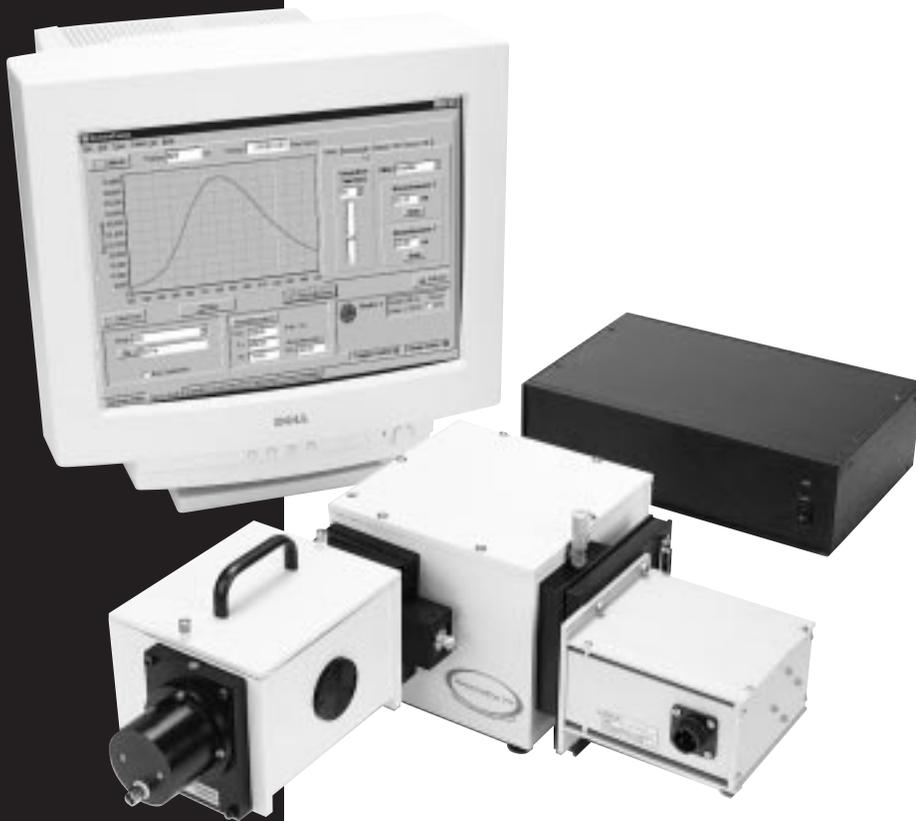


CONFIGURING

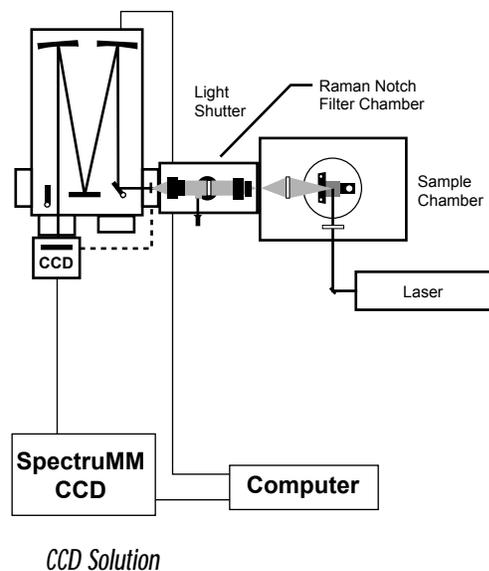
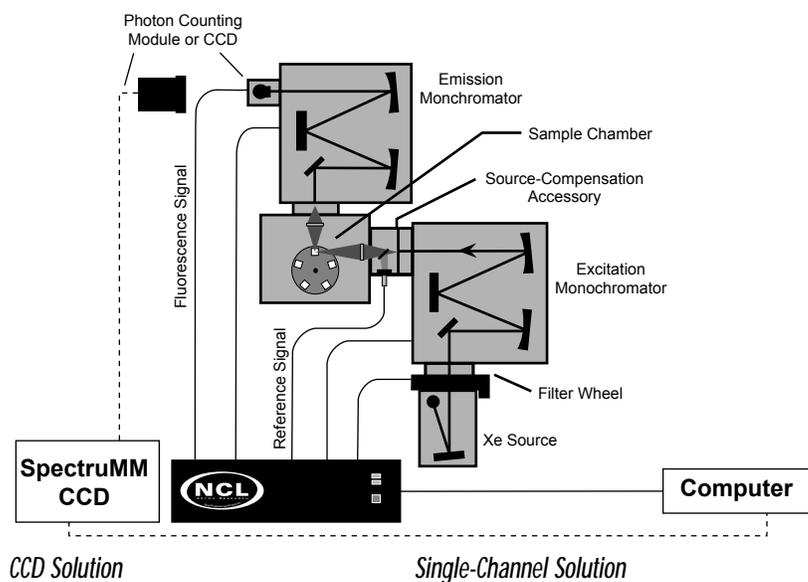
Your Spectroscopy System For PEAK PERFORMANCE



A guide to selecting
the best Spectrometers,
Sources, and Detectors
for your application



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Fluorescence

General-purpose, fluorescence measurement systems typically consist of a UV light source coupled to a monochromator for selection of excitation wavelengths. A sample chamber (or fiberoptic probe), an emission monochromator or spectrograph, and a detector complete the system. A reference channel is also recommended to compensate for source fluctuations. Consider the following for fluorescence measurement systems:

- Most fluorescence measurements can be accomplished with short-focal-length monochromators for both excitation selection and emission measurements.
- Double monochromators can be used to significantly reduce stray light in cases where the emission is very close to the excitation and is extremely weak.
- Excitation at wavelengths longer than 400 nm usually requires a filter wheel between the source and the sample to avoid fluorescence from second-order passage of shorter wavelengths.
- A photomultiplier tube using photon counting or a back-illuminated CCD is highly recommended.

Raman Spectroscopy

Raman spectroscopy has changed greatly with the introduction of CCDs, diode lasers, and holographic notch filters. Good quality, analytical-level spectra can be collected with spectrometers such as the Acton Research SpectraPro 300i or SpectraPro 500i. Most Raman systems today employ CCD detectors. Additional guidelines for Raman Spectroscopy include:

- To avoid fluorescence, use diode lasers above 700 nm. An Nd:YAG laser at 1064 nm can be used with our cooled InGaAs detector for applications where fluorescence in the red is still a problem.
- A Raman notch filter for the specific wavelength employed is normally required when using single monochromators to reduce stray light from the laser.
- A shutter is usually incorporated to eliminate potential damage to the detector from laser scatter.
- Our Acton Research SpectruMM™ for Raman package includes a full-filtered fiberoptic Raman probe and a compact sample chamber for liquid and solid samples. Ask for our brochure.



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Spectrometers

Acton Research SpectraPro 150:

The SpectraPro 150 is ideal for illumination applications where a bandpass of 0.4 nm to 1 nm or larger is sufficient. It is an excellent choice for characterizing light-emitting diodes, and can effectively be used as either the excitation or emission monochromator for most fluorescence applications.

Acton Research SpectraPro 300i:

The SpectraPro 300i can be configured for use as both a spectrograph and scanning monochromator. Its fast f/4 optical system and longer focal length can greatly increase the sensitivity in fluorescence and other weak-phenomena measurements. Due to its superior imaging characteristics and subnanometer resolution, the SpectraPro 300i is an excellent choice when working with tunable lasers. It offers better than 5-cm⁻¹ resolution when used with a green or longer wavelength laser for Raman spectroscopy, and its dual exit slits and motorized diverter mirror make it possible to collect extended measurements in source-characterization and reflectance applications.

Acton Research SpectraPro 500i:

The SpectraPro 500i is a high-resolution, research-grade monochromator and spectrograph. It is ideal for characterization of lasers and it has sufficient resolution for most atomic-emission applications. It also affords higher resolution and stray-light rejection than the SpectraPro 300i for Raman applications. Its two entrance and exit ports allow the researcher to configure multiple experiments that can then be automatically activated from Acton Research SpectraSense™ software.

Acton Research SpectraPro 750:

The SpectraPro 750 is designed for the researcher who requires the highest spectral resolution. Applications include atomic-emission measurements, photoluminescence, Raman, and laser characterization.

Other Spectrometers:

Roper Scientific/Acton Research manufactures a complete selection of scanning monochromators (up to 2-m focal length), imaging spectrographs for CCD applications, precision double monochromators, and vacuum monochromators for applications below 200 nm.

Complete Measurement Systems:

Complete measurement systems are available, featuring precision monochromators, light sources, sample chambers, detector electronics, and data-acquisition software. Contact us today to discuss your measurement requirements.

Accessories

Filter Wheel

A filter wheel equipped with order-sorting filters is recommended for all illumination applications involving broadband light sources, including absorption, transmission, reflectance, and fluorescence above 400 nm. A filter wheel may also be useful for inserting neutral density filters for attenuation in laser and other bright, monochromatic source characterization.

Source-Compensation Accessory

The source-compensation accessory is highly recommended for all quantitative absorption, transmission, reflection, and fluorescence measurements. It increases measurement stability and reproducibility, and allows for real-time %T and A.U. values to be calculated with SpectraSense software.

Sample Chamber

The basic sample chamber can be configured to hold solid samples and 10-mm cuvettes. It can be used for reflectance, absorbance, transmittance, basic fluorescence, and Raman measurements. Accessory or optional lenses may be required under certain conditions.

Optical Shutter

A shutter should be included in any system where there is a potential to damage the detector with high light levels. It is recommended for all system configurations employing PMTs and intense sources, as with Raman and fluorescence applications. A shutter is also required for most CCD-based applications.

Detectors

Silicon Detectors: Silicon detectors work best in high-to-medium light levels (400 to 1100 nm). Use silicon detectors for VIS and VIS-NIR absorption/transmission, reflection, and most source-characterization applications.

Photomultiplier Tubes (PMTs): Most PMTs work in the range of 190 to 700 nm. Use PMTs for most UV-absorption and low-level-emission applications. Check the characteristics of the specific tube before ordering.

Photon-Counting Systems: Photon-counting systems are used in extremely low-light applications such as Raman, some fluorescence, and photoluminescence. Photon counting uses high-grade PMTs and an amplifier/discriminator circuit.

IR Detectors: A wide range of IR detectors are available, including:

- InGaAs (800 to 1700 nm)
- PbS (1000 to 2900 nm)
- InSb (1500 to 5000 nm)
- HgCdTe (2000 to 12,000 nm)

CCD detection system: A full range of Acton Research SpectruMM™ CCD Systems are described in our Complete Spectroscopic Acquisition Systems brochure and data sheets. These detectors are extremely sensitive and are vital when the measurement must be made quickly.

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530 Main Street Acton, MA 01720 • tel: 978.263.3584 • fax: 978.263.5086 • email: mail@acton-research.com

For the latest product and technical information visit us at www.roperscientific.com

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Product Literature

Data sheets

Brochures

SpectraPro monochromators

Spectrum Acquisition Systems

Spectroscopy accessories

Guide to system configuration



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Gratings

CCD Chips

GS 1024 x 128 Front

GS 1024 x 128 Back

GS 1024 x 256 Front

GS 1024 x 256 Back

S 1340 x 100 Front

S 1340 x 100 Back

S 1340 x 100 Red

S 1340 x 100 Back Red

S 1340 x 400 Front

S 1340 x 400 Back

S 1340 x 400 Red

S 1340 x 400 Back Red

S 1024 x 256 Front

S 1024 x 256 Open Elect.

S 1024 x 256 Back