back from the front of the cabinet. This mounting position works best with dull or matte finished surfaces.



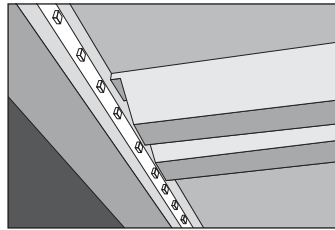
If your countertop is reflective, install the LED tape lighting on the inside back of the cabinet lip frame with the LEDs facing towards your backsplash. This method helps eliminate unwanted light reflections and bright spots reflecting off your countertop. Because of the wide beam angle of the tape light, this mounting position will still provide ample lighting.



Continuous run mounting of LED tape lighting is achieved by drilling a 1/2 in. hole through cabinet side frame lips. When mounting on the back side of the front frame lip, use a multi-tool oscillating saw to make small vertical cuts in the dividers to create slots that allow the tape lighting to pass from one cabinet to another.



Tape light installed through a drilled hole.



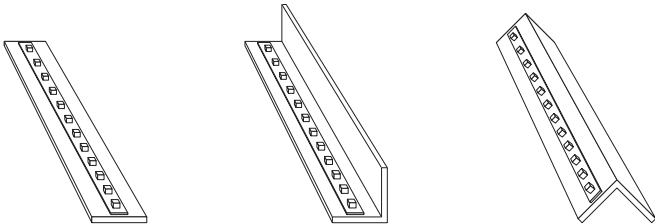
Tape light installed through a slot sawed into cabinet divider.

Create a visual barrier when mounting under a cabinet or shelf with no lip to conceal the LED tape light strip. Use a piece of angle trim, quarter round molding, or any type of trim desired to hide the LEDs.



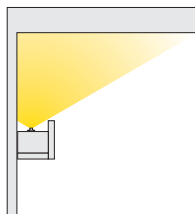
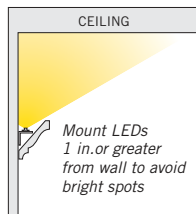
Above Cabinet Uplighting

Most cabinet tops have uneven surfaces. To create beautiful, indirect uplighting over cabinets, simply mount RibbonFlex Pro on any rigid strip (e.g., thin lattice or corner guard molding) and place on top of cabinets. Angle the strip position to achieve the desired illumination.



Cove Lighting

Try different mounting positions to get your desired lighting effect. For a seamless glow with no bright light spots, keep LED tape light strip at least 1 in. away from walls.



Troubleshooting

RGB tape light strip does not light

- Make sure your LED power supply is turned on and receiving power.
- Confirm you have maintained correct polarity when connecting your 12V power supply to your RGB controller, and ensure that you have maintained polarity and consistent wire color sequencing (+12V/G/R/B) from the RGB controller to your LED tape light.
- Check all tape light and RGB controller connections from the power supply to the RGB LED tape light. 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 strip that is not lit.
- Confirm that you have maintained correct polarity and wire color sequencing to the unlit section.
- If only 1 LED series is out, cut out and remove the damaged 3-LED group and splice together LED tape 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 RGB LED tape light you are powering. Install a higher wattage power supply or reduce watts used by shortening the lengths of your LED tape lighting.

LEDs farthest from the power supply are noticeably dimmer or you see a color shift

- 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, the RGB controller, and the tape lighting.
- Use shorter lengths of RGB LED tape lighting. Refer to **Typical configurations** in these guidelines. Consider a different configuration.

Visit armacostlighting.com/installation for additional installation tips and FAQs.

Limited three-year warranty

For terms and conditions, visit armacostlighting.com/warranty. Improper installation, abuse, or failure to use this product for its intended purpose will void warranty. This warranty only applies when all components, including LED power supplies, have been provided by or approved for use by Armacost Lighting. Substituting another manufacturer's product and/or components will void the warranty. The warranty does not cover labor or any other costs or expense to remove or install any defective, repaired or replaced products.

SPECIFICATIONS

Input Voltage.....	12V DC
LED Count	30 LEDs/m
LED Module	SMD 5050 tri-chip RGB
Beam Angle	120° wide
Tape Height/Width	2 x 10mm
Cuttable.....	Every 4 in. approx (100mm)
Listings	CE, RoHS, CSA
Country of Origin	China



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