



NEW

compact

three in one

personal

multilabel

tester

TRIATHLER



It is portable

Triathler is as small and as light as a lap-top computer. You can take it from lab to lab or outside for in-the-field measurements.



It is flexible

Triathler accepts most types and sizes of vials, and it is a simple matter to switch detection mode to suit the signal type – gamma radiation, beta radiation or luminescence.



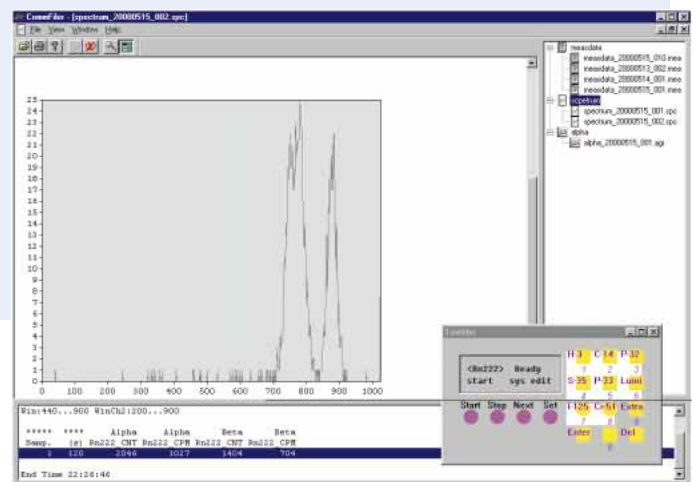
Triathler is a revolutionary new tool for scientists involved in biotechnology, medicine, life science and environmental monitoring.

It's a small, manual single-well instrument that performs liquid scintillation counting, gamma counting and luminescence counting.

We call it Triathler because it is able to perform three different types of detection procedures. It will be used by all those who require instant results in their assays. Triathler is especially ideal if you prefer to work with your own personal instrument. Due to Triathler's extremely small size and light weight you can do now most of your counting on the spot. It is easy to use and yet affordable and doesn't take up any more space on your desk top than a lap top computer.

It is easy to use

Start counting by pressing a key. The result appears on the display. You can also connect Triathler to a PC and easily transfer the data into Windows-based programs



It is sophisticated

For advanced spectrum analysis there is a built-in multichannel analyzer (MCA). Comm.Filer I PC software is supplied with the instrument and allows data transfer to Excel for further processing. For more advanced data processing, Comm.Filer II is available as an option. The picture above and those on the other pages of this brochure were obtained using Comm.Filer II software.

MULTILABEL TESTER GIVES YOU THREE COUNTERS IN ONE AND TRUE ASSESSMENT OF OPERATION

TRIATHLER

IN MONITORING RADIOACTIVITY

Instant DPM gives DPM for most beta emitters, like ^3H , ^{14}C , ^{35}S , ^{32}P , ^{33}P and others, without quench standards

Wipe tests

Tritium wipe test

	Wad	Glass Fiber	Paper
^3H eff. %	7 %	20 %	5 %
BKG (CPM)	50	50	50

The swab material can dramatically affect counting efficiency. Glass Fiber gives clearly the best efficiency.

Alpha wipe test

	Paper	Mixed ester	Glass fiber
Alpha eff. %	75	85	85
Bgn 47 mm (CPM)	0.2	< 0.1*	0.9
Bgn 25 mm (CPM)	0.2	< 0.1*	0.25

*) no Rn-daughters present

Triathler provides fast reliable results for contaminants such as ^3H , ^{14}C , ^{125}I , ^{32}P , ^{35}S , etc. Due to its possibility to measure gamma isotopes up to 1000 keV and LSC up to 2000 keV, Triathler is suitable for many applications.



Tracer studies

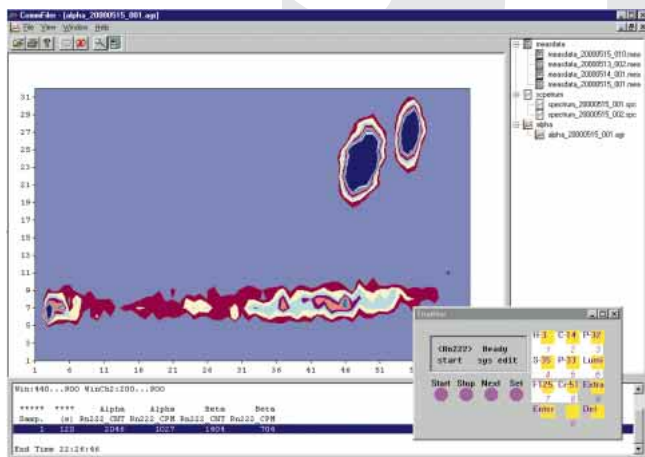
For investigation of water flows in both natural and artificial systems, Triathler allows in-the-field measurement with result collation and presentation in Excel on a connected laptop.

On-line monitoring

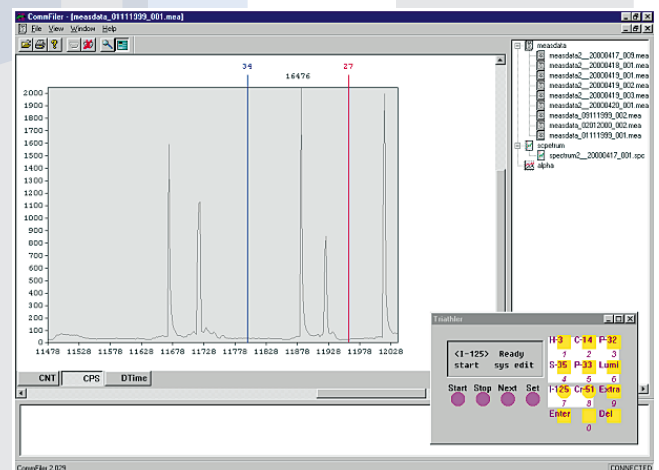
On special request Triathler can be tailored for stack monitoring in radiopharmaceutical laboratories and accelerator labs.

Water measurements

Triathler has alpha-beta separation electronics, which makes it ideal to detect alpha-isotopes like for example radon (^{222}Rn) in water. The illustration below shows alpha and beta nuclides characteristic for ^{222}Rn and its daughters from a well water samples.



Two dimensional spectrum (pulse amplitude vs. length) of extracted ^{222}Rn in water immiscible cocktail was measured with Triathler and the data was transferred into Windows Excel spreadsheet for optimal determination of **alpha/beta discrimination** parameters.



Radioactive release of short lived isotopes in a PET laboratory.

Geological research

The versatility, high performance, and general robustness of Triathler made it the natural choice in the determination of ^3H in oil well monitoring, in the measurement of ^{222}Rn in volcanic gases and air, and in ocean geological surveys.

MULTILABEL TESTER GIVES YOU THREE COUNTERS IN ONE AND TRUE EASE OF OPERATION

TRIATHLER IN BIOSCIENCES

In areas ranging from molecular biology to clinical research to marine biology, Triathler provides reliable results at the time they are needed. Triathler detects all of the commonly-used radionuclides as well as luminescence

Molecular biology

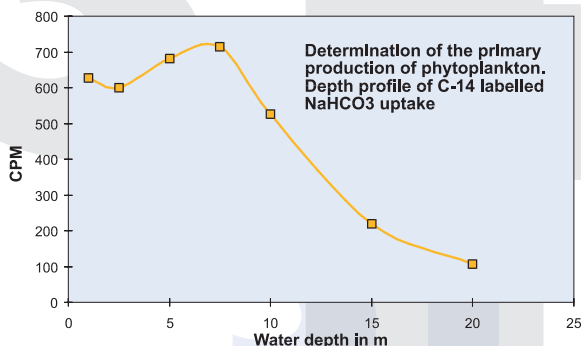
³² P label in microtubes	Efficiency	BG	Comment
1. Cerenkov	40 %	<100	Non-destructive
2. Hidex PSA*	75 %	<100	Non-destructive
3. Mixed with LS cocktail	> 90 %	>150	destructive

*PSA=Plastic Scintillation Adapter

Triathler is well suited for detection of ³H, ¹⁴C, ³²P, ³⁵S, etc. Using the Hidex PSA (Plastic Scintillation Adapter), ³²P can be measured non-destructively with no effect on to the sample. Due to Triathler's small size, it is an ideal bench top counter.

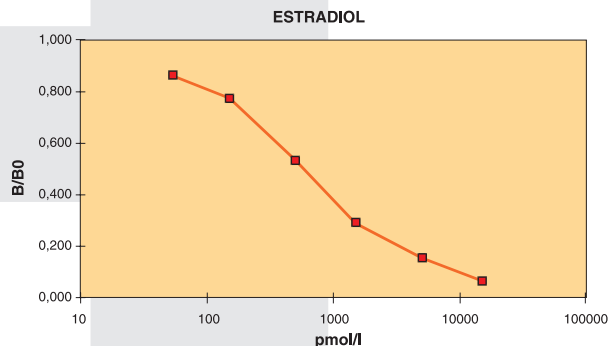
Marine biology

In seawater and lakes, the growth of phytoplankton can be monitored by measuring uptake of ¹⁴C-labelled bicarbonate using Triathler.



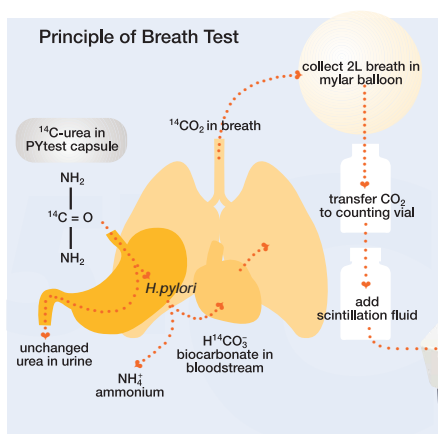
Diagnostic Research

Triathler is ideal for detection of ¹²⁵I used in radioimmunoassays.



Standard curve for Estradiol SPECTRIA kit from Orion Diagnostica, Finland.

Clinical Research

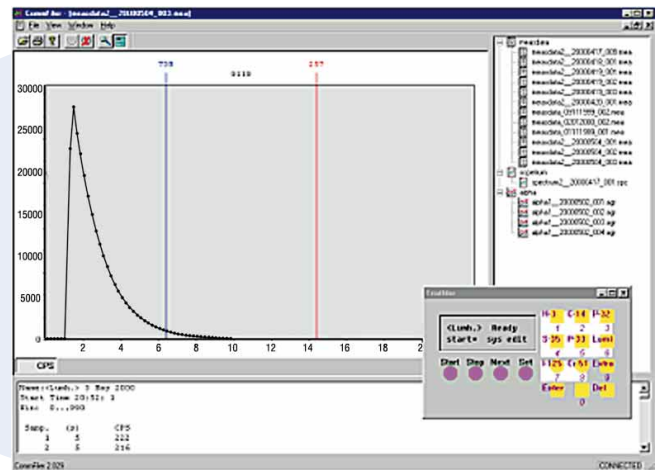


In the *Helicobacter pylori* breath test, the patient swallows urea labelled with ¹⁴C. If the patient is infected with the bacteria, the urea will be cleaved to form ¹⁴CO₂ and NH₃. The ¹⁴CO₂ is measured from breath samples, and Triathler has shown itself to be an extremely useful tool for the rapid processing of these samples.



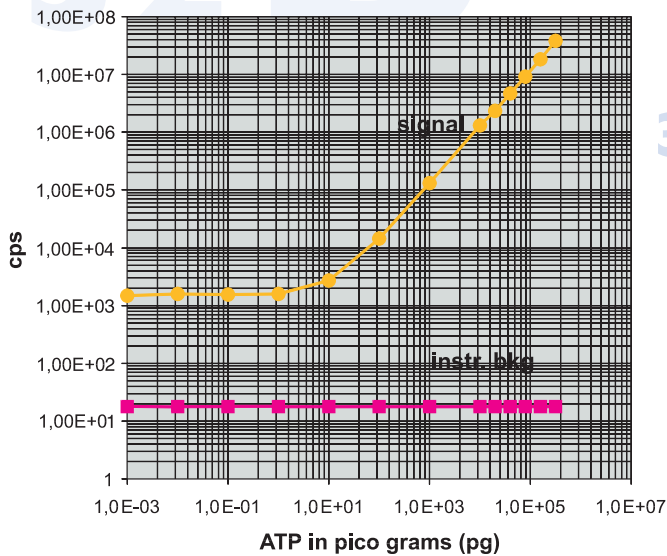
MULTILABEL TESTER GIVES YOU THREE COUNTERS IN ONE AND TRUE FLASH OPERATION IN LUMINESCENCE

As a luminometer Triathler offers high sensitivity with both flash and glow types of reagents. The high sensitivity stems from the instrument's unique design in which virtually all of the light is beamed to the detector. Triathler is well-suited for all types of assay - ATP monitoring, bacterial measurements and luminescence immunoassays. Samples can be measured immediately, so avoiding the risk of changes during transportation in samples taken as field measurements.



Kinetic measurement of a Luminescence sample.

Luminescence range and lower limit of detection (LLD)



In the above measurement, sensitivity is limited by the reagent background. The instrument is capable of luminescence measurement several orders of magnitude lower when reagent background is reduced.

Triathler is ideal for kinetic measurements. You just set the interval and start the readings. If the instrument is connected to a PC, your readings can be transferred directly into Excel.

With its compact injector module, Triathler can accommodate flash-type luminescence reagents.



Reagent injector



TRIATHLER

TECHNICAL DATA

Luminescence Counting

Detector type:	Multiple detector adapters with diffuse white reflectors.
Samples:	The samples may be in Microtubes, LSC-vials or test tubes.
Max. count rate:	3×10^7 CPS

Liquid Scintillation Counting

Detector type:	Multiple detector adapters with diffuse white reflectors.
Samples:	Microtubes, LSC-vials or test tubes.
Energy range:	2 keV...2000 keV
Beta counting efficiency:	up to 48 % for ^3H
Max. count rate:	2,000,000 CPM
Special features:	Special adaptors can be made on request.

Direct ^{32}P measurement

Detector type:	Adapter tube of plastic scintillator
Samples:	Microtubes, which can be non-destructively counted in special Hidex Plastic Scintillation Adapters.
Counting efficiency:	up to 75 % in PSA tubes

Gamma Counting

Detector type:	32 mm x 32 mm (1.25 x 1.25 in) NaI(Tl) crystal detector, through hole, 0.25 mm aluminium window, well dia. 15 mm
Sample size:	max. 13 mm diameter tubes or vials
Background shield:	10 mm of lead

Features

Main unit:	Steel plate case.
Display:	2x16 character LC display
Keyboard:	16 membrane type push buttons
Light detector:	A photomultiplier tube
Microcomputer:	Intel 80196NU, 50 MHz clock cycle
Program memory:	512 kBytes EPROM
Non volatile memory:	64 kBytes of SRAM
Multichannel Analyser:	Dual, gated, 12 bit linear ADC
MCA conversion time:	700 ns
Data output:	RS-232 C to printer or PC
PMT bias supply:	Microcomputer controlled, 0...1300 V
Power input:	+12 V \pm 20 % DC
External power unit:	12 V DC, 2 A

Mechanical Data

Dimensions:	Height 190 mm, depth 330 mm, width 250 mm
Weight:	9 kg

Designed and manufactured in Finland:

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Representative: