

The technology

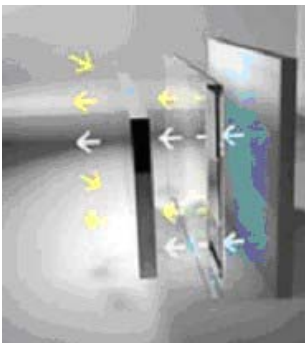
A transreflective liquid crystal display is an LCD that reflects most of the sunlight it is exposed to, and automatically increases or decreases the light emanating from the screen depending on how much light shines on it. Therefore, it reduces the need for manual light adjustment of the screen.

Transreflective liquid crystal displays use a retroreflector to transmit light when external sources of light are available, such as the sun or a lamp, and illuminate the screen well. When these sources are available but do not illuminate well, the display transmits its own light from a backlight at the rear of the display.

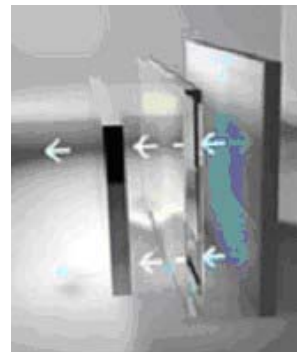
Self adjusting light

These screens reflect most of the sunlight the monitor is exposed to, and automatically increase or decrease the light emanating from the screen depending on how much light that shines on it. Transreflective screens therefore reduce the need for manual light adjustment.

Below are two simple images which illustrate how this technology works.



Transreflective technology with backlight



Standard technology with backlight

When only parts of the screen is exposed to sunlight

Most people have had the experience where they're sitting at work on a day with the sun shining outside until the sun starts shining on your computer screen, making you have to pull the curtains to cover your screen up so you can see what's on it.

For industrial users, it's not that simple. There the screen is often attached to a wall or a rack, making it immovable. In these situations, it's nice to have a monitor that is readable in sunlight, all you would have to do is turn up the light. But what happens when the sun suddenly gets covered by a cloud? Then you would have to adjust the light settings again, turning the light down. In work situations where this has a tendency to occur frequently, tuning the light manually all the time is very impractical. These adjustments would need to happen automatically.

The solutions that Hantarex can offer will give an effect of up to 1200 cd/m². A "normal"

LCD will only give about 250 cd/m².

In most situations the entire screen will not be affected by sunlight, only parts of it. Maybe only 10%, 20% or 50% will be. For LCD monitors with powerful lighting, the solution has to be to increase and reduce the brightness on the whole screen. For users with transreflective monitors, **only the area exposed to the sun will be adjusted**, and it will happen automatically. This way, the difference between normal and intense sunlight will be greatly reduced. We have tried to simulate this effect on the images below.



Standard LCD



High bright LCD



Transreflective LCD

We now know that regular LCDs are usually not suitable in situations with poor lighting. We also know that even if useable, a lot of manual adjustments would have to be used all the time to get the brightness the way we want it. And last but not least, we know that monitors with special fluorescent tube lights are not able to only adjust the brightness on some parts of the screen.

What about heat?

As with all other electronic products, heat can be a major issue, and this problem usually occurs in enclosures, the type industries use. Enclosures can be based on the need for minimal electromagnetic or RF radiation in or out of the monitor. However, it can also be based on so called IP requirements on imperviousness to particles like dust or water. Others may have requirements relating to the Ex standards for explosion hazardous areas or related to the ATEX standards. Regardless, enclosures create a potential heat problem. For most PC solutions, parts of this problem can be solved with fans.

Mechanical

Hantarex offer the following solution, preventing the above:



Landscape solution



Portrait solution

WATERPROOF FEATURES:

- * Special Stainless Steel / Aluminium extra strong cabinet;
- * Sealed cabinet;
- * Input board protection,
- * Reinforced ventilation;
- * Anti condensing system
- * Built in PC rack predisposition
- * Dedicated service door for the PC
- * Service allowed without removing the cabinet from its installation!!
- * **Built in Heater on request**

ANTIVANDALIC FEATURES:

- * Double front 6+4 mm laminated protective glass
- * Reinforced front frame
- * Reinforced back cover

ADVANTAGES

- a) possibility to extract/service PC rack, in few seconds without removing cabinet from its installation.
- b) possibility to change/substitute/update PC, in the future, without modify anything else of the cabinet + monitor
- c) possibility to substitute/update panel in the future without changing also the cabinet
- d) Front protective crystal is a 6+4 safety laminated glass that can be removed and substituted in few time without removing all the cabinet.

Conclusion

There are actually very few disadvantages this technology compared to the solutions that use high intensity fluorescent tubes for readability in sunlight. A short summary follows:

- The brightness on transreflective LCDs does not require regular adjustments as they adjust themselves.
- Transreflective screens are easier on the eyes when only parts of the screen is exposed to bad lighting.
- There will be less heat issues due to the monitors reflecting a lot of the energy in sunlight. These monitors are therefore more suited for enclosures.
- Monitors with transreflective technology do not have size limitations, and can be delivered in multiple sizes.