

USB650 Red Tide Spectrometer

World's Most Amazing Low-Cost Spectrometer

The Red Tide Spectrometer is a low-cost, small-footprint lab spectrometer that's ideal as a general-purpose instrument for your budget-conscious classroom or teaching lab. The Red Tide has a wavelength range of 350-1000 nm, and utilizes a detector with 650 active pixels; that's 650 data points in one full spectrum, or one data point per nanometer. Configured with a 25 μm entrance slit, the Red Tide offers ~ 2.0 nm optical resolution (FWHM).



Flexible Platform, Convenient Interface

The Red Tide is a preconfigured, off-the-shelf spectrometer where all of the optical bench options, such as grating and entrance slit size, are already selected. The Red Tide can be used with various Ocean Optics spectrometer accessories, light sources and sampling optics, to create application-specific systems for various absorbance, reflection and emission applications. With its small footprint (89.1 mm x 63.3 mm), convenient USB interface, and integration times as fast as 3 milliseconds, the Red Tide is a great tool for basic lab measurements.

Spectrometer Alone or with Sampling System

The USB-650 Red Tide comes without a light source or sample system, allowing you the freedom to choose the accessories that best fit your application.

The USB-650-VIS-NIR (at right) comes with a direct-attach light source and sample holder. The light source includes an LED-booster tungsten source and a sample holder for 1-cm cuvettes that connects to the front of the spectrometer. In this configuration, the system has a wavelength range of 370-980 nm.



The USB-650-UV-VIS includes a deuterium tungsten halogen light source and a 1-cm cuvette holder. In this configuration, the system has a wavelength range of 200-850 nm.

Note: The Red Tide USB650 is not recommended for absolute irradiance measurements. For

absolute irradiance, we recommend the [USB2000+](#) miniature spectrometer.

Specifications

Physical	
Dimensions (in mm):	89.1 x 63.3 x 34.4
Weight:	190 g
Detector	
Type:	Linear silicon CCD array
Pixels:	650 enabled pixels
Pixel size:	14 μm x 200 μm
Pixel well depth:	~62,500
Sensitivity:	75 photons/count @ 400 nm
Optical Bench	
Design:	f/4, asymmetrical crossed Czerny-Turner
Focal length:	42 mm input; 68 mm output
Entrance aperture:	25 μm wide slit
Fiber optic connector:	SMA 905
Spectroscopic	
Wavelength range: USB-650 USB-650-VIS-NIR USB-650-UV-VIS	350-1000 nm
Optical resolution:n::	~2.0 nm FWHM
Signal-to-noise ratio:	250:1 (at full signal)
A/D resolution:	12 bit
Dark noise:	3.2 RMS counts
Dynamic range:	2 x 10 ⁸ ; 1300:1 for a single acquisition
Integration time:	3 ms to 65 s (15 s typical max)
Stray light:	<0.05% @ 600 nm; <0.10% @ 435 nm
Corrected linearity:	>99.8%
Computer	
Operating systems:	Windows 98/Me/2000/XP, Mac OS X and Linux w/USB port
Operating software (required):	SpectraSuite Spectroscopy Software