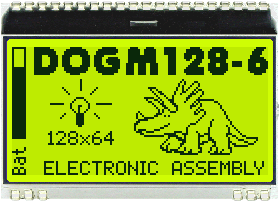
# LCD

### Technology and Technical approach Considerations

The LCD is used as an aid for our human machine interface -to communicate between the controller box and the individual. A super twisted nematic LCD was chosen in order to achieve a high contrast ratio and reduce back light intensity, thus reducing power consumption. The DOGM128-6 Electronic Assembly family of LCDs was chosen because they have low power consumption and they offer more flexibility in graphics programing and tools to help ease the programming process. The DOGM128-6 family includes an integrated LCD driver and uses the SPI communication protocol, allowing for easy integration with a variety of microprocessors. Another factor in our decision was the size of the display. Many of our users are weary students and faculty members. We needed an LCD that allowed for large easy to use text and graphics. Most of our electrical components function on 3.3 V technology. The DOGM128-6 was one of the few LCDs with an appropriate size with a capacity to function with 3.3 V. Our group had to find a display that would be able to operate under varying temperature conditions. This particular LCD met our standards for operating temperature range between -20 degrees Celsius and 70 degrees Celsius. The final consideration was availability. According to Mouser Electronics, this is one of the most widely available LCDs with a large stock. Given the size, quality, and availability, the estimated LCD cost is around 15 dollars. The DOGM128-6 family has LCDs that range from 4 to 18 dollars based on various backlighting and color schemes. This allows us to create an extremely flexible and cost effective product.

### Testing requirements considerations

There is a multitude of tests that must be performed. The first tests to be performed should ensure basic functionality and reliability. The most basic test would be to test basic functionality to ensure the unit can properly display data and graphics. Then, the LCD backlight should be tested. This should be done in the product’s intended environment across various lighting conditions and temperature ranges. This testing will allow us to set the appropriate contrast and brightness and allow for minimum power consumption. Pixel reliability needs to be measured in order to make sure that the LCD is displaying the transmitted data properly.

### Safety considerations

The LCD consists of a glass plate structure. It needs to be properly insulated from the casing of the user interface unit in order to assure minimal stress and decrease the possibility of shatter. On the two sides of the LCD, protective plastic coverings are placed in order to protect against damage during shipping. These must be removed prior to design integration in order to reduce circuit malfunction and the chance of overheating.

### Possible risks and risk management

One possible risk that may arise is that our group may have underestimated the difficulty of graphic LCD programming. We are in contact with various suppliers to determine whether there exists support with graphic LCD programing and researching current graphic LCD implementation. Another risk that may arise is difficulty integrating the LCD with the rest of the product design. In order to decrease this risk, our group has researched LCD communication protocols, driver circuits, compatible microprocessors, and required features needed for LCD functionality.

# References

http://www.lcd-module.com/products/dog.html