



# ocean optics product points

## Maya2000 & QE65000 Spectrometers



### Ocean Optics Family of Miniature Back-thinned FFT-CCD Detector Spectrometers

The Ocean Optics line of high-sensitivity back-thinned 2D FFT-CCD spectrometers for low light-level, UV-sensitive and other scientific applications now includes three versatile options: an improved version of our thermoelectrically cooled QE65000 Spectrometer, distinguished by improved stray light and low noise characteristics; and the uncooled Maya2000 and Maya2000Pro, which offer greater than 90% quantum efficiency, high dynamic range and excellent UV response.

### Advantages of Back-thinned FFT-CCD Detectors

Back-Thinned CCD area image sensors have high UV response, great signal-to-noise characteristics and wide dynamic range, making them especially suited for low light level applications. Because of their great native UV response, FFT-CCD detectors do not require the application of UV-sensitive coatings, which is common with standard CCD-array detectors. That's important because batch-to-batch variation can be problematic with some UV coatings.

### About the Improved QE65000

At about €10,000, the QE65000 certainly merits its "scientific-grade" spectrometer designation -- with the performance to match. But now we've made optical bench enhancements to the QE65000 that provide even greater value: lower stray light, improved efficiency in the UV and Shortwave NIR, and better unit-to-unit reproducibility. Combine that with an onboard TE cooler - stability is +/-0.1 °C of set temperature in less than 2 minutes - and you have a great option for low light-level applications such as fluorescence, Raman spectroscopy, DNA sequencing and experiments with long integration times. For full UV-

Shortwave NIR coverage (175-1100 nm), configure your QE65000 with our HC-1 composite grating. Do you already own a QE65000 and are interested in an upgrade? Contact an Ocean Optics Applications Scientist for details.

### Introducing Maya2000-series Spectrometers

If €10,000 is a little bit out of your budget range, and if long integration times aren't part of your application, the Maya2000 and Maya2000Pro may fill the bill. Indeed, Maya2000 and Maya2000Pro offer great value and performance for most any application requiring high sensitivity, good UV response and great dynamic range.

While Maya2000 and Maya2000Pro have similar performance for most parameters, the Maya2000 has slightly faster readout time and the Pro offers better dynamic range and signal-to-noise (see comparison tables for a specification-by-specification analysis). Also, please note that limited detector availability may make lead times longer for the Maya2000.





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## Maya2000 & QE65000 Spectrometers

### Maya2000-series Spectrometers at a Glance

- 90% quantum efficiency
- USB 2.0 interface
- Low-noise electronics
- Optical resolution to ~0.035 nm (FWHM); resolution depends on groove density of grating and size of entrance aperture (slit)
- 14 grating options, including the HC-1 composite grating for coverage from 175-1100 nm (additional charge)
- Slits available in widths of 5 µm, 10 µm, 25 µm, 50 µm, 100 µm and 200 µm
- Optional propriety order-sorting filters to eliminate second- and third-order effects
- Detector collection lens option for enhanced signal collection
- Fully programmable strobe signals (single or continuous)
- 10 onboard digital user-programmable GPIOs

Uses SpectraSuite Spectrometer Operating Software (runs in Windows, Mac or Linux).

DETECTOR COMPARISON			
	Maya2000	Maya2000Pro	QE65000
Detector:	Hamamatsu S9840	Hamamatsu S10420	Hamamatsu S7031
Architecture:	Back-thinned, 2D	Back-thinned, 2D	Back-thinned, 2D
Thermoelectric cooling:	No	No	Yes
# of Pixels:	All: 2080 x 20 Active: 2048 x 14	All: 2068 x 70 Active: 2048 x 64	All: 1044 x 64 Active: 1024 x 58
Pixel size:	14 µm square	14 µm square	25 µm square
Detector active area (mm):	28.672 horizontal x 0.196 vertical	28.672 horizontal x 0.896 vertical	24.576 horizontal x 1.392 vertical
Well depth:	130Ke-	200Ke-	1000Ke-
Peak QE	90%	75%	90%
QE @ 250 nm	65%	60%	65%
SPECTROMETER COMPARISON			
	Maya2000	Maya2000Pro	QE65000
Integration time:	5 ms - 20 seconds	17 ms - 10 seconds	8 ms - 1500 seconds
A/D converter:	16 bit, 500 kHz	16 bit, 150 kHz	16 bit, 150 kHz
Dynamic range:	5000:1	~8000:1	25000:1
Signal-to-noise ratio:	350:1	450:1	1000:1
Non-linearity (uncorrected):	~4.0%	~10.0%	~1.0%
Linearity (corrected):	<1.0%	<1.0%	<1.0%
Column sensitivity:	~0.45 Counts/e-	~0.32 Counts/e-	~0.065 Counts/e-

