LEVL
Backlighting

CASE STUDY

The challenge

LEVL is a consumer health and wellness device that calculates breath acetone concentration which correlates to body fat burned. To work the device, a user breathes into a breath pod then places the pod in a testing port (pictured above) that displays the user's fat burning state. In collaboration with Logic, PD, LEVL designed the medical device at GMN's Seattle, WA Division. During prototyping, LEVL's testing port needed a cost-effective backlighting solution for its user interface that would display multiple colors independently and evenly.

Project goals

- **Cost sensitive component**
- **Even lighting for text**
- **Light multiple colors independently**

The solution

GMN offers an array of backlighting options including, discrete LEDs, fiber optic weave, light guide films, and electroluminescence. GMN's design and engineering team found that discrete LEDs would be the best solution to create the desired backlit user interface for the LEVL port. Discrete LEDs are an ideal option for lighting small icons and indicators, so they were a perfect fit for the small backlit circles on this device.

To meet cost constraints, GMN used white LEDs instead of LEDs of multiple colors. Installing white LEDs allows for volume purchasing as well as slightly reducing setup and cycle times for populating the PCB boards.

CASE STUDY

GMN achieved the multiple colors of this user interface by applying a graphic overlay printed with transparent colors. This allowed the light from the white LEDs to pass through the overlay with a color.

Another project factor GMN had to consider was achieving even lighting throughout the graphic overlay when the LEDs were illuminated. To meet this design requirement, GMN bonded a bezel frame to the graphic overlay. The bezel frame allowed more room for the light from the LEDs to diffuse before reaching the overlay. Acting as a mounting surface, the bezel frame ensured even lighting throughout the user interface.

In addition, the bezel frame acted as a light blocker (egg crate) that stops light from going from one icon from interfering with another. This allows each icon and text to be lit independently of each other without any light bleed.