

# no-power LCDs

It is hard to beat the convenience of a paper book. It is lightweight and very portable, requires no heavy batteries or chargers, is visible in almost any kind of light, and can be read at any time without waiting for it to power up. An ebook, such as the Panasonic  $\Sigma$ book that is currently sold only in Japan, has the advantages of saving paper and shelf space, but also needs to have the other conveniences of a paper book if it is to gain wide acceptance. That is why the  $\Sigma$ book has a cholesteric liquid crystal display (ChLCD) manufactured by Kent Displays, Inc., Kent, OH. Based on technology licensed from Kent State University's Liquid Crystal Institute, ChLCDs require power only when changing what is displayed. The rest of the time, the display can hold a page image indefinitely with no power. The  $\Sigma$ book can deliver 10,000 to 15,000 page changes using a lightweight set of two AA batteries.

The ChLCDs are ideal for applications requiring low power consumption. Based on a reflective technology, they require no backlighting, and are easy to read even in bright sunlight. Unlike most LCDs, the reflective properties are inherent in the liquid crystals, and do not depend on polarizers to obtain an image. As a result, the display has a wide viewing angle, regardless of the direction it is slanted. The displays are comparable in readability to ink on paper. Light that is not reflected by the display passes through without absorption, allowing for the possibility of powering the device using a solar panel behind the display.

**“The display can hold an image indefinitely with no power.”**

