



CINTRA



UV-Visible
Spectrophotometers



The Cintra series from GBC... the state-of-the-art in UV-Visible spectrometry

Demanding applications or routine analysis

The Cintra is the new generation of high performance UV-Visible spectrometers from GBC Scientific Equipment. These true double beam spectrometers have been designed to provide the performance and versatility required for the diverse range of applications in today's modern laboratory.

Choose an instrument to meet your requirements

Cintra offers a series of instruments that can be matched to the analytical requirements of your laboratory. Whether your needs are for simple routine tasks or fully automated unattended analysis, a Cintra spectrometer, complemented by a complete range of accessories, can be tailored to meet your requirements.

Cintra 10e

Extended wavelength range 190 to 1,200 nm

The new Cintra 10e extends analytical capabilities with a wavelength range of 190 to 1,200 nm. With its fast slew speed of up to 7,000 nm/min, this versatile instrument can now be used for an even wider range of applications. A narrower slit width reduces the bandpass to 1.5 nm providing enhanced resolution, exceeding the requirements of the GMP power resolution test, making the Cintra 10e a cost effective solution for many pharmaceutical applications.

As a budget model, the Cintra 10e is easily the most powerful UV-Vis spectrometer in its class, providing analytical capabilities normally found in more expensive instruments. The combination of high quality optics, extended wavelength range, powerful Spectral software and a wide range of sampling options provides the flexibility and power for most analytical requirements at an unbeatable price.

Cintra 20

The Cintra 20 provides additional flexibility with adjustable bandpass for optimising sensitivity/resolution, and has new improved specifications for Stray Light and also for Photometric Noise, Drift and Linearity. The Cintra 20 is a popular choice for laboratories requiring more versatility for a wider range of applications.

Cintra 40

The Cintra 40 double monochromator UV-Vis spectrometer offers the ultimate in resolution and sensitivity. Using a photomultiplier tube detector, and spectral bandpass adjustable between 0.1 and 2.0 nm, photometric linearity is better than 1% at 4.0 absorbance. The wide dynamic range places the Cintra 40 at the high performance end of the UV-Vis spectrometer market, suitable for the most demanding analytical situations.



High performance features of the Cintra series

While each of the models in the Cintra series can be tailored to your analytical requirements, they share a wide range of outstanding features:

- True double beam optics for excellent long term stability, guaranteeing accurate, precise results.
- Innovative optical design which ensures uncompromised results, even from μL volumes.
- The fastest scan speed of any spectrometer in the world (7,000 nm/minute), for increased productivity.
- Satisfies all the performance criteria of a range of regulatory bodies, including the pharmacopoeias.
- Fully modular drop-in accessories for quick and easy configuration of the system.
- Powerful, fully integrated Windows® based software. A full suite of applications is contained in a single package, with common access to high powered data collection, manipulation and reporting facilities.



THE GBC VISION

GBC Scientific Equipment will advance people's knowledge and their capacity to enhance the quality of life for all humankind.

Optical systems you can rely on

High performance optical systems

The optical design is the heart of any spectrometer, and at GBC we have a long history of quality optical systems. The Cintra series provides unmatched optical performance. High-efficiency all-reflective optics with a minimal optical component count ensures maximum light throughput, utilising a monochromator designed for maximum efficiency at all wavelengths.

Unparalleled optical stability

The Cintra family of instruments all have true double beam optics with a single detector providing excellent long-term stability. This ensures your confidence in the reliability of your results, and also saves time as there is no need to continually re-define baselines or re-zero the instrument.

Increased productivity with the world's fastest scanning instrument

Advanced design features allow distortion-free spectra at scan speeds of up to 7,000 nm/minute, reducing the time to scan a wavelength range by a factor of two when compared to other conventional scanning instruments. Not only does the rapid scan speed ensure increased productivity for your laboratory but also allows the measurement of rapidly changing systems often encountered in kinetics applications.

Guaranteed reproducible optical performance

Precise, reproducible optical performance is achieved day after day, with no operator effort, through a fully automated instrument set-up. Every time the instrument is powered-up, wavelength is calibrated and the source mirror optimised. Source changeover occurs automatically at an operator-set wavelength.

High performance by superior optical design

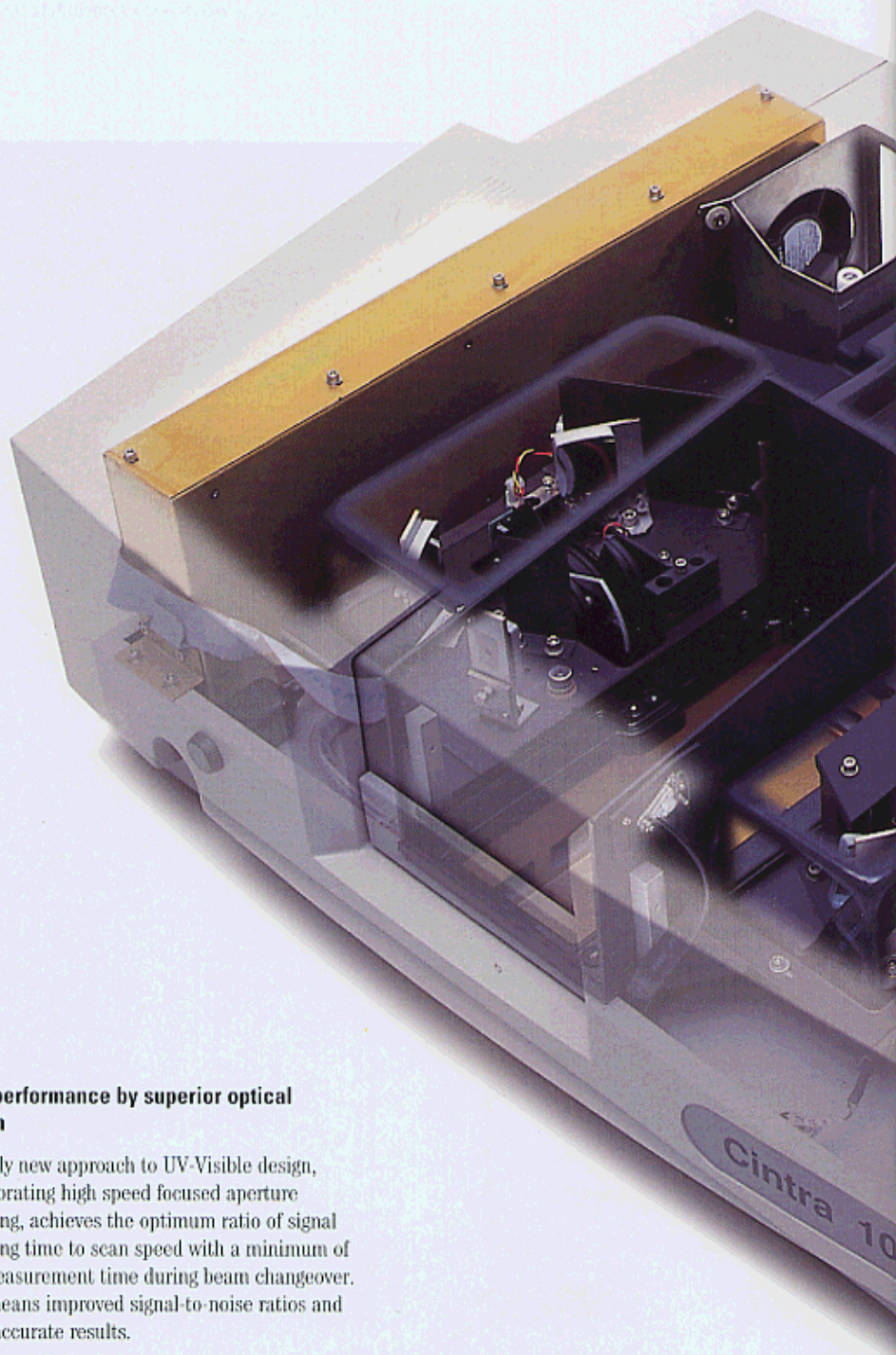
A totally new approach to UV-Visible design, incorporating high speed focused aperture chopping, achieves the optimum ratio of signal sampling time to scan speed with a minimum of lost measurement time during beam changeover. This means improved signal-to-noise ratios and more accurate results.

Stable analytical signal

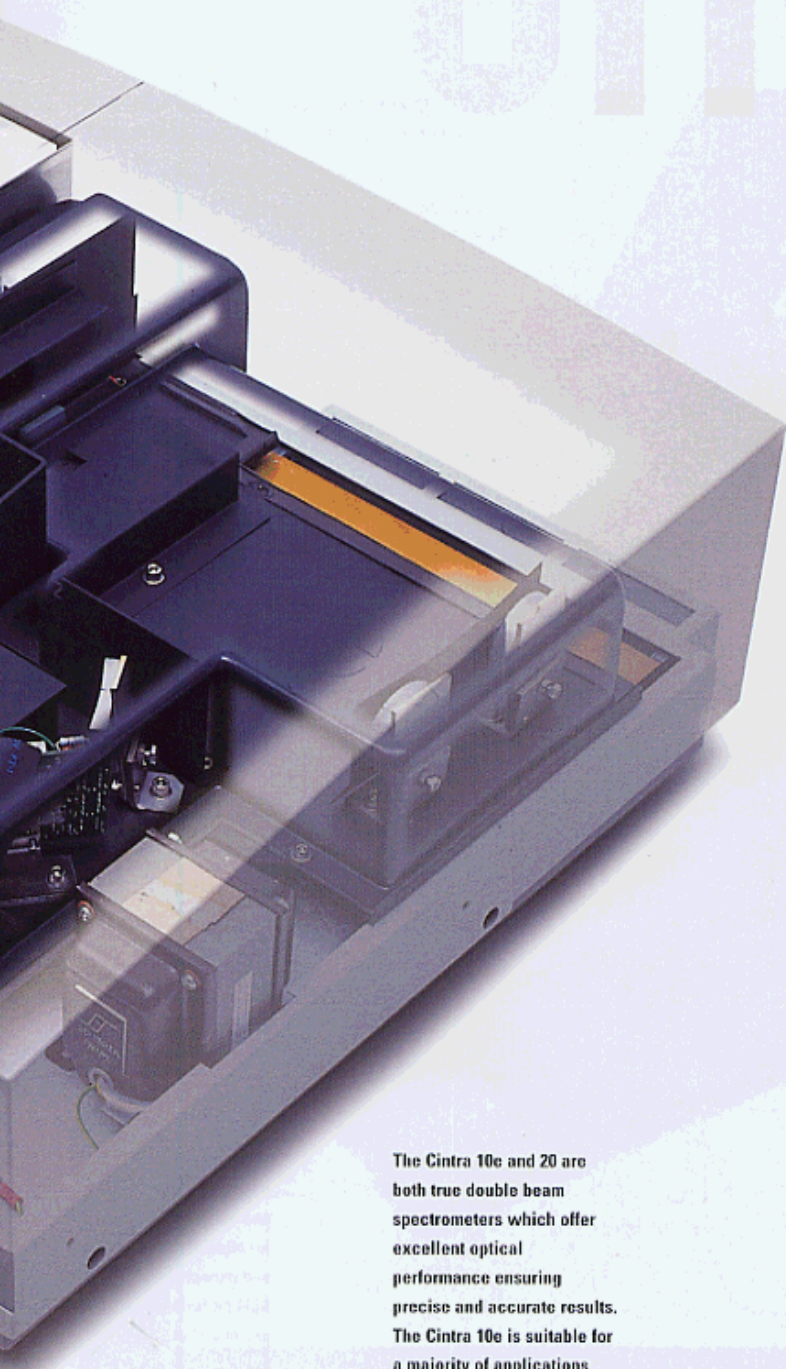
The unique design of the chopper system in the Cintra series automatically corrects for any beam movement caused by slight eccentricities in chopper wheel rotation, ensuring an extremely stable system.

Improved linearity

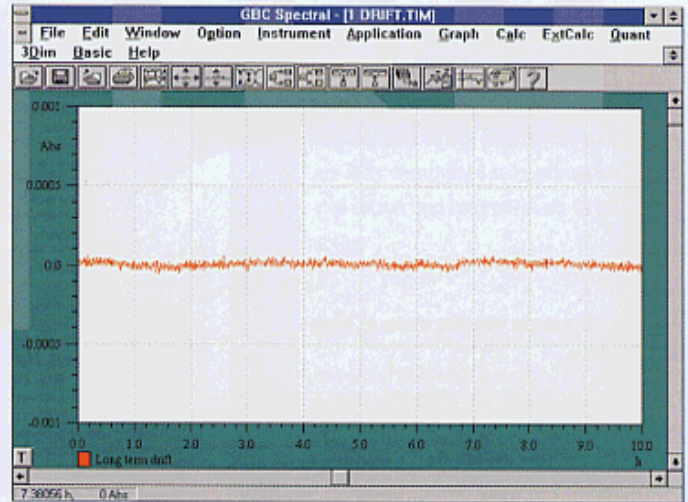
By measuring and correcting for detector dark current twice in every chopper revolution, errors due to dark current drift have been eliminated, improving measurement stability and linearity.



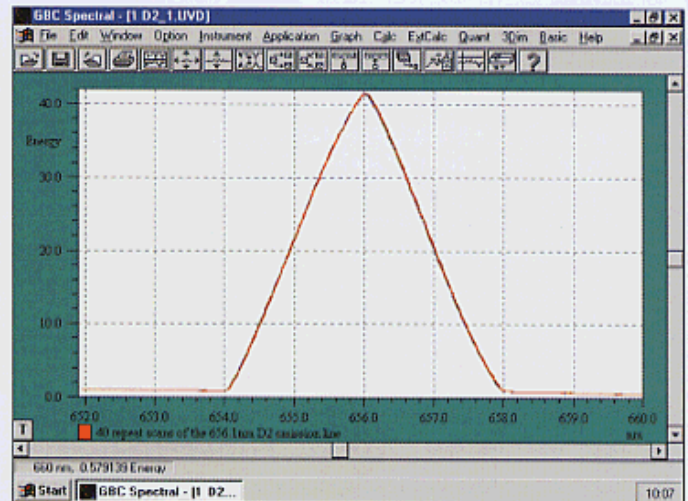
Outstanding wavelength stability,
accuracy and reproducibility



The Cintra 10e and 20 are both true double beam spectrometers which offer excellent optical performance ensuring precise and accurate results. The Cintra 10e is suitable for a majority of applications with a fixed 1.5 nm slit width, while the Cintra 20 offers greater flexibility in resolution with a variable slit width from 0.2 to 5 nm.



The impressive long term stability at 340 nm over 10 hours illustrates the drift-free optics of the Cintra series of instruments.



Forty overlaid measurements of the deuterium light source demonstrate the outstanding wavelength accuracy and reproducibility of the Cintra series.



The rapid chopper-synchronized wavelength drive allows distortion free spectra at scan speeds up to 7,000 nm/minute. The screen shows overlaid scans of potassium dichromate solution, scanned at 5000, 2500, 1250, and 625 nm/minute.

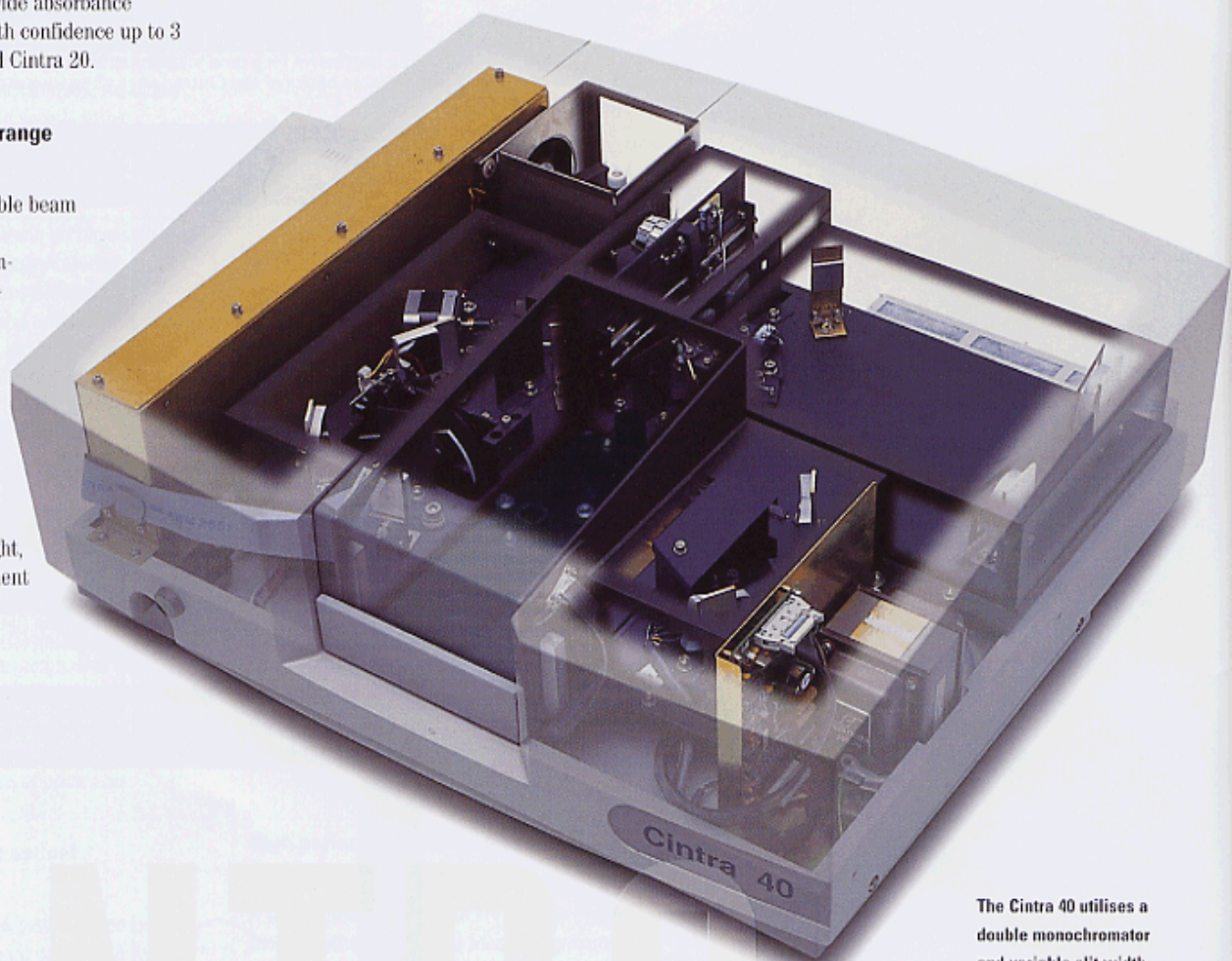
Cintra 40 provides the widest photometric range

Precise, accurate results even at high absorbance

Low stray light levels are achieved using a holographic grating so that photometric accuracy can be maintained over a wide absorbance range. Measure samples with confidence up to 3 Abs with the Cintra 10e and Cintra 20.

Expand the photometric range with the Cintra 40

The Cintra 40 is a true double beam monochromator spectrometer. Unlike some instruments which use a pre-monochromator and main monochromator, the Cintra 40 uses two Littrow monochromators in a Czerny-Turner arrangement. Utilizing double monochromators results in high resolution with extremely low stray light, assuring precise measurement up to 4.5 Abs.



The Cintra 40 utilises a double monochromator and variable slit width for highest resolution and exceptional stray light performance. The use of a photomultiplier tube detector ensures greater spectral sensitivity in the important 200 to 600 nm wavelength range.

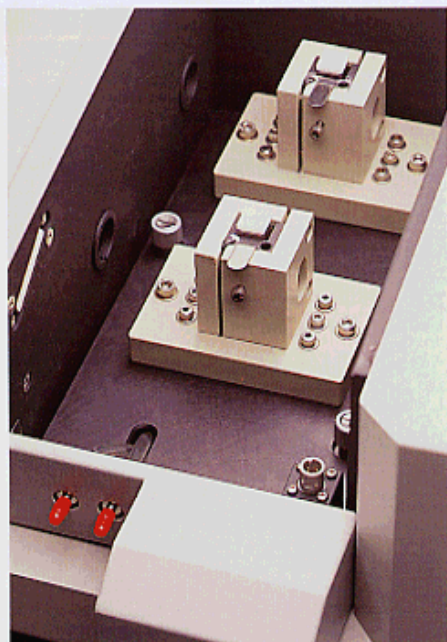
Versatility and easy access for a full range of sampling accessories

Versatile sample compartment with integrated accessory communications

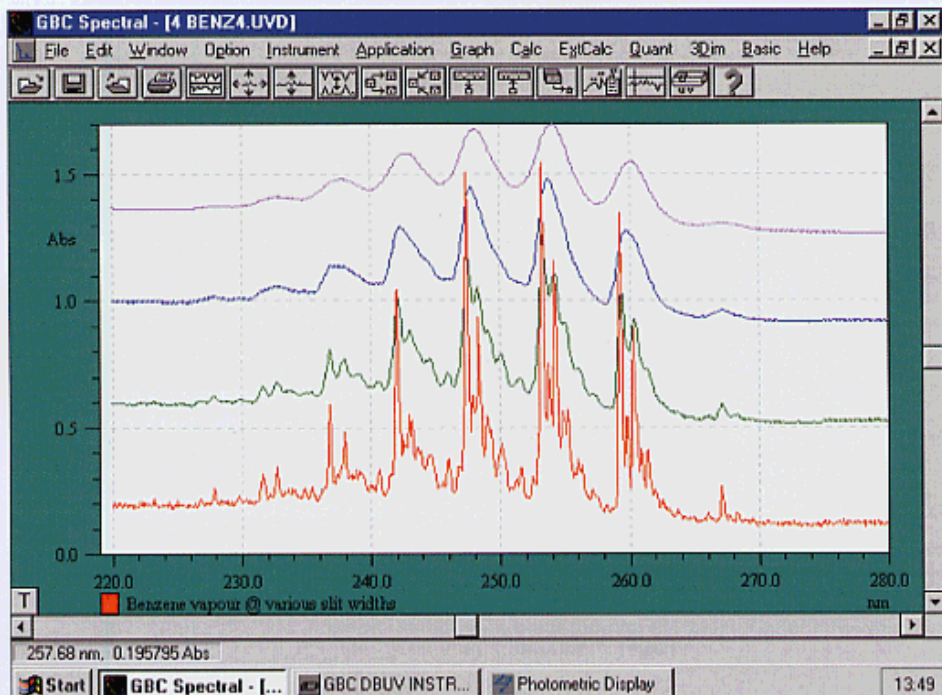
The Cintra series boasts a large sample compartment capable of housing the complete range of available accessories without the need for additional sample compartment extensions. Accessory communication and control is accomplished via inbuilt ports located within the sample compartment.

High resolution and versatility with the Cintra 20 and 40

The Cintra 10e provides a fixed 1.5 nm slit width which is ideal for the majority of applications. The Cintra 20 and 40 each provide a continuously variable slit enabling the selection of the optimum slit width for any sample.



Sampling accessories may be readily exchanged and are automatically identified by the software when fitted.



The effect of changing spectral bandpass is shown by overlaid scans of benzene vapour at various slit widths. The Cintra 20 and 40 provide the ultimate in versatility allowing the use of wide slit widths for broad peaks or narrower slit widths when high resolution is required.

ISO 9001 QUALITY ACCREDITATION

GBC has always placed a strong emphasis on quality in all aspects of our operation, from design and manufacture to the provision of service and support to our customers, and we are fully committed to continuous evaluation and improvement in all areas.

The GBC Quality Management System has been accredited to the ISO 9001 quality standard by Lloyd's Register Quality Assurance Limited. This certification is your assurance that the procedures and processes used to produce the goods and services which GBC provides comply with the relevant International Standard, and demonstrates our commitment to meeting the needs and expectations of our customers.



Spectral Software—a powerful fully integrated Windows® software package

Power and flexibility—the hallmark of GBC software

GBC has established a world-wide reputation for superior instrument software. Spectral software, specially developed for the Cintra series, follows a tradition of inherent simplicity, power and flexibility. Utilizing the powerful multi-tasking environment of Windows®, the Spectral user interface provides the ideal combination of powerful features for the experienced user and the simplicity of point and click operation for the novice operator.

Spectral is easy to use

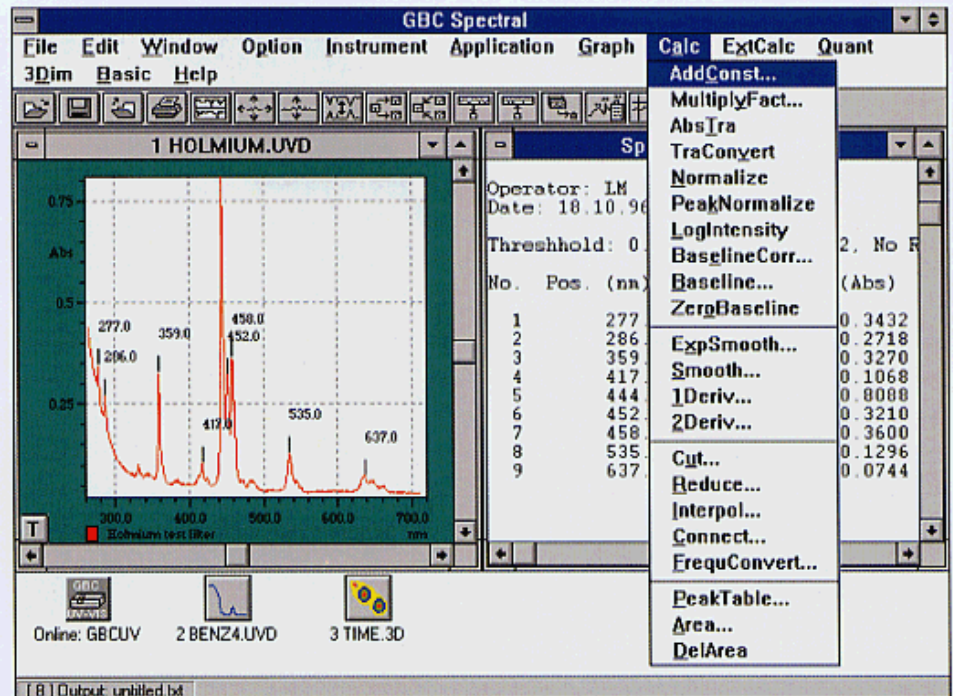
Spectral software uses all the features of the Microsoft Windows® environment. Menu options are linked appropriately to the active window and your current task, to make the system easy to use and understand. A combination of easily recognizable icons, functional pull-down menus and simple to edit dialogs keep you organized and in control. Spectral provides a fully customizable user interface, allowing menu functions and commands to be enabled or disabled as required. The most commonly used commands can be reduced to an icon or button, making routine analysis as simple as point and click.

Full instrument control is at your fingertips

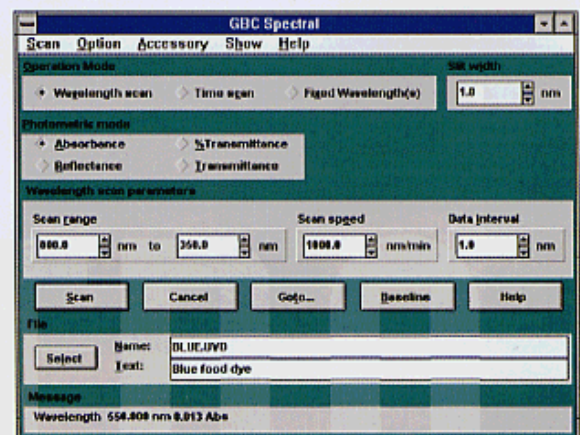
Spectral provides full control of the spectrometer via a common dialog which greatly simplifies operation. All the relevant parameters are at your fingertips for performing wavelength scans, time scans and fixed wavelength data measurements.

Total control over all automated accessories is available within the operating software. Each accessory module is treated as an integral part of the instrument, and control parameters are set from a simple dialog.

Comprehensive instrument controls are all software driven, with fitted accessories automatically detected and controlled.



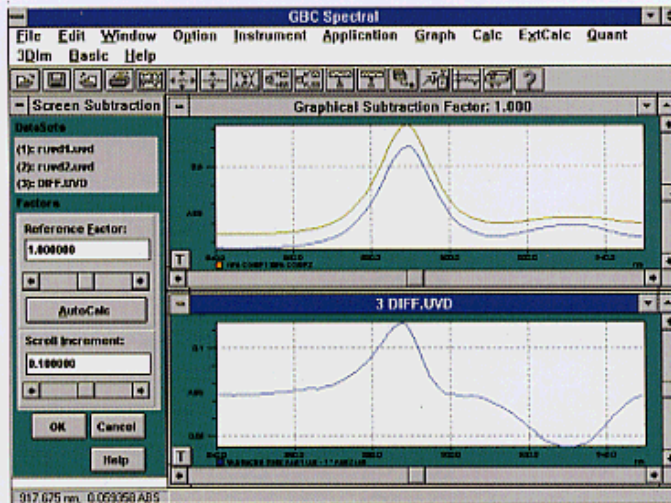
The multiple document user interface means that you can view scans, do post-run calculations or edit reports, etc., while a new analysis is taking place.



Comprehensive graphics, data and reporting functions simplify your task

Powerful graphics and data manipulation

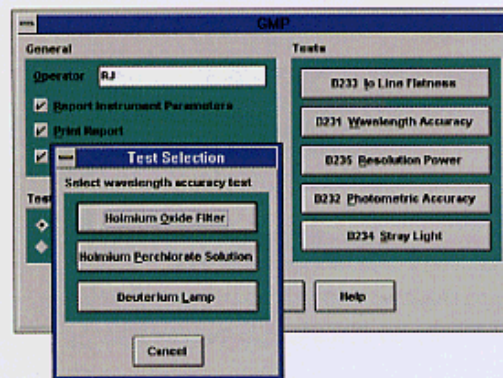
Spectral provides the most comprehensive set of tools for graphics and data manipulation in a single UV-Vis software package. Zooming, annotating, calculating derivatives, smoothing data, adding, subtracting, calculating peak tables, determining colour co-ordinates, determining T_m and %GC, and performing kinetics analysis has never been so easy. In fact, all these tools are available with the click of the mouse at any time.



Display the results of data manipulation to suit your preferences.

Spectral assures the integrity of your results

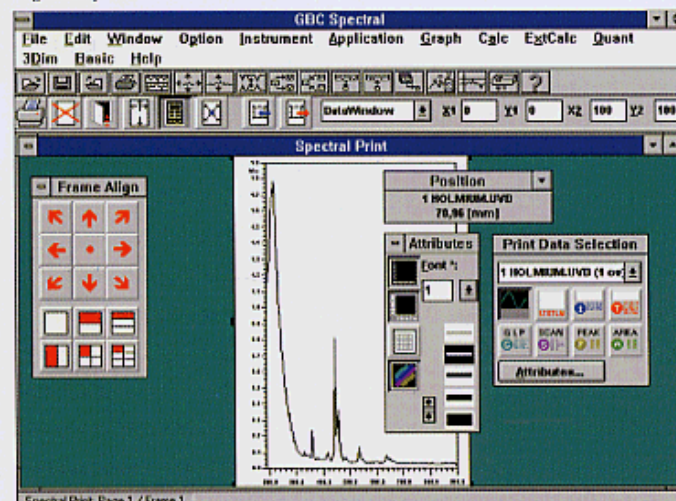
Spectral was designed with Good Laboratory Practice (GLP) in mind. Data integrity is completely assured with a history function to meet GLP requirements. Each spectrum is date and time stamped and includes the instrument serial number and a log of any further manipulations. The original method is saved with the raw data when it is acquired, so that the original method file can be reproduced even if the method file has been modified. Method files can be password protected to prevent accidental modification.



Standard tests ensure your continued confidence in the performance of your instrument and compliance with regulatory controls.

Customized Reports

The powerful report generator of the Spectral software provides the ultimate in flexibility to produce printed reports in your preferred format. You can combine graphics, text, operator, sample and GLP information into a single report and have the capability to place the information exactly where you want on the page. In addition report templates can be saved to disk for later use, simplifying the process to a few mouse clicks. And if this flexibility is insufficient, you can simply transfer your data to third party software packages for further manipulation.



Reporting parameters are all under your control for maximum flexibility in report contents and layout. Choose fonts, colours, line styles and placement to maximise impact.

SPECTRAL

Spectral software includes a range of most-wanted specialized applications

Specific software for a range of common tasks—with no add-on packages

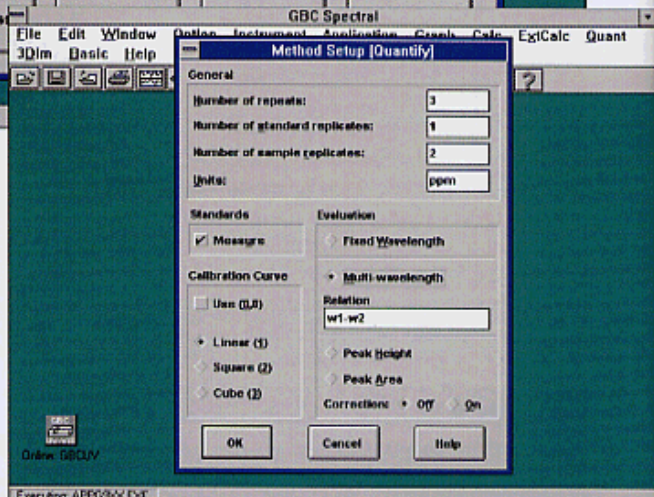
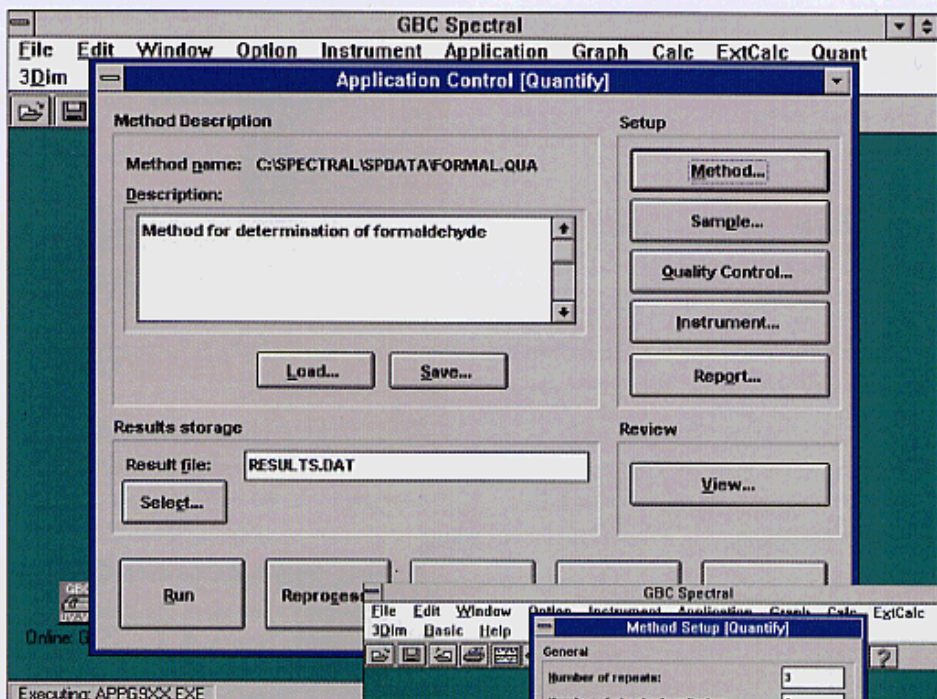
The suite of seven application programs provided as an integral part of Spectral software converts your instrument to a dedicated analytical tool, optimized precisely for the job at hand. These applications allow the automation of data collection and analysis for the more common UV-Visible analytical tasks.

The powerful application packages include:

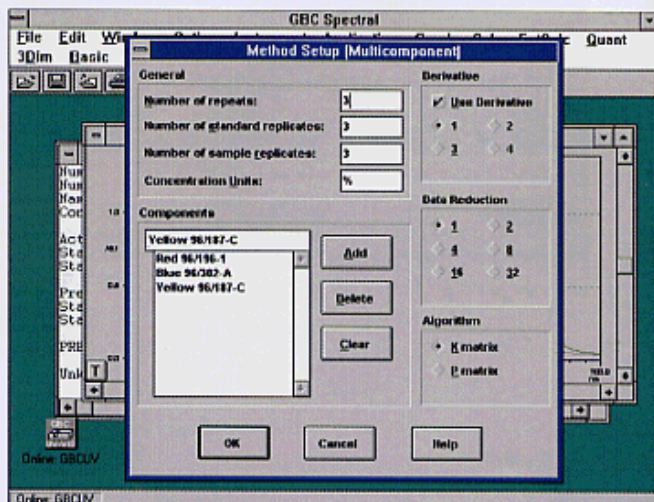
- Automated Measurement—a general purpose application which allows automated data collection and analysis with any of the available software functions.
- Quantify—for the quantification of a single component in a sample, using fixed wavelength(s), peak height or peak area measurements.
- Time Studies—performs photometric measurements including wavelength scans and multi-cell measurements as a function of time.
- Multi-component—for the quantification of a number of components in a sample mixture.
- Colour—calculates a range of colour coordinate schemes derived from tristimulus values.
- DNA Melt—performs photometric measurements as a function of temperature with standard calculations for the determination of T_m and %GC.
- GMP—semi-automates a range of performance tests specified by various regulatory bodies.

The suite of applications shares a common user interface. This simplifies analysis setup, and ensures that method, sample identification, quality control, report generation and total instrument setup are clearly separated and easily accessible.

All applications follow the same logical setup sequence, providing the ultimate in ease of use.



The Quantify application provides fast determination of single components at one or more fixed wavelengths.



Simple method setup for the measurement of multiple components.

Smart software features to store, protect, check and manipulate your data

Rapid method development

Applications methods use a simple and consistent style to set up and store all parameters associated with the analysis, including instrument, accessory and quality control parameters as well as report generation.

Once a method has been set up and validated, initiate the analysis by simply clicking on the RUN button. Password protection can be applied to method files to ensure that unauthorized changes cannot take place.

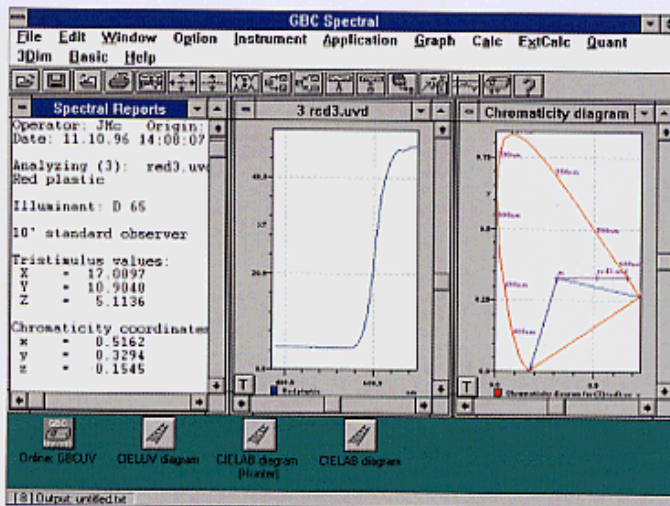
Quality control

A range of quality control functions is included with the quantitative applications to assure the integrity of the data produced.

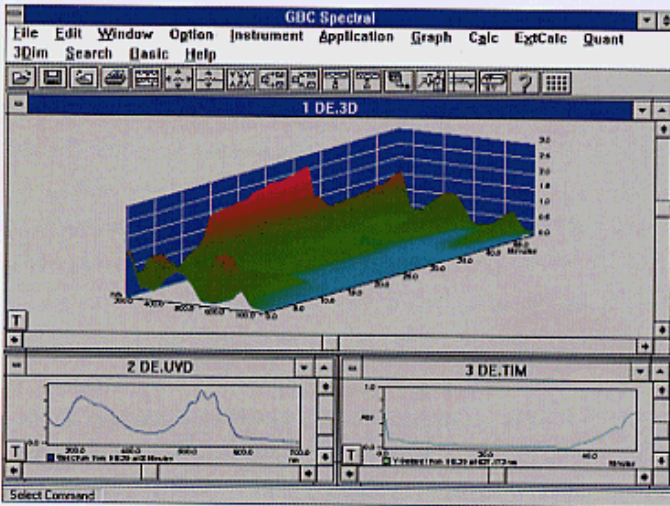
Quality control features include %RSD repeat and %RSD replicate limits, upper and lower limits for quality assurance samples, and calibration curve fit criteria. If any of these criteria are not met the analysis can be halted allowing corrective action by the operator, or the results may be simply flagged in the report.

You only need measure the samples once

Data and method parameters for each analysis are stored in a single file. Results may be calculated post-run, using different analytical parameters. This can be an invaluable time saver in method development as there is no need to re-run the samples. Simply change the relevant parameters and click the re-process button.



Colour analysis using the colour model of your choice is fully automated, with standard conversions from tristimulus values.



3-D Time Studies plots are readily interpreted with selectable displays of time and wavelength slices.

SPECTRAL

Cintra—a complete solution for the pharmaceutical industry

A number of regulatory requirements such as ISO9000, GLP and world-wide pharmacopoeias, impose strict guidelines on the analyst, to ensure accurate results and detailed recording of analytical procedures.

The Cintra series of instruments provides features designed to meet the demanding requirements of regulatory bodies. These are valuable aids to the analyst in simplifying necessary tasks and ensuring the integrity and validity of the analytical result.

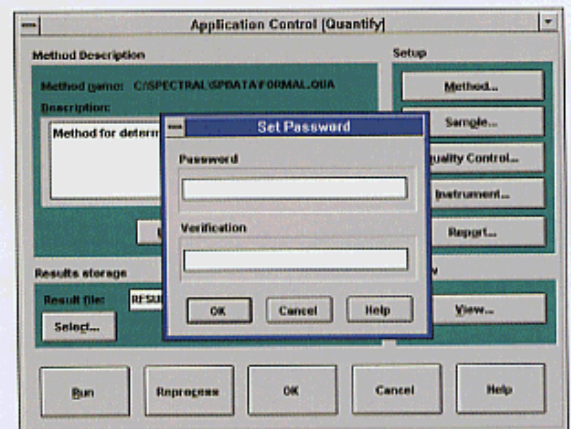
These features include:

- The instrument serial number in the firmware for positive instrument identification.
- Optical performance that ensures compliance with the requirements of regulatory bodies including the pharmacopoeias.
- A GMP/GLP software application for quick and easy validation of instrument performance.
- Certified reference kit, traceable to NIST standards, for verifying instrument performance.
- Password protection on methods to prevent accidental modification of validated methods.
- A suite of GLP tools to ensure data integrity, including the data being saved with the date, time, instrument serial number, operator, instrument parameters and sample information.



Results data includes time, date and operator ID for traceable analysis.

Cintra series spectrometers meet USP, EP and Australian GMP requirements for wavelength accuracy, photometric accuracy, stray light and resolution. These can be checked with standard test kits.



Password protection on methods prevents accidental modification of validated methods.



Instrument Test	Wavelength	Pharmacopoeia Requirement	Cintra Specification
Wavelength Accuracy	UV Range	±1 nm	± 0.2 nm
	Visible Range	±3 nm	± 0.2 nm
Photometric Accuracy (K ₂ Cr ₂ O ₇ solution)	235 nm	±0.01 A	± 0.002 A for all wavelengths
	257 nm		
	313 nm		
	350 nm		
Stray Light (KCl solution)	200 nm	>2.0 A	>> 2.0 A
		<1% T	<< 1 %T
Stray Light (NaI solution)	220 nm	< 0.01%T	< 0.01%T
Resolution (toluene in hexane)	A266/A269	> 1.5	> 1.5

Simplified setup and control for small volumes and kinetics functions makes life science applications easy

Micro volume capability

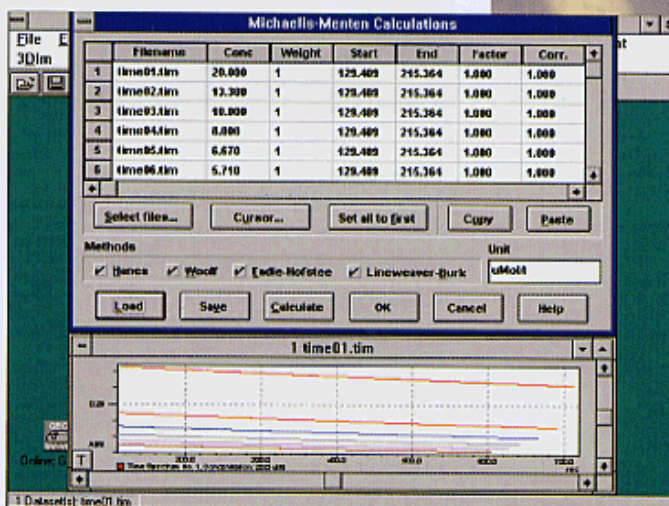
The biggest problem facing the biochemist is the requirement to obtain accurate analysis from limited sample volumes. At GBC we recognise this problem and the innovative optical system is designed to meet this challenge. You can be assured of precise and accurate results even from μL volumes. Whatever your microsampling requirements, there is a configuration that will more than meet your needs. Measure a single sample with the micro-cell holder. Or, if high sample throughput is required, measure up to 12 samples simultaneously with an automated sample changer using volumes as low as $5 \mu\text{L}$.

Enzyme kinetics made easy

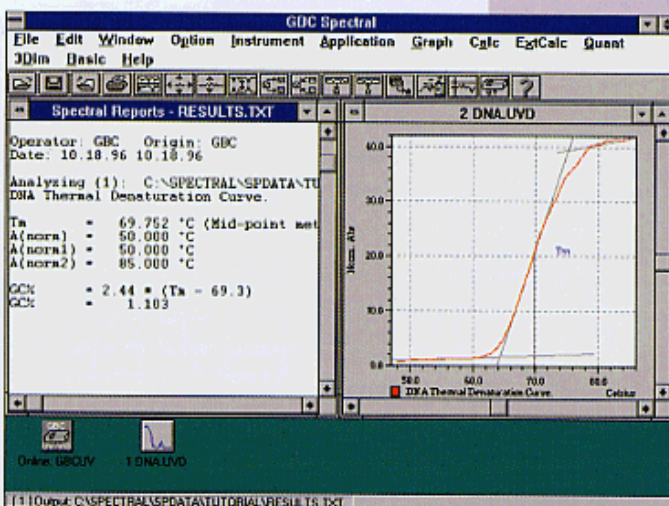
The software provides a complete range of easy to use kinetics functions designed to meet the needs of the enzyme kineticist. Transform data and calculate enzyme activities, or determine substrate concentrations using the "end point" technique from a single mouse click. Choose from a number of standard graphical transformations for the determination of V_{max} and K_{m} , including Lineweaver-Burk, Eadie-Hofstee, Hanes, or Wolf.

DNA Melt

A complete range of Peltier-effect thermo-cells is available, providing precise and accurate computer control of sample temperature. Sample immersion probes provide accurate measurement of the true sample temperature. Perform heating or cooling temperature ramps while collecting single wavelength or wavelength scans. Results can be evaluated using graphical or derivative methods to calculate T_{m} . Choose from the standard Marmur equations or a user-entered expression to derive %GC.



The kinetics application includes all required graphical transformations.



A DNA Melt application showing the denaturation curve.

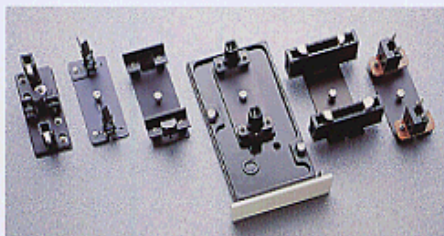
A full range of accessories—
configure the system to meet
your application needs

Modular drop-in accessories for quick and easy changeover

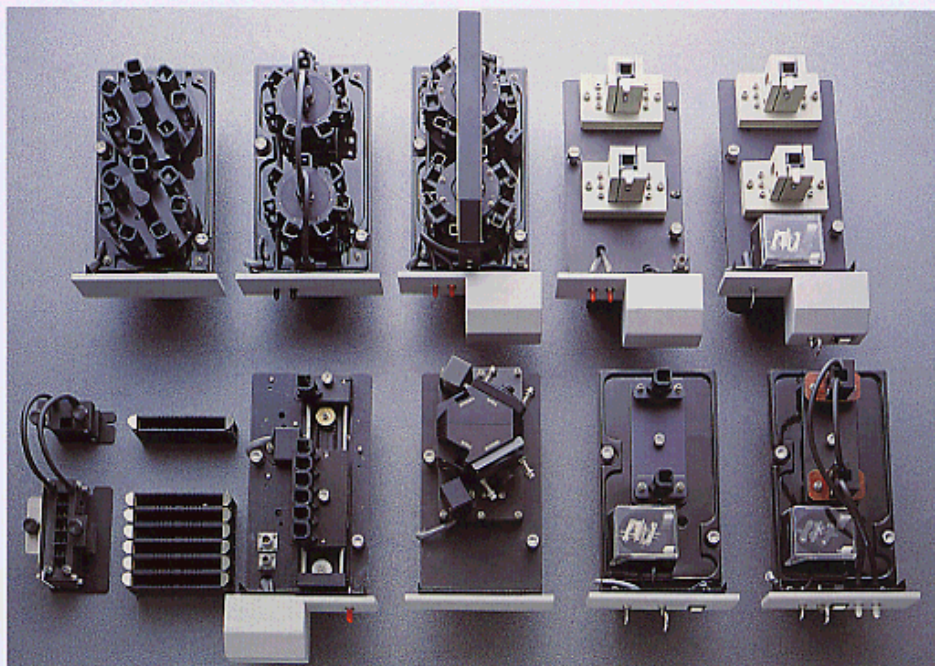
It takes only seconds to replace the standard cell holder with a specialised easy-to-use cell holder. Automated accessories plug directly into built-in ports in the sample compartment, and are automatically recognized by the instrument. There is no need for expensive add-on interfaces or structural extensions. Just drop in the accessory and start analyzing.

1 x 1 cell holders for specialised applications

- Micro-cell holder with simple adjustment of horizontal and vertical position for maximising light throughput.
- Variable path length cell holder for rectangular cells with path lengths between 5 and 100 mm.
- Cylindrical cell holder with simple spring clip action. Holds cells of up to 100 mm path length.
- Slide/solid sample holder for solid samples up to 10 mm thick.



Sample and reference cell holders for single sample measurements are available in a variety of configurations.



The Cintra series has a comprehensive range of interchangeable sampling accessories. Automated accessories are controlled from the Spectral software package, and are automatically identified when connected.

Sample changers for increased sample throughput

Two types of sample changer are available. They provide speed and precision in the positioning of your samples for fast and accurate measurements of sample batches.

All sample changers are fully computer controlled, providing random access to all positions, taking less than one second to move between adjacent cells.

Dual Carousel sample changers

The 7 x 7 sample changer is available in standard and water-thermostatted versions. A 6 x 6 sample changer with a Peltier-effect thermocell is also available for high stability temperature control, including temperature gradients. The dual carousel sample changer offers two modes of operation:

- 7x7 (or 6x6) mode for measuring 7(6) samples against 7(6) references.
- 12x2 (or 10x2) mode for measuring up to 12(10) samples in true double beam mode against 2 reference solutions.

6 x 1 Linear Movement sample changer

The 6x1 Linear movement sample changer provides the ultimate in sample changer flexibility. Allowing up to 6 samples to be measured in batch mode against a single reference solution, the sample changer can be fitted with a range of 6x1 cell holders, including standard, variable path length, water thermostatted and Peltier-effect thermocell versions.

Auto Sipper for automatic sample introduction

The auto-sipper removes the need for cell handling. Sample introduction is as easy as a simple button press. The accessory features computer controlled pump times, and the ability to be used with a number of flow-cell types, including micro-cells. Standard, water-thermostatted and Peltier-effect thermocell versions are available.



Thermostatable cell holders for temperature-sensitive analyses

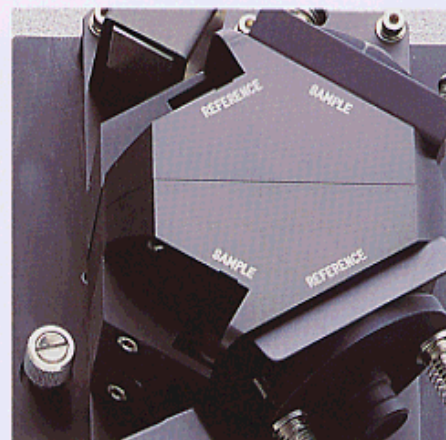
Water-thermostatted cell holders are available in single cell or sample changer (linear or carousel) configurations. When connected to a constant-temperature circulating water bath, these cell holders ensure constant temperature.

For precise and rapid temperature control, a range of Peltier-effect thermocells is available in single cell or sample changer (linear or carousel) configurations. Peltier-effect controllers are useful in applications where an accurate constant temperature or an accurate controlled temperature ramp is required. Optional sample immersion probes are available for accurate monitoring of the true sample temperature.



High speed SDS-270 auto sampler for increased productivity

In conjunction with the sipper, the SDS-270 autosampler provides high speed automated analysis. Samples are contained in three racks, permitting different tube sizes within a batch. The autosampler is totally controlled by the Spectral software via an easy-to-use interface. A built-in diaphragm pump provides a continuous stream of clean rinse solution.



Total Integrating Sphere

The total integrating sphere is ideal for measuring the total reflectance from solid samples such as plastics, paper, textiles and coated surfaces. The sphere provides a transmission position, making it suitable for the measurement of turbid or scattering samples.



Thermostatable cell holders are available in a range of configurations

The software interface consists of three overlapping windows:

- Instrument Settings:** A list of modules including DBUV 6X6, DBUV 7X7, SDS 270, FS3000, DBUV SIPPER (highlighted), DBUV THERMOCELL, DBUV 6X1 STD, DBUV 6X1 THERMOS, and DBUV INSTRUMENT. An OK button is at the bottom.
- Settings (DBUV SIPPER):** Shows the instrument is connected. The communications channel is set to 'OFF' with an ID of 44. An Instrument button is visible.
- Sipper Control:** Shows the operation mode set to 'Auto'. The status is 'AUTOSIPPER'. Filling parameters are: Speed: 18 rpm, FillTime: 5 s, EmptyTime: 5 s, and SettleTime: 3 s. The status indicators show 'Sipper status: Ready', 'Button status', and 'Button released'. Functions include 'Fill', 'Empty', and 'Stop' buttons. OK, Cancel, and Help buttons are at the bottom.

All automated accessories are conveniently identified and controlled from the Spectral software package

Cintra

Hardware Specifications

	CINTRA 10e	CINTRA 20	CINTRA 40
Instrument Format	Spectrometer module with external IBM Compatible computer.	Spectrometer module with external IBM Compatible computer.	Spectrometer module with external IBM Compatible computer.
Photometric System	Double-beam, direct ratio recording system.	Double-beam, direct ratio recording system.	Double-beam, full double monochromator, direct ratio recording system.
Light Source	Tungsten-halogen lamp and deuterium lamp.	Tungsten-halogen lamp and deuterium lamp.	Tungsten-halogen lamp and deuterium lamp.
Light Source Changeover	Automatic source changeover. user-selectable wavelength.	Automatic source changeover at user-selectable wavelength.	Automatic source changeover at user-selectable wavelength.
Wavelength Range	190-1,200 nm	190-900 nm	190-900 nm
Monochromator	Czerny-Turner mounting with holographic grating and automatic lamp peaking	Czerny-Turner mounting with holographic grating and automatic lamp peaking	Dual Littrow monochromators arranged in a Czerny-Turner configuration with automatic lamp peaking.
Spectral Bandpass	1.5 nm	0.2 nm to 5.0 nm in 0.1 nm steps.	0.1 nm to 2.0 nm in 0.1 nm steps.
Scanning Speed	5 to 7,000 nm/minute.	5 to 7,000 nm/minute.	5 to 7,000 nm/minute.
Slew Speed	15,000 nm/minute.	15,000 nm/minute.	15,000 nm/minute.
Detector	Silicon Photodiode	R446 side-on photomultiplier tube.	R928 side-on photomultiplier tube.
Electrical Requirements	110-120 or 200-240 VAC, 200 VA, 50/60 Hz	110-120 or 200-240 VAC, 200 VA, 50/60 Hz	110-120 or 200-240 VAC, 200 VA, 50/60 Hz
Dimensions (sample compartment)	150 x 125 x 280 mm (WxDxH) 120 mm distance between beams.	150 x 125 x 280 mm (WxDxH) 120 mm distance between beams.	150 x 125 x 280 mm (WxDxH) 120 mm distance between beams.
Dimensions (spectrometer)	680 x 640 x 270 mm (WxDxH)	680 x 640 x 270 mm (WxDxH)	680 x 640 x 270 mm (WxDxH)
Weight	39 kg (52 kg packed)	39 kg (52 kg packed)	39 kg (52 kg packed)

Cintra

Performance Specifications

	CINTRA 10e	CINTRA 20	CINTRA 40
Stray Light			
@ 220 nm (10g/L NaI)	<0.01 %T	<0.005 %T	<0.0002 %T
@ 340 nm (50 g/L NaNO ₂)	<0.001 %T	<0.0004 %T	<0.0001 %T
Wavelength Accuracy	± 0.2 nm	± 0.2 nm	± 0.2 nm
Wavelength Reproducibility	± 0.04 nm	± 0.04 nm	± 0.04 nm
Photometric Accuracy (NIST 930D standard filter, 0 to 0.5 A)	± 0.001 A	± 0.001 A	± 0.001 A
Photometric Accuracy (NIST 930D standard filter, 0.5 to 1.0 A)	± 0.002 A	± 0.002 A	± 0.002 A
Photometric Repeatability (0 to 0.5 A)	± 0.0005 A	± 0.0005 A	± 0.0005 A
Photometric Repeatability (0.5 to 1.0 A)	± 0.001 A	± 0.001 A	± 0.001 A
Photometric Noise (500 nm, 2 nm SBW, 1 s smoothing)	<0.00005 A RMS at 0 A <0.0001 A RMS at 1 A	<0.00003 A RMS at 0 A <0.00008 A RMS at 1 A <0.0003 A RMS at 2 A <0.0003 A RMS at 3 A	<0.00003 A RMS at 0 A <0.00006 A RMS at 1 A <0.0002 A RMS at 2 A <0.0002 A RMS at 3 A <0.002 A RMS at 4 A
Photometric Drift (340 nm, 2 nm SBW, stable ambient temperature, 1 hour warm-up)	<0.0003 Abs/hr	<0.0002 Abs/hr	<0.0001 Abs/hr
Photometric Linearity	Better than 1% at 3 Abs	Better than 0.5% at 3 Abs	Better than 1% at 4 Abs
Baseline Flatness (baseline corrected across entire wavelength range)	<0.002 A	<0.002 A	<0.001 A



Increase productivity using a Cintra spectrometer, an autosampler, an autosampler accessory and the high speed SDS-270 autosampler.

Cintra

Software Specifications

Windows® based software providing full control over all instrument and accessory functions, data collection and processing. A suite of seven applications to automate the more common analytical tasks is provided as standard.

Instrument and Accessory Control

Full control of instrument and accessories. Instrument modes include fixed wavelength(s), time scan and wavelength scan. Data automatically saved to disk. Large continuous on-screen display of wavelength and photometric reading. Manual and automatic modes for control of all automated accessories.

Graphics

All data sets are displayed in individual object windows with associated data information window and a history function for GLP. Text and graphics may be displayed together in any combination, in up to fifty windows. Windows can be resized, maximised or minimised to an icon. Windows can be joined to overlay spectra in a common window. An extensive range of graphic manipulation functions including zoom, autoscale, cursor, scroll, and text annotation functions. Complete 3-dimensional graphics with zoom, cursor, rotation, topview and contour functions. User defined setup of axes and colours.

Data Manipulation

A range of tools is available for the manipulation of data sets. General functions include subtraction, addition and division of spectra, Savitzky-Golay smoothing and derivatives, peak table and peak labelling, peak height and peak area, absorbance to transmission conversion, wavelength to wavenumber conversion. A range of specialised functions is available for enzyme kinetics, colour analysis and DNA melt analysis.

Report Window

All numerical data and calculated results are written directly to the report window. All results may be accessed from the report window for editing, printing and disk storage.

Report Generator

Combines graphics, text, operator, sample and GLP information into a single report. Report templates can be saved to disk. Supports a complete range of printers.

Applications

Common user interface which provides method, sample, quality control, instrument, accessory and report setup. Methods can be saved to disk with or without password protection. Data is stored in single file with copy of method parameters. Facility to re-calculate results post-run with different analytical parameters.

Automated Measurement

A general purpose application which allows automated data collection of fixed wavelength(s), wavelength scan or time scan measurements. Up to 24 repeat and 12 replicate measurements on each sample. Allows the use of SBasic macros which can be used to automate any of the available functions within the software.

Quantify

Quantification of a single component using fixed wavelength(s) and corrected or uncorrected peak height or peak area measurements. Up to 24 repeat measurements and 12 replicate measurements on standards and samples. Choice of linear, squared or cubic curve fits. Complete range of quality control parameters including upper and lower QC limits, repeat %RSD, replicate %RSD and calibration correctness.

Time Studies

Collect fixed wavelength(s) data or wavelength scans as a function of time. Simultaneously collect up to 12 samples with a sample changer.

A range of post-run kinetics functions for determination of enzyme activities, V_{max} and K_m . Transformations include Lineweaver-Burk, Eadie-Hofstee, Hanes and Wolf.

Multicomponent

Quantification of a number of components in a sample mixture. Calculations can be performed using up to the fourth derivative. Up to 24 repeat measurements and 12 replicate measurements on standards and samples. Complete range of quality control parameters including upper and lower QC limits and repeat and replicate limits.

Colour

Calculates a range of colour co-ordinate schemes derived from tristimulus values. Colour co-ordinate schemes include XYZ, chromaticity co-ordinates, CIE $L^*a^*b^*$ and CIE $L^*u^*v^*$. Facility to calculate user defined co-ordinate schemes derived from XYZ. Up to 24 repeat measurements and 12 replicate measurements on samples. Complete range of quality control parameters including upper and lower QC limits and repeat and replicate limits.

DNA Melt

Provides full instrument and Peltier-effect thermo-cell control. Perform single wavelength or wavelength scan measurements as a function of temperature. Measure thermo-scans with user definable ramp (heating or cooling). Determine thermal transition temperatures, T_m , by graphical or first derivative determination. Calculate %GC from standard Marmur equations or user-defined equation-based T_m .

GMP

Semi-automates a range of performance tests as specified by world-wide pharmacopoeias. Tests include baseline flatness, wavelength accuracy, photometric accuracy, stray light and resolution. Report includes test criteria, complete results including pass or fail status, and instrument operating parameters as well as the test operator's ID.

Minimum Computer Configuration

IBM™ compatible computer incorporating Intel™ Pentium™ microprocessor operating at 90 Mhz. 1 floppy disk drive and 1 hard disk (greater than 120 Mb recommended). 8 Mb RAM minimum (16 Mb recommended). SVGA card and SVGA monitor. 1 parallel port and 2 serial ports. Bus mouse and 101 keyboard. Microsoft Windows® 3.1 or later, DOS Version 6.2 or later.

Cintra

Accessories Specifications

Auto sippers

Standard four-roller peristaltic pump based system with quick release tubing. Connects directly to the instrument's inbuilt accessory port in the sample compartment. Controlled by Spectral software with control of flow speed, timing and direction. Flow through or sample return modes. Can be used in conjunction with an autosampler for high speed unattended analysis. Pump speed: 0–16 rpm. Fill/empty time: 1–150 s. Pump direction: forward and reverse. Provided with standard 1x1 cell holder for use with 10 mm cells. Compatible with: 1x1 cylindrical cell holder, 1x1 micro cell holder, 1x1 variable path length cell holder. Flow cell must be ordered separately.

WATER THERMOSTATED

As per standard auto-sipper but includes built-in water thermostatted cell holder for temperature control. Suitable for use with 10 mm cells. Requires constant temperature water recirculator for temperature control.

PELTIER EFFECT THERMOCELL

As per standard auto sipper but includes built-in 1x1 Peltier effect thermocell for precise control of temperature. Suitable for use with 10 mm cells. Peltier effect thermocell is controlled by Spectral software with control of temperature, ramp rate and temperature stability. Steady state and temperature ramp modes. Optional sample immersion probes for monitoring sample temperature. Peltier element is air cooled. Temperature range: 5–100 °C. Heating/cooling rates: 0.1–10 °C/minute. Temperature control accuracy: ± 0.5 °C. Temperature control precision: ± 0.5 °C. Temperature stability: User selectable in the range 0.1–5 °C. Note that the achievable lower temperature limit depends upon the ambient temperature.

Peltier effect thermocell accessories

Available in 1x1, 6x1 and 6x6 configurations. Peltier effect thermocell is controlled by Spectral software with programmable temperature, ramp rate and temperature stability. Steady state and temperature ramp modes. Peltier element is cooled by external water supply. Optional sample immersion probes for monitoring sample temperature. Temperature range: (Water temperature -15)°C to 100 °C. Heating/cooling rates: 0.1–10 °C/minute. Temperature control accuracy: ± 0.5 °C. Temperature control precision: ± 0.5 °C. Temperature stability: User selectable in the range 0.1 to 5 °C. Note that the achievable lower temperature limit depends upon the temperature of the external water supply.

Total Integrating Sphere

The Total Integrating Sphere is a barium sulfate coated, integrating sphere, with light detection by a built-in photo multiplier tube attached to the base. The accessory is fitted with 10 mm cell holders and solid sample holders for both sample and reference beams. Capable of measuring total %transmittance, absorbance and reflectance. Sample incident angle 8°. Supplied with a pair of Spectralon reference disks. Connects directly to the instrument's built-in accessory port in the sample compartment.

Sphere diameter: 63 mm. Port/sphere area ratio: 8%. Wavelength range: 200–800 nm. Detector: R446 side-on photo multiplier tube. Corrected baseline 200–800 nm: 0.002 A. Photometric noise at 500 nm (0 Abs): <0.005 A RMS.

Linear movement module

Linear movement based sample changer for controlled movement of up to six samples within the sample compartment. Connects directly to the instrument's built-in accessory port in the sample compartment. May be fitted with standard, variable path length, water thermostatted and Peltier-effect thermocell 6x1 cell holders. Six sample beam cells. One reference beam cell. 6x1 cell holder must be ordered separately.

6X1 CELL HOLDERS

6x1 standard cell holder suitable for use with 10 mm cells. Minimum path width 4 mm.

6x1 variable path length cell holder suitable for use with 5, 10, 20, 30, 40, 50 and 100 mm pathlength cells. Minimum path width 4 mm.

6x1 water thermostatted cell holder for use with 10 mm cells. Minimum path width 4 mm. Control of sample and reference temperatures. Requires constant temperature water recirculator for temperature control.

6x1 Peltier effect thermocell for use with 10 mm cells. Minimum path width 4 mm. Computer control of sample and reference temperatures. Requires external water supply for heat transfer.

Dual carousel sample changers—7x7 and 6x6

The dual carousel sample changer comprises automated twin carousels, capable of holding 7 (6) sample/reference pairs or up to 12 (10) samples and 2 reference cells in true double beam mode. Connects directly to the instrument's built-in accessory port in the sample compartment. Standard and water thermostatted versions are available for the 7x7 dual carousel sample changer. Peltier effect thermocell version is available for the 6x6 dual carousel sample changer. Suitable for use with 10 mm cells. Minimum path width 4mm. Seven (six) Sample beam cells. Seven (six) Reference beam cells. Operation modes 7x7 (6x6 Peltier) or 12x2 (10x2 Peltier).

Water thermostatted version requires constant temperature water recirculator. Peltier effect thermocell requires external water supply for heat transfer.

SDS-270 Sample Delivery System

X-Y-Z autosampler with capacity for up to 270 samples and ten standards with continuous flow rinse position via built-in diaphragm pump. Supplied with three 60 position sample racks to hold 180 samples. PTFE coated inert sample probe with adjustable height. Controlled by Spectral software with control of sipper flow speed, timing and direction, as well as rinse time, air slug capability and measurement delay time. Flow through or sample return modes. Requires auto-sipper for operation. Connects to serial port of computer. Optional racks for 21, 24, 40, 60 or 90 samples.

Power Requirements: 100–260 V AC, 47–440 Hz, 30 VA.

Dimensions: 405 x 375 mm.

*GBC Cintra 10e, Cintra 20 and Cintra 40
Ordering Information*

UV-Vis Spectrometers

Cintra 10e	99-0339-00
Cintra 20	99-0340-00
Cintra 40	99-0341-00

Each Cintra UV/Visible spectrometer is supplied complete with a standard dual 10 mm pathlength cell holder, Operation Manual and Spectral software.

1x1 Cell Holders

1x1 cylindrical cell holder	99-0175-00
1x1 micro-cell holder	99-0176-00
1x1 water-thermostatable cell holder	99-0190-00
1x1 Peltier-controlled thermo-electric cell holder	99-0191-x1
1x1 variable pathlength cell holder (up to 100 mm)	99-0177-00
1x1 slide/solid sample holder	99-0222-00

Sample Changers

7x7 dual carousel	99-0178-00
7x7 water-thermostatable dual carousel	99-0179-00
6x6 Peltier-controlled thermo-electric dual carousel	99-0343-x1
Linear movement module (without cell holders)	99-0181-00
Accessories for linear movement module:	
6x1 cell holder	99-0183-00
6x1 water-thermostatable cell holder	99-0184-00
6x1 Peltier-controlled thermo-electric cell holder	99-0185-x1
6x1 variable path length cell holder (up to 100 mm)	99-0208-00
Auto-sipper	99-0189-00
Auto-sipper with water-thermostatable cell holder	99-0214-00
Auto-sipper with Peltier-controlled thermo-electric cell-holder	99-0205-x1
SDS-270 Sample Delivery System	99-0326-x1

Supplied complete with test tubes, teflon coated probe, cables, tubing and three 60-position sample racks

Other Accessories

Total Integrating Sphere	99-0188-00
Neutral Density Filter Kit	95-0550-00
Certified Reference Kit	95-0551-00
Constant-temperature water recirculator	99-0193-00
Closed water recirculator with coolant radiator for use with Peltier devices	99-0212-x1

A complete range of cells (including micro-cells) is available.
Consult your local distributor for details.

x: reflects local power requirements.

Consult your local distributor for the correct suffix.



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EQUIPMENT**

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