

Application Note 101JM

Introduction:

A unique application was recently presented to Metaphase Technologies. The users of a dual-hulled ship needed a system that would monitor the relative balance of the craft and provide signals to adjust the ballast to maintain equilibrium.

Background/problem:

When a ship takes on a heavy load, it may alter its equilibrium. To restore equilibrium, the ship can adjust the ballast in one, or both, of the hulls. The challenge is to detect the imbalance and to quickly transmit control signals for correction. Metaphase Technologies developed a new LED light system to detect unbalanced conditions as the ship's load shifts such as during rough sea conditions.



Example of a dual-hulled ship

Solution:

For this application, Metaphase developed the MT-FL500x100 LED lighting system. It is a high intensity, tight beam angle, infrared LED light which is excellent for cutting through fog and other adverse marine conditions. The light is completely protected for immersion or the splashing of water which will normally occur during seagoing operations. Since the primary application will be

in salt water, corrosion protection was a primary consideration in the design. The light enclosure is marine grade with a special clear cover and a corrosion resistant finish.



Metaphase Technologies MT-FL500x100

The application had one LED lighting system on the interior side of each hull where the transverse clearance could be greater than fifteen (15) meters. High resolution cameras are placed opposite the lights to detect relative movement of the tight beam LED light. As one hull rises or sinks lower relative to the other side, the images captured by the camera detect the center of gravity shift of the LED targets. The imaging software provides signals to the ship's control system to adjust the ballast to restore equilibrium.

Conclusion:

Metaphase has been providing custom, specialty LED lighting systems for unique applications such as this for over twenty years. For any application we offer free testing and encourage you to bring us your most challenging applications for a custom solution.