Projectors - DLP, LCD, LED

Autor:
Data de publicació: 04-03-2017

October 2, 2016

Projectors can be used for delivering lectures and presentations to large groups, as well as watching movies and other videos at a backyard home theater. They can be found in a variety of environments, including classrooms, conference rooms, and in homes and yards. Projectors range in size and capabilities, from handheld devices that need a dark room to deliver a viewable image to high-powered devices that are easily read, even in brightly lit offices. There are many makes and models on the market these days, and projectors can be purchased from electronics retailers or specialty stores dealing in camera and projection equipment. For consumers who prefer to shop online, sites like eBay are excellent options. Discover the differences between three kinds of projectors: LED, LCD, and DLP projectors as well as how the technology works and the advantages of each for consumers so that the right projector can be purchased.

DLP, LCD, and LED Technology

The technology used in projectors can generally be broken down into two types: transmissive or reflective. Because LCD projectors pass light through the LCD panels rather than bouncing it away, they are considered a transmissive medium. A DLP projector uses mirrors to direct the light in an image, so it is considered to be reflective.The third type of projector discussed, an LED projector, is named for the light source, not the type of projection technology.

How DLP Projectors Work

DLP projectors first appeared on the market in the 1980s, and they rely primarily on a DLP chip (called a digital micromirror device, or DMD), comprised of up to 2 million tiny mirrors, no wider than one-fifth the width of a human hair. Each mirror in this chip is capable of independent adjustment, moving toward or away from the light source to create a dark or light pixel. At this point, however, the image is in grayscale. Color is fed to the DMD by a beam of light that passes through a spinning color wheel before it reaches the chip. Each segment of the color wheel delivers one color. Basic color wheels support red, blue, and green, whereas more advanced color wheels support cyan, magenta, and yellow. While these chips can create up to 16.7 million colors, a DLP projector with a three-chip architecture can deliver up to 35 trillion colors. After color reaches the DMD, the image is fed through the lens and onto the projection screen.

Advantages and Disadvantages to DLP Projectors

DLP projectors require less maintenance than LCD projectors because they have a filter-free and sealed chip design, which means dust cannot settle on the chip and cause an image spot. They are effectively immune to color decay. Furthermore, they are not subject to the misalignments that can occur in LCD projectors with a three-panel design, which require each panel to be in perfect position to combine the image at the proper angle. However, DLP projectors with slower color wheels may give off a rainbow effect, which is when bright flashes of color appear on the screen, like rainbows.

Also, although the chip is sealed, other components are not, so dust can settle on the color wheel and affect image quality. Another disadvantage may be the poor viewing range. Most DLP projectors are not readily compatible with zoom lenses or lens shift functions, which means they are best suited to smaller environments. This would likely not be the best choice for a large home theater projector.

How LCD Projectors Work

LCD projectors have also been around since the 1980s, and use the same liquid crystal displays that create the

images in watches and other electronic devices. Specifically, most LCD projectors use 3 LCD technology, a patented system that combines three liquid crystal displays. An image is created in a multistep process, which begins with the light source providing a beam of white light. The white light is passed to three mirrors, called dichroic mirrors, that are specially shaped to reflect only a certain wavelength o flight. In this case, the mirrors reflect red, blue, and green wavelengths. Each beam of colored light is then fed to an LCD panel, which receives an electrical signal that tells it how to arrange the pixels in the display to create the image. All three LCD panels create the same image, but they have different hues because of the colored light passing through the panel. The images then combine in a prism, creating a single image with up to 16.7 million colors that is passed through the lens and projected onto the screen.

Advantages and Disadvantages to LCD Projectors

The technology in LCD projectors is more established and reliable than film projectors. However, they may still require maintenance, as pixels can burn out and dust particles can interfere with image quality. On the other hand, LCD projectors have no moving parts, as DLP projectors do, and they are generally less expensive than their DLP counterparts. They also support setups in larger rooms where a greater projection distance is needed, because they are compatible with zoom lenses and lens shifts. This makes them great for larger, at-home cinema projects, as long as there is a smooth projection surface available.

How LED Projectors Work

LED projectors are defined not by the display technology used, but the lighting. In fact, some DLP projectors with "solid-state illumination" technology are actually LED projectors. Another type of projector, the pico projector, commonly uses LED technology as well. Pico projectors are essentially handheld devices that use LCoS, or liquid crystal on silicon, which is similar to an LCD panel but reflective rather than transmissive. In these cases, the projector replaces the traditional lamp with longer-lasting and more efficient LEDs, colored in red, green, and blue. In DLP projectors, this also replaces the color wheel technology, instead letting the red, blue, and green LEDs shine directly on the DMD chip.

The Advantages and Disadvantages to LED Projectors

The LEDs in an LED projector have a much longer life than traditional projector lamps, rated at 10,000 or even 20,000 hours as opposed to 1,000 hours to 5,000 hours. As such, the LED light source is meant to last the entire life of the projector without ever needing to be replaced. This is a big advantage in multimedia setups because replacing traditional lamps can be a major expense in projector maintenance. There is no warm-up or cool-down time needed because the LEDs are much more energy-efficient than traditional light sources, and they are also much quieter. This reduces maintenance and operating costs.

Factors to Consider when Buying LED, LCD, and DLP Projectors

When buying a projector, consumers should weigh the advantages of each type of device. The differences between the projectors can be summarized in the following chart.

Projector Type

Technology Type

Light Source

DLP

Reflective

LED or standard lamp

LCD

Transmissive

Standard lamp

LED

Transmissive or reflective

LED

Beyond the technology used, however, there are other significant differences. LCD projectors are typically less expensive for smaller venues, such as home theaters. They also give the user the advantage of a longer throw distance and greater zoom capability, both of which are lacking in many DLP projectors. This makes LCD projectors ideal for larger environments. However, DLP projectors do not suffer the color decay that LCD projectors do and they are easier to maintain because of their filter-free design.

DLP projectors with LED technology are even simpler because the lamp does not need to be replaced, saving time and money for users. Pico projectors that use LED technology have the same long life, but are designed to be ultra-portable, connecting to smartphones, tablets, and other mobile devices. As such, they do not offer the same high levels of brightness found in larger projectors. They typically have a brightness of less than 200 ANSI lumens, whereas larger projectors can have a brightness of 1,000 ANSI lumens, up to 4,500 ANSI lumens or more.

These days, there are also manual projection screens and electric projection screens from which to choose. The choice between the two is determined by budget constraints, as well as the desired use. Electric projection screens are motorized and move automatically, whereas manual projections screens are pulled down by hand, such as the screens used in older classrooms.

Buying LED, LCD, and DLP Projectors on eBay

Purchase all types of projectors on eBay using the keyword search to locate a specific type or brand. Simply enter a keyword, such as "DLP projector" into the search bar and locate hundreds of choices. Filter your results by the type of technology used, whether it is LCD, LED, or DLP. You can also narrow down options by factors like brand, image brightness, resolution, aspect ratio, and more. Check to see if the projectors are equipped with the proper ports, such as a VGA and/or an HDMI cable.

Choosing a Seller

When shopping on eBay, you can filter your results by more than just the type of product. These options include the price range, free or expedited shipping, as well as the seller's location. By choosing a seller who is closer, you may receive your items faster. In addition, by choosing a local merchant, you may be able to arrange to pick up the item yourself rather than having it shipped.

You may also want to look for Top-rated Sellers, who have high ratings and positive feedback from shoppers who have bought from them before. eBay's Advanced Search function lets you display results from only Top-rated Sellers. In addition, you can search for items from specific sellers if you know their ID or have added them to your "My Saved Sellers" list.

Conclusion

LCD and DLP projectors differ in the kind of projection technology used, and each can work better in different environments. Whereas an LCD projector uses transmissive liquid crystal display panels that let light pass through, then combine the images into a prism and projects it through the lens, a DLP projector uses a reflective chip made up of millions of microscopic mirrors, each capable of independent movement, to bounce light through a lens that then projects the image. LED projectors, on the other hand, are defined by the light source, not the projection technology. Instead of a traditional halogen lamp, they use light-emitting diodes, which are more environmentally-friendly and longer lasting. LED projectors use either DLP technology, replacing the color wheel and white-light lamp with red, blue, and green LEDs, or LCoS technology, which is found in handheld projectors. Whichever kind of projector best suits the consumer, eBay is an excellent place to find it.

Tags:
led projector

lcd projector

dlp projector