

Wolf House  
Market Street  
Pocklington  
York YO42 2AB

**Wolf Laboratories**



**Tel: 01759 301142 Fax: 01759 301143 Email: [sales@wolflabs.co.uk](mailto:sales@wolflabs.co.uk) Website: [www.wolflabs.co.uk](http://www.wolflabs.co.uk)**

## Cecil Aurius Spectrophotometers

### Aurius Series

With an optical bandwidth of 4nm and superb stability, accuracy and precision these very easy to use instruments are ideal general purpose spectrophotometers. Excellent for routine and quality control laboratories, they offer a wide range of quantitative techniques with wavelength scanning as an option. Both UV Visible and Visible versions are available with full validation procedures.

### Super Aurius Series

The Super Aurius instruments are unique for their very high performance scanning, with derivatives, overlay, extended analytical power and multi-cell Kinetics. They cover the full 190-1000nm wavelength range with a narrow 1.8nm optical bandwidth. With straylight of 0.01%, wavelength precision of 0.1nm and baseline stability of better than  $\pm 0.001A/hr$ , the most demanding analytical work may be undertaken.

### Performance With Convenience

The ease of operation makes even complex tasks simple. An exceptional range of software and accessories makes the Aurius and Super Aurius instruments superb multi-user instruments, ideal for multi-discipline laboratories.

### Absorbance Accuracy

The low straylight of the instruments, less than 0.01%, allows a measurement of 3 absorbances to be made with an error close to 1%. This performance should be compared with errors of 26%, 10% and 6% which result from straylight of 0.5%, 0.1% and 0.05% respectively for the same measurement.



## Six Screen Width Viewing

All scans, curves and data produced by the spectrophotometers may be scrolled across the screen providing a very wide 6 screen widths - 550mm - of viewing of extended displays.

## Ease Of Operation

The large screen with contrast control, displays menus and prompts for all applications. All curves, scans and data displayed on screen may be reprocessed before printing.

## Software Enhancement By E-SEF

E-SEF - Encoded Software Enhancement Facility - is an important new Cecil design feature. Optional software modules are enabled by entering correctly allocated encoded numbers. These numbers can be provided by telephone, fax or E-Mail. Exact software requirements may therefore be tailored after instrument purchase without incurring delay before use.

## Integral Printer

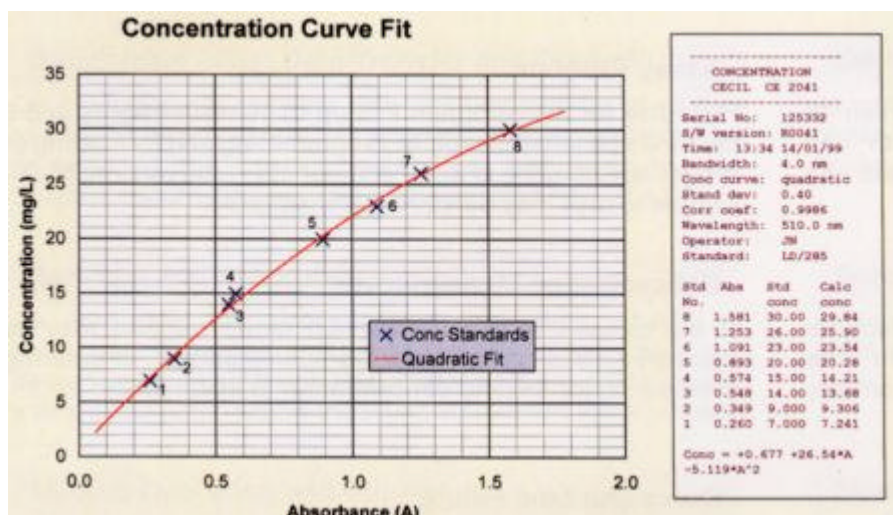
The integral printer versions provide hard copy of spectra, curves and time course plots, as well as timed and dated reports of all experiments. An external, Epson compatible, printer may be used providing large size high quality plots and documentation of quantitative assays.

## Accurate Quantification

For optimum accuracy when measuring concentration, a calibration line may be fitted to a series of up to 30 standards or replicates. Accuracy is improved over using a single known concentration or entering a factor.

## Concentration Curve Fitting

When concentration is not linearly related to absorbance a quadratic or cubic curve may be fitted to up to 30 standards or replicates, with or without an intercept. A straight line may be fitted when a linear relationship exists. Curves are displayed with data for each standard documented.



## Editing Of Data

Suspect standards revealed by the initial fit may be deleted or replaced for a new fit. Up to 30 curves may be stored security protected.

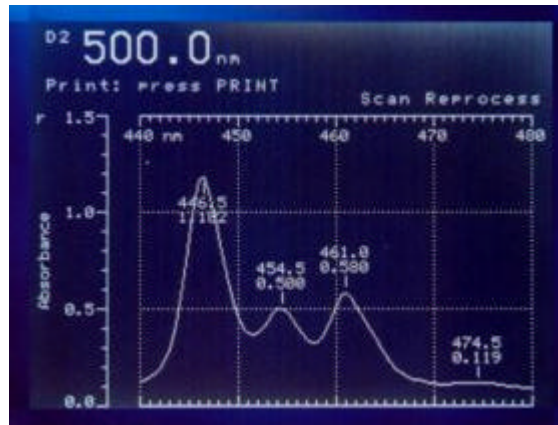
## Wavelength Scanning

Wavelength scanning from 190-1000nm is standard on Super Aurius instruments with a narrow 1.8nm optical bandwidth. For the Aurius range scanning software is optional with a 4nm optical bandwidth.

Scans at up to 4000nm/min are displayed with peaks and valleys tabulated and scans of up to 6 screen widths may be viewed by scrolling. Spectra may be printed on either the integral printer, as shown below, or an external printer.

### The Super Aurius range offers in addition:

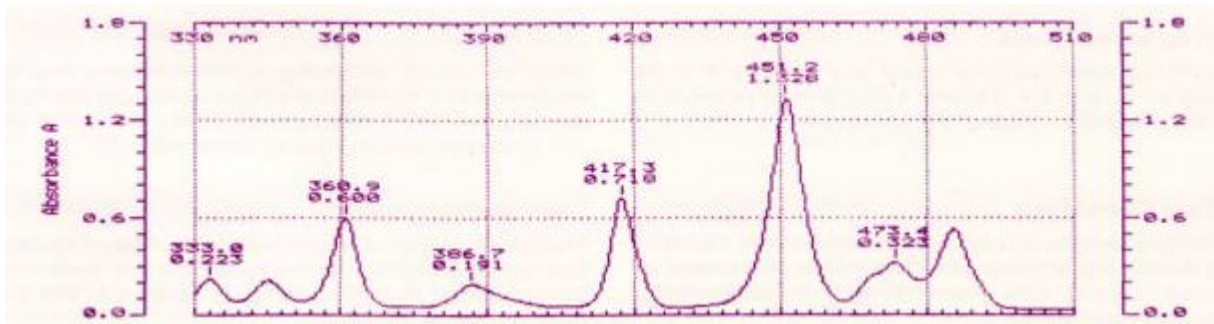
Derivative spectra, spectral storage and overlaid spectra and time plot as standard.



## Cell And Wavelength Programming

A cell program software module enables up to 4, 6 or 8 cells to be programmed with the appropriate cell changers. Programming of up to 10 different wavelengths is also provided by the wavelength program software module.

A combined cell and wavelength program may be run for up to 8 cells and 10 wavelengths. A cell and wavelength program may be used for calculations using complex formulae entered using the Assay program, with automatic formatting and printout of results.



(Scan is an option on the Aurius Range.)

## Wavelength Scan

Scans at up to 4000nm/min are presented on screen or printed with all peaks annotated with wavelength and absorbance. Tables are also presented listing all peaks and troughs with values. Scan is an option on the Aurius range.

## **Derivative Spectra**

Derivative spectra are readily produced, with selectable smoothing, either alone or superimposed on the fundamental, with or without an offset. Scaling is automatic, with all peaks and troughs quantified.

## **Overlaid Spectra**

Up to six scans, including stored scans, may be overlaid, with or without offsets for convenient comparisons or further manipulation.

## **Dynamic Scan Recall**

The last eight scans are automatically retained for recall by selection from a list and may be reprocessed, overlaid or transferred to protected memory for future use.

## **Difference Spectra**

New scans or scans from store may be presented on screen and the difference spectra produced. The scans may be normalised enabling spectral stripping to reveal impurities or additives.

## **Band Area Height Computation**

Band areas with correction for sloping background absorption are readily quantified, with all details and construction displayed. Band areas may also be computed for derivative spectra to facilitate difficult quantification.

## **Scan Storage**

Spectra may be stored in safe memory for future recall. Each spectrum is automatically allocated a recall number, when stored, and may be security code protected against tamper or deletion.

## **Programmed Scans**

Scans, automatic, single or repeat may be made of a cell program of up to 4, 6 or 8 cells. A programmed sequence of scans may also be made of a single sample.

## **Time Course Plots**

Changing samples or flows may be examined and displayed by making a time course plot. Data may be reprocessed or stored, security code protected, with an automatically assigned recall number.

## **Assay Program**

Formulae for measurements at up to 10 wavelengths may be entered rapidly. Programming and formatting of results is automatic at entry without user intervention. Multi-sample assays are automatic and may be stored as methods.

## **Concentration Measurement**

In the concentration measurement mode samples may be measured either by using a calibration standard, or entering a known factor relating concentration to absorbance.

## **Curve And Line Fitting**

A straight line, quadratic or cubic curve may be fitted to up to 30 standards, with or without an intercept at the origin. Standards may be deleted and replaced and a new curve fitted.

## **Reaction Kinetics**

Single and multi-cell kinetic measurements are possible with plots and data displayed on screen. Data may be reprocessed and curves stored, security code protected against tamper or deletion.

## **Multi Wavelength Assays**

Assays are provided using either two or three wavelengths. A wine colour assay is provided which may use up to ten different wavelengths. Computations at up to four wavelengths are also provided.

## **DNA And Protein Assays**

Protein analyses may be made using either the 2 or 3 wavelength methods of Warburg and Christian. Also programmed are techniques and analytical procedures for assays by Lowry, Bradford, Biuret and BCA methods.

## **Ratio And Difference**

Absorbance ratioing at 280/260nm, or two user selected wavelengths, is provided for DNA purity assays. The scaled difference of absorbance values at two wavelengths is also provided.

## **Cell Program**

Using the various cell changers, measurements may be made on up to 4, 6 or 8 cells at a single wavelength with cycle time and number of cycles entered by the operator. A cell and wavelength program may be combined.

## **Wavelength Program**

Measurements may be programmed for 10 different operator selected wavelengths with the cycle time and number of cycles selected by the operator. A wavelength and cell program may be combined.

## **DataStream - Fast Data Transfer**

Cecil DataStream software provides fast transfer of all data to a PC for incorporation into a spread sheet or mathematical package of the users choice. Fast and easy to use.

## **Self Test and Calibration**

An automatic test procedure, at switch-on, checks all instrument functions and calibrates wavelength against a deuterium lamp emission line. Performance is confirmed by a timed and dated report including instrument serial number.

## **Method Operation and Storage**

Up to 30 sets of instrument parameters, including concentration curves may be stored, security code protected. When recalled, instrument parameters are automatically set, avoiding errors.

### **Software Enhancement By E-SEF**

E-SEF - Encoded Software Enhancement Facility - allows software modules to be enabled using encoded numbers provided by telephone, fax or E-mail. Software requirements may be tailored, at any time, as required.

### **Data Storage With Security**

Data, including spectra, concentration curves, kinetics and time course plots may be stored in safe memory, security code protected against tamper or deletion.

### **Display Scrolling For Wide Viewing**

Use of the display scrolling facility enhances the effective screen width to 550nm and enables spectra and data up to six screen widths to be viewed.

### **Reprocessing**

Scans, time course plots, and reaction curves may all be reprocessed to any required format on the display screen and then plotted on the integral or an external printer.

### **Parallel And Serial RS232c Ports**

External printers and computers may be connected via the two ports provided. Data may be down loaded to a computer for mass spectral storage, processed or transferred to a spread sheet.

### **Performance Validation**

Software and certified standards enable wavelength accuracy, absorbance accuracy, bandwidth etc. to be validated. A timed and dated report includes the serial number of the instrument.

### **Cells And Flowcells**

As well as 10mm cells and flowcells, holders are available for rectangular and cylindrical cells up to 100mm pathlength. A holder for solid samples is also available.

### **Automatic Cell Changers**

Automatic changers are available for 4, 6 or 8 cells, providing rapid sample changing or full programming.

### **Sipette Sampling**

Samples down to 300 microlitres may be measured in a 10mm cell. Sampling is under control of the instruments microprocessor system. Samples may be saved or pumped to waste.

### **Micro Sampling**

Small or valuable samples down to 50 microlitres or less may be measured using a specially designed cell and holder.

### **Ultra-Micro Sampling**

A special precision cell holder is available for ultra-microcells using as little as 5 or 10µl of valuable samples. Samples are loaded into the cell by pipette.

## Sample Temperature Control

Water and thermoelectric temperature control is available for single cells and automatic cell changers. Temperature is set from the control panel and displayed on the screen.

## Temperature Programming

Temperature programming of samples using a single cell or 4 cell changer is possible using a Thermoelectric controller with a range of 10°-100°C producing temperature programmes at up to 1°C per minute.

## Batch Sampling

Automatic batch sampling for up to 100 samples is available. The pump fits within the sample compartment and volume etc is set from the control panel and displayed on screen. Batch number entry is provided.

## Dissolution Testing

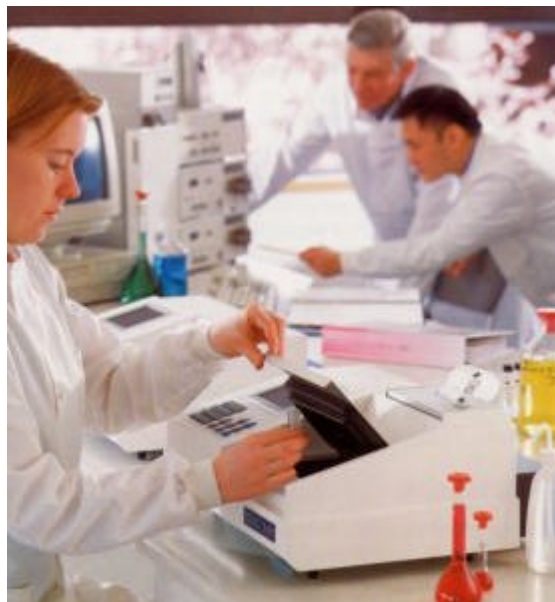
Versions of the instruments fitted with an 8 cell changer, special piping port and lid, are available for dissolution testing using Cecil TD software and a PC.

## Flexibility

Simplicity of operation, for even complex tasks, coupled with a wide range of software and accessories, makes the Aurius and Super Aurius instruments ideal multi-user instruments, and excellent for multi-discipline laboratories.

## Assay Program

Complex assays allow text entry of any formula with up to 76 characters. For complex calculations up to 20 such formulae may be entered and linked for formidable computing power without a PC. Assays may use up to 10 wavelengths and 8 cells in any automatic programmed method. Once entered programmes may be stored, as methods, security protected. Tabulation of results is automatic and the ease and speed of use makes Assay Program a very powerful tool.



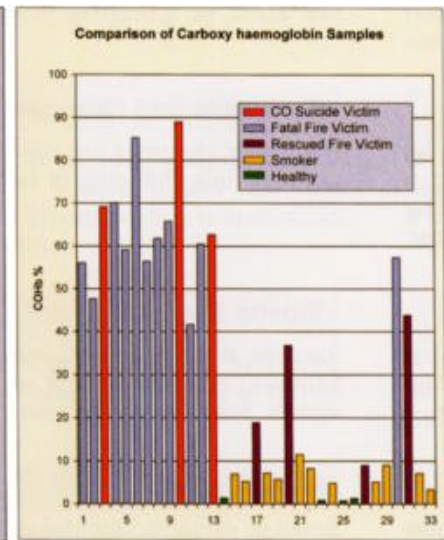
## Fast Program Any Assay

Any quantitative assay may be rapidly input for automatic computation using the Cecil Assay Program software module. No programming skill is required by the operator.

Transcription and calculation errors are avoided and validation is simple as no PC is used. Calculations for a series of Carboxy Haemoglobin samples is shown below with the formulae used.

```

-----
COHB 80040002
CECIL CK 2041
Serial No: 125332
S/W version: R0041
Time: 14:39 20/01/99
Bandwidth: 4.0 nm
Path length: 10 mm
Operator: JN
Reference: Air
Sample: 85/430
Wavelength formula:
A1 = reading at 430.0 nm
A2 = reading at 432.0 nm
Ratio = A1/A2
COHb = ((1.322*Ratio-1)/(0.855*Ratio+0.994))*100 %
-----
Absorbance A
Wavelength Ratio COHb
430.0 432.0 %
Sample
1 0.292 0.182 1.605 58.09
2 0.547 0.376 1.456 47.65
3 0.132 0.059 2.236 69.18
4 0.148 0.084 1.753 70.09
5 0.213 0.143 1.490 69.17
6 0.292 0.059 5.033 83.34
7 0.123 0.047 2.636 56.45
8 0.325 0.182 1.786 61.80
9 0.221 0.103 2.146 63.76
10 0.168 0.091 1.846 66.99
11 0.469 0.287 1.634 61.47
12 0.263 0.134 1.963 62.49
13 0.281 0.138 2.036 62.68
14 0.139 0.174 0.787 1.342
15 0.147 0.175 0.840 1.352
16 0.143 0.176 0.811 1.370
17 0.276 0.169 1.634 58.99
    
```



## Multi-Wavelength Assays

Absorbance ratios are standard and quantitative assays using both two and three wavelengths are available, including the methods of Warburg & Christian for nucleic acids and proteins, shown here.

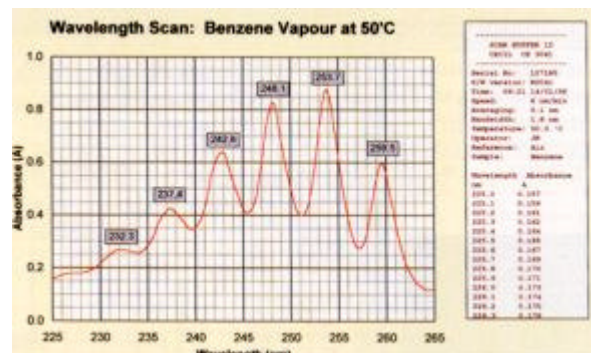
```

-----
MULTI WL ASSAY
CECIL CK 2021
Serial No: 125332
S/W version: R0041
Time: 13:49 13/01/99
Bandwidth: 4.0 nm
Operator: JN
Reference: Air
Sample: DF/752
Wavelength formula:
A1 = reading at 260.0 nm
A2 = reading at 280.0 nm
Conc1 = 62.9*A1 - 36*A2
Conc2 = -757.3*A1 + 1552*A2
Ratio12 = Conc1/Conc2
Ratio21 = Conc2/Conc1
-----
Absorbance A
Wavelength Conc1 Conc2 Ratio12 Ratio21
260.0 280.0
Sample
1 0.326 0.318 9.057 246.7 0.037 27.23
2 0.456 0.457 12.23 363.9 0.034 29.76
3 0.793 0.781 21.76 611.6 0.036 28.10
4 0.777 0.769 21.19 605.1 0.035 28.56
5 1.246 1.232 34.02 969.5 0.035 28.47
6 1.248 1.182 35.95 889.4 0.040 24.74
7 1.570 1.496 44.90 1133 0.040 25.23
8 1.706 1.638 48.34 1250 0.039 25.86
9 2.025 1.944 57.39 1484 0.039 25.85
    
```

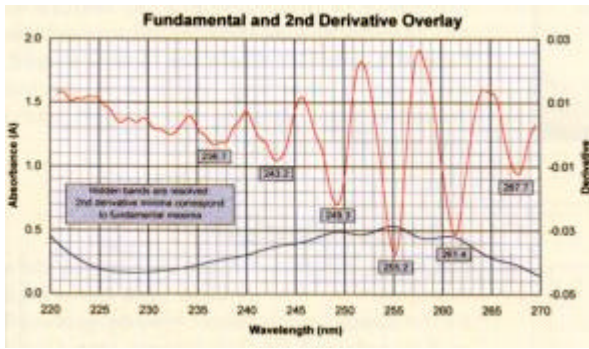
## Super Aurius Performance

The Super Aurius range offers uncompromised performance and analytical power only available in much larger and more expensive instruments. With 1.8nm optical bandwidth even closely spaced or narrow bands may be resolved, as illustrated by the benzene vapour spectrum shown here.

With the added power of the 'Quant S' software module, scans may be overlaid and differencing, stripping and band area computation carried out.



Storage for 30 spectra, with full security, is provided. Derivative spectra are also standard, with multi-cell Kinetics provided by the 'Kinetics K' module.



## Derivative Spectra

Spectral information is often masked by overlapping absorption bands, sloping background absorption, or the occurrence of a small peak or shoulder on the side of a broad absorption band.

Derivative spectroscopy may be used to enhance fine detail, reduce the effects of a sloping background and accurately locate a masked band for measurement.

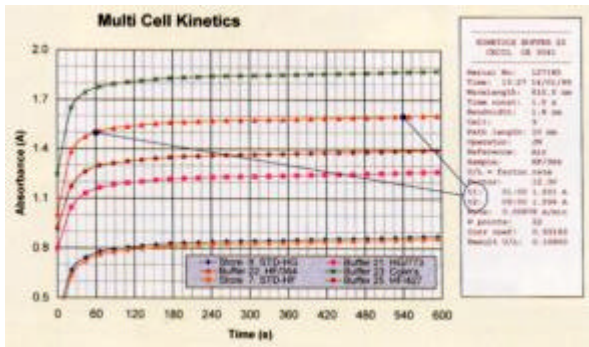
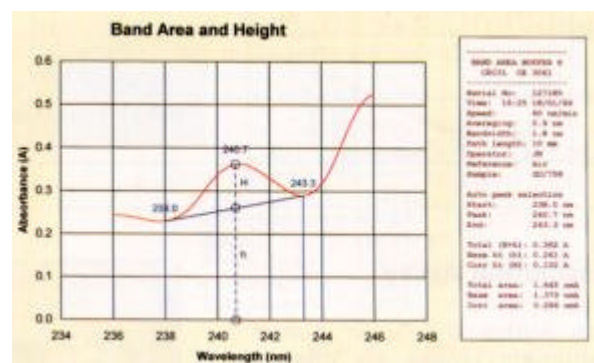
Derivatives may be displayed alone or superimposed on the fundamental, with or without an offset.

## Band Quantification

For accurate quantitative work it is often required to determine the area or height of an absorption band corrected for background absorption.

A very easy to use programme is provided for this purpose. The analytical result is displayed on the screen, with construction lines, enabling the quality of the chosen parameters to be assessed.

Band quantification may be stored as a method security protected.



## Multi-Cell Kinetics

The Super Aurius Series offers multi-cell Kinetics as well as single cell Kinetics as available on the Aurius Series. Plots are displayed on the screen and printed.

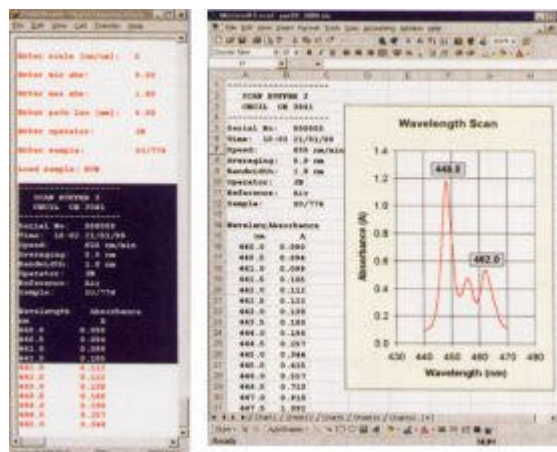
Regression analysis is applied to the user selected portion of the reaction curves (t1-t2) and results are reported in Units/Litre.

Data may be reprocessed and curves stored security protected.

Water and thermoelectric sample temperature control are available, also sample stirring.

## DataStream

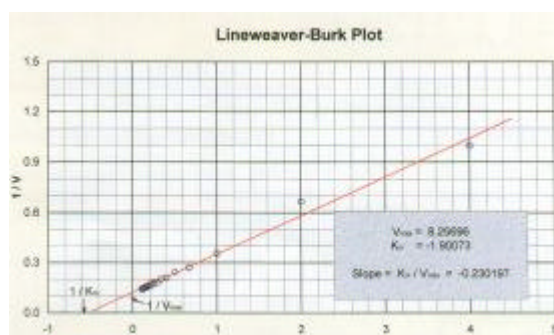
Cecil DataStream provides for rapid transfer of raw data, or data processed and formatted by the spectrophotometer, to a PC for instant display. Scans, single measurements, programmed measurements and sophisticated analytical procedures may all be transferred with great ease. Transferred data may be saved on disk or incorporated into a spreadsheet or maths pack. Incorporation into Microsoft Excel is shown here for display, manipulation, graphical presentation, archiving or report generation.



Simplicity of operation is a key feature as any familiar spreadsheet or maths package -Excel, Lotus 123, Grafit etc - may be used, avoiding a learning cycle and saving valuable time. Reports are printed using any printer supported by Microsoft Windows.

## Advanced Kinetics

Raw Kinetics data may be transferred by DataStream into 'Grafit'. The Lineweaver Burk transformation, shown below, was automatically plotted together with the values of  $K_m$  and  $V_{max}$ . Other transformations may be used.



## Dissolution Assay

Both ranges are offered equipped for Dissolution Assay applications using an autochanger for up to 8 cells and with a piping port. Complete systems are offered, as shown here, including dissolution baths, pumps and dissolution software. The Super Aurius should be used when a narrow 1.8nm bandpass is required.



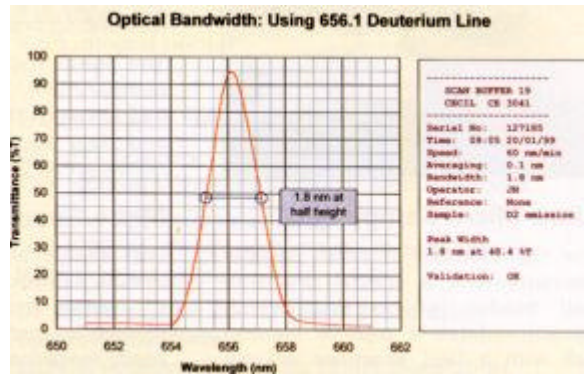
## Performance Validation

Instrument performance may be validated using a comprehensive software module available on all instruments and which may be released by E-SEF.

Tests are provided for laboratories subject to regulatory control or following good G.L.P. These include a range of Pharmacopoeia tests (EP/BP/USP), a selection of which is shown here.

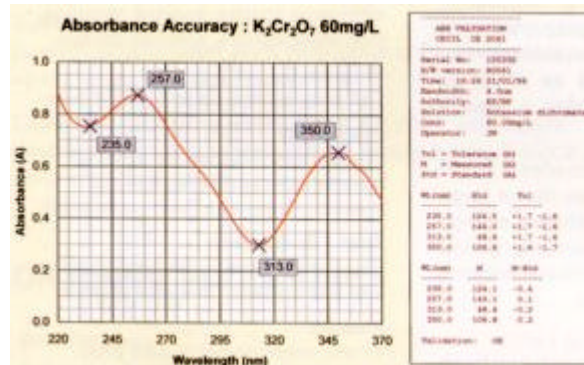
## Optical Bandwidth

The very accurate method for validating optical bandwidth uses the narrow deuterium emission line at 656.1nm. The width, at half height, of the measured band due to the emission line measures the actual bandwidth. The band is drawn and the half width automatically documented.



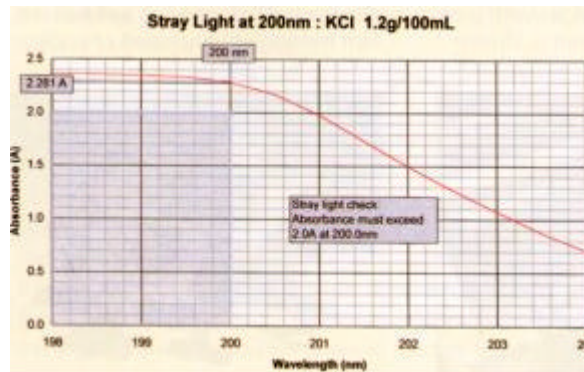
## Absorbance Validation

The Pharmacopoeia (EP/BP) test for absorbance accuracy is one of the tests provided. The test measures the values of peaks and valleys in the absorbance spectrum of a 60mg/L solution of Potassium Dichromate in a 10mm pathlength cuvette. The results of such a test run are shown here.



## Straylight

Straylight may be measured using the Pharmacopoeia (EP/BP) test shown here. This test uses a 1.2% W/V solution of Potassium Chloride in water, measured against water in the reference beam. An absorbance in excess of 2A must be measured at a wavelength of 200nm. The ASTM tests at 220nm and 340nm are more widely used and are provided for.



## Validation Using Filters

Absorbance and Wavelength validation are most conveniently carried out using filter sets calibrated by Cecil Instruments on its reference spectrophotometer against standards certified by the NPL. Full validation programmes for these tests are provided.

```
-----
          ABS VALIDATION
          CECIL CE 2041
          -----
Serial No: 125353
S/W version: R0040
Time: 12:13 14/04/99
Bandwidth: 4.0 nm
Wavelength: 510.0 nm
Tolerance: 2.0 %
Filter:
          Neutral density
Temperature: 25.0 °C
Operator: IH
NPL cert: Q9RM4T03/1
CECIL cert: C1246

Fil = Filter
Std = Standard (A)
M = Measured (A)
Dif = ((M-Std)/Std)*100

Fil Std M %Dif
-----
.25 0.2426 0.2444 0.7
.50 0.5492 0.5470 -0.4
1.0 1.1001 1.0994 -0.1
1.5 1.5081 1.5066 -0.1
2.0 2.0963 2.0920 -0.2
2.8 2.8098 2.8000 -0.3

Validation: OK
```

## Micro Sampling

For analytical measurements of minute samples, such as the purity of nucleic acid in a biological sample, or samples prepared with costly reagents, measurements may be made on samples as small as 50µl, or even less, using a special cell and holder. The optical system provides a small image at the sample position so that a large proportion of the available energy passes through the sample, giving accurate, low noise measurements with excellent linearity.



## Micro Sipette Sampling

For rapid measurement of samples as small as 300µl with low cross contamination this is the ideal sampling system.

Without cell handling all measurements are made in the same cell, enhancing accuracy and eliminating breakages.

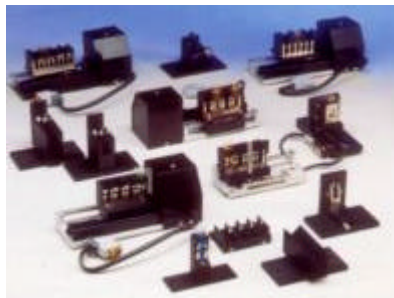
The pump, mounted in the sample compartment, is controlled by the instrument with control information and data on screen. Fully documented printouts are provided.

## Ultra-Micro Sampling

For the ultimate in small sample measurement, a special precision cell holder is available which accommodates a pipette loaded cell with a 10µl chamber volume and a 10mm pathlength. A similar cell is also available offering a chamber volume of 5µl with a 5mm optical pathlength.

## Sampling Accessories

A complete range of sampling accessories is available, some of these are shown and include cell changers, 50 $\mu$ l and 5 $\mu$ l cell holders, film holder and microcell changer.



## Thermoelectric Temperature Control

The CE2024 controller provides temperature control for a single cell, sipette cell or four cell changer. Water cooling is provided for work below ambient. Temperature programming is also provided for thermal melt experiments.



## Water Thermostating

Water thermostatted holders are available for single cells, sipette cells, long pathlength cells and the four cell changer. A holder with pipe port and special lid fitted is shown here.



## Automatic Cell Changers

Four, six and eight cell changers are available. A long pathlength holder is available for four cells. Water and Thermoelectric temperature controlled holders may also be used.



## Assay Program

Construction and entry of mathematical formulae involving measurements at multiple wavelengths with automatic computation of assay results

## DataStream

Fast data transfer to PC for use with Excel or other spread sheets

## Quant M

Multi wavelength assays at 2 or 3 wavelengths, Warburg and Christian assays at 2 or 3 wavelengths, wine assay, at up to 10 wavelengths

## **Quant P**

Protein assay using the methods of Lowry, Bradford, Biuret and BCA

## **Quant S - Super Aurius only**

Quantitation of corrected bands, difference spectra, spectral stripping, overlaid spectra, spectral storage.

## **Program C**

Cell program for up to 4, 6 or 8 cells

## **Program W**

Wavelength program for up to 10 wavelengths and timed interval measurements at a fixed wavelength

## **Scan - Aurius only**

Wavelength scans with peak labelling and peak tables. Time course plots while re-processing.

## **Kinetics**

Kinetic measurements with plots, reprocessing of data

## **Kinetics M**

Multi-cell Kinetics linked with autocell changing, and plotting of reaction curves

## **Validation**

Absorbance and Wavelength validation using certified standards or liquids. Validation of optical bandwidth, etc.

## Aurius Specification

Monochromator	Littrow using 1200 L/mm holographic grating
Optical Bandwidth	4nm
Wavelength Range	190-1000nm; 325-1000nm visible versions
Wavelength Accuracy	Better than $\pm 1$ nm
Wavelength Reproducibility	0.1nm
Self Test and Calibration	Automatic at switch on
Straylight	Typically less than 0.01% at 220nm and 340nm
Display Screen - LCD	High resolution backlit with contrast control
Display Scrolling	Provides 6 screen widths for viewing plots etc.
Autozero	Automatic by press button
Photometric Ranges	Digital display of -0.3-3A, 0-200%T, 0-9999C
Photometric Accuracy	$\pm 0.005$ A or 1% whichever is greater
Photometric Noise	Less than $\pm 0.0002$ A (500nm)
Stability	Better than 0.001A/hour at constant temperature
Multi-Wavelength Analysis	2 and 3 wavelength methods.
Assay Program	Enter multi-wavelength formula for automatic computation and formatting of any assay
Curve Fitting and Editing	Linear, quadratic or cubic; up to 30 standards
Cell and Wavelength Programming	Up to 8 cells and 10 wavelengths combined
Method Storage	Up to 30 methods stored in protected memory
Absorbance Ratioing	260/280nm or two selected wavelengths
Peak Seek	Automatic search programme, baseline corrected
Reaction Kinetics	Tabulation of results, reaction plots, reprocessing
Batch Sampling	100 samples, internal control, screen display
Real Time Clock	Timed and dated reports
Computer/printer interfaces	Bi-directional serial RS232 and parallel ports
Sample Temperature	Displayed and set from keyboard
Size	480 x 340 x 205mm
Weight	16.8Kg Visible; 18.6Kg UV; + 0.9Kg with printer
Power Requirements	110-250V, 50/60Hz, 170W/120W UV/Visible versions

### SuperAurius Additional Specification

Optical Bandwidth	1.8nm
Wavelength Scale Expansion	Selectable by keyboard entry 1-100nm/cm
Scan Speed	Selectable by keyboard entry 1-4000nm/m
Photometric Plotting Ranges	Keyboard entry of limits; or automatic optimum
Baseline Flatness	Better than $\pm 0.002A$ (300nm/min) most of range
Overlaid Spectra	Spectra and derivatives with or without offset
Spectral Reprocessing	Spectra manipulated and replotted over any range
Spectral Storage	Up to 100 spectra may be stored security code protected
Derivative Spectra	1st and 2nd derivatives
Time Course Plotting	Plots may be reprocessed and stored

### Cell Holders

### Part No.

Adjustable holder for sipette or single 10mm cell	1010 32 00
Universal cell holder, 10mm cells upwards	1010 38 00
Long pathlength cylindrical cell holder	1010 39 00
Holder for solid samples or films	2020 33 00
Ultra-microcell holder : 50- $\mu$ l cells	2020 39 00
Ultra-microcell holder : 5 and 10- $\mu$ l cells	2021 30 00

### Cell Changers And Holders

4 cell automatic changer (no holder)	2021 34 00
4 x 10mm cell holder for auto changer	2010 24 00
4 x 50mm cell holder for auto changer	2010 36 00
6 cell automatic changer and holder	2021 36 00
8 cell tablet dissolution autochanger system	3021 37 00
4 microcell manual changer and holder	2020 38 00
3 x cell changer (1-40mm) for water analysis	2020 35 00

### Sipette And Batch Sampling

Holder for SIP or sipette cells up to 50mm	2020 37 00
Batch sampler for 40 samples with pump	2021 82 00
Batch sampler for 100 samples with pump	2021 82 02
Return micro-sipette system no cell or holder	2021 21 00

### Calibration Filters

Holmium filter in holder	202 01 44
Didymium filter in holder	303 01 30
Set of 2 certified wavelength filters in holders	303 40 00
Set of 4 certified absorbance filters in holders	594 44 00
Set of 6 certified absorbance filters in holders	594 66 00

### Temperature Control - Water

Holder for single or sipette cell	1010 33 00
Holder for 4 cells - for autochanger	2020 36 15
Lid and pipe port for water thermostating	1010 05 00

### Temperature Control - Thermoelectric

Thermoelectric programme controller	CE 2024
Holder for single or sipette cell	2020 31 20
Holder for 4 cells with autochanger	2021 32 20

### Temperature Programming

Thermoelectric programme controller	CE 2024
Single 10mm cell holder	2020 31 20

### Sample Stirring

Electronic controller for sample stirring	7200 31 01
Cell holder for sample stirring	2010 32 00
Water thermostatted holder for stirring	2010 33 00
4 cell holder for sample stirring	2010 34 00

### Lamps

Deuterium lamp with hours indicator	2202 01 42
Tungsten halide lamp - in pairs	2303 01 40

### Printers And Cables

RS232c cable for 25 pin PC	2021 26 00
RS232c cable for 9 pin PC	2021 83 00
Printer connection cable	8000 71 00
Dot matrix printer	8000 70 01
Colour inkjet printer	8000 72 01
Print rolls and ribbon for integral printer	2020 03 20

Spectrophotometers are supplied complete with cell holder, power cable, instruction manual and short form operating instructions.

### Aurius Visible Range

#### CE 2011 Spectrophotometer

325-1000nm Wavelength range  
4nm Bandpass

#### CE 2031 Spectrophotometer

325-1000nm Wavelength range  
4nm Bandpass. With Integral Printer

### UV / Visible Range

#### CE 2021 Spectrophotometer

190-1000nm Wavelength range  
4nm Bandpass

#### CE 2041 Spectrophotometer

190-1000nm Wavelength range  
4nm Bandpass. With Integral Printer

#### CE 2021D and CE 2041D Tablet Dissolution

##### Spectrophotometers

Special version suitable for tablet dissolution applications, using TD software

##### System 1

Spectrophotometer, spare lamp(s) spare fuses,  
2 cells and dust cover.

### Super Aurius

#### CE 3021 Spectrophotometer

1.8nm Bandpass, 190-1000nm wavelength range,  
scanning.

#### CE 3041 Spectrophotometer

1.8nm Bandpass, 190-1000nm wavelength range,  
scanning. With integral printer.

#### CE 3021D and CE 3041D Tablet Dissolution

##### Spectrophotometers

Special versions suitable for tablet dissolution applications, using TD software.

##### System 1 : Cells and Spares

Spectrophotometer with two silica cells, spare lamps, spare fuses and dust cover.