



# PROTECTING PEOPLE AND THE ENVIRONMENT

The LB 134 Universal Monitor UMo II

# A VERSATILE & MOBILE MONITOR FOR RADIATION PROTECTION

The LB 134 Universal Monitor UMo II with integrated dose rate detector



## One device, multiple applications

The LB 134 is a versatile instrument for dose and dose rate, as well as the exposure rate and even contamination measurements. The system quickly adapts to your needs through a variety of different detectors that can be attached to the base unit.

This enables the system to be used for many different applications

- ▣ Determination of the gamma or neutron dose rate in ambient equivalent dose and dose rate  $H^*(10)$
- ▣ Detection of radioactive alpha and beta/gamma contaminations
- ▣ Fast tracking of contaminations and activities

## Dose rate monitoring according to your needs

Solutions for monitoring the radiation dose are indispensable tools when working with radiation sources or X-ray machines in laboratories, radiology, radiography or any other technical irradiation facility.

Dose and dose rate monitoring systems from Berthold reliably detect any increase in the dose rate at your workplace and enable you to take decisions quickly and well-informed.

## LB 134 UMo II benefits at a glance

- ▣ **Designed for mobility:**
  - lightweight, handy but nonetheless very robust
  - practical bag with carrying strap
- ▣ **Designed for simplicity:**
  - Integrated dose rate detector
  - the basic unit recognizes the external probe and automatically adjusts the parameters
- ▣ **Designed for connectivity:**
  - PC software including remote application
  - Option of connecting to the visualisation and archiving software MEVIS



Figure 1: LB 134 UMo II base unit. Its software offers numerous measuring modes and parameter settings

# EXCELLENT SENSITIVITY. GREAT FLEXIBILITY.

Dose and dose rate monitoring solutions

## Solutions for Gamma and X-Ray fields

### LB 134 with integrated dose rate detector LB 1346

Measuring range: 100 nSv/h to  
20 mSv/h  
Energy range: 50 keV to 1.3 MeV

### LB 1236-H10 high-sensitivity dose rate detector

Measuring range: 50 nSv/h to  
10 mSv/h  
Energy range: 30 keV to 1.3 MeV

## Solutions for Neutron fields

### LB 6411 high-sensitivity neutron detector

Measuring range: 30 nSv/h to  
100 mSv/h  
Energy range: thermal up to 20 MeV

### LB 6411-Pb for high energy neutrons

Measuring range: 30 nSv/h to  
100 mSv/h  
Energy range: validated up to 100 MeV

## LB 134 UMo II benefits for dose and dose rate monitoring

### ▣ Versatile detection:

- Integrated dose rate detector (Geiger-Müller tube) and 3 additional external detector options for gamma or neutron radiation detection

### ▣ Versatile application:

- Operation as portable or semi-stationary system



Figure 2: Mobile measurement setup of LB 134 UMo II connected to LB 6411 Neutron Dose Rate Probe.



Figure 3: Portable combination of the LB 134 UMo II with the LB 1236-H10 gamma probe.



# WHEN SENSITIVITY COUNTS

Exposure rate measurements & radiation sensors



"Its excellent sensitivity as well as its high adaptability make the UMo II a versatile solution for dose and dose rate, as well as exposure rate and contamination measurements."

Dr. Rüdiger Collatz, Berthold Technologies

## The UMo II as a portable neutron survey meter solution

The UMo II LB 134 can be used in combination with the neutron measuring device LB 6414 as a mobile measuring system for plutonium contaminations, providing excellent sensitivity. The energy-dependent response of the device has been optimized for fission neutrons.

### Applications

- ◆ Detecting illegally traded plutonium
- ◆ Locating Plutonium contaminations
- ◆ Measurement of  $^{240}\text{Pu}$  equivalent mass
- ◆ Nuclear waste inspection
- ◆ Measurement of  $^{252}\text{Cf}$  and other neutron sources
- ◆ Monitoring the intensities of neutron radiation fields

### Detector

- ◆  $^3\text{He}$  proportional counter tube in PE moderator
- ◆ Neutron energy range: Optimized for 10 keV to 1000 keV
- ◆ Ambient dose equivalent response  $H^*(10)$ :
  - 27 counts/nSv or 0.13  $\mu\text{Sv/h}$  per cps for Am-Be
  - 68 counts/nSv or 0.05  $\mu\text{Sv/h}$  per cps for  $^{252}\text{Cf}$
- ◆ Dimensions: 310 mm x 180 mm x 130 mm



Figure 4: The LB 134 can be used as a portable neutron survey meter in combination with the LB 6414.

## The UMo II as a portable gamma survey meter solution

The UMo II LB 134 provides a high  $\gamma$ -sensitivity when connected to the LB 1234 NaI Scintillation-Counter probe. A combination, that makes it an ideal measurement system for the detection and rapid identification of radioactive sources.

### Applications

- ◆ Transport control
- ◆ Waste inspections
- ◆ Border and baggage controls
- ◆ Control of metal scrap
- ◆ Localization of contaminations
- ◆ Activity measurement

### Detector

- ◆ LB 1234 with 1" x 1" or LB 1234-2 with 1.5" x 1.5" NaI Crystal
- ◆  $\gamma$ -sensitivity: 250 cps per  $\mu\text{Sv/h}$  in  $^{137}\text{Cs}$  radiation field and 3000 cps per  $\mu\text{Sv/h}$  in  $^{241}\text{Am}$  radiation field
- ◆ Background: approx. 30 cps at 0.1  $\mu\text{Sv/h}$   $\gamma$ -ambient dose rate
- ◆ Energy range: 25 keV to 2 MeV
- ◆ Dimensions:  $\varnothing$  40 mm x 305 mm, LB 1234-2  $\varnothing$  51 mm x 305 mm ( $\varnothing$  50 mm at the handle)



Figure 5: In combination with the LB 1234, the UMo II LB 134 offers a powerful mobile system for detecting radioactive gamma sources.

# NO CHANCE FOR RADIOACTIVE CONTAMINATION

Explore our LB 134 measurement solutions



Figure 6: LB 134 - LB 1343 combination with matching wall mountings.

Radionuclides are used in a wide variety of applications. However, they can also be dangerous if handled improperly. Therefore, working with radioactive materials requires continuous monitoring to detect possible contamination of surfaces and objects in work areas as well as on clothing and exposed skin. The LB 134's wide range of connectable detectors makes it a versatile measurement system for reliably detecting contamination, regardless of radionuclide or location.

## LB 134 UMo II benefits for contamination measurement

- ▣ **Highest sensitivity:**
  - provides high measuring accuracy and sensitivity, even at low energies with Berthold's patented ZnS-single photon counting technique
- ▣ **Supports a wide range of applications:**
  - provides various measuring modes: ratemeter, scaler timer, survey, clearance
  - Display in cps or Bq/cm<sup>2</sup> with factory-defined calibration factors for more than 50 radionuclides
  - free memory locations available for customer-specific calibration factors
- ▣ **Extremely low background:**
  - <10 cps for LB 1342,
  - <15 cps for LB 1343



Figure 7: Two different scintillator probes are available: LB 1342 with 170 cm<sup>2</sup> area (left) and LB 1343 with 345 cm<sup>2</sup> area (right).

# EASY DATA MANAGEMENT

The LB 134 PC Software

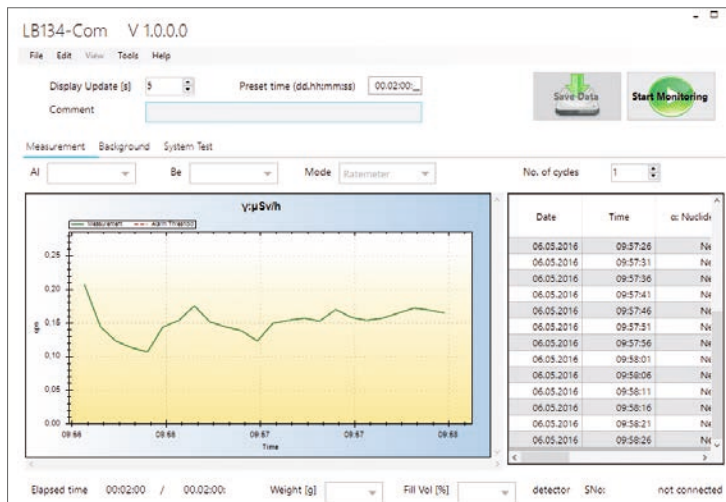


Figure 8: The LB 134 software displays the measuring points in a clear graphical format and the zoom function makes it easy to analyse them.

The LB 134 software has been designed with your application in mind.

- ❑ **Easy data management:**
  - Graphical data evaluation, including Zoom function
  - Calculation of the characteristic limits according to ISO 11929
  - Carry out online measurements
- ❑ **Easy adjustment of measurement parameters:**
  - Simple configuration of all measurement parameters via PC
  - Generation of backup files (parameter configuration) and download via PC or USB stick

# PERFECTLY ADAPTED TO YOUR APPLICATION

The LB 134 accessories

A wide range of accessories adapts the UMo II perfectly to your application:

- ❑ A selection of matching wall brackets permits the UMo II to be used as a semi-stationary system or as an exit monitor for personnel. The instrument and the detectors can be easily detached from the wall bracket and used as portable monitor when needed.
- ❑ A variety of different cables enables the connection to various portable detectors.
- ❑ Practical carrying bag with strap



Figure 9: A practical bag with carrying strap is available for the LB 134.



## TECHNICAL SPECIFICATIONS

### Instrument

|                                  |   |
|----------------------------------|---|
| Display                          | Monochrome LCD 192 x 64 pixel<br>Electro-luminescence illumination  |
| LB 1346 Gamma radiation detector | Geiger-Müller tube (built-in)   |
| Measurement modes                | Ratemeter, scaler-timer, search, clearance mode   |
| Dimensions                       | 160 x 160 x 55 (L x W x D in mm)  |
| Weight                           | 1400 g (with batteries)   |
| Data memory                      | 2400 measured values with date & time   |
| Communication                    | USB (1 device, 1 host for memory stick), RS 485, low voltage relay  |
| Max. operating time              | >15 h alkaline batteries 2.6 Ah (4 x AA)<br>>10 h NiMH rechargeable batteries<br>1.9 Ah (internal detector activated) |

### Environmental conditions

|                   |                                |
|-------------------|--------------------------------|
| Temperature Range | -20 °C to +40 °C (operation)   |
| Rel. humidity     | 0 % to 80 % (no condensation)  |
| External pressure | 500 to 1300 hPa (operation)    |
| Protection class  | IP 53 (according to IEC 60529) |

## ORDERING INFORMATIONS

### Instrument & accessories

|          |   |
|----------|---|
| 62688-10 | LB 134 base unit  |
| 62552    | Wall bracket LB 134   |
| 59221    | Set of Ni-MH accus (4) for LB 134                               |
| 62869    | Connection Cable 11p. - 11p.                                    |
| 64971    | Detector Spiral cable with angle plug-in connection 11p. - 11p. |
| 65287    | LB 134 Extension Cable, 8m long, 11p. - 11p.                    |
| 66578    | Connection Cable RS485/Relais 6p, free ends, 3 m long           |
| 62436    | Case for LB 134, probes and access                              |

### Probe options & accessories

|       |  |
|-------|--|
| 63189 | LB 1342 contamination probe 170cm <sup>2</sup>                 |
| 65281 | Wall bracket LB 1342   |
| 63190 | LB 1343 contamination probe 345cm <sup>2</sup>                 |
| 64140 | Wall bracket LB 1343   |
| 63998 | LB 1236D-H10 gamma probe                                       |
| 64039 | LB 6411D neutron dose rate probe                               |
| 64040 | LB 6411-1D neutron dose rate probe (with reduced gas pressure) |
| 55589 | Case for LB 134 with LB 6411                                   |
| 64144 | Bracket LB 134 for LB 6411                                     |
| 64985 | LB 6414D neutron survey meter                                  |
| 72386 | Case for LB 134 with LB 6414                                   |
| 36103 | LB 1234 NaI scintillation counter probe 1"                     |
| 70701 | LB 1234-2 NaI scintillation counter probe 1,5"                 |

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