

CECIL



**SPECTROPHOTOMETRIC
BIO ANALYSIS**

BioQuest™
BioAquarius™



BioQuest™

Compact design, 4nm optical bandwidth. Fully programmed for bioanalysis, scanning, integral printer version.

Symmetrical double beam design, 1.8nm optical bandwidth. Fully programmed for bioanalysis. A very capable general purpose scanning double beam spectrophotometer.

Bio Spectrophotometers

Specially pre-programmed for bioanalysis and molecular biology, the BioQuest and BioAquarius also have all the normal functions of UV visible spectrophotometers, scanning, time course plots, single wavelength measurements in Absorbance, Concentration or Transmittance, cell and wavelength programming, method storage etc.

Protein Analysis

Preprogrammed methods for all the normal protein analyses are provided, these include the following methods:-

Bradford	Biuret
Lowry (low sens.)	BCA
Lowry (high sens.)	Direct UV

Assays may also be carried out using the Warburg and Christian 2 or 3 wavelength methods and the Kalb and Bernlohr procedures, all of which are preprogrammed.

Nucleic Acid Assays

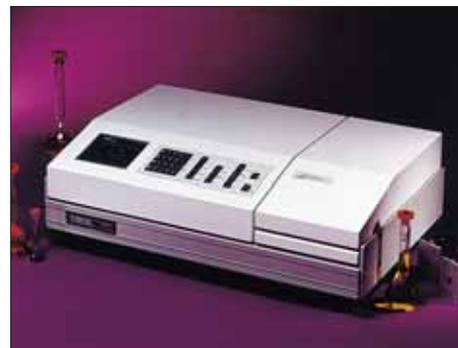
Concentration and purity may be determined by the methods of Warburg and Christian, Kalb and Bernlohr or using user selected parameters.

DNA, ssDNA, dsDNA, RNA and oligonucleotides may be quantified and examined for purity using one wavelength, or two or three wavelength ratio methods.

Molecular concentration may be determined for Oligo Samples and theoretical melting points for DNA samples calculated using the nearest neighbour interaction model.

Concentration Curve Fitting

For more accurate measurements and for measurements where Beer's law is not obeyed a straight line quadratic or cubic curve may be fitted to up to 30 standards or replicate standards. Editing of suspect standards may be carried out and the final curve stored in code protected memory for future use.



BioAquarius™

Reaction Kinetics

Both single and up to 6 cell multi-cell Kinetics are readily carried out. Water or thermoelectric temperature control is available also sample stirring.

Reaction curves are displayed on screen and regression analysis applied to the user selected part of the curves to calculate results.

Advanced Kinetics is possible providing such plots as Michaelis Menton and Lineweaver Burk etc., from which Km and Vmax are automatically calculated.

Small Sample Measurements

A return Micro Sipette system is available which uses a 75µL cell, measurements on samples of 300µL or less may be made with low levels of cross contamination.

A special holder accommodates cells of 50µL for measuring valuable small samples. These cells may be used in both sample and reference beams in the BioAquarius instrument.

For the ultimate in small sampling a special pipette loaded 5µL cell with 5mm pathlength is available.

Experimental Thermal Melt (Tm)

Thermoelectric temperature programming is available for thermal melt (Tm) determinations.

A fully annotated plot of absorbance against temperature is displayed. Data may be reprocessed, derivatised, overlaid, stored or transferred to a PC.

Method Generation and Storage

All preprogrammed methods may be modified by the user to meet their requirements. Any modified method may then be stored as an additional method in code protected memory.

DataStream - Data to PC

The DataStream system allows all data to be exported rapidly and with great ease, to a PC for incorporation into a spreadsheet or mathematical package of the users choice - Excel, Grafit etc - for report generation and mathematical manipulation.

Program Any Assay

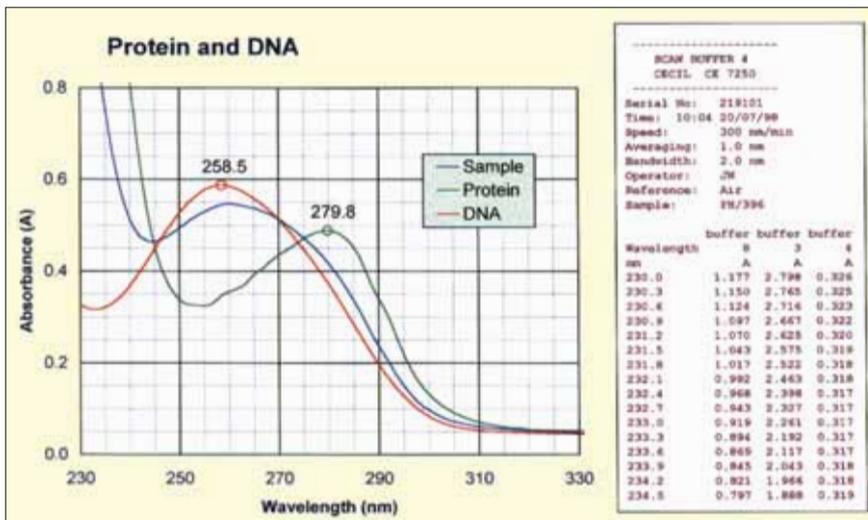
The Cecil Assay program software module enables users to mathematically formulate any assay for measurement at up to 10 wavelengths. Rapid text entry of any formula and setting a wavelength program is all that is required for automatic measurement of any sample. A cell program may be incorporated for multiple automatic sample measurements. Up to 20 formulae, each with up to 76 characters, may be combined for the most complex of assays.

Never before has programming assays for automatic measurement and computation been so easy.

Application Example

A typical experiment is illustrated here. The scans of protein, DNA and a sample mixture are shown overlaid over the range 230-330nm.

An automatic calculation of the ratios and the DNA purity of the sample was made using the pre-programmed three wavelength ratio method. The results were automatically tabulated as shown.



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RATIO 260/280,320
CECIL CE 7250
-----
Serial No: 219101
S/W version: R0040
Time: 11:54 20/07/98
Bandwidth: 2.0 nm
Operator: JN
Reference: Buffer
Sample: TY/381
Wavelength formula:
A1 = reading at 260.0 nm
A2 = reading at 280.0 nm
A3 = reading at 320.0 nm
Ratio = (A1-A3) / (A2-A3)
InvRatio = (A2-A3) / (A1-A3)
PurityDNA = (A1/A2) * 100/1.8 %
-----
Absorbance A
Wavelength          Ratio  InvRatio  PurityDNA
260.0  280.0  320.0
Sample
1  0.560  0.430  0.065  1.356  0.737  72.35
2  0.559  0.430  0.064  1.352  0.739  72.22
3  0.559  0.428  0.063  1.359  0.736  72.56
    
```

ORDERING ACCESSORIES

	BioQuest™	BioAquarius™
Cell Holders		
Micro sipette 10mm cell holder	1010 32 00	503 26 00
Adjustable holder for micro cell		6600 57 00
50µl ultra microcell holder	2020 39 00	8020 39 00
Rectangular cells up to 100mm	1010 38 00	595 27 00
Cylindrical cells up to 100mm	1010 39 00	595 26 00
Cell Changers		
4 cell auto changer, no holder	2021 34 00	9070 31 00
Holder for 4 x 10mm cells	2010 24 00	2010 24 00
6 cell auto changer, no holder		9070 34 00
6 cell auto changer and holder	2021 36 00	
Holder for 6 x 10mm cells		5500 33 00
8 cell auto changer with holder	3021 37 00	9070 32 00
4 position microcell changer	2020 38 00	505 38 00
Sipette and Batch Sampling		
Sipette system, no holder or cell	2021 21 00	9070 21 00
10mm sipette cell	202 07 02	202 07 02
40 Batch sampler with pump	2021 82 00	2021 82 00
100 Batch sampler with pump	2021 82 02	2021 82 02
Lamps		
Deuterium lamp with indicator	2202 01 42	2202 01 42
Tungsten halide lamp - in pairs	2303 01 40	2303 01 40
Sample Stirring		
Electronic stirrer	2010 31 00	2010 31 00
Cell holder 10mm cell	2010 32 00	579 02 00

	BioQuest™	BioAquarius™
Temperature Control - Water		
Single or Sipette cell holder	1010 33 00	503 36 00
4 cell holder	2020 36 15	202 36 16
2 x 4 cell holder, sample and ref.		202 36 15
6 cell holder		5500 36 15
Thermoelectric Control		
Thermoelectric Controller	CE 2024	CE 2024
Single or sipette cell holder	2021 31 20	8020 56 00
4 cell holder	2021 32 20	9070 57 00
2 x 4 cell holder		9070 58 00
6 cell holder		9070 59 00
Gel Scanning		
Gel scanner - no trough		9070 39 00
Gel trough - 5 x 100mm, silica		570 07 02
Printers and Cables		
RS232 cable for 25 pin PC	2021 26 00	2021 26 00
RS232 cable for 9 pin PC	2021 83 00	2021 83 00
Printer connection cable	8000 71 00	8000 71 00
Dot matrix printer	8000 70 01	8000 70 01
Colour ink jet printer	8000 72 01	8000 72 01
Certified Calibration Filter Sets		
2 Wavelength filters	303 40 00	303 40 00
4 Absorbance filters	594 44 00	594 44 00
6 Absorbance filters	594 66 00	594 66 00
2 Wavelength and 6 Abs. filters	594 77 00	594 77 00

SPECIFICATIONS

	BioQuest™	BioAquarius™
Optical System	Single Beam	Symmetrical Double Beam
Monochromator	Littrow, 1200 L/mm grating	Czerny Turner 1200 L/mm grating
Wavelength Range	190 - 1100nm	190 - 1100nm
Wavelength Accuracy	Better than 1 nm	Better than 0.5nm
Wavelength Reproducibility	Better than 0.1nm	
Scan Speeds	1-4000nm/min	
Photometric Range	-0.3 - 3A, 0-200% T and C	
Photometric Noise	Better than 0.00004A at 1A, 500nm RMS	
Photometric Accuracy	Better than 0.005A at 1A	Better than 0.004A at 1A
Baseline Flatness	Better than ±0.002A p.t.p.	Better than ±0.001A p.t.p.
Method Storage	30 methods security code protected	
Spectral Storage		100 spectra, code protected
Derivative Spectra		1st to 4th
Overlaid Spectra		Up to 6
Concentration Curve Fitting	Linear, quadratic and cubic curves, to 30 concentration standards or replicates	
Display Screen With Scrolling	Large LCD with 6 screen widths of scrolling for wide view	
Stability	Better than 0.001A/hr	Better than 0.0001A/hr
Computer Interface	Bi-directional serial RS232 and parallel ports	
Size and Weight	480 x 340 x 205; 18.6 19.5 Kg	635 x 410 x 210; 33Kg

PRE-PROGRAMMED BIO-ASSAYS

Protein

Lowry Low Sensitivity
 Lowry High Sensitivity
 Bradford
 Biuret
 BCA
 Direct UV
 Warburg and Christian 260/280
 Warburg and Christian 260/280 : 320 Background
 Kalb and Bernlohr 260/230
 Kalb and Bernlohr 260/230 : 320 Background

D N A

Ratio at 260/280
 Ratio at 260/280 : 320 Background
 Ratio at 260/230
 Ratio at 260/230 : 320 Background
 Warburg and Christian 260/280
 Warburg and Christian 260/280 : 320 Background
 Kalb and Bernlohr 260/230
 Kalb and Bernlohr 260/230 : 320 Background

ss D N A

ds D N A

R N A

Thermal melt Tm

Molecular concentration

Percent recovery

Phosphate concentration

Ratio at two user selected wavelengths

Difference at two user selected wavelengths

Multi-Wavelength Assay using user selected wavelengths

Concentration Curve Fit : linear, quadratic, cubic to 30 standards and replicates

All user specific assays may be stored as protected methods

Cecil Instruments policy is one of continuous development. We therefore reserve the right to change specification without notice.

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ORDERING

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

BioQuest™

CE 2501 Spectrophotometer
 190-1100nm wavelength range
 4nm Optical bandwidth.

CE 2502 Spectrophotometer
 190-1100nm wavelength range
 4nm Optical bandwidth with integral printer.

BioAquarius™

CE 7250 Spectrophotometer
 190-1100nm wavelength range
 1.8nm Optical bandwidth.

SOFTWARE MODULES

Program C

Cell program for 4, 6 or 8 cells, may be combined with Wavelength Program.

Wavelength Program

Up to 10 wavelengths may be programmed and the program may be combined with a Cell Program.

Quant S

Quantification of corrected bands, difference spectra, spectral stripping.

Kinetics M

Multi-cell Kinetics for up to 4 or 6 cells.

Validation

Validation of absorbance, wavelength, bandwidth, straylight etc. using liquid samples or certified standards.

DataStream

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

Assay Program

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

