

Creating Holiday & Landscape

Laser & LED Light Displays

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www.LasersandLights.com



Lasers and Lights

The Original Dealer for BlissLights Lasers 2007
and home of the largest selection of Outdoor & Indoor
Lasers and LEDs for homes and businesses!

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Intro

A short introduction to lasers, the laser industry, and “Lasers and Lights”

*Thank you for your interest in Lasers and Lights. After years of leading the way in the Laser Industry, we decided it would be great if we could give fellow laser enthusiasts all the design tips and tricks we have accumulated in one easy to read booklet. We will continue to revise it and add more over time, especially to the **photo gallery** and **links** sections at the end.*

History

The term "laser" originated as an acronym for "Light Amplification by Stimulated Emission of Radiation". According to Wikipedia, "the first laser was built in 1960 by Theodore H. Maiman at Hughes Research Laboratories, based on theoretical work by Charles Hard Townes and Arthur Leonard Schawlow. A laser differs from other sources of light in that it emits light coherently. Spatial coherence allows a laser to be focused to a tight spot, enabling applications such as laser cutting and lithography. Spatial coherence also allows a laser beam to stay narrow over great distances (collimation), enabling applications such as laser pointers. Lasers can also have high temporal coherence, which allows them to emit light with a very narrow spectrum, i.e., they can emit a single color of light."

Lasers entered the public eye most commonly with superman's laser beam eyes. Laser cutting became a reality, and lasers entered people's homes with the advent of cd players and laser pointers. At the end of the 20th century, lasers began to enter the stage lighting arena but were a fancy high tech occurrence in high budget shows and expensive nightclubs. They cost 1000's of dollars, were hard to get, and were a wild inspiring spectacle.

BlissLights, a company based in Southern California, first invented and patented the technique of splitting a single laser beam into thousands of laser beams in 2006, and Lasers and Lights first brought their new invention to the world at the 2007 Las Vegas "Mobile Beat DJ Convention". Their first projector, the Bliss 50, cost \$3,200. After a year, a simpler and less expensive Bliss 15 model was made. It was still another year or two later until an outdoor version was made and it cost \$1,200. Around 2011 the Spright series came out and prices dropped to \$199 and sales took off. More recently the Spright variable speed MOTION and COLOR model with a 16 color LED build in were the latest 2015/16 models. **Lasers and Lights was the original promoter and retailer to offer BlissLights to the world.** Now, Laser projectors are seen everywhere, but none compare in quality, serviceability and design to BlissLights.

Outdoor

Since 2011, BlissLights Outdoor Laser Projectors have been transforming the landscape lighting industry.

Now there are many options for outdoor laser projectors on the market offering a variety of features.

Lasers and Lights now offers many outdoor lighting options including:

Lasers:

BlissLights Spright Series

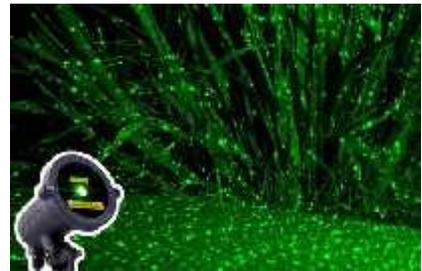
Sparkle Magic Illuminator Series

Compact Green Garden Laser

Lasers and Lights Multipattern Laser projectors

Lasers and Lights Brand Laser Projectors and the BIG BEAM Series including

Red-Green-Blue Variable Speed Big Beam Laser Projector – our premiere product



L.E.D.s

(Modern LED landscape lighting uses very little electricity and can add a variety of soft stationary or moving colors. Lasers and Lights is proud to offer this new way to beautifully illuminate the outdoors)

BlissLights Color – a remote controlled 16 color LED with Lasers

16 color led with remote

Blue water LED

Lasers and Lights Flying Snowflake Projector



Outdoor guide

This guide will help you plan your lighting display. We will help you consider what the effects will look like, where you want to illuminate, where you will be enjoying it from, how you will power the show, and the most important and most overlooked question, "Is it dark enough?" Let's begin there.

Ambient Lighting -- The darker the better!

The brilliance of laser beams is most powerful when there is no other competing lighting. If you really want to have a nice display, you must either have a space that is dark or be able to turn off or block out other lights, especially white lights. Street Lights, porch lights and other landscape lighting can make the area too bright for more subtle lasers or LEDs to be clearly visible. The best saturation of beams is achieved with projectors from 20' to 60' from the surfaces, but the darker your surroundings, the more you can increase the distance and get a good effect. Also, note that Green laser beams are much brighter than the red, blue or purple laser beams, so if you have ambient lights that you can't turn off, lean on the green.

Project onto Lighter surfaces where possible!

The lighter the surface color the more the colors shine. Think of the movie theatre, with the "Silver Screen." White paint reflects all the light that hits it, dark colors absorb light. You will have to go to greater effort to get a beautiful lighting effect if your surface is dark. If you have the luck of a white or light colored house or architectural features, most people will think you have actually painted something on the surfaces to get such a brilliant effect. Still, many beautiful displays are set up on dark trees and shrubs. Remember, green leaves reflect green light, so green lasers will still shine bright, even though red may be nearly invisible. If you do have a dark surface, get up close, and choose your colors carefully.

Variety of Beams, Colors & Movement

Since there are so many options in how you will light up your land, you will have to consider: do you want moving beams or stationary laser beam? Should they move fast or slow? Or how about both? Do you want multiple colors, or just one, or different themes in different areas? What about patterns? Bigger beams that stand out more and reach farther, or a greater number of smaller beams with more density of coverage? Do you only want lasers, or also soft LED colored light or a mix? Do you want to be able to change what your projectors do without moving them around, or do you want simple lights that will do the same thing all the time? Again, the most important to remember: Green lasers will always show up best. On light surfaces, close up and in dark settings, the other colors can show up well also. LED Lighting will add its own magic, but may lessen the effect of the lasers if it gets too bright or too concentrated. We share more on **Color** in the Features section toward the end of the book.

Coverage

Consider the surfaces you want to light up with your beams. The laser beams typically spread by either 80-90 degrees or 160 degrees on most outdoor lasers. Knowing this will help you make the best use of your lasers for saturating the objects you project on. If you want to concentrate your lighting on a single tree or smaller area, we offer a number of tighter 80-90 degree projectors like the Sparkle Magic Series. If you have overhanging trees, large walls, or surfaces in all directions to cover, then take advantage of a bigger 160 degree spread like BlissLights Spright Motion or our 2016 variable beam series that will send beam in all directions with less concentration. If you are specifically lighting walkways, stages, etc. make sure the lighting is directional and you can even add shading or block off some of the spread to light only where intended. At times, we use reflective tape around the edge of a projector to prevent beams from going where they are unwanted, like right in your face in your favorite chatting chairs. Check out this blog article for more: <https://lasersandlights.wordpress.com/2015/10/28/plan-your-holiday-and-landscape-laser-display-by-knowing-the-spread-of-your-laser-coverage/>

Location, and Viewing Angle

Once you have decided the surface you'd like to illuminate, use a mounting location that aims at the maximum number of surfaces from the viewer's angle. Choose the places you want to view the light display from; decide whether you will project from the house to view from indoors thru windows, or towards the house for viewing from the street or yard. Maybe you'll do both and enjoy the view both from the home and from the street. To get the best of these views, many customers add more projectors to increase the beautiful effects for viewing from many angles. Also, note that if you have the special vantage point of looking outward directly in line with the beams, any rain, snow, fog or even dust will show up much more and increase the magical 3D effect.

Rain Video <https://lasersandlights.wordpress.com/2016/03/12/lasers-in-the-rain-like-sparkling-jewels/>

Snow Video <https://www.youtube.com/watch?v=EOWZfFs2Mmk&list=PLC06C7A987CC7C5E3&index=11>

Fog Video <https://www.youtube.com/watch?v=hkETeV8Cc9I>

Mounting

After choosing your surfaces and angle, then comes the task of mounting your laser. Almost all lasers come with a yard stake by default, and many have a mounting stand as well. Usually those mounting stands can be set on a flat shelf, or they can be hung on screws. With some models, we have a spring clip accessory that allows for mounting the unit on trees, railings, walls, or many other options. Also, important for mounting is to consider where the main walkways are so that you avoid areas where frequent shading will occur as people walk or stand in front of the projector, as well as avoiding placing at eye level by mounting the projector high up or in a tucked away spot if possible for the fun of hearing your visitors ask "where is that coming from?!"

PROTECT YOUR LASERS FROM THEFT!

The other concern in regard to mounting is theft. The street side laser mounted on a stake is particularly vulnerable to theft by anyone who walks by. If you live in an area where theft may be an issue, we highly suggest you mount up high and out of reach. If you really want to mount with a stake, there are some ways to make your projector more secure including crafting an additional security stake.

Our [blog](#) has more detailed instructions on attaching a cable to a stake in the ground.

Power & Wiring Systems

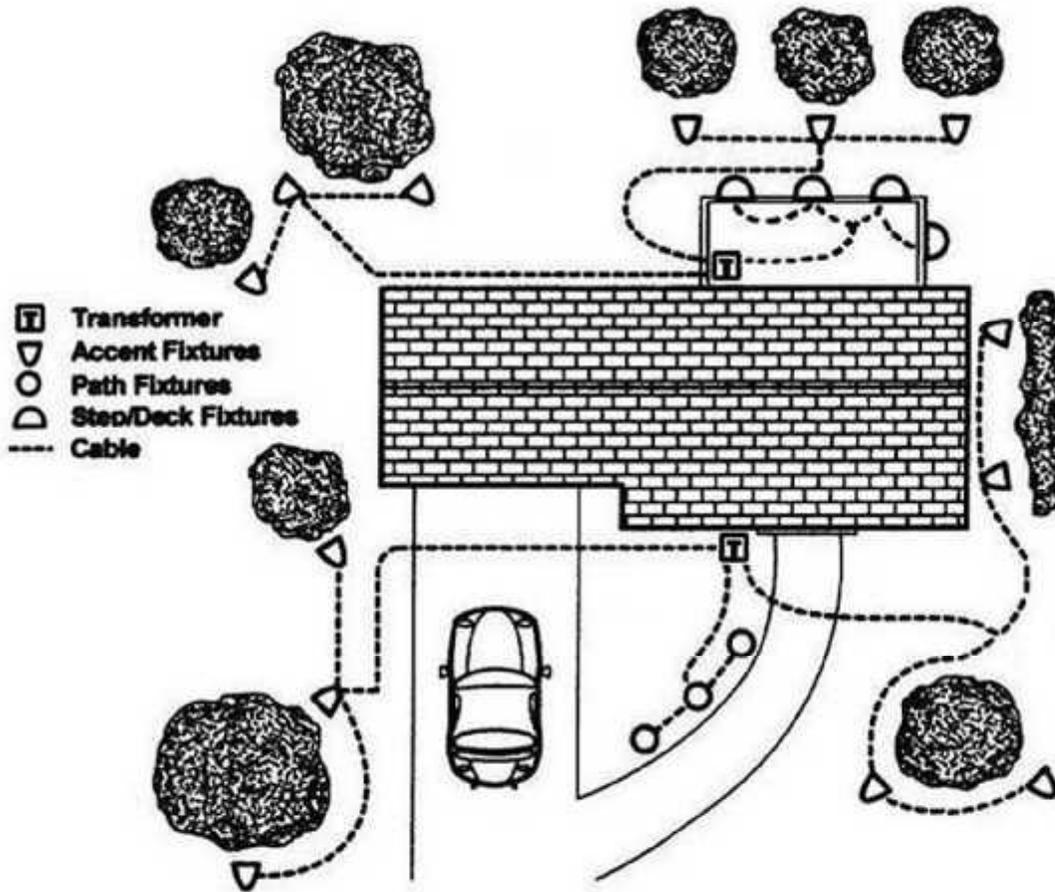
Landscape lasers and LEDs are powered by transformers that convert standard 120-volt current to 12 volts and use waterproof wiring connectors and thin low voltage wiring. To avoid running unsightly and dangerous 120-volt extension cords around your yard, you can use our low voltage lighting systems connectors, splitters, and extensions to power one or many projectors. Find your exterior power sockets and consider how much wire will be needed. For older models that did not have built in timers, we also have light sensing timers and Timer/Transformers that can automatically turn on many projectors nightly using and connect directly to our Low Voltage Wiring Systems.

Notes on Notched & Unnotched connectors

Low voltage wiring connectors usually use male/female interlocking connectors that have either notched or plain round connections. Polarity is rarely an issue with lasers but making sure your wiring connectors are compatible with transformers or low voltage wiring arrays is necessary.

Sample Landscape wiring diagram using transformer

7



Our blog has even more detailed info on power and wiring if you want more information.

<https://lasersandlights.wordpress.com/2015/09/01/eliminate-extension-cords-new-low-voltage-waterproof-cable-for-blisslights-sprights-and-all-12-volt-ac-landscape-lights/>

Added Special Effects -- Screen Surfaces and Fog

If your laser landscape plan is coming together nicely, but you want make it even more spectacular, you can achieve 3D holographic effects by giving the lasers more to reflect off. Try adding additional white surfaces, fabrics, semi transparent plastics, iridescent materials, mirrors, or go all the way with fog, smoke or haze, which makes the whole length of each beam illuminated and creates a marvelous 3D effect.

[Check out our Lucidity Festival Haze Machine display:](https://www.youtube.com/watch?v=hkETeV8Cc9I&list=PLC06C7A987CC7C5E3&index=15)

<https://www.youtube.com/watch?v=hkETeV8Cc9I&list=PLC06C7A987CC7C5E3&index=15>

Safety of Laser Beams

Laser beams have various degrees of strength, intensity, and classification. All of our landscape projectors are designed to be safe to use! BlissLights has gone to great lengths to rigorously test and prove that no single beam coming out of the projector could be harmful to the eyes.

Despite these thorough safety standards, we highly advise that people **avoid eye contact with the laser beams closer than a few inches away. We also suggest avoiding viewing single beam lasers unless you are positive that they are from a safe source.**

Extra Holiday Tips

A high percentage of our outdoor lasers get used in holiday displays, and we wanted to close the outdoor section with a few holiday tips. First, remember that bright Christmas lights may drown out the effect of lasers, plan accordingly so that lasers get the best possible effect. Second, remember that many of the projectors run on a 6-hour timer, so make sure your lights come on once it's really dark to make the most of them. Third and always, we find with lasers that More is Better! Go Big and have fun!

Indoor

Indoor Overview:

Indoor Laser Projectors have been around for many years, traditionally available at very high cost for the most motivated club owners and high end stage productions. BlissLights began the laser revolution in 2007 by making more consumer-friendly lasers which started at prices in the \$1000s, and now just 10 years later they are widely available to the public at a fraction of the original cost.

Additionally, the modern development around LED lighting has continued to revolutionize the industry with very low cost and long lasting solutions that might make lamps and classic light bulbs extinct in the next few years.

With so many colors and effects available, we really enjoy being artisans of the indoor lighting field and use beautiful Lasers and Lights year-round to create magical home and business environments.

All of our outdoor friendly products can be used indoors, but our special indoor only Products include the Flying Cloud Projectors, the Mystify Laser Projector, Twilight, Laser Fog Show, BlissLights Bliss 15 Green and Bliss Blue, and the original and most sophisticated Bliss 50.

Short Indoor Guide

The darker the better!

The Laser Starfield Projector's effects are most powerful when there is no other competing light in the room, in which case their effects can be seen up to 100' away. If you are lighting tables, walkways, stages, etc., make sure the background lighting is directional and add shading to prevent it from spreading further than needed.

Project onto Light colored surfaces!

The lighter the surface, the more the colors shine. It can look like you have actually painted bright dots of paint on the walls and ceiling to get such a brilliant effect when shining on white, but even on dark colors the effects can be stunning.

Location

Typically, the best placement for mounting indoor effects lighting is in a corner, mounting the light low enough to get a 30-degree angle towards the ceiling and high enough to be above participant's heads who might shadow the effect. Using a Bliss15 or Bliss50 with this positioning, the blue "cloudfield" will be overhead in the center of the projection. The BlissLights projectors send laser beams at 160 degrees in all directions from the lens up to 100 feet away with some beams traveling farther so that beams from a single projector can cover an entire gymnasium or dance hall!

Adding screen surfaces and Fog

For more special effects, you can add white surfaces with fabrics, semitransparent plastics, iridescent materials, mirrors and fog, smoke or haze. With fog, the whole length of each beam becomes illuminated with a marvelous 3D effect.

Fair Weather Landscape Lighting

When the weather is warm and dry, you may consider using your indoor projectors outdoors for adding a magical effect to your summer parties. Follow the instructions from the outdoor guide, but take extra care to protect your more delicate lights from the elements. Products not found within our outdoor section are not made to withstand moisture or cold temperatures under 60 degrees where indoor lasers will not operate. Remember that rainproof and cold resistant outdoor lasers are available.

Product Features

An in depth look across different brands at features, accessories, remote functions, safety, and troubleshooting

Lasers vs LEDS -- What's the difference?

A Laser Projector will send laser light a long distance in fine beams, creating a potent visual effect but providing very little ambient light: you mostly see the laser dots, not the space and surfaces.

An LED on the other hand will light up an area close to the source and may grant some colorful effect, but will also significantly illuminate the objects being lit. Many people use both together, and we have some products with both features like the BlissLights COLOR, Bliss 15, and Bliss 50.

Colors

Laser projectors primarily come in 3 colors: Green (532nm), Red (665nm), Blue (445nm) and more recently Purple (365nm). Green is the brightest and most popular. Red has been around a long time and is commonly used for other applications but is not as popular for landscape as it doesn't show up as well even when it is made with a more powerful diode. Blue is the newest popular laser color but is VERY hard to see usually, right at the edge of our visible spectrum and much less visible. Purple is being tried out in the laser market, but is so close to ultraviolet/ "blacklight" that it needs to completely dark and projected on a white surface to enjoy its effect; that is the way all laser lights show up best.



Moving vs stationary

In the beginning, outdoor laser projectors didn't move. Then, slow movement was created, and now, variable speed is a common option. The moving lasers are often referred to as "firefly effect" while static projectors create an image more like "stars."

Beam Sizes and Patterns

Modern Laser projectors are now being made with a variety of effect. Some have smaller or larger beams which impact visibility and range, but also change the density of the coverage. We custom made Big Beam Laser Projectors to achieve visibility where other lasers are lost.

Other Laser projectors are exploring projecting patterns, some of which move and change. Presently we offer many styles of moving pattern holiday projectors



Timers

Originally the most common accessory, many landscape lasers now come with built in timers, which need continuous power to stay on their 24-hour cycle. We still offer light sensing timer/transformers that can automatically turn on many units as dusk approaches and for turning on multiple projectors from a single power source, and 24 hour on/off timers can also be used. Do note that using a timer to reset the power to your projectors will reset the settings you have calibrated in last use, whereas the built-in timers keep their settings.

REMOTE CONTROLS

Remote controls are becoming more popular for new projectors built after 2015. Each remote control works a little bit differently. BlissLights remotes use infrared and work on any similar products, and need to be used up close. More recently, some remote controls are using radio waves and must be "paired" to their projector, and while that takes a moment to setup, they then can be used at a short distance. This advancement makes changing the settings easier and faster when they are out of reach. Remotes have a variety of options: change speeds of rotation, change the color or color combination of laser beams, adjust the timer function, and some products, especially those with LEDs have flashing, strobing, and other color change features. Here are some of the remote controls on the market today:



Accessories

Wiring Accessories and Options Revisited

We really strive to make the whole lighting setup process easy for our customers. We offer a variety of different low voltage wiring accessories to make your yard light up from just one plug, without messy power-strips or bulky extension cords. Check out the 12volt wiring section of our site to find the perfect splitters, extensions, and timers to make your electrical system as elegant as your lighting.

Here's a video: <https://www.youtube.com/watch?v=NKHsPcxbZXs&list=PLC06C7A987CC7C5E3&index=2>



Mounting

Most landscape lasers and LEDs come with a ground stake to push into the dirt. We sell many additional options for a secure installation that can make better use of the display and make it less prone to theft. Here are some links to other mounting accessories:



extenders

optional flat bases



spring clips that can mount on fences, tree branches, ledges and poles

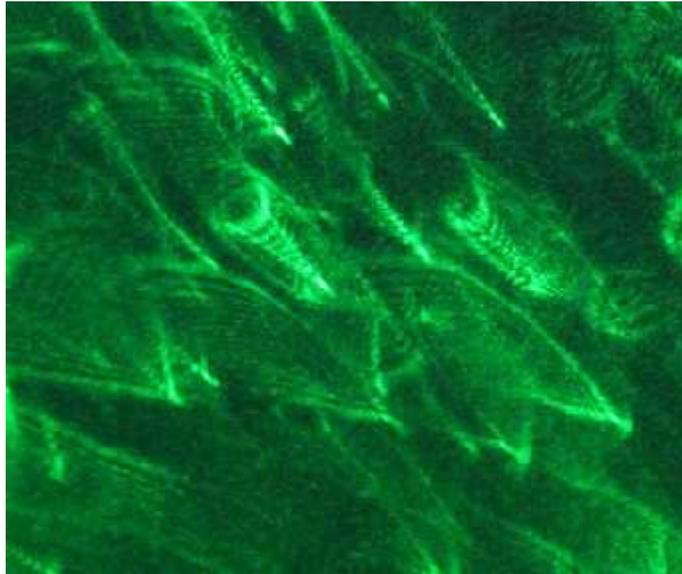


WAVE ADAPTORS

In 2016 we began offering a special add-on for our projectors that increases the complexity of the display. This simple device is compatible with most of our products, but is suggested for use with GREEN LASERS ON WHITE WALLS AND DARK LOCATIONS ONLY.

3 videos are available on the product page:

<https://lasersandlights.com/collections/outdoor/products/wave-lens-adapter>



Troubleshooting your lights:

Laser Projectors are expected to work for about 7000 hours. Blisslights products all come with a **1 year warranty** and lifetime serviceability. Sometimes an issue can be as simple as a new transformer. Here is a basic guide to troubleshooting to go through before you call us about a malfunctioning laser.

Light does not come on.

- Check that the product is properly plugged in and outlet is on.
- Check if the socket works with an alternative electrical product.
- If you have more than one of the same product, try swapping transformers.
- Certain lights may need a few minutes to warm up

Remote control does not operate light

- Some projectors need to have the remote aiming right at the face of the unit up close.
- Try the syncing process again within the 1st minute plugged in (see owner's manual)
- Replace the battery in the remote.

Light becomes very dim after long term working

- Turn off the light and restart it once it cools down.
- If it is still very dim, check with supplier by email for options.

The products is making unusual noises or smells

- Switch product off immediately and disconnect from power socket.
- Consult with supplier by email.

Safety of Laser Beams

Laser beams have various degrees of strength, intensity, and classification. All of our landscape projectors are designed to be safe to use! BlissLights has gone to great lengths to rigorously test and prove that no single beam coming out of the projector could be harmful to the eyes.

Despite these thorough safety standards, we highly advise that people **avoid eye contact with the laser beams closer than a few inches away. We also suggest avoiding viewing single beam lasers unless you are positive that they are from a safe source.**

Summary

We love our work, helping people experience wonder and joy and living a richer life through the magic of added color and light. It has been a long road of learning the ins and outs of this field, and we hope we have given enough tips to beautifully transform your environment.

The industry is evolving at a rapid pace, with new brands and styles emerging every year. Lasers and Lights is committed to staying at the leading edge of the industry and providing

Quality

Innovation

Value

And whenever possible, ***Sustainability***,

because we believe the world doesn't need more cheap plastic junk in landfills.

Join us as we light up the world and build a brighter future for the children in all of us.

Thanks again for reading and for spreading the Lasers and Lights experience.

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(A subsidiary of Wood Heat Stoves & Solar, Inc.)

Our sites:

www.LasersandLights.com

Our YouTube videos:

<https://www.youtube.com/user/lasersandlightsocom>

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<https://lasersandlights.wordpress.com/>

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INDOOR: <https://lasersandlights.com/blogs/lasersandlights-com-blog/96039233-indoor-laser-light-projector-photo-gallery>