MICROSTAR® PACK

LANDAUER revolutionises dose measurement with the microStar mobile reader!

Designed for mobility, the microStar® pack is an equipment adapted to the **in situ assessment of OSL (Optically Stimulated Luminescence) detectors**, InLight® dosimeters and nanoDot® single dots.

This pack gives you the opportunity to manage your dosimetry **independently and in any indoor location**.

The microStar reader enables to analyse the dosimeters, import and export data files, assign participant information to a dosimeter. Pocket Annealer enables to reset the dosimeters.

With the microStar® pack you will discover **new applications**. Easily monitor the doses, quickly measure on site, effectively check the doses of patients or staff and so on!

Contents of the microStar pack – complete version

- 1 microStar reader for reading OSL dosimeters, InLight and nanoDot
- 1 Pocket Annealer to reset the dosimeters
- 1 2D bar code reader
- 1 dosimeter kit as chosen, including
  - a kit of dosimeters for worker dose monitoring
  - a kit of dosimeters for calibration
  - a kit of dosimeters for quality control
- 1 laptop computer, including
  - 1 Open Office licence
  - 1 reader software
  - 1 user manual in English
- 1 kit of power (E, F) and USB cables
- 1 manual pin cutter (if InLight dosimeter kit chosen)

Services included with the pack

- Delivery and setting up
- 1 day staff training on the equipment
- 1 year warranty, parts and labour

Options

- Extension of warranty
- MicroStar pack - basic version, without Pocket Annealer
- Transport box

Pocket Annealer

microStar portable reader and associated laptop computer

OSL technology: enable multiple readings

The microStar pack equipment uses the OSL (Optically Stimulated Luminescence) technology from LANDAUER®.

OSL technology relies on the principle of light emission. The dose is monitored by an aluminium oxide powder doped with carbon (Al_2O_3:C). During analysis, the Al_2O_3:C is stimulated with LED and glow in proportion to the amount of radiation exposure and the intensity of stimulation light.

The optical stimulation keeps more than 99% of the information in the detector making possible multiple readings.

MICROSTAR® PACK

MICROSTAR® READER

Carry out your own dosimetry with complete independence!

The microStar reader is a portable reader designed for the **treatment of OSL dosimeters**, whether InLight dosimeters or nanoDot single point measurement dot. It can be used **on site or in the field** to **measure the radiation doses precisely and straight away**.

The microStar can be used for **workstation studies, in vivo dosimetry, radiological emergency and to monitor a dosimetry laboratory**.

The reader connects via a USB cable to an external computer. The microStar software provides control over data recording, analysis, and the setup and management of the database.

Calibration is carried out by reading the calibrated dosimeters. **Several kits of dosimeters exposed to known dose levels are included in the microStar pack**. Some quality control dosimeters, also included in the pack, allow you to control the reader calibration and its performance.

IMPORTANT

The recommended frequency for quality control procedures is defined by the user frupon the radiation assessment application. The microStar reader must be calibrated at least once a year.

You could find the description of the calibration protocole in the user manual, uploadable from the laptop computer included in the microStrar pack.

Advantages

Portable reader

Small and light, the microStar can be used on site or in the field. Strong, it's easy to relocate.

Plug-and-operate

Easy to configure, it doesn't need consumable (gas, filter,...) nor heating.

Reduced maintenance

As any metrologic equipment, the microStar reader requires preventive maintenance. Delivered with dosimeter kits, one for calibration, the other for quality control, adjustment and calibration are easy. It can be realised by your yourself thanks to the software.

Full and user friendly management interface

The microStar reader works with Microsoft® Windows® operating system and an SQL database. In addition to interpreting results, this software allows a simple setting of parameters for reader operation and advanced data management (search filters, file import/export, addition of personalised fields, etc.).

Immediate results

The microStar reader enables you to obtain a dose readout in 10 secondes.
1. Put the detector in the microStar drawer,
2. Turn the rotating knob for first dot dose measuring,
3. Dose is displayed,
4. Repeat the operation for the remaing dots.

Multiple readings

The OSL technology keeps more than 99% of the information in the detector making possible multiple readings.

Traceability of sensitivity

The InLight and nanoDot dosimeters need no evaluation of their sensitivity before analysis. The sensitivity is already established in our laboratory and is traceable. It is automatically read by the microStar during dosimeter reading.

Traceability of the reading

Using the bar code reader allows easy and automatic assignment. High throughput is possible.

Technical specifications

Dimensions	Height = 12 cm Length = 33 cm width = 24 cm
Weight	16 kg
Power supply	110 - 220 V 1.5 A / 50 - 60Hz
Gas	No
Load capacity	Manual (1 detector)
Reading time	100 dosimeters per hour
OSL dosimeters type	InLight dosimeter nanoDot dot
Units of measurement	gray, sievert, rem, rad and their multiples
Operating temperature	-10 °C to 40 °C
Hydrometry	< 90 %

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POCKET ANNEALER

The Pocket Annealer is a portable equipment which allows **to reset the dose on the InLight and the nanoDot up to 1 Gy**.

Advantages

- **Portable**
  Light and small, the Pocket Annealer is easy to transport with the microStar reader.

- **Nearly instant reset** in less than 10 seconds

- **Easy to use**
  No computer needed to reset, a simple power supply is enough.

The Pocket Annealer is automatically delivered with the microStar pack - full version.

Specifications

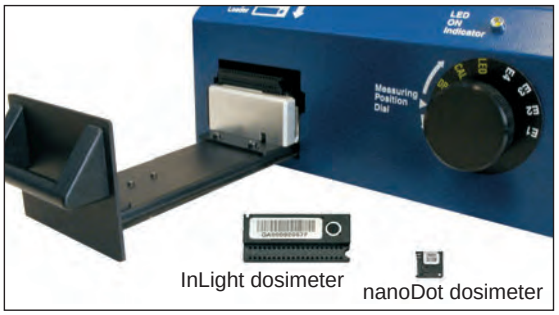
Dimensions	11.5 cm x 28 cm x 28 cm
Weight	5.4 kg
Power supply	110 - 220 V 1.6 A / 50 - 60 Hz
Load capacity	Manual (1 dosimeter)
Annealing time	Time range from 0 to 255 seconds Time adjustment by step of 1 second
Annealing performance	10 seconds of exposure to reach a value less than 0.1 mSv with an initial dose < to 1 mSv
Operating temperature	-10 °C to 40 °C
Hydrometry	< 90 %

IMPORTANT
If you only use the microStar reader for applications in which the cumulative doses are above 1 Gy, you don't need the Pocket Annealer.

OSL DOSIMETERS

The microStar pack is delivered with **a dosimeter kit of your choice**. These dosimeters, InLight or nanoDot, depend on OSL technology which is used by more then 2 millions people worldwide.

Each kit includes a kit of dosimeters for measuring and a kit of dosimeters for **calibration and quality controls of the reader**.



Choice of kit	Dosimeters for measuring	Dosimeters for calibration and quality control
InLight	50 InLight dosimeters (Model GA detector, model 2 cover, alligator clip) 1 000 Security pins 200 Information labels	1 ^{137}Cs InLight calibration kit
nanoDot	100 nanoDot dosimeters 5 microStar adaptors for nanoDot	1 80 kVp nanoDot calibration kit 1 ^{137}Cs nanoDot calibration kit 1 nanoDot kit to calibrate by yourself (radiotherapy)

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OSL DOSIMETERS

InLight dosimeter

The InLight dosimeter consists of four OSL detector elements of 5 mm diameter which are inserted in a barcode labeled case. This case contains a slide equipped with four filters on each side - open window, plastic, aluminium and copper. Due to this design the detectors are capable of measuring, and differentiating, between X- and gamma rays, and beta.

The dosimeter includes a detector, a cover, an alligator clip. You may customize your dosimeters with a design by yourself.

The GA detector model allows to measure $H_p(10)$, $H_p(0.07)$ and $H^*(10)$.

InLight dosimeter

Advantages

- **Ready to use dosimeter**
- **Multiple reading of the dosimeter possible**

  The optical stimulation keeps a very great part of the information in the detector. It is thus possible to reread the dosimeter* without significant loss of signal.
  The Pocket Annealer allows you to reset the doses and re-use the InLight dosimeter.
- **Archiving of the dosimeter for later investigation**

**Dosimeter reusing: unlimited for a dose < 0.1 Gy. Cumulative dose > 20 Gy: dosimeter sensitivity can be affected.*

InLight filter-case

Technical performance

NanoDot dosimeter

The nanoDot is a detector which allows you to get an immediate dose assessment. It consists of just one 4 mm diameter dot of aluminium oxide powder doped with carbon, Al_2O_3:C. Each detector

Type of radiation	Measurement range	Minimum value	Maximum value
Photons	15 keV to 6 MeV - E_{max} = 18 MeV	0.05 mSv	10 Sv
Beta	> 250 keV	0.05 mSv	10 Sv

is identified on the front by a unique alphanumeric code.

When read, the dosimeter must be removed from its plastic pouch and inserted in an adaptor. Consisting of a single OSL dot, the measure does not allow differentiation between X- and gamma rays, and beta. Unlike the InLight dosimeter, you need to know in advance the energy type being measured.

nanoDot
Dot for single point measurement

Advantages

- **Known and traceable sensitivity**
  Its sensitivity is indicated by a serial number.
- **Radiolucent dot**
  The nanoDot is not visible in X-ray imaging.
- **Can be sterilised**
  The nanoDot is delivered with sealed packaging to avoid any contamination. This product can be cold sterilised using any sterilisation product which doesn't attack plastic.

nanoDot
in plastic pouch

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NanoDot dosimeter (following)

Technical performance

The nanoDot analysis are based on the adjustment and calibration of the equipment carefully carried out by you. They are expressed in absorbed dose.

Type of radiation	Measurement range	Minimum value	Maximum value
Photons	15 keV to 25 MeV	0.05 mGy*	15 Gy*
Beta	> 250 keV	0.05 mGy*	15 Gy*

Width	10 mm
Height	10 mm
Thickness	2 mm
Pouch	45 x 40 mm

NanoDot dimensions

microStar
nanoDot adaptor

Dosimeters for calibration and quality controls

Calibration of the microStar reader is carried out by reading the dosimeter calibrators. The reader must be calibrated at least once a year.

The microStar pack is delivered to you with several kits of **dosimeters to perform the reader calibration** and a kit of **quality control dosimeters to monitor its calibration and performance**.

A kit consists of irradiated dosimeters and corresponding certificates.

Information

Discover the microStar starting and calibration videos on our YouTube space.

http://www.youtube.com/Landauerfr

These sets are made up as follows:

	Composition	Characteristics
1 InLight kit ^{137}Cs calibrated	1 calibration kit, ^{137}Cs calibrated InLight	Energy 662 keV 15 InLight, 3 detectors at each dose: 0 mSv, 100 mSv, 500 mSv, 5,000 Sv
	1 quality control kit, ^{137}Cs calibrated InLight	Energy 662 keV 15 InLight: 3 detectors at 0 mSv, 12 detectors at 5 mSv
1 nanoDot kit ^{137}Cs calibrated	1 calibration kit, ^{137}Cs calibrated nanoDot	Energy 662 keV 15 nanoDot, 3 detectors at each dose: 0 mSv, 5 mSv, 30 mSv, 500 mSv, 1,000 mSv
	1 quality control kit, ^{137}Cs calibrated nanoDot	Energy 662 keV 6 nanoDot:, 3 detectors at each dose: 0 mSv, 10 mSv
1 nanoDot kit 80 kV calibrated	1 calibration kit, 80 kVp calibrated nanoDot	Energy 44 keV 15 nanoDot, 3 detectors at each dose: 0 mSv, 5 mSv, 30 mSv, 500 mSv, 1,000 mSv
	1 quality control kit, 80 kVp calibrated nanoDot	Energy 44 keV 6 nanoDot, 3 detectors at each dose: 0 mSv, 10 mSv
1 nanoDot kit to calibrate	50 nanoDot dosimeters	nanoDot to calibrate by yourself (in the case of radiotherapy)

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APPLICATIONS

	A set of dosimeters for measuring	Calibration sets and quality control recommended
PATIENT DOSIMETRY		
RADIOTHERAPY (15 keV-25 MeV for photons and > 1 MeV for electrons) Check the dose delivered to patients during radiotherapy treatment Control the in vivo dose and/or on the skin surface before a treatment. Activities: external therapy, curietherapy. *The MicroStar reader is classified as an instrument of quality control in radiotherapy. It must not be used to adjust the radiation dose delivered to a patient.*	nanoDot kit 	Kit to calibrated
RADIODIAGNOSIS (Photons - low energy) Monitor the dose given to a patient through a plate Measure the patient doses during a conventional or interventional radiodiagnosis. Equipment for conventional radiodiagnosis: scanner, X-rays generators, EOS system. Equipment for interventional radiodiagnosis: X-rays generators	nanoDot kit 	80 kVp calibration kit
STAFF DOSIMETRY		
JOB STUDIES Measure doses taken by the staff member at his/her work station With a reliable measure over long periods. Classify personnel.	nanoDot kit 	^{137}Cs calibration kit
AREAS Measure integrated doses in specific areas of the establishment Delineate and signpost the monitored and controlled areas and forbidden areas or those with particular regulations.	InLight kit 	^{137}Cs calibration kit
ALARA PROCEDURE Optimise the dose taken by the staff member Measure the doses taken by the professional/staff member according to his/her practices. Advise the practitioner/staff member in order to improve his/her practice.	nanoDot kit 	80 kVp calibration kit ^{137}Cs calibration kit
EQUIPMENT MONITORING Control the radiation emissions from the radiological equipment Measure the equipment radiation emissions for the staff member Equipment emitting radiation (X-rays generators etc.) Field concerned: RADIODIAGNOSIS (Photons - low energy) Monitor the efficacy of the EPI and EPC radiology Monitor the protection efficacy, individual and collective, for the staff working with the equipment. Dosimeters used: nanoDot recommended.	nanoDot kit 	80 kVp calibration kit ^{137}Cs calibration kit
RADIOLOGY EMERGENCY To analyse a staff dosimeter in an emergency To immediately measure the dose taken by a member of staff in a radiology emergency. Check the dose on site before sending it to our laboratory for an official analysis. *Dosimeters used: only the InLight chest dosimeters.*	InLight kit 	^{137}Cs calibration kit
LENS Carry out job studies on doses received by lens Workstation study to measure doses received by lens by staff members at their workstation.	nanoDot kit 	80 kVp calibration kit ^{137}Cs calibration kit
ENVIRONMENTAL DOSIMETRY		
BACKGROUND MEASURES Ensure a dosimeter monitoring of the background measure Carry out an internal technical check of the background measure required by regulations.	InLight kit 	^{137}Cs calibration kit
INDUSTRIAL, SPATIAL AND SCIENTIFIC RESEARCH		
INDUSTRIAL RESEARCH & DEVELOPMENT Monitor the product conformity in relation to radiology specifications Within the R&D and operational framework, check and characterise the radiation emissions and/or the radiology protection of new products and materials in the process of manufacture. E.g: Case-Mate tests, efficacy of shields, etc.	To define according to requirements	To define according to requirements
SPACE RESEARCH Evaluate the radiologic protection of equipment and material exposed to cosmic radiation Simulate space conditions for tests of your equipment and material.	To define according to requirements	To define according to requirements
SCIENTIFIC STUDIES AND RESEARCH Support for research projects and scientific studies Evaluate research hypotheses. Create and validate new methods for measuring doses	To define according to requirements	To define according to requirements
ADVICE AND TRAINING		
RADIOPROTECTION ADVICE Sell advisory services to radioprotection professional clients	To define according to requirements	To define according to requirements
RADIOPROTECTION TRAINING Perform simulations of radiation and dose measurements for trainees	To define according to requirements	To define according to requirements

LANDAUER GUARANTEES AND SERVICES

Services included with your equipment

Delivery and setting up in your workplaces

One day staff training

Our expert engineers train your staff in the use of the material as well as in the OSL technology.

Telephone help on +33 (0)1 40 95 62 90

A question about your equipment, its use, on your results or on the calibration of your equipment? For all equipment under guarantee, our technical team is committed to answering your questions.

Our engineers are available by phone from Monday to Friday between 8.30 am and 5.30 pm:
Tel.: +33 (0)1 40 95 62 90,
E-mail: info@landauer.eu.

Our Client Service Relations is also available to you for all information requests, your complaints and your current orders.

Telemaintenance

Our engineers will also help you to use the microStar management software or to resolve a problem relating to this by taking you through it remotely. For this, your computer must be connected to the Internet.

The LANDAUER guarantee

LANDAUER equipment is guaranteed for one year, parts and labour, in case of breakdown.

Work is carried out in your location. This is one of our engineers who moves on your site.

For any equipment, LANDAUER guarantee conditions are detailed in the maintenance contract sent by email after purchase.

Services	Guarantee
Labour	Included
Parts	Included
Repairs	Included
Checking that it is working correctly	Included
Monitoring and carrying out various adjustments	Included
Intervention report	Included
Travel and food/accommodation costs for our personnel	In addition
Costs of packaging and transport one way	Included
Costs of packaging and return transport	Included
Loan of replacement apparatus during the time of the repair > 2 weeks	Included
Exchange with new equipment of equivalent specifications if the repair is impossible or if we judge that an exchange is preferable	Included
An extension of the current warranty of your equipment following a repair	Included

Customised options

Extensions of the warranty

Warranty extension is proposed for:
- 2 additionnal years,
- 4 additionnal years.

Customised services

Over the full life of your equipment, LANDAUER offers you numerous services to meet your needs:
- Out of warranty intervention,
- Additional on site or factory training.

9, rue Paul Dautier
CS 60731
78457 Vélizy-Villacoublay Cedex
France

Phone: +33 (0) 1 40 95 62 90
Fax: +33 (0) 1 40 95 62 89

info@landauer.eu
www.landauer.eu

Find us on
www.landauer.eu