

OLIS PLT 3

Elegant & Direct Alternative to Time Correlated Single Photon Counting

Time Correlated Single Photon Counting (TCSPC), the traditional method for phosphorescence lifetime measurements in the microsecond range, is slow, laborious, and inelegant. The only means to collect a full luminescence decay curve is with repeated excitation pulses followed by gradually increasing delays.

The OLIS method collects a full 100 point decay curve with each excitation pulse. And, with the full curve appearing instantly after each pulse, it is immediately obvious how many repetitions to make to achieve necessary S/N.



The superior OLIS acquisition scheme is achieved using sophisticated FPGA device and code which contains 100 photon counters which sequentially receive the output of the single photon counting photomultiplier tube detector. Sample excitation is by a computer controlled pulsed LED; detection is by an exquisitely sensitive photon counter.

- **Ease of operation:** the user sees the full decay of the luminescence intensity following each excitation pulse
- **Obvious:** Selection of the appropriate timing of the decay acquisition is quickly obvious and easily understood and changed, if appropriate for the sample
- **Practical:** Judgment of the signal-to-noise required for accurate decay information is easily seen
- **Fast & flexible:** One adjusts the timing to repeat the acquisition of the decay curve up to 4000 time per second for a 250 microsecond decay (i.e., four times per millisecond). If the decay is 1000 microseconds long, one can collect the sum of 1000 events per second.
- **Versatile:** Excitation pulse length and thus the intensity of the luminescence is easily adjusted
- **Multiwavelength:** With use of the scanning emission monochromator, one can collected the decay as a function of wavelength; alternatively, one uses optical filters to change the wavelength seen by the detector.
- **Run concurrent with spectral acquisition on a CLARiTY UV/Vis or free-standing**

Here, the OLIS Phosphorescence Lifetime method is used to measure dissolved oxygen. The oxygen concentration is calculated from the luminescence after the decay profile is fitted to a one exponential and the resulting Tau is converted to O2 concentration using the Stern-Volmer equation.

