8

THINGS YOU NEED TO KNOW ABOUT

TRANSPARENT OLED EBOOK

PLANAR®

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WHAT IS TRANSPARENT OLED TECHNOLOGY?

Transparent OLED is a transparent display technology that displays dynamic or interactive information on a transparent surface glass, allowing users to view what is shown on the display while being able to see through it.

Designers can overlay text, digital images and video content onto physical objects or scenes that sit behind the glass.

Transparent OLED displays are self-emitting and utilize Organic Light Emitting Diode (OLED) technology to eliminate the need for a backlight or enclosure, making it possible to create truly see-through installations in a virtually frameless glass design.

This eBook will highlight the ***8 Things You Need To Know About Transparent OLED technology.***

1

T-OLED Pixels are Partially Clear

Each pixel in a transparent OLED display is made up of four sub-pixels: red, green, blue and white. The area surrounding those subpixels is clear, which is why the display is transparent.

This is why there is a direct relationship between resolution and transparency. If the display contains more active pixels that creates less space for the clear pixels, it results in a display that is less see-through.

This is why the Planar® LookThru™ Transparent OLED Display is Full HD resolution today, as it optimizes transmission and resolution.

2

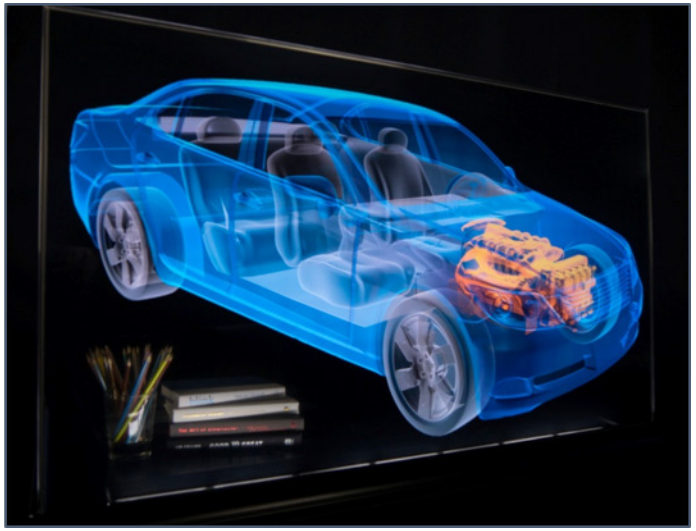
Black is Clear – White is Opaque

Unlike transparent LCD displays, black or dark content on the display is clear and white or bright content is opaque. You can see this in the photos below.

The car image appears to be floating in space and through the black background you can clearly see the books and pencils, physical objects set behind the display.

The full screen image of the boat appears in the foreground, but if you look closely at the hull of the boat you will see some objects behind the display, made visible by the dark area.

White or bright content will be opaque and shine from the screen and appear in the foreground



Black or dark (or off-state) content will be see-through

3 Ambient Light Affects Perceived Transparency

The more you light the items behind, the more transparent the screen

Just like any glass surface, ambient light affects that appearance of transparency. The two images below are the same display, the same on-screen content (a model), and the same plant behind the display. The only difference is that the plant has been “uplit.”

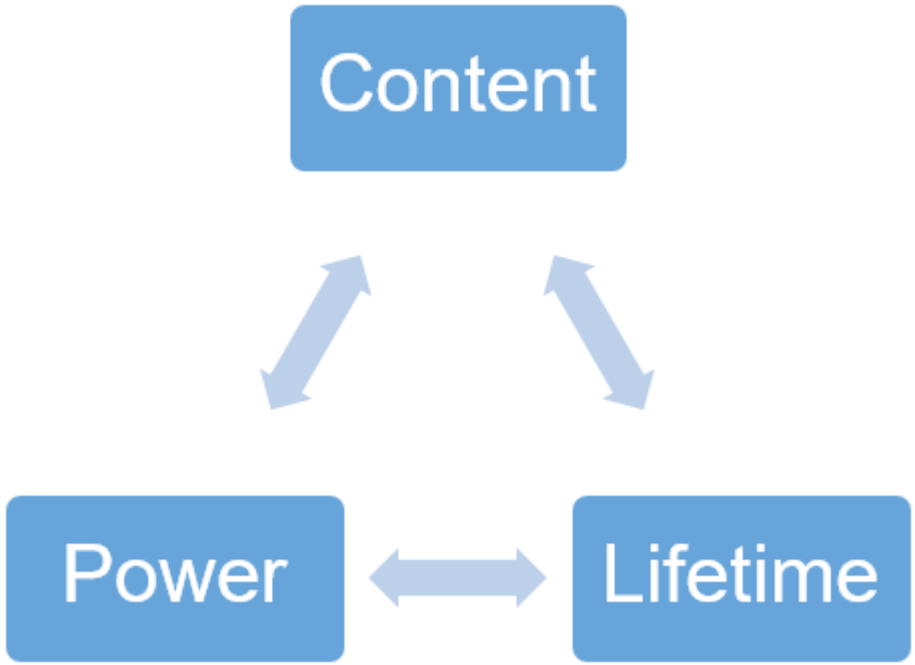
With more light on the object behind the display you can see the leaves of grass are much more visible through the display than they would be if the light was off. A transparent display in an entirely dark room will appear opaque. A transparent display in a light filled room with objects or scenes heavily lit behind the display will appear like transparent glass.

No uplight. Display looks more opaque.

Plant is uplit. Display looks more transparent.

4 Content is King of Lifetime and Power

- Content drives power and lifetime
- Black pixels are at rest (low power, longer life)
- Highest energy-use color is blue (and it ages faster than other primaries)
- Lifetime is related to hours of use for each pixel
- For a longer life, keep content mostly black and keep content moving to avoid damaging the display with image retention



5 Readability Makes Exhibits Possible

Transparent OLED is quite clear, which makes reading fine details or text on objects behind the display possible. This allows retail merchandisers or museum exhibit designers to place transparent OLED displays in front of goods or artifacts without obscuring the view.

In addition, the display is optically clear enough to make it possible to see a long distance past the display. A wall that is 12 feet past the display will be clearly visible. A sign that is 10 meters away can be read.

Another electronic display placed behind the transparent glass will create a unique 3D layered effect and is quite possible with this display technology.

Pencils and book titles are readable through display.Objects dozens of feet or meters behind the display are viewable.

6 Broad Color Gamut Reads As Brightness

OLED has long been recognized for its amazing color performance. While best-in-class LCD displays achieve around 72% NTSC color space (a measure of the number of colors that the display is capable of showing), OLED can achieve greater than 100%. This means more vivid reds, more vibrant greens and eye-popping blues.

This color performance, together with the peak brightness characteristics of the emissive display, creates a display that appears much brighter than expected from reading specifications alone.

Your eye translates color as brightness and in a side-by-side comparison with a “brighter” display, the transparent OLED display will be the most vivid.

Greater than 100% NTSC

7 Thin Edge Details Make Tiling Possible

The Planar® LookThru™ Transparent OLED Display is fantastic when used as a single display, but some applications require a display larger than 55 inches - this is where the product's design delivers installation flexibility.

In the illustration to the right, four displays are tiled into a video wall array - two sitting on a table top and two mounted to a ceiling. Three edges of the display have only 6-7mm of inactive area, which makes the tiling effect quite possible and attractive.

To further facilitate tiling, a range of accessories is available, including four tiling components that protect display intersections, and Base Plates for securing Planar LookThru displays to ceilings, tables and walls.

To achieve the full video wall experience, the video wall should be accompanied by a multi-channel video processor which can play back one video or content selection across multiple monitors assembled into a video wall.

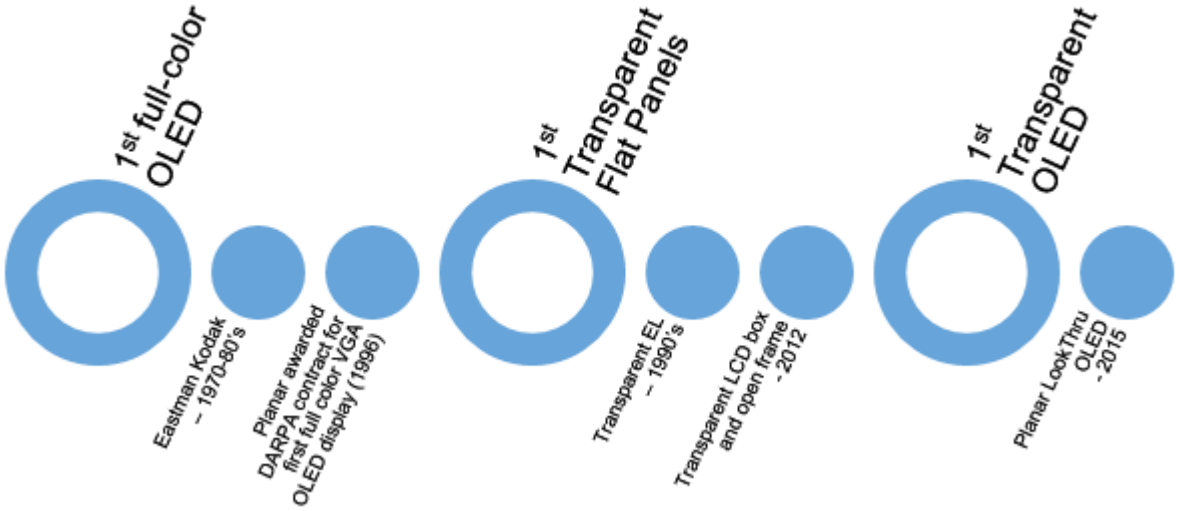
Edge detail is approximately 6-7 mm on three sides; 98 mm wide on one long edge

8 Planar is the Transparent Display Market Pioneer

Development on OLED started in earnest in the 1980s. By the 1990's, Eastman Kodak was a subcontractor to Planar on a DARPA contract from the US government to develop a commercial product in VGA resolution.

The first Planar transparent display, an electroluminescent display, was introduced in the late 1990's. Since then, Planar have had transparent displays in the Planar product line, adding the Planar® LookThru™ LCD Display Box and Installation Kit in 2012.

In early 2015, Planar was first to demonstrate a transparent OLED and now offers a line of transparent OLED products.



Planar LookThru Transparent OLED Displays

The Planar LookThru Transparent OLED display is available in 55-inch diagonal. It can be used in both portrait and landscape modes, can be table-mounted, ceiling-mounted or built into custom fixtures using a straight flush-mount design.

The display can be tiled to create large, eye-catching video wall arrays. The Planar LookThru provides Full HD resolution that allows for beautiful graphics and full-motion video. It comes with standard digital inputs including HDMI and DisplayPort, and is fully controllable for advanced installations.

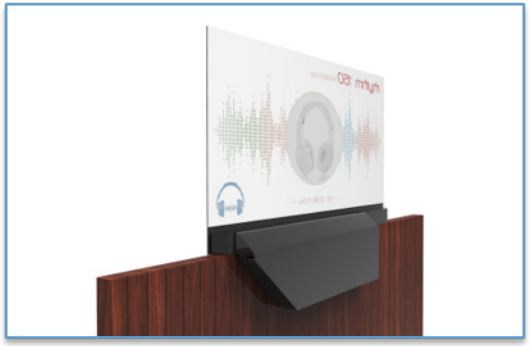
The Planar LookThru utilizes proprietary proprietary proprietary Planar® ERO-OLED™ (Extended Ruggedness and Optics™) technology featuring Corning® Gorilla® Glass. This high-durability surface can withstand the rigors of high-traffic environments and interactive touch.

It also improves perceived contrast by more than 300 percent, making the display more readable and impactful even in bright public venues.

For more information, visit www.planar.com/lookthru

Table top

Ceiling mount



Straight mount

CONSIDERATIONS WHEN PLANNING & DESIGNING TRANSPARENT OLED DISPLAYS

Creativity is the watch word when designing with transparent displays. Whether in stand-alone configurations or integrated into larger video wall arrays (as illustrated to the right), the possibilities are endless.

When specifying a transparent OLED display, one must remember the limitations of the technology, as well as its benefits. The best performance of the display will come when content developers, artists and programmers work closely with integrators to ensure the content utilizing a lot of black in every frame (for maximum transparency and lifetime), is highly dynamic (no static logos or words) and makes the use of ambient or spot lighting that can be orchestrated with the screen content for amazing effect.

APPLICATIONS

The Planar LookThru OLED fulfills the promise of transparent displays with never-before-possible applications in digital signage including retail, hospitality, corporate and museum settings.

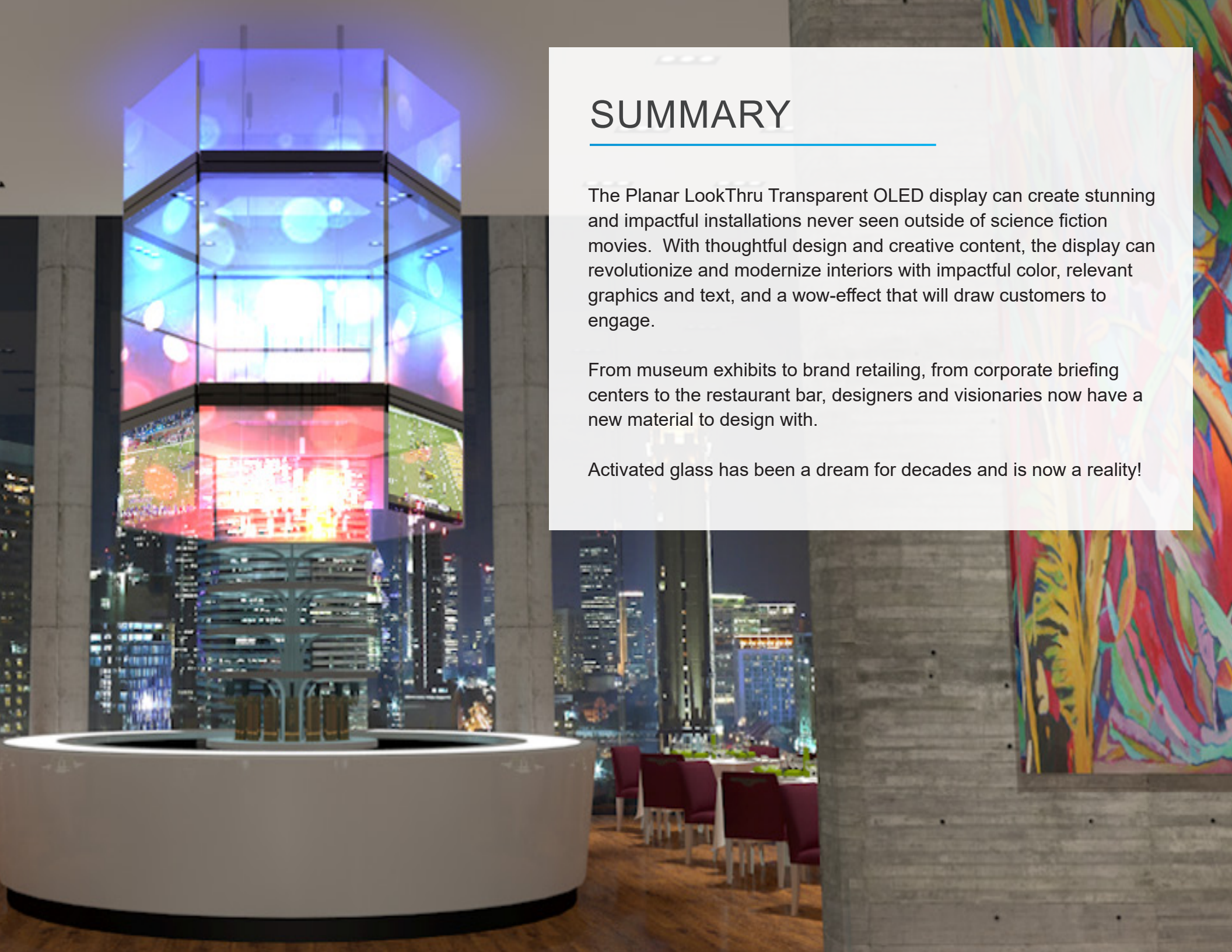
It can be integrated into any environment in which glass is used including building exteriors, room dividers, glass conference rooms, storefront windows, glass counters, museum exhibits and ticket booths.

RETAIL

CORPORATE

HOSPITALITY

MUSUEM



SUMMARY

The Planar LookThru Transparent OLED display can create stunning and impactful installations never seen outside of science fiction movies. With thoughtful design and creative content, the display can revolutionize and modernize interiors with impactful color, relevant graphics and text, and a wow-effect that will draw customers to engage.

From museum exhibits to brand retailing, from corporate briefing centers to the restaurant bar, designers and visionaries now have a new material to design with.

Activated glass has been a dream for decades and is now a reality!

ADDITIONAL INFORMATION

Planar is a global leader in display and digital signage technology, providing premier solutions for the world's most demanding environments. Planar LED video walls, LCD video walls, 4K displays, image processing solutions, transparent and interactive displays deliver the most comprehensive portfolio of award-winning commercial display solutions.

For more information visit www.planar.com

LED VIDEO WALLS

LCD VIDEO WALLS

REAR PROJECTION VIDEO WALLS

LARGE FORMAT 4K LCDs

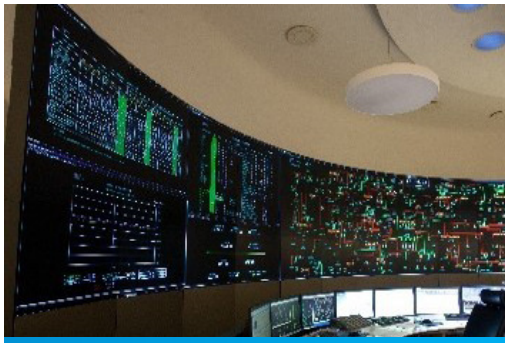
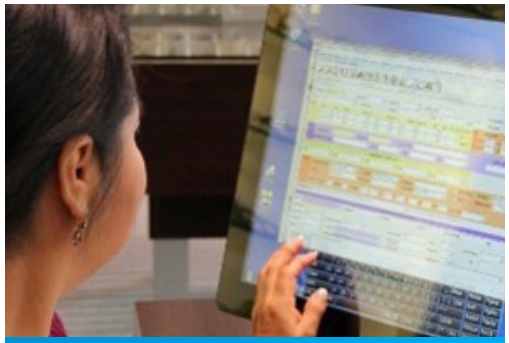


IMAGE PROCESSING



DESKTOP & TOUCH MONITORS