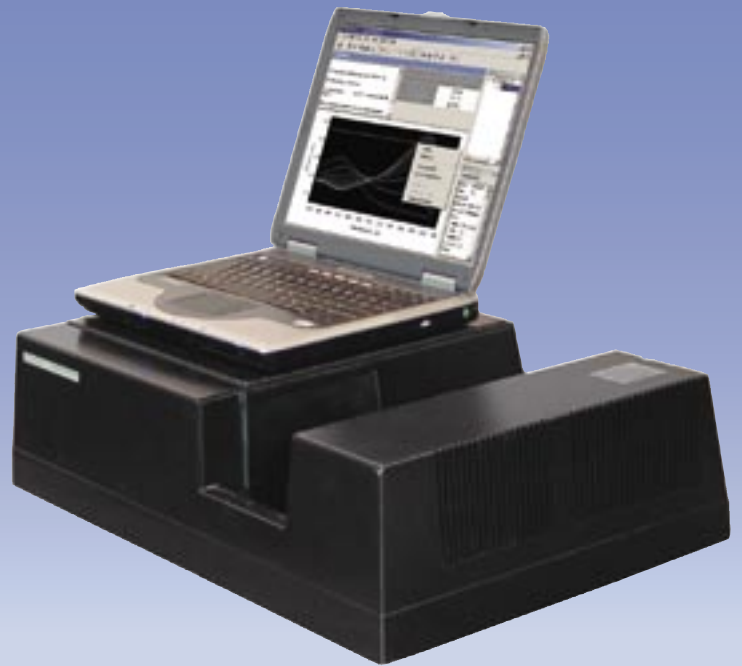


The Olis[®] HP 8452 Diode Array



A Comprehensive Upgrade to a Trusted Spectrometer.

Sometimes, products come along that just keep working. The solid-state HP 8452 is one such instrument. This diode array by Hewlett-Packard remains a perfectly reliable spectrometer, years after it was introduced. But, like all instruments which are more than a few years old, the 8452 has obsolete computer control.

Olis, Inc. offers a Windows XP Professional software package that can run on a tower or laptop PC. This Olis SpectralWorks software package has a modern emphasis on multiple wavelength data acquisition and data analysis. The HP 8452 collects scans. And with our software, its collection rate nearly doubles to ten scans per second. The display of scans is now practically instantaneous: today's Olis software

plots 100 scans on the screen in 10 seconds! Data handling – from extracting fixed wavelength kinetic traces to fitting the 3D files to poly-exponential equations – is easy, fast, and effective.

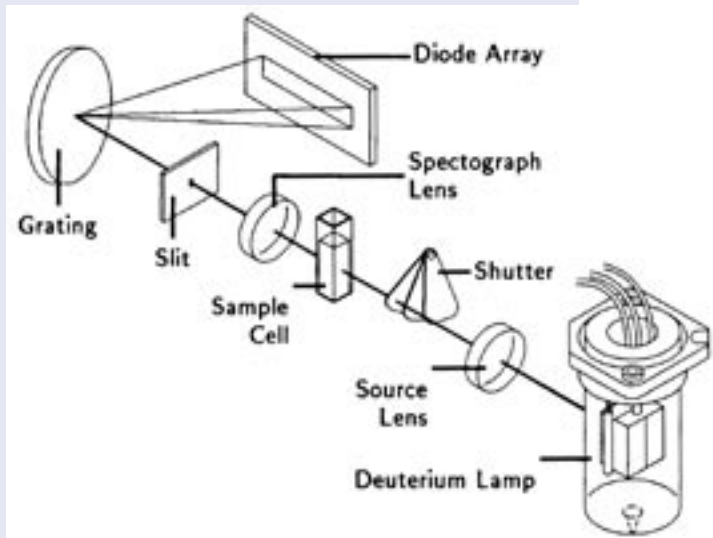
Nearly all original HP accessories are supported. And, many modern accessories for temperature ramping, multiple sample handling, automatic titration, and even stopped-flow mixing can be added.

Stay with a perfectly reliable spectrometer, either yours or ours¹. In addition to bringing its computer hardware and software technology into the most modern era, we offer upgrade services such as new shutters, lamps, and cosmetic improvement. Make a trusted instrument better for less than half the cost of all-new.

¹ We offer comprehensive upgrades to the 8452s in your laboratory, and we offer complete workstations using HP 8452s we have in our storehouse.

Important Features of the HP 8452 Diode Array:

HP 8452 Optical Diagram



- Single, collimated (parallel) beam that allows flexibility in the selection of cuvettes and accessories.
- Diode array detector allows simultaneous access to all wavelength information.
- Low-noise lamp with low power requirements.
- Low radio frequency interference (RFI) and high electrostatic discharge immunity.

Technical Specifications for the HP 8452A

Wavelength Range	190 to 820 nm
Wavelength Accuracy	$< \pm 2$ nm
Wavelength Reproducibility	± 0.05 nm (typical with constant conditions)
Spectral Bandwidth	2 nm
Stray Light	at 200 nm = $< 0.05\%$ at 340 nm = $< 0.05\%$
Photometric Range	0.0022 - 3.3 Å; 0.5 second measurements at 350 nm
Photometric Accuracy	± 0.005 Å; at 1 Å, 440 nm, NIST 930e
Photometric Noise	< 0.0002 Å RMS; at 0 Å, 500 nm, sixty 0.5-second scans
Photometric Stability	< 0.001 Å/hr; (at 0 Å, constant ambient conditions, after 1 hour warm up): measured over 60 second period, every 5 seconds
Baseline Flatness	< 0.001 Å RMS; 0.5 second blank followed by 0.5 second scan
Shortest Scan Time	0.1 seconds; full range
Rapid Scan Mode	10 scans per second; 70 nm range
Power Requirements	Line Voltage: 80-132 or 170-264 V; AC Line Frequency: 47-66 Hz
Dimensions	L: 23.8 in; W: 16.7 in; H: 7.3 in
Weight	33.2 lbs.
Environmental Conditions	Operating Temp.: 0-40 °C Non-operating Temp: -40 – 65 °C

Changes to the HP 8452

Adding the Olis SpectralWorks¹ Control

The Olis SpectralWorks software communicates with the Olis HP 8452 through a USB port or an IEEE card. The USB option allows use of the laptop computer or tower; the IEEE choice is only compatible with the tower PC.

Hardware Improvements Made by Olis

Thorough internal and external cleaning of the diode array is followed by a fresh coat of stain-resistant black paint, the installation of a new deuterium lamp, and the replacement of the shutter assembly inside the diode array. The shutter is the only moving part in the instrument and the most common source of technical issues. Replacing the shutter assembly extends the life of the diode array for years.

These hardware improvements are made to all instruments sold by Olis, Inc. as complete workstations.

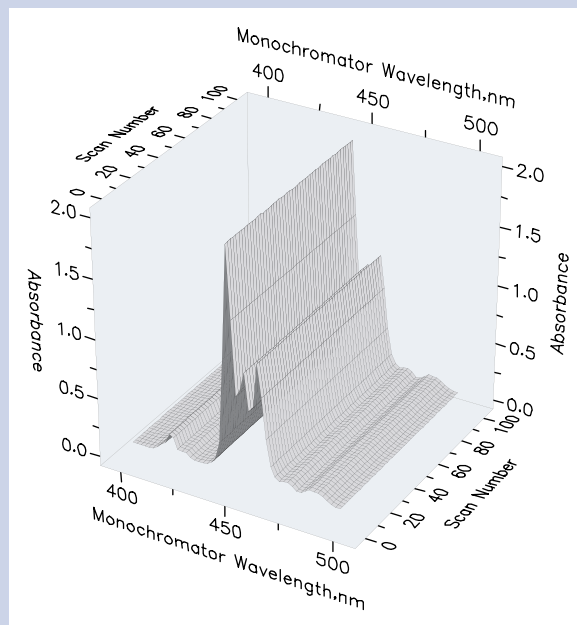
They are available for your instrument, too, as optional refurbishments.

Data Acquisition Improvements Made by Olis Enhancements:

The data acquisition rate of the Olis computerized HP 8452 is now 10 scans per second rather than the original 6 scans per second. In addition, our graphical presentation of the data is instantaneous, making it practical to collect and view tens or even hundreds of scans. Shown are 100 scans collected in 108.3 seconds with the Olis SpectralWorks program.



USB Adapter



¹ No effort was made to replicate the original HP software. Instead the Olis SpectralWorks developed for the Olis rapid scanning spectrophotometer has been customized to control the diode array and its accessories. You will have the same clear, fast, and powerful software to use on your \$10K diode array as other Olis clients enjoy on their ten-fold more expensive Olis rapid-scanning spectrophotometers!

Cell Holders for the Olis Diode Array

While many HP 8452 diode array come with a standard 1 cm² rectangular cell holder, there are many different options of cell holders, a few of the most popular are pictured.

The Olis QNW Peltier Cuvette Holder

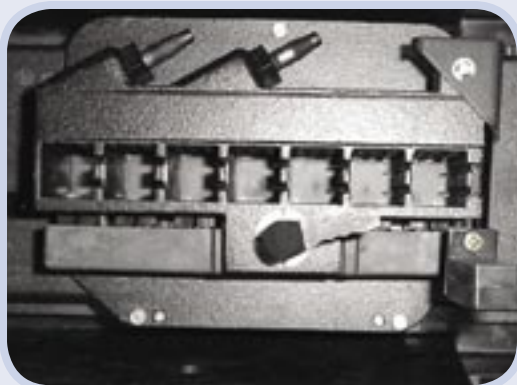
Single 1 cm² cuvette holder has built-in stirring and a temperature range of -55 to + 105° C, with $\pm 0.02^\circ$ C precision. This cell holder with built-in temperature regulator is exceedingly fast (i.e., 5-85° C in under 5 minutes) and just as remarkably, the conductivity is so good that the sample lags only by a little. Thermoelectric device includes the heat exchange unit, a very small closed cycle cooling box.



QNW Peltier Cell Holder



Single Cuvette Holder



Multi-Cell Transport

Water-Jacketed Single Rectangular Cuvette Holder

May be used in conjunction with a manual (analog) or computer-controlled (digital) water bath. The temperature range is determined by the chosen water bath. When the water bath comes from Olis, it will be compact model by Julabo with a temperature range of -26 to 200° C.

HP Water-Jacketed Seven Position Holder

The multi-cell transport can be computer controlled through the Olis SpectralWorks software for the measurement of multiple samples during an experiment. Temperature regulation of the samples is achieved by the addition of an analog (manual) or digital (computer-controllable) water bath, we support the Julabo F30 with a temperature range of -26 to 200° C.

Additional Non-Standard Accessories

Olis Diode Array with Titrator

The Olis titrator is a two, three, or four syringe device for mixing user specified volumes of protein and titrant, enzyme and inhibitor, etc., for fully automated introduction of freshly mixed solutions into the measuring cuvette. The solutions can be degassed for anaerobic work or they can be temperature regulated for thermal studies. To minimize photolysis effects, the solutions can be kept in the dark other than during data acquisition. And no magnetic stirring is required for homogenous sample preparation, so that all pathlength cuvettes are suitable.

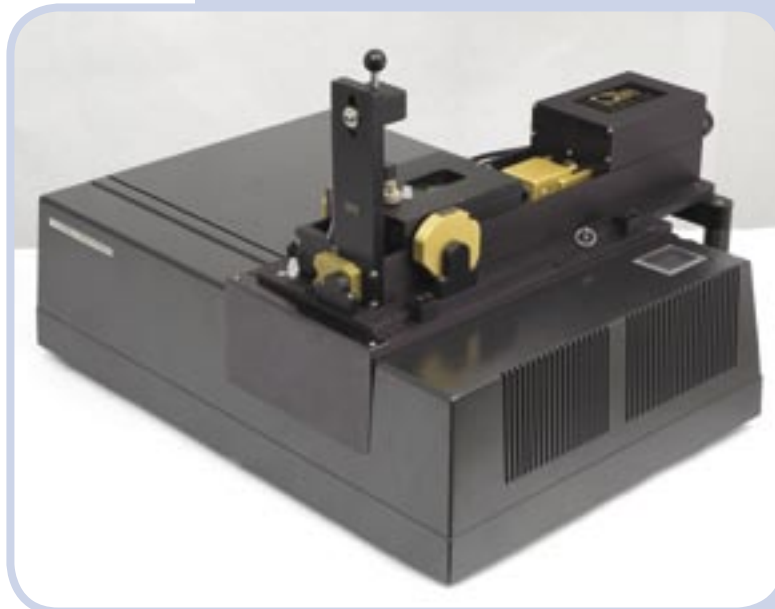
- Use for automated preparation of two, three, or four solutions.
- Standard syringe volumes are 2.5 mL, with 0.5, 1, 5, and 10 mL also available.
- Automate simple protein denaturant titration or complex enzyme, substrate, inhibitor, and buffer mixtures with our titration accessories, both two and four syringe versions.



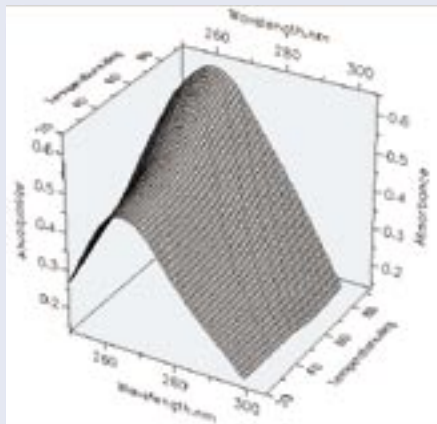
Diode Array with USA Stopped-Flow

Mount an Olis USA stopped-flow mixing unit to add millisecond mixing to the Olis modernized HP diode array. Olis stopped-flows have ceramic valves, rendering them impervious to temperature extremes, corrosives, and gas exchange. Also unique to Olis stopped-flows is a safety interlock system which prevents misfiring of the stopped-flow, ensuring against loss of sample and damage to the hardware or operator.

While the HP 8452 supports acquisition of only 10 scans per second, this is sufficient for modestly fast kinetics.



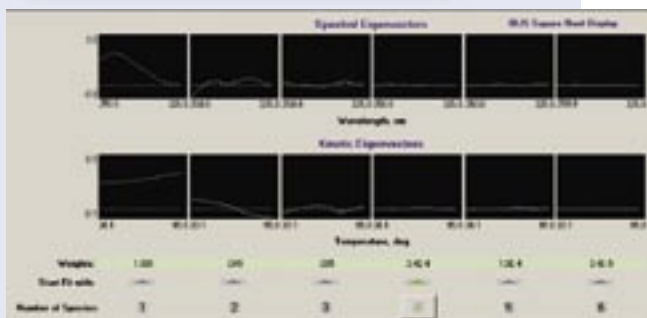
Modern Data Fitting of Multiple Wavelength Data



An exceptionally complex case is shown here. Often, simple models are sufficient for correct and complete fits to single and multi wavelength data acquired by the HP 8452 diode array as it follows steady- state, equilibrium, and kinetic processes.

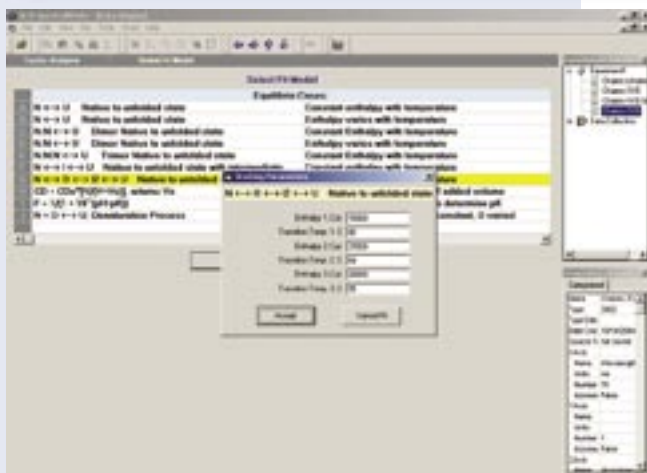
Step 1

Using data acquired during one experiment¹, in which an Olis Peltier cell holder in an HP 8452 was controlled by Olis SpectralWorks™ software, these 76 scans will be fitted to find the melting temperature, the starting and final species, and two intermediate states.



Step 2

Multiple wavelength analysis begins with singular value decomposition (SVD), which separates kinetically distinct species from static nonspectral data (i.e. noise). In their data, four species are found, with the fourth spectral contribution being exceedingly small.

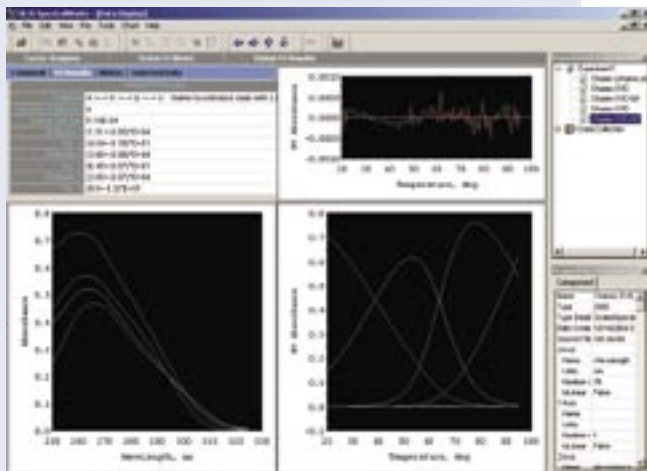


Step 3

Knowing that four species are present in the raw data, a $N \leftrightarrow U$ case is chosen with two spectral intermediate states, e.g. $N \leftrightarrow 1_1 \leftrightarrow 1_2 \leftrightarrow U$.

Step 4

Results returned for evaluation include spectral shapes, kinetic traces, rate constants, statistical information and, most importantly, residuals (plot in upper right panel).



¹ Experiment conducted in Prof J. Brad Chaires laboratory, University of Louisville

Modern Data Fitting of Single Scans and Fixed Wavelength Data

In addition to 70 mechanisms for multiwavelength data, the Olis SpectralWorks program includes all commonly required data processing routines for single spectral scans and fixed wavelength kinetic traces. Shown here is a Peak Finder Routine. The pull-down menu lists processes to apply to individual scans; other fits are available for kinetic traces.

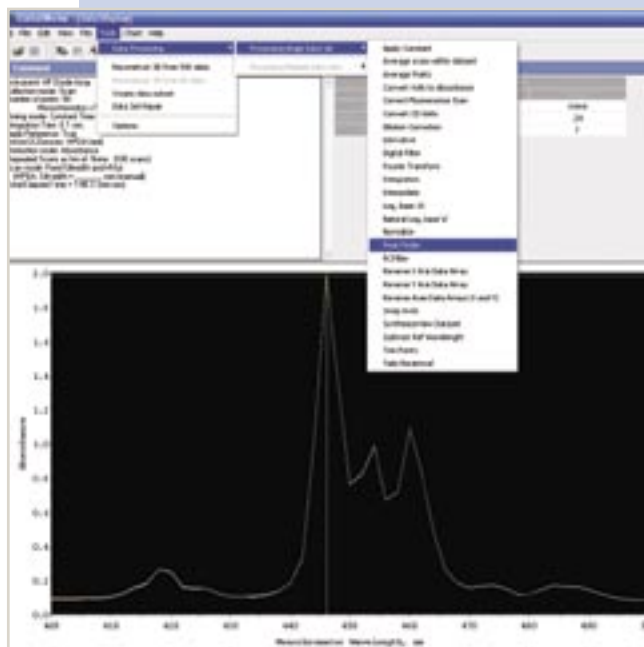
The Peak Finder data process determines the location of peaks along a spectra by averaging the slope in given point counts and determining when that slope shifts from positive to negative.

Step 1

Start by selecting your dataset.

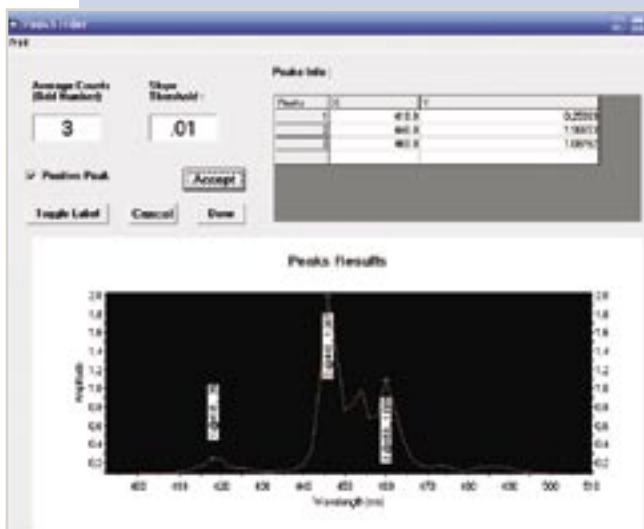
Step 2

Select Peak Finder from the Data Process Menu



Step 3

Accept default values or customize the average counts and the slope threshold to get instant results.



Modernize your Trusted HP 8452 Diode Array from Old to Olis!



For more information on this and other Olis products:

Visit www.olisweb.com

Write sales@olisweb.com

Call **1-800-852-3504** in the US & Canada
1-706-353-6547 worldwide