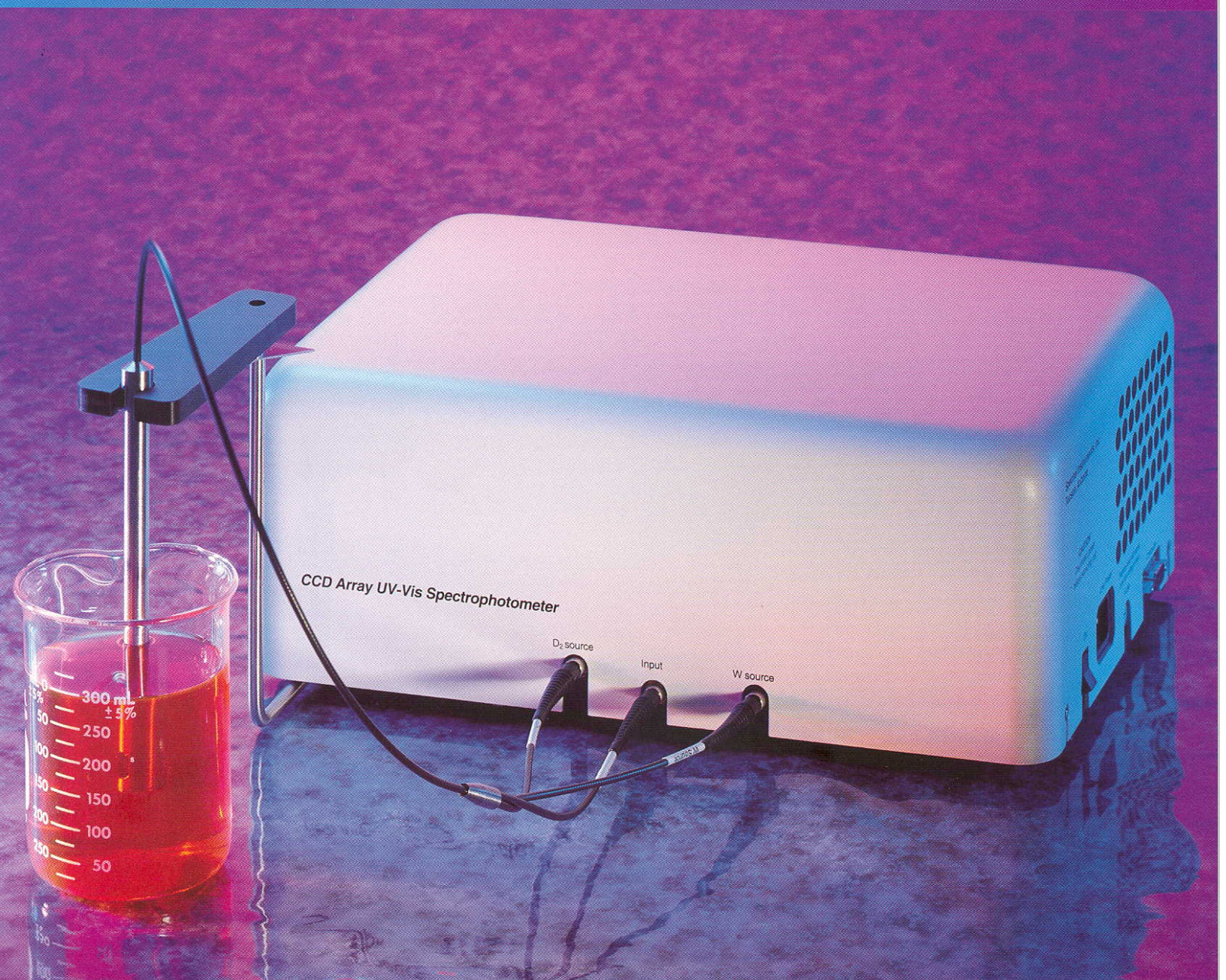
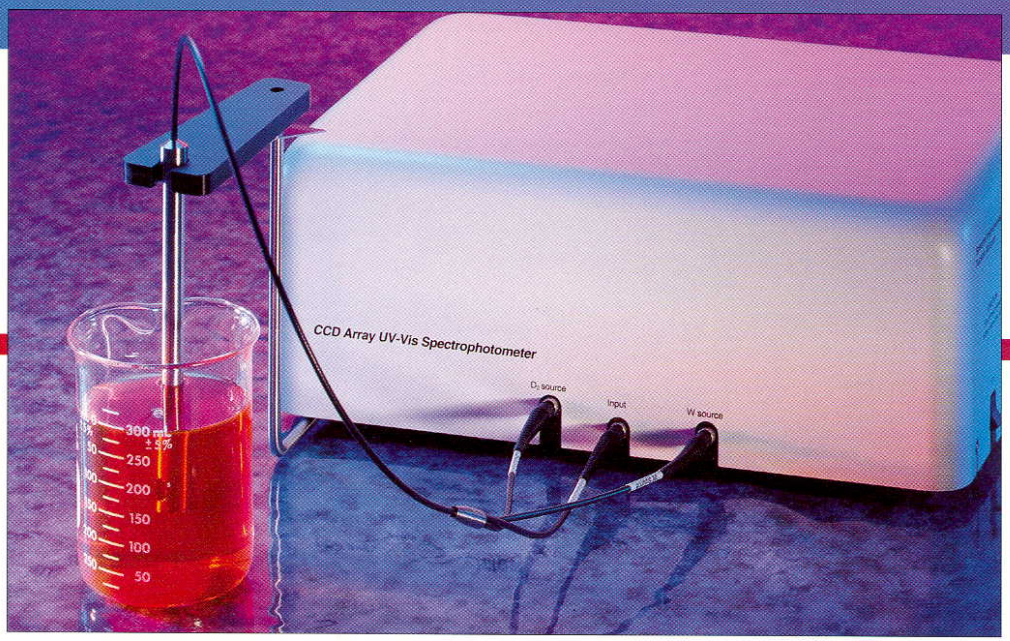
Fiber Optic CCD Array

UV-Vis Spectrophotometer



Fiber Optic CCD Array UV-Vis



It's Revolutionary!

The 400 Series Spectrophotometer is truly a revolutionary approach to UV-VIS instrumentation. The latest electro-optical technologies are incorporated into a radically new design, resulting in features and performance unprecedented in a laboratory grade spectrophotometer.

Features:

- **CCD array detection**
- **Fiber optic sampling**
- **190-980 nm range with 1 nm bandwidth**
- **LabVIEW®-based software**

Applications:

- **General analytical laboratory**
- **Teaching laboratory**
- **Color analysis**
- **Remote monitoring**
- **In-situ sampling**
- **Spectroradiometry**

CCD Array Detection

A charge coupled device (CCD) array detector provides the ability to acquire a full spectrum in the time it takes a scanning unit to sample a single wavelength. This detector exhibits high quantum efficiency – and readout noise which is 100X lower than conventional photodiode array detectors. This high sensitivity, coupled with an efficient spectrometer design, means that far less light is necessary for accurate absorption measurements, which in turn results in a lower potential for sample heating and photo-oxidation.

The 400 Series instruments have all of the benefits of array detection including no moving parts, extremely high wavelength stability and reproducibility, as well as rapid spectral acquisition. All 400 series models feature a spectral bandwidth of less than 1.2 nm.

Fiber Optic Sampling

The 400 Series optical system is designed specifically for use with fiber optic sampling. This means that the simplicity and flexibility of using fiber optic probes is inherent in the instrument rather than a feature available only through the addition of an expensive attachment. In addition, types of fiber optic sampling accessories that are inherently inefficient, such as reflectance probes, are now practical to use.

The wide range of available fiber optic sampling attachments makes the instrument ideal for routine laboratory use, optical spectroradiometry, color measurement and for situations that present special sampling challenges such as within glove boxes, batch processing and under fume hoods. Fiber optic probes can be extended in length up to several meters for the UV and kilometers in the visible region for situations requiring remote sampling such as continuous environmental or process monitoring.

Intelligent Electronics

The 400 Series instruments use the latest digital signal processor (DSP) technology which intelligently acquires data, eliminating the need for the operator to adjust measuring parameters.. The system automatically adjusts the detector integration time according to the optical density of the sample. The total time to acquire and display a full spectrum is 2 to 4 seconds for the 410/420 models, and under a half second for a full 190 to 980nm spectrum on the 430/440 models. All of this performance is housed in one of the smallest, most compact laboratory grade spectrophotometers available.

Performance

The 400 series instruments are meant for demanding laboratory applications. They have a quality holographic grating and precision optics for low stray light resulting in a 3.2 AU range. The wavelength range is 190 to 980 nm with 1.1 nm bandwidth using a single spectrometer. Temperature controlled optics are employed for better than .005 AU/hour stability even with normal room temperature fluctuations.

Cost

The new technologies employed in the 400 Series instruments allow it to be priced competitively with manual and scanning UV/Vis spectrophotometers and well below photodiode array spectrophotometers while still employing advanced fiber optic sampling.

SPECTROPHOTOMETER

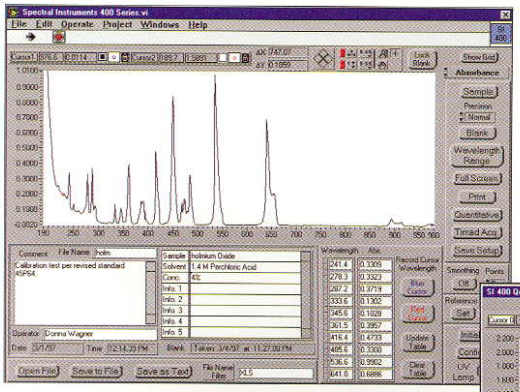
It Delivers Unprecedented Performance...

Friendly and Powerful Software

The 400 Series instruments are designed for an easy interface to PC and Macintosh computers. The interface is performed over standard RS-232 serial data link, thus no additional computer hardware is required in most cases. The instruments have complete, powerful, and sophisticated software for analysis, with a highly intuitive graphical interface that is advanced, yet simple to use for both the experienced and students alike.

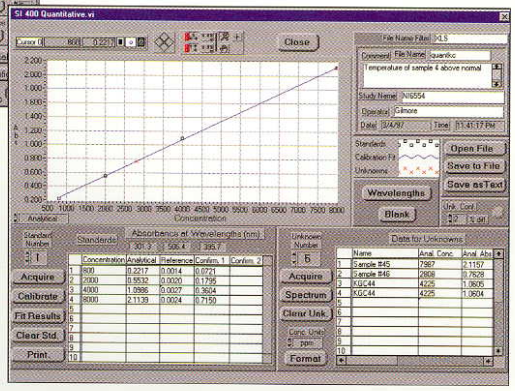
The SI400 applications use the "virtual instrument" concept in which the traditional knobs, dials, and indicators of an instrument are replaced with their virtual equivalent displayed on the computer screen. Control of the instrument is accomplished using a mouse and/or keyboard.

Software customization can easily be accomplished by Spectral Instruments, or by the user with the addition of National Instruments' LabVIEW programming system.



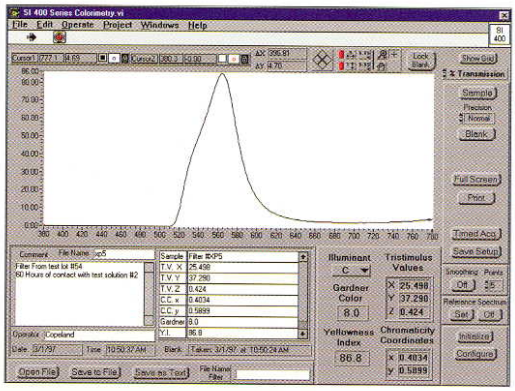
The SI400 general analysis software includes separate front panels optimized for general spectral acquisition, quantitative and kinetics work.

The main front panel *(left)* is used for system setup and general spectral acquisition. Most operations, such as acquiring blank and sample spectra, and saving and retrieving data files, require only pointing and clicking the mouse.

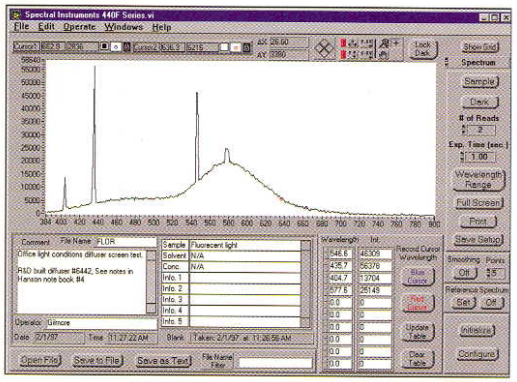


The quantitative front panel *(right)* is used to acquire and analyze data for quantitation of unknown samples based on known standards. Beer's law plots are generated and known concentrations computed using a statistical best fit to the data.

The SI400 Color software provides CIE tristimulus values at all common illuminates *(below)*. Color numbers are available in many industry specific values such as Gardner, yellowness index and chromaticity. Custom industry specific color values can easily added to the application. Remote fiber optic sampling options including ATR probes, filter holders, dip probes, reflectance probes and integrating spheres allow measurements on liquids, filters, powders and solid objects.



The SI400 Spectroradiometry software provides capture and display of spectra to analyze lamps, LEDs, luminescent materials and displays *(below)*. Absolute radiometry is performed using a calibrated light source as reference. Relative radiometry can be performed using any arbitrary reference.

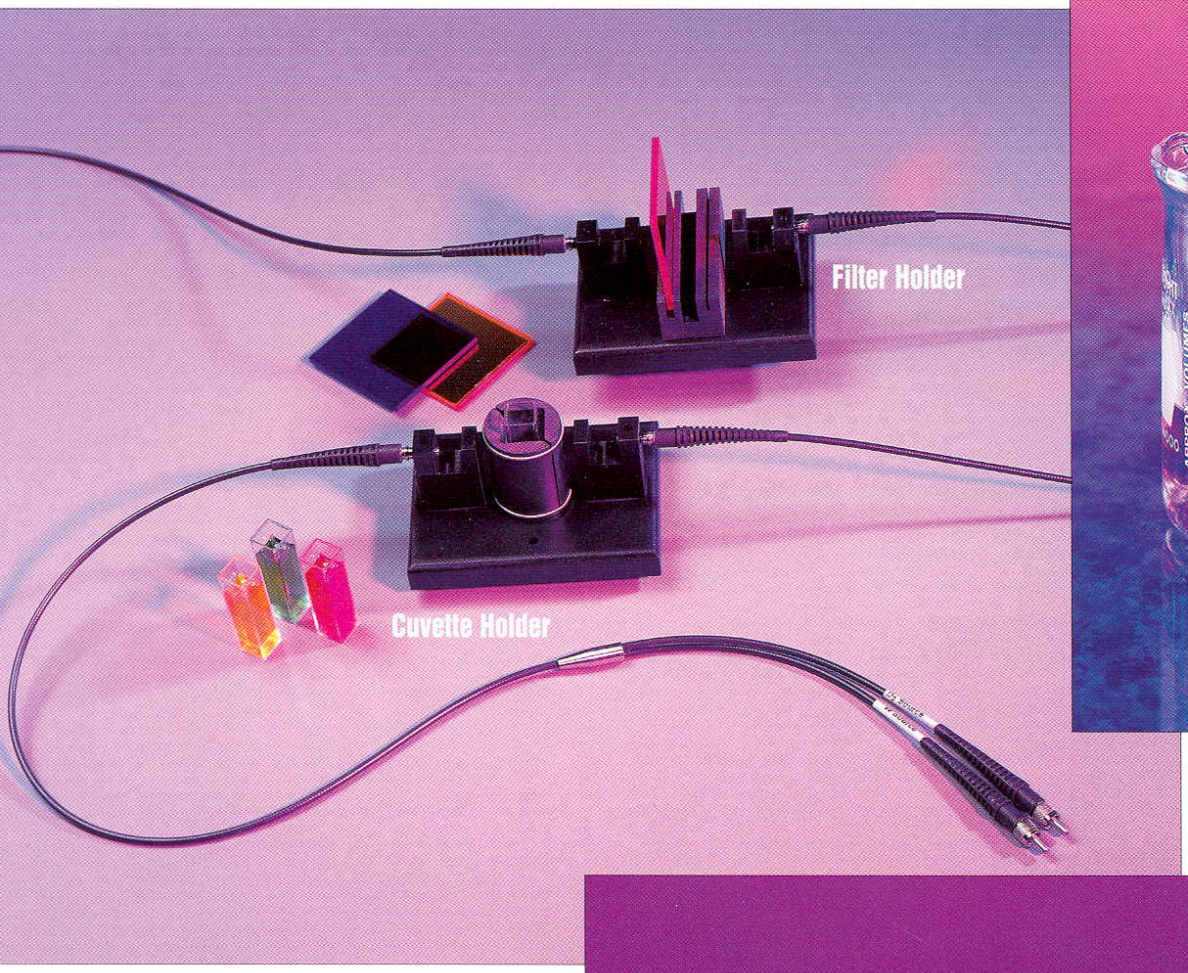


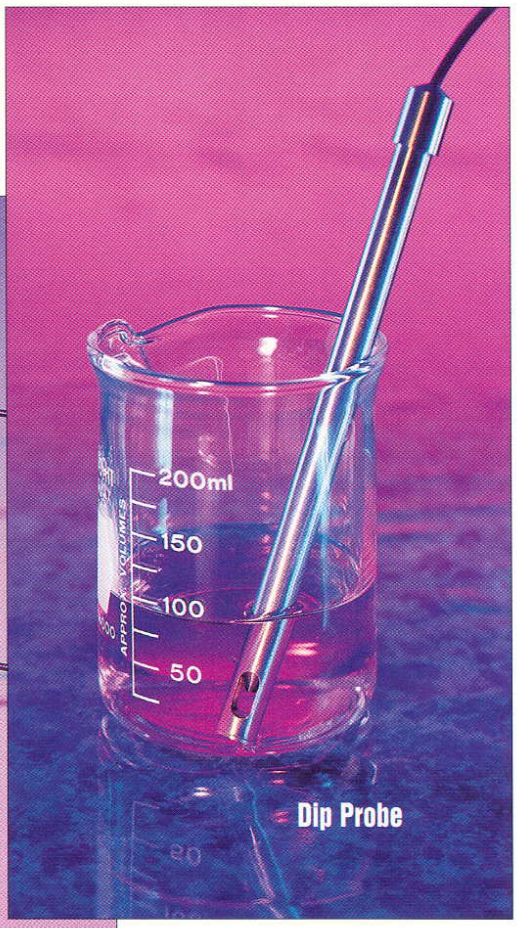
Photonics

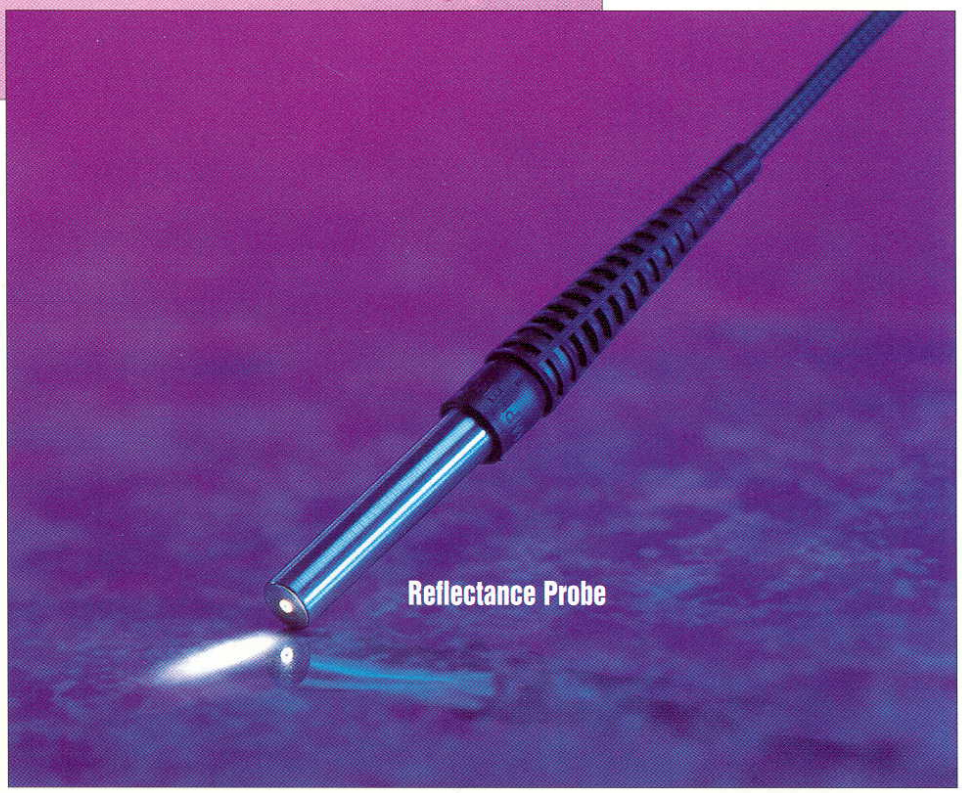
High Performance CCD Spectrophotometers

Accessories

A wide range of accessories are available for the 400 Series instruments. Remote fiber optic sampling options including cuvette holder, dip probe, ATR probe, filter holder, reflectance probe and integrating sphere reflectance probe – allowing measurements on liquids, gases, powders and solid objects.







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