

TRADE ARTICLE

BY: JAMES R BENYA, PE, FIES, FIALD

A PARTNER OF FOCUS ON ENERGY



focus on energySM

Partnering with Wisconsin utilities

Retail Lighting Revolution – Part Two: Display Case – A Modular Solution

Linear Light Modules

Most casework lighting is based on linear LED lighting modules (see Figure 1). LED component manufacturers sell modules to fixture makers. The fixture maker determines how powerful the light is to be, and whether it will operate in constant current (CC) or constant voltage (CV) modes.

Some electronics manufacturers sell only circuit boards, while others sell complete modules that are “plug and play” ready (see Figure 3). A complete module as shown in Figure 2 consists of the basic module, optics, heat sink and other parts needed to make a consumer-ready product.

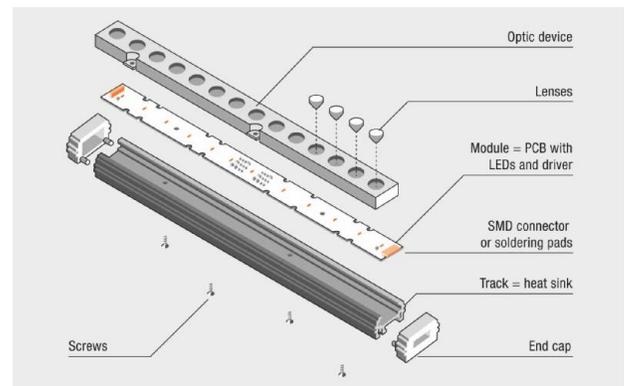
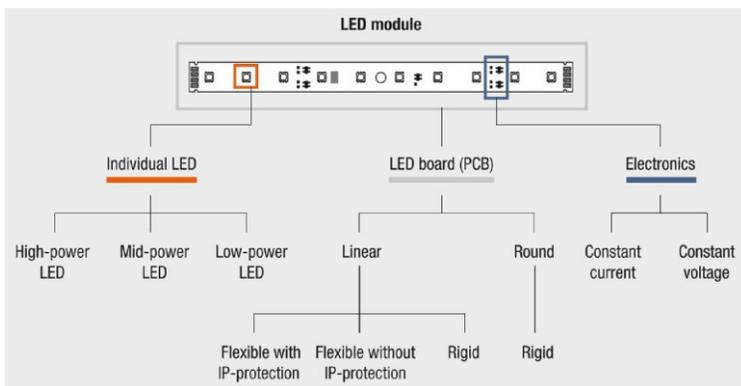


Figure 2 - A basic LED module with 10 LED's (Osram). Note the options that allow manufacturers to decide how bright the board will be and whether the product has ingress protection (IP) against liquids.

Figure 1 - A complete module ready to be made into a system (Osram)



Figure 3 - Plug and play LED light bars for 12- or 24-volt operation.

Some manufacturers sell LED in strips and long rolls that are sometimes called tape light, which can be used to make long continuous lights. This part of the market is more for custom display and shelving companies who want the smallest possible product cut exactly to size (see Figure 4).



Figure 4 – (Left) A roll of LED tape light (CAL Direct Lighting); (Right) tape light installed in a corner extrusion for a display case (Solid Apollo).

The extrusion serves as both mounting and heat sink for the LEDs. Rolls are available in various power levels and LED colors. Extrusions are available in many shapes and mounting hardware accessories for cabinets and cases.

TRADE ARTICLE

BY: JAMES R BENYA, PE, FIES, FIALD

A PARTNER OF FOCUS ON ENERGY

At 2.5 watts per foot and less, do-it-yourself tape light and extrusion systems will generally be fine. However, at higher wattages per foot, heat sinking becomes critical and completed systems should be considered.

Note that in general, linear LED lighting systems operate at low voltage DC. This allows the cabinetmaker to hide a low voltage power supply somewhere else, such as in the base of the display cabinet, and run thin power wires without conduit easily into the cabinet. Up to 100 watts of LED lights can operate from a single power supply and cable similar to the cable from a laptop computer to its power pack. Some LED modules have built-in power supplies and operate at 120 volts AC, but these modules tend to be larger and are better suited for valence lighting and general-purpose lighting such as ceiling coves.

Specific Purpose LED Display Lighting

For new installations, LED lighting systems will typically be supplied as part of millwork or display units. Many cabinetmakers will use specific purpose LED products. In older stores and displays, LED lighting systems offer a great opportunity to improve store and merchandise appearance. Turning to a manufacturer of specific-purpose LED lighting systems is an excellent idea.

Figure 5 shows a close-up of a system designed specifically to mount vertically in refrigeration cases. Unlike older technologies like fluorescent lamps, LED systems like it cold, so they are a great choice for refrigeration settings. These systems are easily installed using existing or new wiring and are National Sanitation Foundation approved. Many system manufacturers ensure the product is ready for exact use and have solutions for existing wiring and mounting hardware for many refrigerated case brands..



Figure 5 - Mid-power (bottom) and high power (top) systems for use in refrigerated cases (GE)

Figure 6 shows a lighting system specifically designed to replace fluorescent lighting systems in produce and dairy cases. It is listed by UL and NSA for the application, and listed by DLC for financial incentives from utilities throughout the nation. Figure 7 shows a system designed specifically for jewelry cases, but it can also be used for lighting museum cases and vitrines.



Figure 6 - Dairy case with all-LED replacement lighting (International Light Technoloaies)



Figure 7 - Jewelry display case lighting system (GE)