

Article – Sunlight and Solar Clearing

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Sun is the biggest enemy of LCD displays. It will cause them to heat up, discolor, and eventually turn black. The sun hits the display surface with a maximum intensity of 12250 watts/m² of energy, which will cause the temperature of the Liquid Crystal Module to increase significantly, even on the coldest of days. This can have the effect of literally causing the Liquid Crystals to boil and turn black, what is known as solar clearing.

We have all probably seen our phones turn off because they are “too hot” and need to cool down before use, but outdoor displays don’t have the luxury of taking a break when they are too hot. QSRs, media companies, and transit stations rely on the display being on and visible no matter what the ambient conditions are. Keeping LCDs cool is critically important to providing a 24/7 use in all environments, where temperature fluctuates and direct sunlight is always an issue.

~~Unlike LEDs which are highly reflective and deter much of the sun load,~~ LCDs have very low reflection and absorb almost 98% of the light-solar energy. This means that viewing an LCD outdoors works great because of the low reflection, but keeping it cool is close to impossible. LCDs require lower luminance than LEDs in order provide the same or better visual image quality, yet keeping them cool is the biggest challenge.

LG-MRI’s patented CoolVu® technology is designed to provide a consistent visual image in direct sunlight and in temperatures up to 50°eC with no loss in image quality. The innovative technology begins by using computational fluid dynamics to model ~~out~~ the internal temperature of the LCD, LCM, media player, and circuit boards over a 15 year period in real world light-solar and temperature scenarios. Before we build a product, we ensure that it will perform up to spec in the real world for a 10 year period. The CoolVu® feature uses a dual loop cooling system that immediately exhausts out the heat from the sun and never lets it have an effect on increasing the heat within the unit. Since this heat is exhausted from the onset, we never have to worry about heat buildup from the sun, which lowers our energy consumption and allows us to more comfortably run all of our internal components without the worry of overheating them. CoolVu® is also unique in that zero outside air flows over any electronics or optics within the display. All critical internal components of the LG-MRI displays remain, cool, dry, and contaminate free (i.e., absolutely clean for life). As an added bonus, all of this is accomplished without the use of air-filters, completely eliminating a common requirement for periodic maintenance found in competitive products.

When considering an outdoor digital signage deployment, don’t gloss over conversation about the sun.

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