

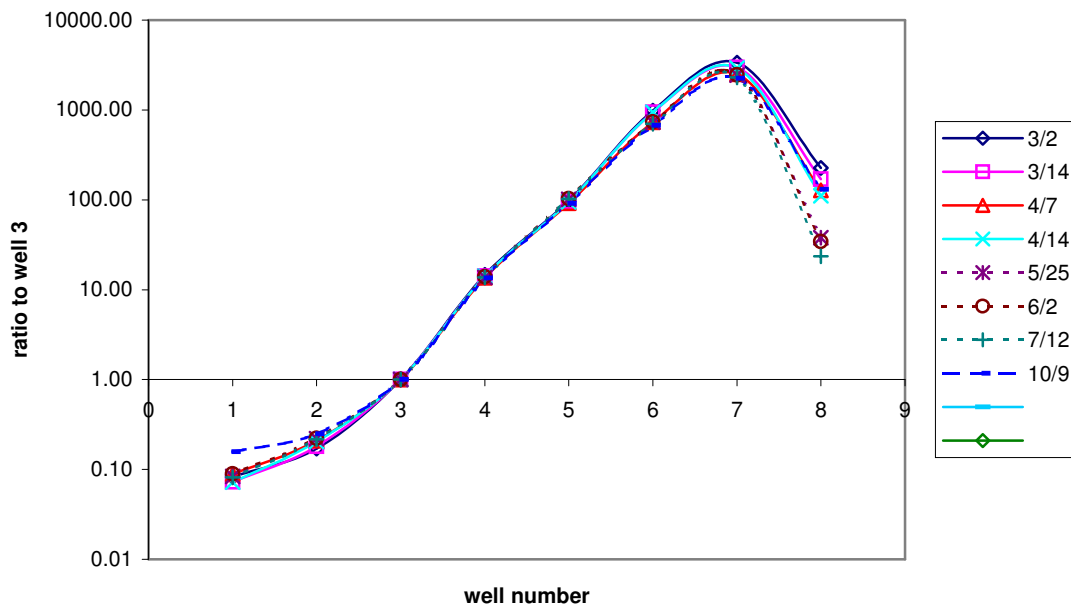
Harta Luminometer Reference Microplate.

Harta's Luminometer Reference Microplate utilizes linear optical attenuator (patented), as opposed to using neutral density filters. This attenuator enables one to reliably and easily attenuate a light source to any level, in linear fashion, down to the lowest limit of Photo Multiplier Tube (PMT) detection capability.

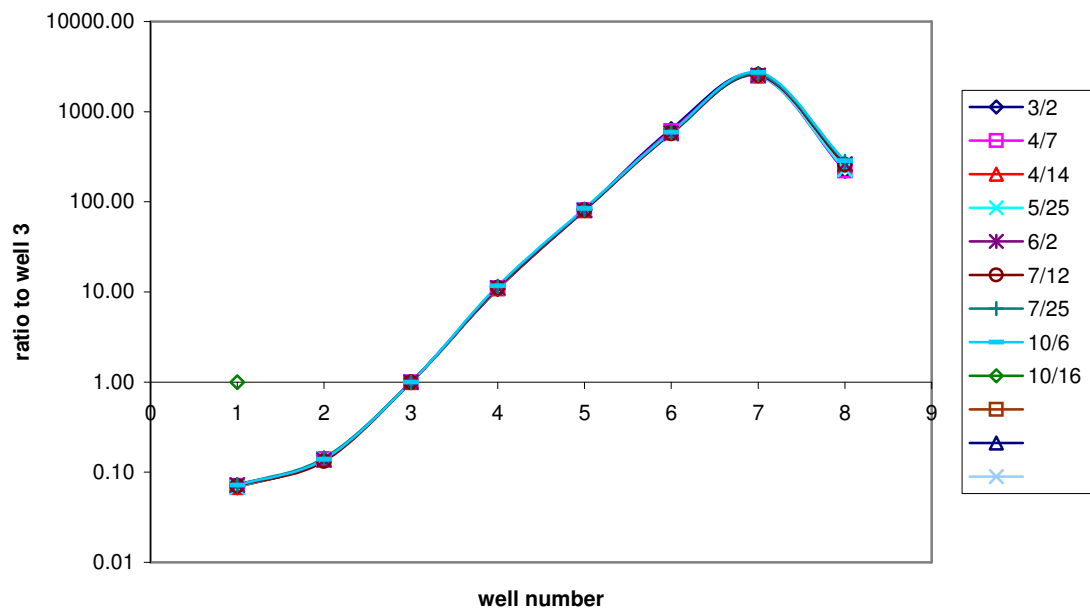
This system enables us to provide multiple light points attenuated to any level, from a level that saturates the PMT, down PMT's lowest limit of detection, and any levels in between. Once adjusted to the desired levels, the attenuators are locked. This provides a convenient way to verify or validate the PMT / detector's Dynamic Range, Sensitivity and Stability.

Dual light sources provides a way to verify the health of the reference plate itself, should one of the light sources fail, the plot of data reading will clearly show it.

Our current plate has 8 light points, seven of these light points comes from a primary electronically feedback controlled constant light source, and, the eighth light point comes from a secondary identical light source, which will maintain a constant light output as long as there is sufficient battery voltage. The light from the primary source is then attenuated using our proprietary linear optical attenuator, to provide seven different levels of light points. Since these seven light points comes from a single source, once they are set, they maintain a constant ratio. These seven points provides a convenient set of light levels to verify the linearity of the detection system. Since the probability of two separate circuits failing at the same time and at the same rate is very remote, the secondary light source provides confidence about the health of the plate. The secondary light points will turn off when the battery level reaches down to 4.5V, while the rest will stay on until the battery discharges below approximately 3.5V. This will prevent



Light Plate 1
perfect plate



plot 3, perfect light plate

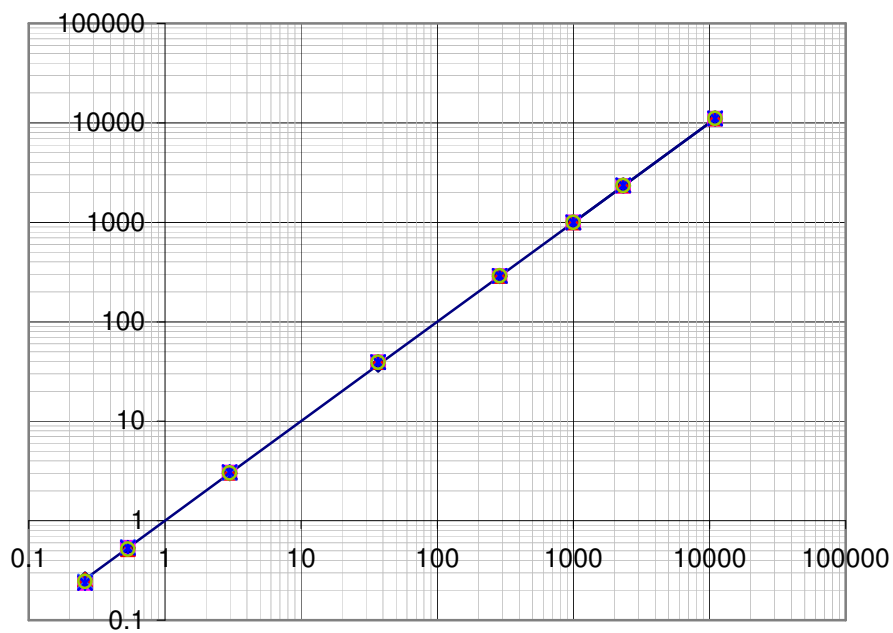
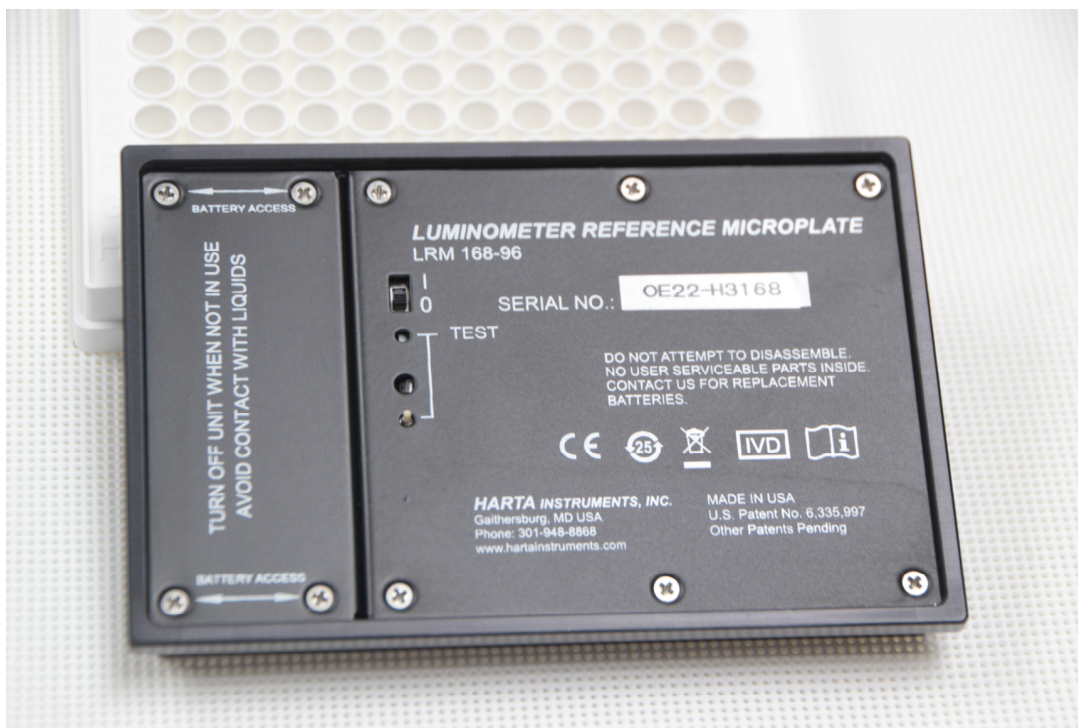
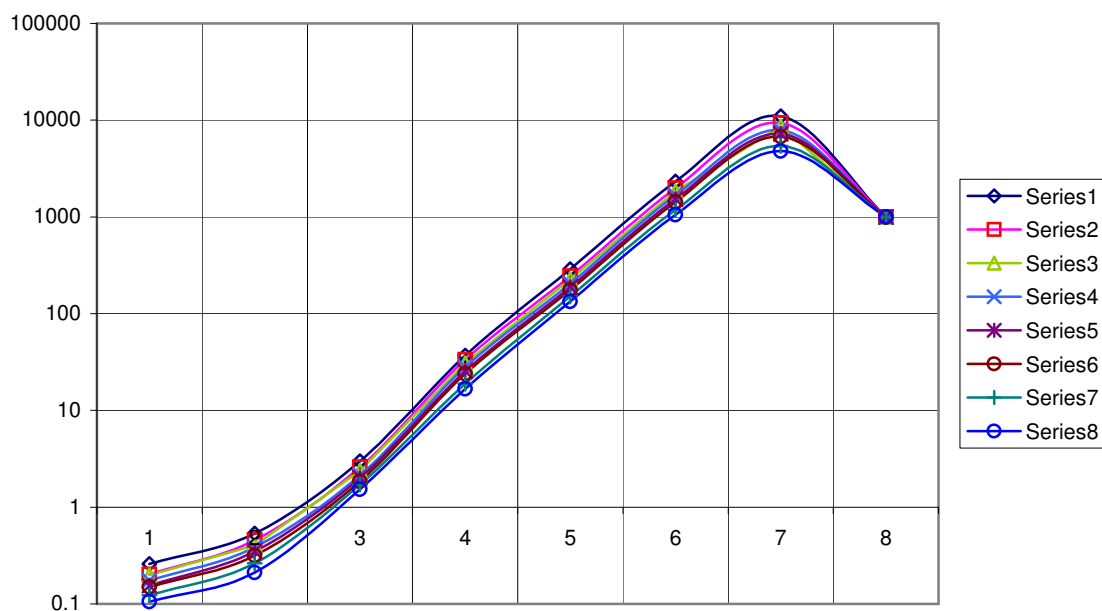


plate with simulated primary light source failure



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