AZUMO

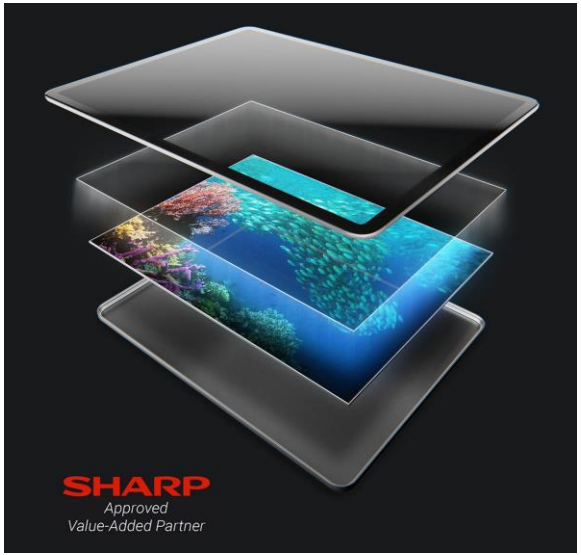
Front Light Panel FAQs

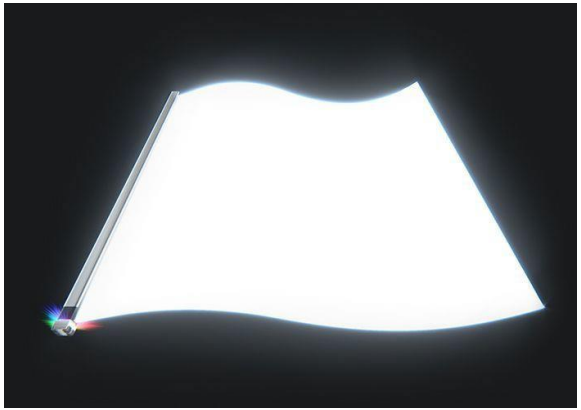
A very low-power, thin, and flexible display light that laminates to the top of a display

What's an FLP?

Short for Front Light Panel an FLP is a very thin film that acts as the light source when laminated on top of a display.

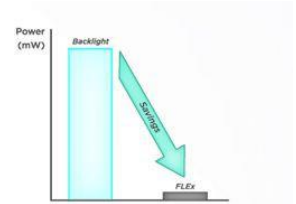
This film is transparent, ultra thin (50µm) and flexible.





What are the benefits of an FLP?

Low Power - one LED, efficient coupling
Ultra Thin - adds less thickness to product
Clear - invisible, distortion free
Uniform - even, diffused light source
Flexible - edgeless, fits curved panels
Elegant - laminated streamlined module



Maintains Low Power

Thinner Devices

How many pins does the front light panel FPC have?

The FPC of the front light panel has two pins with the power pin marked with a (+) sign.

Is there a bend radius for the front light panel FPC?

Our FPC is robust, and as long as it's not bent right at the LED or the lightbar on the opposite end, the flexible portion can be folded back over on itself without any issues. When folding it, care should be taken not to put any stress on the LED connection into the light bar.

Other than that, we intentionally make it long so it can be folded into the necessary location.

See our FLP handling guide.

How about the display FPC?

The display FPC is much more fragile and should not be bent until the final assembly stage, however, it depends on the display manufacturer.

Sharp specs the bend repetitions at 3 times per display in the downwards direction. The FPC should never be bent upwards.

Can I use a resistor as a current sink to deliver current to the LED?

We recommend using a constant current sink to ensure a stable current against variations in temperature, supply voltage and LED Vf.

The single resistor approach is acceptable for cost-sensitive applications; however, a tolerance analysis is necessary to ensure the operating envelope of the LED is within its safe range (<25ma If).

continued

Example calculation:

* Power supply V = 5 V ± 5% [4.75 - 5.25 V]
* Resistor R = 97.6 Ohm ± 1% (96.6 - 98.6 Ohm)
* LED Vf is between 2.8 and 3.3 V

Worst case maximum current is (5.25-2.8)/96.6 = 25.3 mA
Best case minimum current is (4.75-3.3)/98.6 = 14.7mA

For maximum longevity we recommend operating the LED at the lowest current that provides acceptable brightness performance for the application. As for guarding against overcurrents, the exact amount of margin will depend on the actual tolerances of the system, the above is just an example calculation.

Why the long opaque area?

The opaque area is necessary to ensure light uniformity. Care should be taken when installing the FLP in 01 and 03 orientations as creasing the opaque film might affect the light performance.

Is there a performance difference between 01, 03, 06 configurations?

From a performance standpoint, there is no difference between these configurations.

The difference is strictly mechanical in order to offer multiple options to choose from when integrating the FLP into your design.

Can I scan the display in landscape mode?

The display is scanned portrait mode, that cannot be changed. However, the viewing angles are symmetrical, so if you want to orient it in landscape mode, you just need to build your content rotated 90 degrees so it presents correctly before writing to the display.

What are operating and storage temps for the solution?

Using Sharp as example, the Sharp Memory LCD has a storage temperature of -30C. At that level, however, the liquid crystal material freezes to a solid state and may not recover once returned to normal temperature. We've seen the Sharp displays run at -40C to +80C. The response time at the low temperatures does slow down significantly but no permanent damage has been reported.

On the Azumo side, we test to those specs for the front light panel. We have selected materials that match LCD environmental specifications.

Are these display solutions intrinsically safe?

The simple answer is yes. You can build an intrinsically safe device with Azumo FLPs.

Do you have any recommendations for mount the display?

We have seen the displays mounted in multiple ways. One recommended design is installing the display in a gasket using PSA and pressure to keep it in place.

We've also seen customers using a carrier piece to key off the exposed glass edges and then bond the flat part of the display with double sided adhesive so he LCD is fixed onto the carrier. The carrier then is assembled into the device.

Thank you

AZUMO