

illuminating! Deck Lighting & Installation

DecksDirect.com Deck Lighting & Installation Guide

Congratulations!

You've made an illuminating decision.

DecksDirect.com created this Lighting Guide to empower you with the basics of lighting options, deck light planning and deck light installation.

From post cap lights to rail and step lighting, today's low voltage and solar lighting options make it easy for homeowners to select and install their own embellishments, furthering the satisfaction and enjoyment you get from your deck.

For additional assistance or advice, just take advantage of the experts at DecksDirect.com by calling 1-888-824-5316, 7a.m. to 5:30p.m. Monday through Friday, CST. Callbacks can also be provided afterhours and on weekends.

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Before



After

Be a Power Deck Profile

We're so confident you'll enjoy this process, we invite you to share photos of the installation and finished product by sending them to:

Lighting@DecksDirect.com

We'll feature you at DecksDirect.com as another success.

All About Deck Lights

Before you can plan your deck lighting, make sure you know all the delicious options available to you! Here's a quick overview to get you started. From functional lighting to fun accents, the combinations and possibilities are all up to you, and the look you want to create! The experts at DecksDirect.com can help you sort through all the choices in lighting style, size, layout and more.

Styles



Post Cap



Rail Light



Step Light



Online tip!

At DecksDirect.com, complementary post cap, rail and stair lighting can be easily found by selecting "Related Products" on any product web page.

Post Caps

From ornamental to functional styles, post caps put the finishing touch on your deck décor by taking their place atop the posts that punctuate your deck railing. Styles range from classic unlit to customizable illumination; in sleek, powder-coat and even hand-crafted finishes. The options for adding ambience multiply when you consider complementary counterparts in rail and stair lighting, or outlining your deck with alternating lit and unlit post caps.

Rail Lighting

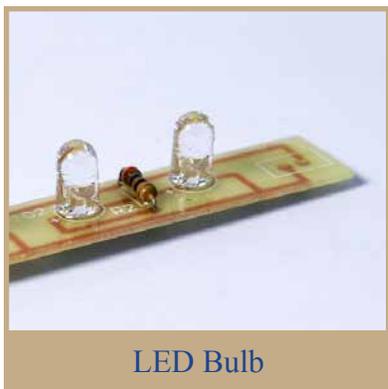
Side-mounted, low-voltage sconces on your deck railing posts provide a complementary glow to the illumination or unlit accent of a matching post cap. A range of styles give you the flexibility to customize your deck with illumination that adds utility, decorative accents or warm highlights.

Stair and Step Lighting

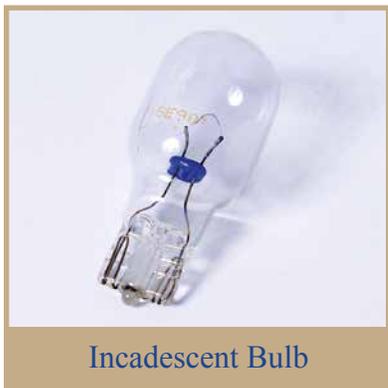
Recessed lighting blends smoothly into stairways and steps – mounted in the risers or underneath the steps – increasing safety while adding beauty and harmony to your deck activities. Some recessed LED lights can be used to highlight accent railing or other features you love about your deck.

All About Deck Lights

Bulb Options



LED Bulb



Incandescent Bulb



Project Note!

Most home centers only sell AC transformers, but you can easily find several brands of both AC and DC transformers at DecksDirect.com.

LED

If you want to “go green” with your lighting, think LED! All solar lights and certain low voltage (12v) lighting use LEDs.

LED stands for light emitting diode - instead of using the standard filament seen in



incandescent light bulbs, LEDs are illuminated by the movement of electrons in semiconductor material. This makes them an efficient light source that remains cool to the touch and reduces energy costs.

Most LED bulbs require a DC 12-volt transformer, but some higher-end styles are rated for both AC and DC power. Check the item description on your bulbs to verify the power type required.

Incandescent

Incandescent bulbs create light by use of a filament. When power is applied the filament glows, generates heat, and produces light. Incandescent bulbs are available for low voltage and line voltage applications, and the wattage used varies with the type of light bulb installed.

Incandescent bulbs require line voltage or AC transformers, a large selection of both line voltage and AC transformers at DecksDirect.com.

LED vs. Incandescent Comparison

Among other benefits, LEDs require less energy to produce the same amount of light as an incandescent bulb. This makes them a more efficient light source that saves energy usage and costs over time. Some of the main differences are shown here.

	LED	Incandescent Bulb
Average life span	50,000 hours	1,200 hours
Energy used to produce 1,600 lumens (light output)	16-20 watts	100 watts
Heat emitted during operation	No	Yes
Attracts insects	No	Yes
Replaceable bulb	No	Yes
May be fueled by solar panel	Yes	No
Illumination	Single direction	Omnidirectional

All About Deck Lights

Power Sources



Single Tap AC Transformer



Multi Tap Ac Transformer



DC Transformer



Solar Panel

Low Voltage (12 volt)

Low voltage deck lighting uses a transformer plugged into a standard wall outlet to convert ordinary household power from 110 volts down to 12 volts. It's so easy and safe to install that in most areas of the U.S., installation doesn't require an electrician unless you choose a transformer that hardwires into your electrical system. Nonetheless, always contact your local building department before starting any construction project.

A variety of transformers are available to power low-voltage lights:

AC transformers: Used to convert AC current to the voltage required by incandescent bulbs.

Single / Simple Tap configurations: Single or simple-tap transformers have just one terminal which delivers current reduced to a pre-set amount, usually to 10% of the incoming voltage.

Multi Tap configuration: The multi-tap transformer has several terminals available (usually from 11-15 volts). This flexible voltage system ensures better current stability that prevents dimming and early bulb burnout.

DC transformers: DC transformers are not as commonly used in household applications, but required for applications like LED lights. They convert AC voltage to lower-voltage DC power. DC transformers are available in single tap configuration as explained above.

Line Voltage (110 volt)

Compared to low voltage lighting, line voltage products create a larger amount of light but also use more electricity. This isn't a typical do-it-yourself project, as the installation of higher energy voltage generally requires a licensed electrician and/or permit. This guide doesn't address line voltage lighting.

Solar

Using a solar panel to convert sunlight into electricity, solar lighting is preferred in situations where wiring is not practical or an option. It doesn't produce as much light as low voltage and line voltage power, so it's most often used to create accent lights (see chart on page 3). The LED bulbs are fueled by rechargeable NiCad (Nickel Cadmium) batteries which require sunlight, with charging and run times based on the season and location. For example, solar lights in northern climates will run 8-12 hours in the summer and 3-6 hours in the winter. The same lights in southern climates, with greater sun exposure, will run even longer.

Planning Essentials

The best way to save time and money with your deck lighting is by starting with a clear vision of the end result. This next section will walk you through the essential

elements that need to be understood and decided before you purchase a single light or wire nut.

Lighting plan

Sketch it out.

Start by sketching out a deck plan. It doesn't have to be perfect, but simply visualizing the layout of your deck and lighting objectives will go a long way towards achieving the results you want.

Once you have the deck outlined, mark significant features in their approximate locations, especially if these are fixed items. These may include benches and other seating, tables, large planters, and outdoor fireplaces or grills. You may also want to light steps leading to the yard or inside to the home.

Think utility.

What areas of the deck do you want to light for safety or functionality? This may include stair treads, areas used for grilling, or other high traffic spots. A combination of rail lighting, recessed stair lighting and post caps can cast the right amount of light without interrupting the relaxed atmosphere, or even the moonlight, you enjoy on your deck. As you consider these locations, pencil them in on the deck plan.

Think ambience.

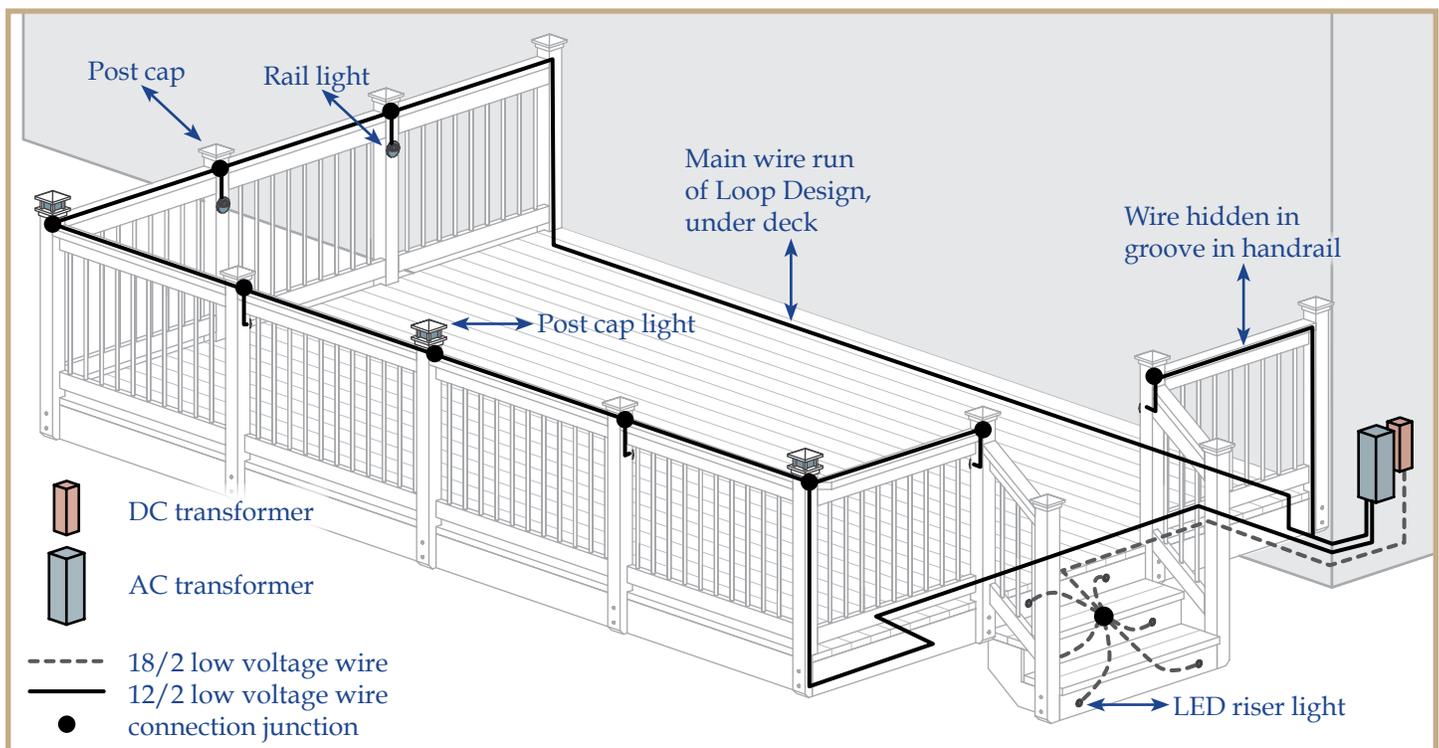
This is where the fun starts. Do you want low accent solar lights to soften your deck environment, perhaps add romance? Or bright splashes of luminance to highlight details and architectural features? Pencil these locations on your deck plan as well.

Choose your lights.

Choose your light fixtures types and finalize the locations. As you consider all your options, don't neglect your deck material and balusters. You'll want the style, color and luminance of your lights to complement the existing features, as well as your personal style. When you've finalized your light choices and locations, mark these in pen on the deck plan.

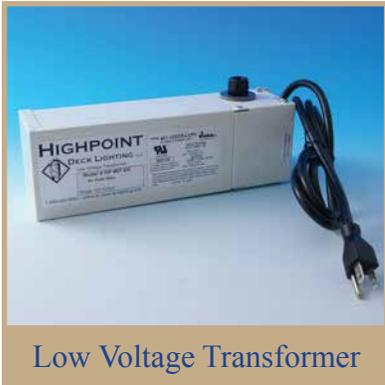
Measure before you order!

When ordering post caps, the best way to make sure you obtain the correct light size is to measure the actual size of your deck posts. Post sizes may vary and standard 4x4 posts are not actually 4 inches by 4 inches, but measure 3-1/2 x 3-1/2.



Planning Essentials

Transformer Basics



Low Voltage Transformer

$$\begin{array}{r} \text{Total light watts} \\ \times 1.1 \\ \hline = \text{Transformer size} \\ \text{needed} \end{array}$$

Transformer size equation

Low voltage deck lighting uses a transformer plugged into a standard wall outlet to convert ordinary household power from 110 volts down to 12 volts. To determine the size of transformer needed, add up the total number of watts for each light fixture in your deck plan. Then, add another 10% for cables and connections that add hidden watts to your system. A simple equation to use is:

$$\text{Total light watts} \times 1.1 = \text{transformer size needed}$$

Choose the transformer that most closely matches your total lamp wattage, and round the number up instead of down. You may also want to leave some room to add more lights in the future. For example, 13 fixtures all rated at 20 watts will require a 300 watt transformer or...

$$\begin{array}{l} 13 \text{ fixtures} \times 20 \text{ watts} = 260 \text{ total watts} \\ 260 \text{ total watts} \times 1.1 = 286 \text{ watts} \end{array}$$

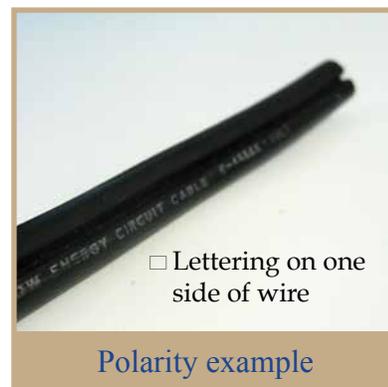
Wiring

Wiring gauge tells you exactly how much current the wire can carry. It's an inverse relationship: higher current runs on thicker cable, which is indicated by a lower number gauge. Wire should be purchased according to the type of light you have selected, the location of the lights and the wire layout. (See chart at the end of this section for a guide.)

Staying consistent in matching wire types is important as you continue through the wiring process. Most wires will have a "smooth" black wire combined with another wire that has white lettering and/or is ribbed - matching polarity is especially critical for LED lights.



12/2 & 18/2 wire



- Lettering on one side of wire

Polarity example

Planning Essentials

Layout

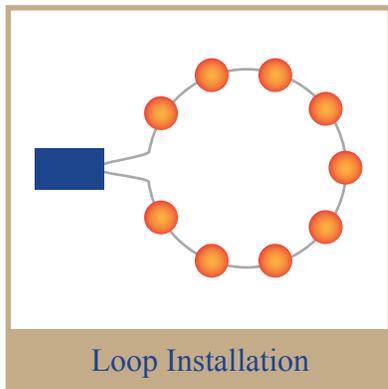
Decide where you want to run your wires: stapled exposed under the handrail, hidden in a routed space within the railing, or under the deck and up each post. As current runs along the main cable to each light fixture in a circuit, voltage drop may occur,

which can lead to insufficient voltage being supplied to lights at the end of your run. To limit voltage drop, it is recommended that for circuits with multiple light fixtures and/or long runs, you loop the main cable as illustrated in the first diagram below.

Sample Layouts

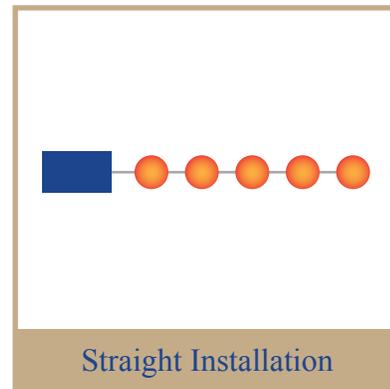
Loop Installation

Light fixtures are arranged in a looped circuit, reducing the effects of voltage drop. DecksDirect.com recommends this installation type.



Straight Installation

Also called a line installation, the wiring in this layout starts at the end of your lighting and follows the direct light fixture sequence, all the way to the transformer.

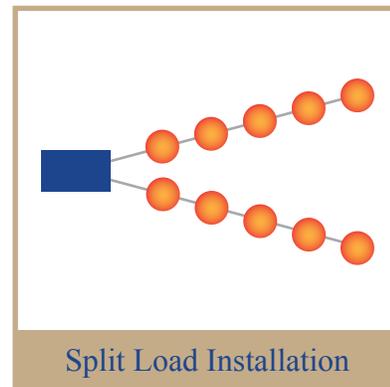
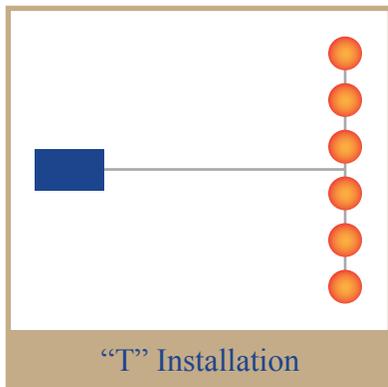


“T” Installation

In this layout, the transformer is centrally located among the lights. This creates a more equal distribution of power but also requires a heavier gauge of wire (8 or 10 gauge) running from the transformer. This is a good layout for lighting that is a long distance from the transformer.

Split Load Installation:

This wiring layout is recommended when light fixtures run in two or more directions from the transformer. For this layout, locating the transformer in the center of the run reduces the effects of voltage drop.



Key  = Transformer  = Light  = Wire

Planning Essentials

Wire Quick Guide

Quick guide to wiring layouts, wattage and wire gauge

Wiring guide for 12 volt, incandescent lighting			
If you're using this wiring layout:	With this much wire:	And this is your total wattage:	You need this gauge of wire:
Straight "T" Split Load	200 feet	150 watts	12 gauge (12/2) exterior grade wire
Loop	300 feet	300 watts	12 gauge (12/2) exterior grade wire
Straight "T" Split Load	320 feet	150 watts	10 gauge (12/2) exterior grade wire
Loop	450 feet	350 watts	10 gauge (12/2) exterior grade wire
Straight "T" Split Load	500 feet	150 watts	8 gauge (12/2) exterior grade wire
Loop	750 feet	300 watts	8 gauge (12/2) exterior grade wire

Wiring guide for 12 volt, LED lighting			
If you're using this wiring layout:	With this much wire:	And this is your total wattage:	You need this gauge of wire:
Straight "T" Split Load	150 feet	40 watts	18 gauge (18/2) exterior grade wire
Loop	250 feet	60 watts	18 gauge (18/2) exterior grade wire
Straight "T" Split Load	250 feet	40 watts	14 gauge (14/2) exterior grade wire
Loop	400 feet	60 watts	14 gauge (14/2) exterior grade wire

Step-by-Step Instructions

Tools List

For your convenience, we've compiled a list of the tools most commonly used to install deck lighting. Depending on your deck plan and the choice of lights, you may not use or need all of them.

- Drill
- 1-1/2" - 2" Forstner bits (size will vary depending on the lights being installed)
- 1/2" Drill bit, 12" long
- Auger bits
- Wire strippers
- Staple gun with stainless steel staples
- Wire (appropriate gauge for your lights and installation, see previous page for guide)
- Waterproof wire nuts - usually 2 for each transformer and 2 for each light
- Timer - if desired, a digital or manual timer for controlling your lights can be installed between the transformer and electrical outlet.
- Transformer
- Blower or shop vacuum
- Safety glasses
- Table saw or circular saw for cutting wire runs, if desired
- Screwdrivers
- Allen wrenches



Drill



Forstner bit



Drill Bit



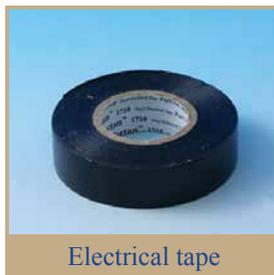
Auger bit



Wire strippers



Wire



Electrical tape



Wire nuts



Timer



Transformer

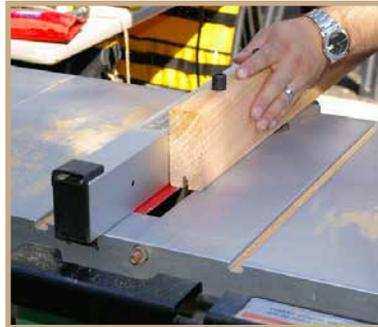
Post Cap Light Installation

Before you begin:

Place the transformer in its anticipated location without connecting it to the power source.

New Decks: If you're doing light and handrail installation simultaneously, prepare the underside of the railing by cutting a space for the wire. The groove should be sized to the gauge of wire, creating a snug fit. This will reduce the chances of hitting it with a screw later.

Existing Decks: If you're installing lights on an existing deck and handrail, you'll run the wire underneath the handrail and staple it every 4-6 inches with stainless steel staples.



Before you begin



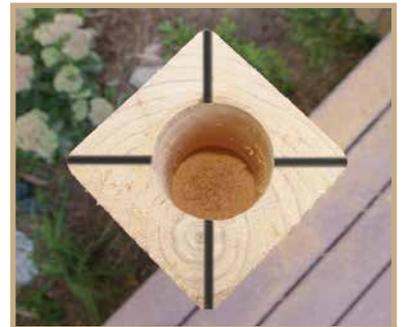
Before you begin

1. Looking down on the post, mark the center with an "X" by drawing two lines from corner to corner.

2. With a 1-1/2" - 2" Forstner bit, drill a hole slightly deeper than the incoming wire level. After drilling holes in each post, go back and use a shop vac to clear away as many wood particles as possible.



Step 2



Step 2

3. Using the 1/2" drill bit, create a hole from the side of the handrail post into the core of the deck post. If you're creating a chain of lights, you may need to create holes in both sides of the post.

4. Run the appropriate gauge of wire from the transformer to the first light, leaving a loop of extra wire at the top of each post.

New Decks: Run your wire from post to post in the railing groove you created before starting. Do not install the top rail until after the lighting system has been tested and verified to work!

Existing Decks: Loosely run the wire along posts and underside railings, threading them up and creating a loop in each deck post. Do not secure any of the wire with staples at this point.



Step 3



Step 3



Step 4



Step 4

Post Cap Light Installation

5. Cut back any excess wire and leave enough exposed to make connections without creating excess bulk. Separate each wire pair into 2-3" single strands. Using wire strippers, remove approximately 1/2" of sheathing from each wire - including the wires on the light fixture.

6. Stay consistent in matching wire types as you continue through the wiring process. Most wires will have a "smooth" black wire combined with another wire that has white lettering - matching polarity is especially critical for LED lights. See example in the wiring and layout section for more information.

Taking one wire from the light fixture and its counterpart from the wire threaded into the post, hold the two wires together with the ends even. Twist a waterproof wire nut onto them, pushing firmly until hand-tight. DO NOT over torque. Repeat for the second set of wires. Wipe away any excess silicone sealant in and around conductors, and then wrap the connections with electrical tape to prevent accidental dislodging.

7. Tuck the wire and wire nuts into the recessed hole on top of the post, and place the cap in position. DO NOT secure the post cap, handrail or wiring until you have tested the entire lighting system.

8. ALWAYS READ AND FOLLOW THE INSTRUCTIONS THAT COME PACKAGED WITH YOUR TRANSFORMER BEFORE INSTALLATION.

Locate and remove a perforated knockout circle in the bottom or side of the transformer to run the wires through. Secure the transformer in the desired location using the mounting brackets found on the transformer. If the transformer has a built-in photo eye, make sure it's exposed to direct or indirect sunlight.



Step 5



Step 5



Step 6



Step 6



Step 7



Step 7



Step 8



Step 8

Post Cap Light Installation

9 Separate each wire pair into 2-3 inch single strands. Using wire strippers, remove approximately $\frac{3}{4}$ " of sheathing from each wire. Secure one side to the common connection point and the other side to the 12v connection point on the connection terminal of the transformer. For transformers that do not have connection terminals, waterproof wire nuts will be needed for your connections.



Step 9



Step 9

Installation Tip!

When connecting the wires in a "loop" configuration, polarity/consistency of the wires must be maintained.

10. If the transformer has an on/off switch, verify the switch is in the "OFF" position before plugging the transformer into a timer or directly into a GFCI outlet. After connection to an outlet, turn the transformer switch to the "ON" position.



Step 10



Step 10

Installation Tip!

If the transformer has a photo eye built into the transformer, place a piece of tape over the photo eye for testing a low voltage system during daylight hours. It may take 2-5 minutes for the photo eye to respond after covering.

11. Finish the wire installation. Having verified that the light system works, unplug the power source to the transformer.

New decks: Secure the handrail's top board, any other finishing boards and post caps. Take care not to hit any wires with screws.

Existing decks: Secure the wiring along the posts and under the handrails by using the staple gun. Be sure to center the staple directly over the wires and DO NOT staple through the wire. If you accidentally staple the wire, simply remove the staple and re-apply a new one.

Depending on the post cap fixture, attach it with the finishing screws provided, or slide it into place.



Step 11



Step 11

Clear silicone caulk works great for securing post caps that don't have mounting screws.

Plug in the transformer and turn its power switch to "ON". Enjoy your illuminating deck experience!

For troubleshooting, see "Frequently Asked Questions" in this lighting guide.

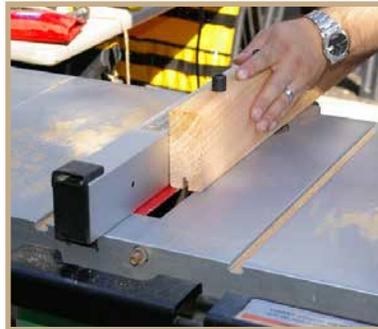
Rail Lights with Post Cap Installation

Before you begin:

Place the transformer in its anticipated location without connecting it to the power source.

New Decks: If you're doing light and handrail installation simultaneously, prepare the underside of the railing by cutting a space for the wire. The groove should be sized to the gauge of wire, creating a snug fit. This will reduce the chances of hitting it with a screw later.

Existing Decks: If you're installing lights on an existing deck and handrail, you'll run the wire underneath the handrail and staple it every 4-6 inches with stainless steel staples.



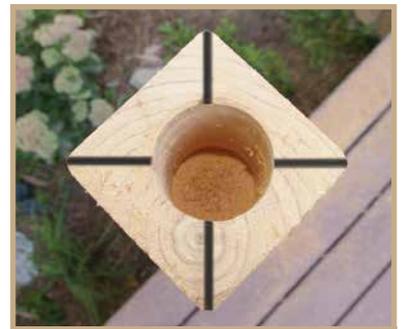
Before you begin



Before you begin



Step 2



Step 2



Step 3



Step 3

Design Note!

Rail lights are often available in styles matching lit and unlit post caps. It's easy to install both at the same time – all you have to decide is the style you prefer. For help at any time, call the DecksDirect PowerLine by calling 1-888-824-5316, 7a.m. to 5:30p.m. Monday through Friday, CST. Callbacks can also be provided afterhours and on weekends.

1. Looking down on the post, mark the center with an "X" by drawing two lines from corner to corner.
2. With a 1-1/2" – 2" Forstner bit, drill a hole deeper than the incoming wire. After drilling holes in each post, go back and use a shop vac to clear away as many wood particles as possible.
3. Drill the wire hole. Using the 1/2" drill bit, create a hole from the side of the handrail post into the core of the deck post. If you are creating a "chain" of lights, you may need to create holes in both sides of the post.

Rail Light with Post Cap Installation

4. Determine the desired height for your rail lighting – ideally, it will be level or just below the hand railing. Using a tape measure, mark the location in the center of each post.

Drill wire hole for the rail lights. Position a ½" drill bit on the spot marking the location of the rail lighting, and drill at an angle to the pocket in the center of the post.

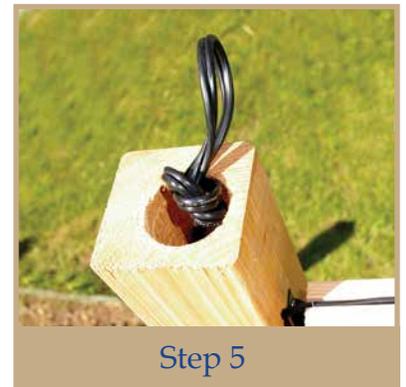
If the rail light is too far below the post hole, a second hole down from the pocket may be needed.



5. Run the appropriate gauge of wire from the transformer to the first post and rail light, leaving a loop of extra wire at the top of each lit post and at the location of each rail light.

New Decks: Run your wire from post to post in the railing groove you created before starting. Do not install the top rail until after the lighting system has been tested and verified to work!

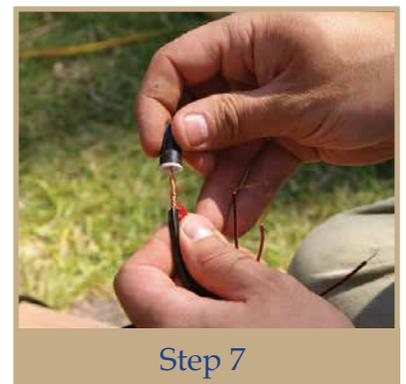
Existing Decks: Loosely run the wire along posts and underside railings, threading them up and creating a loop in each deck post. Do not secure any of the wire with staples at this point.



6. Cut back any excess wire at the rail lights and post cap light locations, and leave enough exposed to make connections without creating excess bulk. Separate each wire pair into 2-3" single strands. Using wire strippers, remove approximately ¼" of sheathing from each wire – including the wires on the light fixture.

7. Stay consistent in matching wire types as you continue through the wiring process. Most wires will have a "smooth" black wire combined with another wire that has white lettering – matching polarity is especially critical for LED lights. See example in the wiring and layout section for more information

Taking one wire from each light fixture and its counterpart from the wire threaded into the post, hold the two wires together with the ends even. Twist a waterproof wire nut onto them, pushing firmly until hand-tight. DO NOT over torque. Repeat for the second set of wires. Wipe away any excess silicone sealant in and around conductors, and then wrap the connections with electrical tape to prevent accidental dislodging.



Rail Lights with Post Cap Installation

8. Tuck the wire and wire nuts into the recessed hole on top of the post, placing the cap and rail lights in position. **DO NOT** secure the post cap, rail light, handrail or wiring until you have tested the entire lighting system.

9. ALWAYS READ AND FOLLOW THE INSTRUCTIONS THAT COME PACKAGED WITH YOUR TRANSFORMER BEFORE INSTALLATION.

Locate and remove a perforated knockout circle in the bottom or side of the transformer to run the wires through. Secure the transformer in the desired location using the mounting brackets found on the transformer. If the transformer has a built-in photo eye, make sure it's exposed to direct or indirect sunlight.

10. Separate each wire pair into 2-3 inch single strands. Using wire strippers, remove approximately $\frac{3}{4}$ " of sheathing from each wire. Secure one side to the common connection point and the other side to the 12v connection point on the connection terminal of the transformer. For transformers that do not have connection terminals, waterproof wire nuts will be needed for your connections.



Step 8



Step 8



Step 9



Step 9



Step 10



Step 10



Installation Tip!

When connecting the wires in a "loop" configuration, polarity/consistency of the wires must be maintained.

Rail Lights with Post Cap Installation

11. If the transformer has an on/off switch, verify the switch is in the "OFF" position before plugging the transformer into a timer or directly into a GFCI outlet. After connection to an outlet, turn the transformer switch to the "ON" position.



Step 11



Step 11



Installation Tip!

If the transformer has a photo eye built into the transformer, place a piece of tape over the photo eye for testing a low voltage system during daylight hours. It may take 2-5 minutes for the photo eye to respond after covering.

12. Finish the wire installation. Having verified that the light system works, unplug the power source to the transformer.

New decks: Secure the handrail's top board, any other finishing boards and post caps. Take care not to hit any wires with screws.

Existing decks: Secure the wiring along the posts and under the handrails by using the staple gun. Be sure to center the staple directly over the wires and DO NOT staple through the wire. If you accidentally staple the wire, simply remove the staple and re-apply a new one.

Depending on the post cap and rail lighting fixtures, attach them with the finishing screws provided, or slide into place. Clear silicone caulk works great for securing post caps that don't have mounting screws.

Plug in the transformer and turn its power switch to "ON". Enjoy your illuminating deck experience!

For troubleshooting, see "Frequently Asked Questions" in this lighting guide.



Step 12



Step 12

Step Light Installation

Before you begin:

Place the transformer in its anticipated location without connecting it to the power source.



Before you begin



Before you begin

Design Note!

Step lights are often available in styles matching post caps and rail lighting. It's easy to install all at the same time – all you have to decide is the style you prefer. For help at any time, call the experts at DecksDirect.com at 1-888-824-5316, 7a.m. to 5:30p.m. Monday through Friday, CST. Callbacks can also be provided afterhours and on weekends.

1. Determine spacing and placement for lights. Be sure to avoid positioning the step lights into stair joists. For best results, space lights 3-6' apart, horizontally. Measure and mark the desired placement for each light.



Step 2



Step 2

Project Note!

If steps are not preexisting, postpone placing floor boards on steps until after installation of lights.

2. Recessed step lighting comes with a variety of back-box designs. For example: Highpoint Deck Lighting recessed step lights require either a 1" or 3" round hole, while Aurora Deck Lighting recessed step lights require a 2-3/4" x 6" square hole.

If a circular hole is required, most manufacturers carry Forstner or bore bits that match their specific installation design.

Cut or drill the opening for each step light into the stair's riser board, with size and shape matching the manufacturer's recommendation. Repeat this for all step lights.



Step 3



Step 3

3. Loosely run the appropriate gauge of wire from the transformer to the location of the furthest light. Then, run the wire from light to light, leaving a loop of wire at each step light location.

Step Light Installation

4. Cut back any excess wire at the step light locations, and leave enough exposed to make connections without creating excess bulk. Separate each wire pair into 2-3" single strands. Using wire strippers, remove approximately 1/2" of sheathing from each wire – including the wires on the light fixture.

5. Stay consistent in matching wire types as you continue through the wiring process. Most wires will have a "smooth" black wire combined with another wire that has white lettering – matching polarity is critical for LED lights. See example in the wiring and layout section for more information.

Taking one wire from each light fixture and its counterpart from the wire threaded into the post, hold the two wires together with the ends even. Twist a waterproof wire nut onto them, pushing firmly until hand-tight. DO NOT over torque. Repeat for the second set of wires. Wipe away any excess silicone sealant in and around conductors, and then wrap the connections with electrical tape to prevent accidental dislodging.

6. Tuck the wire and wire nuts through the recessed hole and place the step lights in position. DO NOT secure any lights or wiring until you have tested the entire lighting system.

7. ALWAYS READ AND FOLLOW THE INSTRUCTIONS THAT COME PACKAGED WITH YOUR TRANSFORMER BEFORE INSTALLATION.

Locate and remove a perforated knockout circle in the bottom or side of the transformer to run the wires through. Secure the transformer in the desired location using the mounting brackets found on the transformer. If the transformer has a built-in photo eye, make sure it's exposed to direct or indirect sunlight.



Step 4



Step 5



Step 5



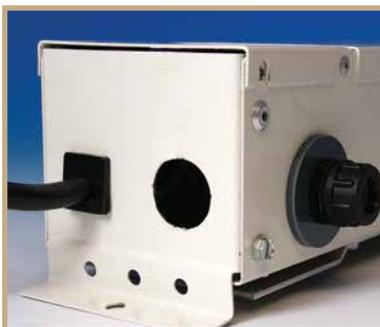
Step 5



Step 6



Step 6



Step 7



Step 7

Step Light Installation

8 Separate each wire pair into 2-3" single strands. Using wire strippers, remove approximately $\frac{3}{4}$ " of sheathing from each wire. Secure one side to the common connection point and the other side to the 12v connection point on the connection terminal of the transformer. For transformers that do not have connection terminals, waterproof wire nuts will be needed for your connections.



Step 8



Step 8



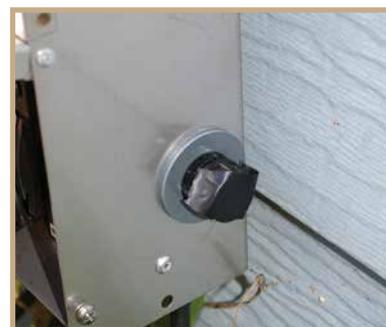
Installation Tip!

When connecting the wires in a "loop" configuration, polarity/consistency of the wires must be maintained.

9 If the transformer has an on/off switch, verify the switch is in the "OFF" position before plugging the transformer into a timer or directly into a GFCI outlet. After connection to an outlet, turn the transformer switch to the "ON" position.



Step 9



Step 9



Installation Tip!

If the transformer has a photo eye built into the transformer, place a piece of tape over the photo eye for testing a low voltage system during daylight hours. It may take 2-5 minutes for the photo eye to respond after covering.

10 Finish the wire installation. Having verified that the light system works, unplug the power on the transformer.

Depending on the step lighting fixtures, attach them with the finishing screws provided, or slide into place. Take care not to hit any wires with screws.

Plug in the transformer and turn its power switch to "ON". Enjoy your illuminating deck experience!



Step 10



Step 10

For troubleshooting, see "Frequently Asked Questions" in this lighting guide.

Frequently Asked Questions

□ How do I get the wire from under the deck to the top of a wood post?

Option 1:

Drill a 1/2" hole from under the deck out through the face of the post. Drill a core in the top of the post, following the instructions found in this lighting guide for Post Cap Installation.

From below the bottom of the post pocket depth, drill a 1/2" hole at an angle up to the pocket. Thread the wire through the hole and out the face of the post. Run the wire along the face of the post and thread back into post pocket. Remove any twists in the wire and staple to the face of the post with stainless steel staples. Cover wire with matching trim.

Option 2:

Use hollow engineered posts.



Option 1 - step 1



Option 1 - step 2



Option 1 - step 3



Option 1 - step 4



Option 2



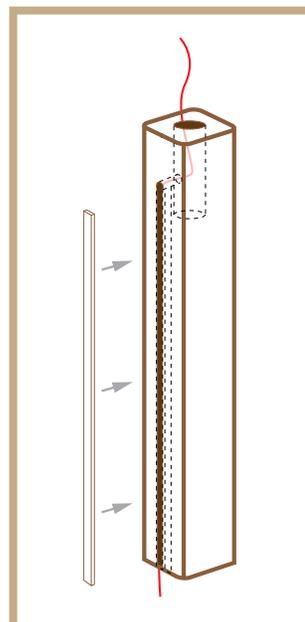
Option 2

Option 3:

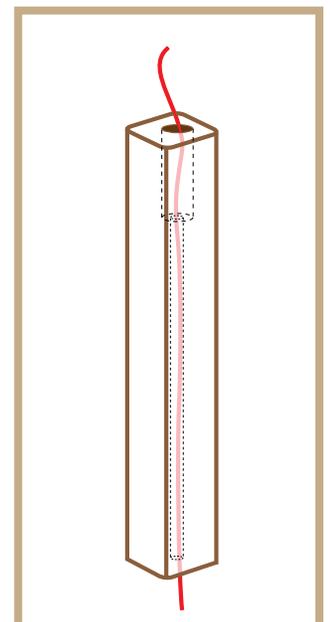
Cut or route a channel into the post. Once the wire is installed, cover with a batten strip or cut a filler piece to match the slot size and material. Secure with marine grade adhesive and sand smooth.

Option 4:

Drill a 1/2" hole continuously through the post from the top to bottom. This is fairly difficult to do and typically requires expensive drill bits or bit extensions. Be careful to stay in the center, and don't let the drill bit bend off and out the side of the post.



Option 3



Option 4

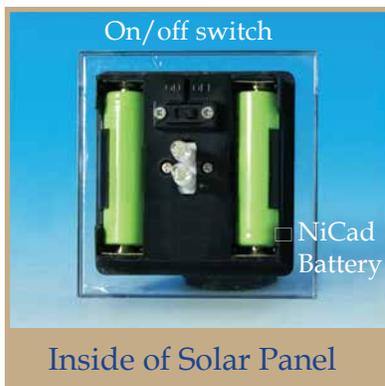
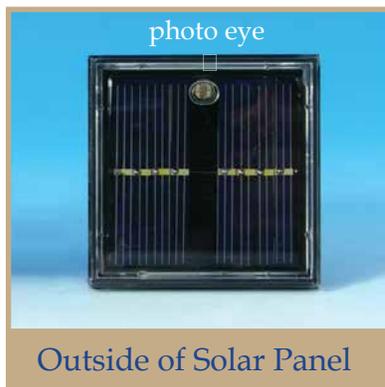
Frequently Asked Questions

□ My solar lights will not light up, what's wrong?

In most situations, this is a battery issue. It can take up to three weeks for a new solar unit to cycle to full capacity. It may also be time to replace your rechargeable batteries. NiCad rechargeable batteries can run for approximately 1,000 cycles or roughly 3 years, but the batteries supplied by the manufacturer may only last 6-24 months.

To test solar LED bulbs, replace the NiCad batteries with AA alkaline batteries. Cover the entire solar collector to test the unit. If it lights up, replace the NiCad batteries. NiCad rechargeable batteries can be found at battery specialty stores or at DecksDirect.com. Never use alkaline batteries permanently in a NiCad rechargeable unit, this will void any warranties and could damage the light.

If your solar panel is not receiving enough sun light, this will also affect its performance. Ensure that the solar panel is in an optimum position to receive sunlight, and remember that cloudy days and time of year may periodically affect and alter performance.



□ My low-voltage lights will not light up, what's wrong?

Make sure your transformer is plugged in and turned on. If you have a photocell on your transformer, you will need to cover the eye of the photocell with a small piece of electrical tape and wait a few minutes for the transformer to warm up. If they still do not turn on, double check your connections and make sure that you have been consistent with your positive and negative leads. If one light does not work, this could be the issue.

□ How many low voltage lights can I install on a transformer?

The number of lights per transformer is directly related to the wattage used: total light watts x 1.1 = transformer size needed.

□ Some of my lights appear dimmer than others, what can I do?

This is generally a wiring issue, often caused by using 200 feet or more wiring for one run of lights. A loop method of installation may solve the problem. Please refer to the "instillation" section of this guide on page 7. You can also use a voltage meter to check the fixtures at the end of each lighting row; the voltage should be between 10-½ and 11-½ volts.

□ What type of bulb is used in this light, how do I replace it?

Bulb types vary from light to light. Generally the bulb type can be found on the light bulb itself, on the packaging or online under the product description at DecksDirect.com. Most replacement bulbs can be purchased at a local hardware or auto parts store. LED light bulbs last between 30,000 - 100,000 hours and not all are replaceable.

For options, call DecksDirect.com at 1-888-824-5316.

Frequently Asked Questions

□ I already have low voltage landscape lighting – can I add deck lighting to this?

Sometimes. Your existing transformer is handling a specific wattage, and you will be adding more wattage with the deck lighting. If there is excess capacity from the transformer, a new line of lighting can be added. We do not recommend tapping into existing landscape lighting lines.

Most landscape lights use incandescent bulbs with an AC transformer. We don't recommend adding LED lighting to an AC transformer.

□ What is a multi-tap transformer?

A multi-tap transformer is designed to handle more than one lighting system at a time. By installing your deck lighting with a multi-tap transformer, you can easily add more lighting systems in the future without having to buy and install another transformer. One major benefit is a reduction in light dimming and premature bulb burnout. To determine the size needed, add the combined wattages of the lighting that will be attached to the transformer, then divide the number by .08. For example:

$$220 \text{ total wattage} / .08 = 275$$

Multi-tap transformer size: 300 watts.

□ What size post cap light do I need?

Lights on DecksDirect.com are listed by the exact size of the opening at the base of the light. Check the measurement of your posts and select the size that most closely matches your post. Note: sizes may vary and most "4x4" wood posts are not actually 4" x 4", but measure 3-1/2" x 3-1/2"!

□ Can I use both incandescent and LED lights on the same transformer?

Yes, but it may decrease the overall life of your LED lights and void the manufacturer's warranty. It can still be done, but you need a standard AC transformer, and the first and last lights in your series need to use incandescent bulbs.

□ Can I put the lights on an inside switch?

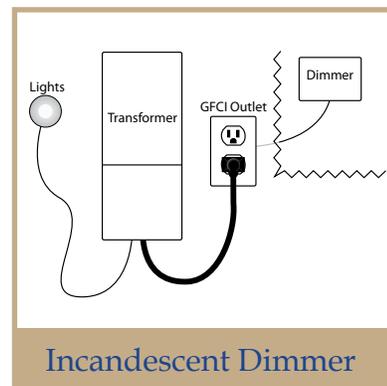
Yes, the transformer must plug into an outlet that is wired to the inside switch. Set the transformer to manual mode and use the light switch to operate it. If your lights use a photocell, you may want to remove or cover it.

□ Can the light output be reduced on the low voltage light?

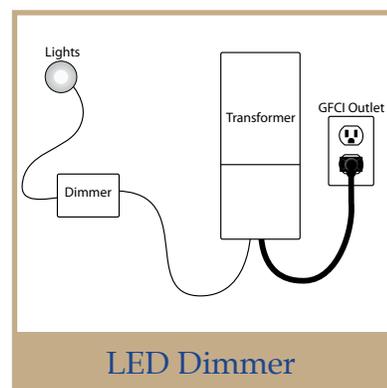
With incandescent lights, you can replace the bulb with a lower wattage one, or install a dimmer switch. For LED lights, you need to add a dimmer switch to reduce the light output.

□ Can I use a dimmer switch with my deck lighting?

For incandescent bulbs on AC transformers: A standard dimmer switch can be installed on the 110v side of the transformer, enabling it to control the outlet the transformer plugs into. Contact a certified electrician for this and all other changes or updates to 110v wiring.



For LED bulbs on DC transformers: An in-line dimmer can be installed along the 12 volt wire and typically includes a remote control for ease of use.



For LED bulbs on AC power: LED bulbs that require AC power cannot be dimmed, even with a DC power transformer.

About Us



DecksDirect.com was founded in 2003 for the express purpose of creating a better deck building experience for the do-it-yourselfer. A family owned and operated company located in Minnesota, we understand the pleasures of deck living, not to mention the satisfaction that comes from building the deck your family will enjoy for years.

That's why DecksDirect.com is dedicated to the builder in all of us. We partner with and stock the products of reputable manufacturers to bring you a huge selection of deck lighting, balusters, railings, post caps, and installation hardware. So whether you're motivated by form, function, fascination - or all three - you'll find what you want at DecksDirect.com.

What's the difference?

You can choose from a multitude of online retailers to get all the materials you need for building a deck, but DecksDirect.com gives you something more: a live person to walk you through choosing materials and accessories as well as the installation process.

For over 20 years we've worked in the deck industry: collaborating and consulting with architects, builders, do-it-yourselfers, home centers, homeowners, manufacturers, material suppliers, and professionals. This means we'll give you the honest, accurate and experienced advice you need to get the job done right, with beautiful results!

Visit DecksDirect.com to see our full line of products and current specials. Or call 1-888-824-5316 to speak with us today.

Contact Us

If you have any questions or if you would like to speak with a deck expert, you can contact us any of the following ways:

Phone: 1-888-824-5316

Summer Hours: 7am to 5:30pm CST - Monday thru Friday. Callbacks after-hours and weekends.

Direct E-mail: support@DecksDirect.com

We promptly respond to all e-mail inquiries as our customers are very important to us!

Fax: 1-888-256-5848

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3900 50th Ave. N. Suite #100

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"Thank you so much. I appreciate your effort to make me a satisfied customer. I can't wait until my railing and lights are installed to see the professional look it will give."

~Karen, DecksDirect.com customer