

OPTIONAL SOFTWARE - E-SEF Enabled

SM1 Nucleic Acid and Protein - more advanced calculations:

Warburg and Christian

DNA	260/280
DNA	260/280, 320
Protein	260/230
Protein	260/230, 320

Kalb and Bernlohr

DNA	260/280
DNA	260/280, 320
Protein	260/230
Protein	260/230, 320

SM2 Molecular calculations
Molecular concentrations
Recovery of oligonucleotides
Phosphate concentration
Protein purity
Theoretical thermal melt

SM3 Protein Assay - Bradford 595nm

SM4 Bacterial Growth
Optical density at 600nm

SM5 Validation: Wavelength, Absorbance, Bandwidth etc

SM6 Method Storage for 30 methods security protected

ACCESSORIES AND SPARES

Cell holder for 50µL cells - type E	2020 39 00
Printer connection cable	8000 71 00
Dot matrix printer	8000 70 01
Spare deuterium lamp	2202 01 42
2 Certified wavelength filters with certificate	303 40 00
4 Certified Absorbance filters with certificate	594 99 00
Dust cover	2020 01 23

SPECIFICATION

Wavelength Range	190-370nm, 595 and 600nm
Wavelength Accuracy	±1nm
Wavelength Reproducibility	±0.1nm
Wavelength Calibration	Automatic at switch on
Wavelength Selection	Automatic for assay selected
Monochromator	Littrow 1200 lines per mm holographic grating
Optical Bandwidth	4nm
Straylight	Less than 0.02% at 280nm (Acetone)
Photometric Range	-0.3 - 3 Absorbance
Photometric Linearity	±1% or ±0.005, whichever is greater
Stability	Better than 0.001A/hour at 240nm constant T.
Real Time Clock	Timed and dated reports
Light Source	Deuterium lamp with life indicator
Printer Output	Centronics parallel port
Power Requirements	110-240V, 50/60Hz, 100W
Size and Weight	480 x 340 x 205, 17.6Kg, (18.5kg printer version)

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

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GeneQuest™

BENEFITS

Full screen display of menus, prompts and results

Software options password enabled at any time by E-SEF

Storage for 30 user methods, password protected

Warning of poor sample transmission

Signal enhancement for poor sample transmission

Plot of curve fitted to standards

Full UV range available to create methods

ORDERING

Each GeneQuest analyser is supplied complete with an ultra microcell holder, power cable, operator's manual and short form operating instructions.

CE 2301 Analyser

190-370nm, 595 and 600nm
4nm optical bandwidth

CE 2302 Analyser

190-370nm, 595 and 600nm
4nm optical bandwidth
With integral printer

ISO 9000
CERTIFIED COMPANY



GeneQuest™



DNA / RNA
ANALYSER





Dedicated to Molecular Biology

The GeneQuest™ Analyser is a spectrophotometer dedicated to the requirements of the Molecular Biology Laboratory. Fully programmed methods include those for RNA, ds DNA, ss DNA, oligonucleotide primer, proteins, bacterial growth and cell culture measurements and molecular calculations, including theoretical thermal melt.

Ultra Micro-Samples

Measurements are possible for a wide range of sample volumes, from 2000µL to 5µL using an appropriately selected cell in the ultra microcell holder fitted as standard in the GeneQuest™.

STANDARD SOFTWARE

- A260/A280 Ratio
- A260/A280 with background correction at 320nm
- A260/A230 Ratio
- A260/A230 with background correction at 320nm

Simplicity of Operation

Insert the reference, press ZERO, then insert the sample and press RUN to obtain a fully documented report complete with header, sample number and space for the operators name etc. Operation could not be more simple.

Operators may create and store up to 30 of their own methods with the method storage option.

Automatic Wavelength Selection

All the fully programmed methods are selected from a menu and displayed with headers, prompts and details on the large display screen on which information may be scrolled for viewing.

All wavelengths for any given assay are automatically selected and measured. Results are displayed on the screen and a timed and dated printout is available on an external printer, or the internal printer of the CE2302.

Enhanced Performance

The excellent accuracy of the GeneQuest™ for normal samples is further enhanced for poorly transmitting samples by an automatic integration process initiated in response to an alert message.

Validation

To fulfil legislative requirements and GLP, onboard software allows for performance validation using filter sets calibrated by Cecil Instruments and supplied with calibration certificates traceable to NPL standards. Methods for liquid samples are also provided.

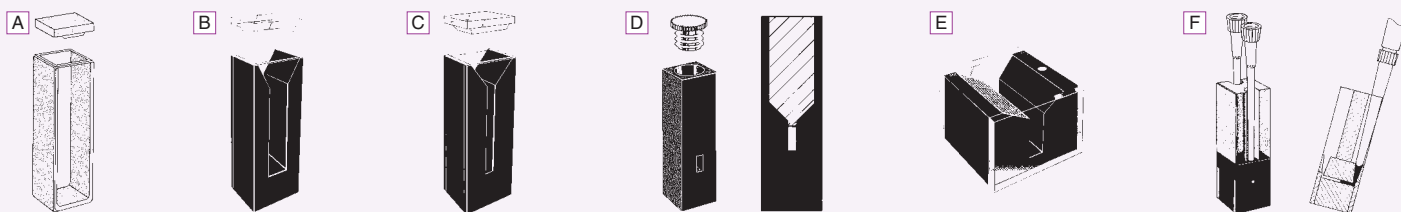
- ss DNA concentration
- ds DNA concentration
- RNA concentration
- Direct UV method for protein at 280nm

SAMPLE CELL SELECTION

A range of UV transmitting silica cells is available. The listing given here enables the cell appropriate to the sample volume to be chosen. All cells except the standard must be of the self masking type.

Using a 10mm pathlength cell an absorbance value of 1 is estimated for a concentration of 50µL/mL of ds DNA

Volume (µL)	Pathlength (mm)	Cell Description	Cell Type	Part Number
2000	10	Standard	A	202 07 26
500	10	Semi-micro, thick base	B	202 07 57
250	10	Micro, thick base	C	202 07 38
70	10	Ultra micro	D	202 07 15
50	10	Ultra micro	E	2020 07 01
		use holder 2020 39 00		
10	10	Ultra micro, pipette filling	F	202 07 64
1000	5	Standard - use spacer	A	202 07 25
5	5	Ultra micro, pipette filling	F	202 07 63



D2 260.0_{nm} 0.836_A
Measurement finished Ratio 260/280

Operator: JN
Reference: Air
Sample: DK/753
Wavelength formula:
A1 = reading at 260.0 nm
A2 = reading at 280.0 nm
Ratio = A1/A2
IRatio = A2/A1

Absorbance A

Sample	260.0	280.0	Ratio	IRatio
1	0.459	0.457	1.004	0.996
2	0.807	0.794	1.016	0.984
3	0.321	0.313	1.026	0.975

D2 280.0_{nm} 0.000_A
Theoretical Tm

THEORETICAL Tm
CECIL CE 2302

Serial No: 141099
S/W version: T0231
Time: 09:08 28/10/99
Molarity = 0.050 mol/L
MerLength = 54
%GC = 42 %

$Tm = 81.5 + 16.6 * \log(\text{Molarity}) + 0.41 * \%GC - 675 / \text{MerLength}$
= 65 °C

D2 280.0_{nm} 7.325_{mg/L}
Direct UV

DIRECT UV
CECIL CE 2302

Serial No: 141099
S/W version: T0231
Time: 09:01 28/10/99
Bandwidth: 4.0 nm
Conc curve: quadratic
Stand Dev: 0.00
Corr coeff: 1.0000
Wavelength: 280.0 nm

Std No.	Abs	Std conc	Calc conc
2	1.188	26.00	26.00
1	0.794	18.00	18.00

QUANT MENU
CECIL CE 2302

Serial No: 141099
S/W version: T0231
Time: 10:09 28/10/99

Bio Analysis
ssDNA
dsDNA
RNA
DNA Ratio
Ratio 260/280
Ratio 260/280,320
Ratio 260/230
Ratio 260/230,320
Warburg & Christian
DNA 260/280
DNA 260/280,320
Protein 260/280
Protein 260/280,320
Kalb & Bernlohr
DNA 260/230
DNA 260/230,320
Protein 260/230
Protein 260/230,320
Theoretical Tm
Tm (Wallace)
Tm (Baldino)
Bacterial Growth
Protein Assay
Bradford
Direct UV

BRADFORD
CECIL CE 2302

Serial No: 141099
S/W version: T0231
Time: 08:53 28/10/99
Bandwidth: 4.0 nm
Conc curve: linear
Stand Dev: 0.06
Corr coeff: 0.9999
Wavelength: 595.0 nm
Operator:
Standard:

Std No.	Abs	Std conc	Calc conc
3	0.931	18.00	18.03
2	0.556	11.00	10.92
1	0.353	7.000	7.053

Conc = +0.350 +19.00*A

Assays Displayed on Screen

Shown here are three screen displays of typical assays, for protein by the direct UV method, ratios at 260/280nm and a theoretical melt Tm calculation.

Printout of Assays

The printouts shown here are for typical assays using the Bradford method at 595nm, the determination of dsDNA, and the results of the Kalb Bernlohr determination of nucleic acids and proteins.

A plot of any curve or straight line fitted to a series of standards is always available to verify the fit.

The printout on the left of this page shows a list of all the available methods offered by the GeneQuest™.

DSDNA
CECIL CE 2302

Serial No: 141099
S/W version: T0231
Time: 15:43 27/10/99
Bandwidth: 4.0 nm
Wavelength: 260.0 nm
Operator: JN
Reference: Air
Sample: RS/553
Wavelength formula:
A1 = reading at 260.0 nm
Dilution = 2
PathLength = 10 mm
Factor = 50
Conc = A1 * Factor * 10 * Dilution / PathLength
ug/mLdsDNA
Avogadro = 6.02214e23
MolWt = 158.4 g
Molecules = Conc * Avogadro / (MolWt*1e6) /mL
MolConc = Conc * 1e3 / MolWt pmol/uL

Sample	Absorbance A	Conc ug/mLdsDNA	Molecules /mL	MolConc pmol/uL
1	0.319	31.90	1.213e+17	201.4
2	0.458	45.80	1.741e+17	289.1
3	0.807	80.70	3.068e+17	509.5
4	1.258	125.8	4.783e+17	794.2
5	0.461	46.10	1.753e+17	291.0

KALB & BERNLOHR
CECIL CE 2302

Serial No: 141099
S/W version: T0231
Time: 10:27 28/10/99
Bandwidth: 4.0 nm
Path length: 10 mm
Operator: JN
Reference: Air
Sample: WQ/740
Wavelength formula:
A1 = reading at 230.0 nm
A2 = reading at 260.0 nm
A3 = reading at 320.0 nm
Dilution = 4
Conc = ((A2-A3)*49.1 - (A1-A3)*3.48) * Dilution ug/mLdsDNA
Avogadro = 6.02214e23
MolWt = 213.7 g
Molecules = Conc * Avogadro / (MolWt*1e6) /mL
MolConc = Conc * 1e3 / MolWt pmol/uL
ExMolConc = 1150 pmol/uL
Recovery = 100 * MolConc / ExMolConc %
PhosConc = Conc/315.0 pmol/uLPO4

Sample	Absorbance A			Conc ug/mLdsDNA	Molecules /mL	MolConc pmol/uL	Recovery %	PhosConc pmol/uLPO4
	230.0	260.0	320.0					
1	0.335	0.320	0.305	2.528	7.125e+15	11.83	1.029	0.008
2	0.336	0.320	0.306	2.332	6.572e+15	10.91	0.949	0.007
3	0.338	0.322	0.307	2.514	7.086e+15	11.77	1.023	0.008