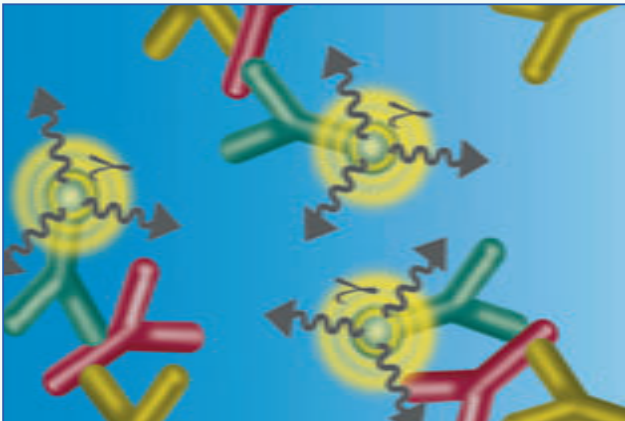
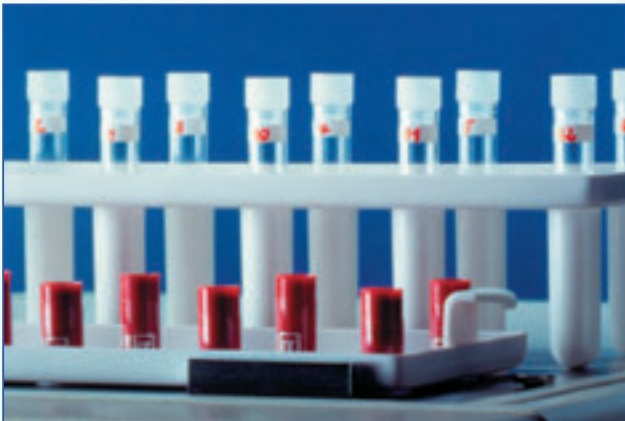


detect and identify



Multi Crystal LB 2111

Gamma Counter

Multi Crystal LB 2111

Gamma Counter

The Multi Crystal LB 2111 gamma counter from BERTHOLD TECHNOLOGIES is a compact, robust and easy-to-use instrument for most applications where γ -emitting isotopes are used.

The instrument can be operated in a stand alone mode or can be hooked to a personal computer. In either of the options the user is guided through a clearly structured and easy-to-use assay setup. Templates facilitate the definition of new measurement protocols and data evaluation.

Sample loading is made easy and convenient by means of 12 position sample racks that are simply inserted into the matching boreholes of the detector crystals. Sample throughput is high as 12 tubes (or even 24 tubes with the extended model) can be measured at a time.

The absence of any moving parts and the robust electronics guarantee a long lifetime and error-free operation.

Sample Racks

The sample racks facilitate loading of 12 samples at a time in a most convenient way. With multiple racks all samples of a measurement campaign can be prepared in advance.

The sample rack concept has another important advantage: in case a tube is contaminated on the outside the contamination is never carried on to the instrument. The racks themselves can be cleaned and decontaminated.



Detectors

The 12 detectors are made of high-quality NaI borehole "well type" crystal providing best measurement geometry for γ -emitters located in a sample tube. The crystals cover an energy range up to 500 KeV - suitable for the common isotopes, e.g. ^{125}I , ^{57}Co , ^{59}Fe , ^{51}Cr and ^{99}Tc .

A thick lead shield of 6 mm, i.e. in total 12 mm of lead surrounding each of the detectors efficiently prevents crosstalk between the samples in the individual detectors.

For specific loading patterns any of the detectors can be disabled individually. Exchangeable plastic liners prevent detector contamination.



Instrument models

The Multi Crystal LB 2111 gamma counter is available as a 12 detector unit. To increase throughput a second detector block may be added resulting in a 24 detector instrument.

Both models can be operated stand alone or with the PC software LBIS.

Stand alone operation

In this configuration a video terminal and a keyboard are connected to the gamma counter. A serial matrix printer is to be used for data output. The stand alone configuration supports all requirements of a laboratory's routine assays incl. raw data (CPM), RIA, IRMA, ratio and receptor type.

Software features

	Stand alone	LBIS
■ Assay types: raw data, ratio, RIA, IRMA, receptor	✓	✓
■ Curve fitting: smoothed spline, linear, quadratic and cubic regression	✓	✓
■ Logit/Log data transformation	✓	✓
■ Full standardisation	✓	✓
■ Reference curve with calibrators	✓	✓
■ Curve overlay & averaging		✓
■ Assay QC based on controls or patient means Shewart plot, precision profiles	✓	✓
■ Manual data entry	✓	✓
■ Re-run of data	✓	✓
■ Result data upload to host PC	✓	✓
■ File storage of result data		✓
■ Storage of last run	✓	✓
■ Worklist download from host PC		✓
■ Worklist import from file		✓
■ Manual patient ID input	✓	✓
■ Single instrument support	✓	✓
■ Dual instrument support		✓
■ Triple instrument support		✓
■ Quadruple instrument support		✓
■ Instrument QC	✓	✓
■ Instrument Reset	✓	
■ Windows® user interface		✓

Detector standardisation

The standardisation procedure corrects for slight variations in detector efficiencies. Either, a single tube containing the isotope e.g. ^{125}I , is sequentially counted in each of the detectors or 12 tubes, each with the same amount of activity, are counted simultaneously in all 12 detectors.

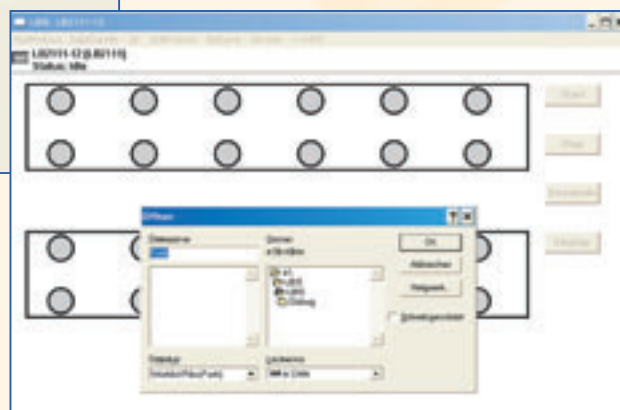
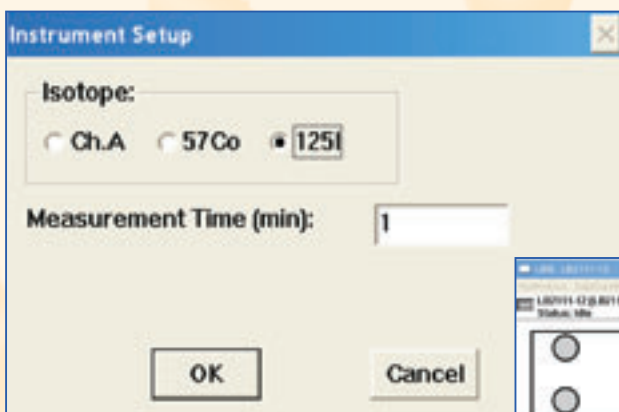
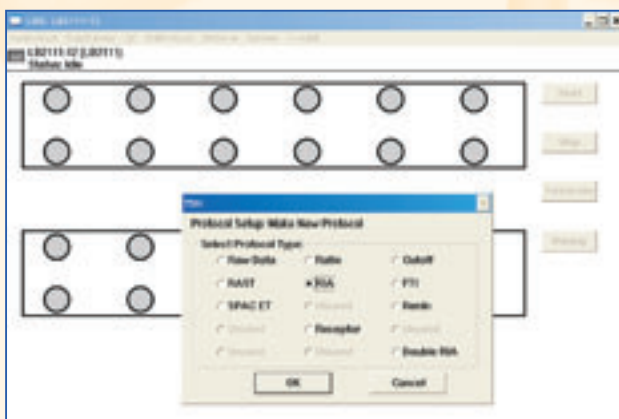
Together with the standardisation the high voltage supply is optimised for each detector.

detect and identify

LBIS immunoassay evaluation software

The LBIS software is a Windows® based instrument operation and data evaluation software with a graphical user interface. It supports all common types of competitive (RIA) and immunometric (IRMA) assays with superior curve fitting algorithms increasing the reliability of the calculated results at the lower concentrations.

LBIS supports worklist download and sample data upload to host computers. Up to 4 instruments connected to one PC can be run with one LBIS software.



Instrument QC and IVD certification

Many laboratories are subject to quality management (QM) especially if assays for *in vitro* diagnostics (IVD) are performed.

The instrument's operating software – both the stand alone version as well as LBIS – support the QM requirements, e.g. the German DIN 6855, by the Instrument QC functions.

The functions and their recommended frequency of execution include

■ Efficiency	weekly/daily
■ Absolute & relative background	weekly/daily
■ Relative detector efficiency	half yearly
■ High voltage adjustment	half yearly

The QC routines can be easily performed with 12 individual matched ¹²⁵I or ⁵⁷Co sources or even more conveniently with the long-lived ¹²⁵I multi test source containing 12 sources of 2 KBq each.

The QC report includes absolute and relative detector count rates and efficiencies, background counts, the respective 2-sigma values and the means, CVs and matching of the detector efficiencies.

The Chi Square test is available as an additional routine to verify the instrument's performance.

The Multi Crystal LB 2111 gamma counter holds the CE certification according to IVD Directive 98/79/EC (Annex I and Annex III sections 2 to 5).

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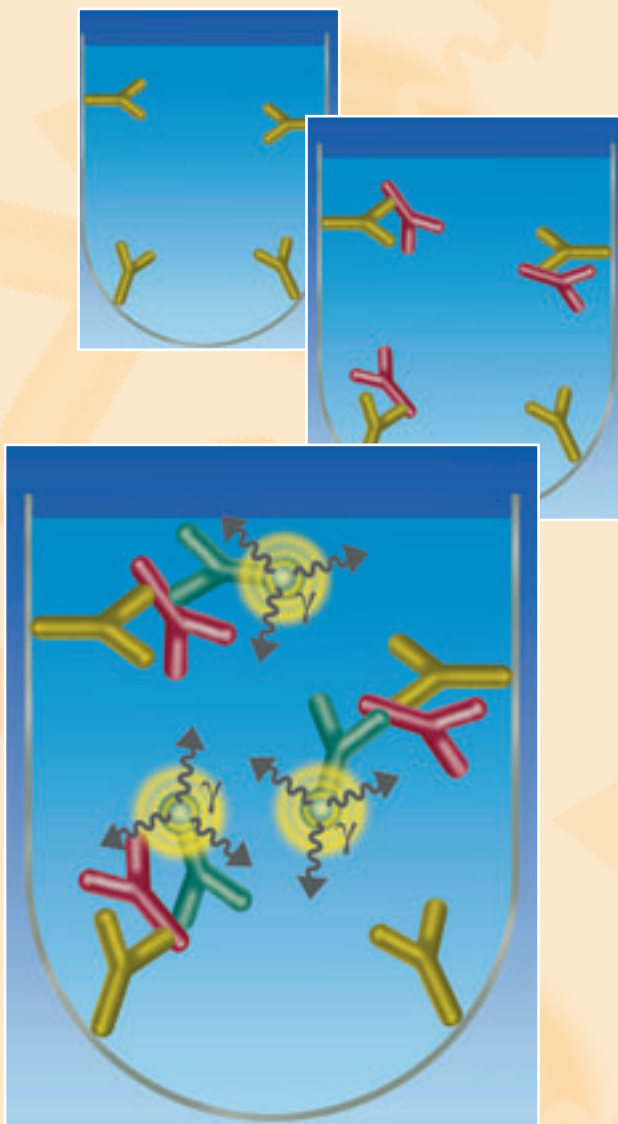
Applications

RIA and IRMA type immuno assays mainly with ^{125}I :

- Thyroid hormones
e.g. T3, T4, TSH
- Reproductive hormones
e.g. LH, Estriol, FSH, Progesterone, Testosterone
- Drug abuse screening
e.g. THC, Cocaine, Amphetamine
- Allergy
e.g. Histamines, IgE
- Vitamins
e.g. Vitamin D
- Growth deficiency
e.g. hGH
- Neurotransmitter
e.g. Serotonin, Dopamine
- Bone and mineral metabolism
e.g. Osteocalcin, Calcitonin
- Gastric diseases
e.g. Gastrin, Leptin, Ghrelin
- Veterinary
e.g. Canine T3, Canine TSH, Porcine GH
- Tumour markers
e.g. AFP, CEA, PSA
- Neonatal screening
e.g. neonatal TSH, neonatal T4
- Diabetes
e.g. Insulin, Glucagon, C-Peptide
- Nephrology
e.g. urinary Albumin
- Iron metabolism
e.g. Ferritin
- Calcium metabolism
e.g. Parathormone
- Heart diseases
e.g. Digoxin

Other Applications

- Infectious diseases
e.g. Hepatitis
- Cytotoxicity based on ^{51}Cr release
- Kidney clearance with ^{99}Tc
- Receptor binding
- Iron metabolism with ^{59}Fe



Multi Crystal LB 2111

Technical Specification and Order Information

Detection Unit	12 x 1.25" borehole NaI crystal with photomultiplier tube
Shielding	6 mm lead shielding surrounding each detector
Detector crosstalk	0.413 % (12 mm lead shielding between detectors)
Energy range	0 – 500 KeV
Isotopes	¹²⁵ I, ⁵⁷ Co, ⁵¹ Cr, ⁵⁹ Fe, ⁹⁹ Tc all other radioisotopes within the energy range
Efficiency	75 % for ¹²⁵ I, 35 % for ⁵¹ Cr
Tube format	ø 14.5 mm in rack ø 16 mm in bore hole
Interface	serial RS 232
Software	embedded RIA software or LBIS Windows PC immunoassay software
PC operating system	Win98, Win2000, WinNT, WinXP (for operation with LBIS only)
PC requirements	Pentium processor, 500 MHz (or better), FDD 3.5" or CD ROM drive, display 1024 x 768 (or better), serial port (for operation with LBIS only)
Power supply	220 V / 50 Hz or 110 V / 60 Hz (depending on model)
Regulations	CE, UL, CSA, IVD CE
Temperature range	Storage: 0 - 40 °C Operation: 15 - 35 °C
Humidity	10 - 85 % non condensing
Dimensions	395 x 235 x 510 mm (WxHxD)
Weight	39 Kg

Operation Modes

CPM raw data	single or dual channel
CPM ratio	RAST, Cr-Release, T3 Uptake
RIA	e.g. FT4, single or dual channel
IRMA	e.g. TSH, single or dual channel
Combined RIA/CPM ratio	e.g. FTI
Combined RIA/IRMA	e.g. FT4/TSH
Receptor binding	e.g. ER
Assay QC	based on intra assay controls
Instrument QC	detector efficiency, standardisation, background

Order information

LB 2111 Gamma Counter RIA, 12 detectors, incl. terminal & printer, 230 V	81425-10-230
LB 2111 Gamma Counter RIA, 12 detectors, incl. terminal & printer, 115 V	81425-10-115
LB 2111 Gamma Counter LBIS, 12 detectors, incl. LBIS software, 230 V	81425-11-230
LB 2111 Gamma Counter LBIS, 12 detectors, incl. LBIS software, 115 V	81425-11-115
LB 2111 Gamma Counter RIA24, 24 detectors, incl. terminal & printer, 230 V	81944-10
LB 2111 Gamma Counter RIA24, 24 detectors, incl. terminal & printer, 115 V	81944-20
LB 2111 Gamma Counter 24 basic, 24 detectors, 230 V	81944-01
LB 2111 Gamma Counter 24 basic, 24 detectors, 115 V	81944-02
24-pin matrix printer with accessories	08687
12 position sample rack, 10 pcs.	30002
Test source ¹²⁹ I	08691
Test source ⁵⁷ Co	23806
Multi-Test source 12-fold ¹²⁹ I	24831
PC immunoassay software LIBS	21328
PC terminal software WinTerm	29890
Vials 5 ml, 12x75 mm, 2000 pcs.	09778

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BERTHOLD TECHNOLOGIES GmbH & Co. KG

P.O. Box 100 163
75312 Bad Wildbad
Germany

Phone: +49 7081 177-0
Fax: +49 7081 177-100
E-mail: Bio@Berthold.com
Internet: www.Berthold.com/Bio