Sirius Single Tube Luminometer

Highest Performance – Utmost Flexibility

Berthold
DETECTION SYSTEMS

Sirius Highest Sensitivity and Linearity

Sirius supports a variety of sample formats

Concept

Sirius can be employed according to the individual needs of each user. In its basic configuration the luminometer is ready for standard measurements. Sirius can be upgraded to form a powerful measurement system for any luminescence application.

The Sirius luminometer measures standard glow chemistry of single samples from a variety of sample formats. For flash chemistry, and to make operation more convenient, the instrument can be formatted with one or two built-in automatic reagent injectors.

In stand-alone mode, the built-in microprocessor software supports four protocols for data evaluation, including background subtraction capabilities and replicate management, as well as printer output. Modular PC-Software further enhances performance by organizing the measurement dialog and data evaluation.

Applications

Sirius is the perfect choice for all luminescent flash and glow applications performed in single sample format, for example:

- Reporter gene assays, including dual-reporter assays
- Cell proliferation, cytotoxicity and biomass assays
- Apoptosis assay
- ATP assays
- Ca^{2+} measurements and aequorin-based assays
- Cellular luminescence/reactive oxygen species
- Environmental toxicity and mutagenicity assays

DLReady™

Closing the sample drawer initiates measurement automatically

The Sirius Luminometer combines a very small footprint with excellent performance and outstanding ease of use.

The retractable drawer slides the sample into the measurement chamber. Due to the unique design, a variety of sample formats can be accommodated. It is not necessary to press any key to process the samples, in stand-alone or in PC-operation.

Photon Counting Detector

Sirius Luminometer features advanced photoncounting electronics along with a highly sensitive detector. It provides the lowest signal background and highest linearity covering 6 decades. No cumbersome internal calibration is required and no gain switch is needed.

Light collection is maximized through both the proximity of the sample to the detector and the use of optimized light reflectors surrounding the sample vial. As a result, reporter gene assays using firefly luciferase can now detect less than 1000 molecules of the enzyme with the Sirius Luminometer.

Injection System

Sirius is available with up to two high-precision reagent injectors. Variable injection volumes can be set from 20 to 300 µl. Flexible speed settings and precise injector positioning allow homogenous mixing of reagents for every type of sample.

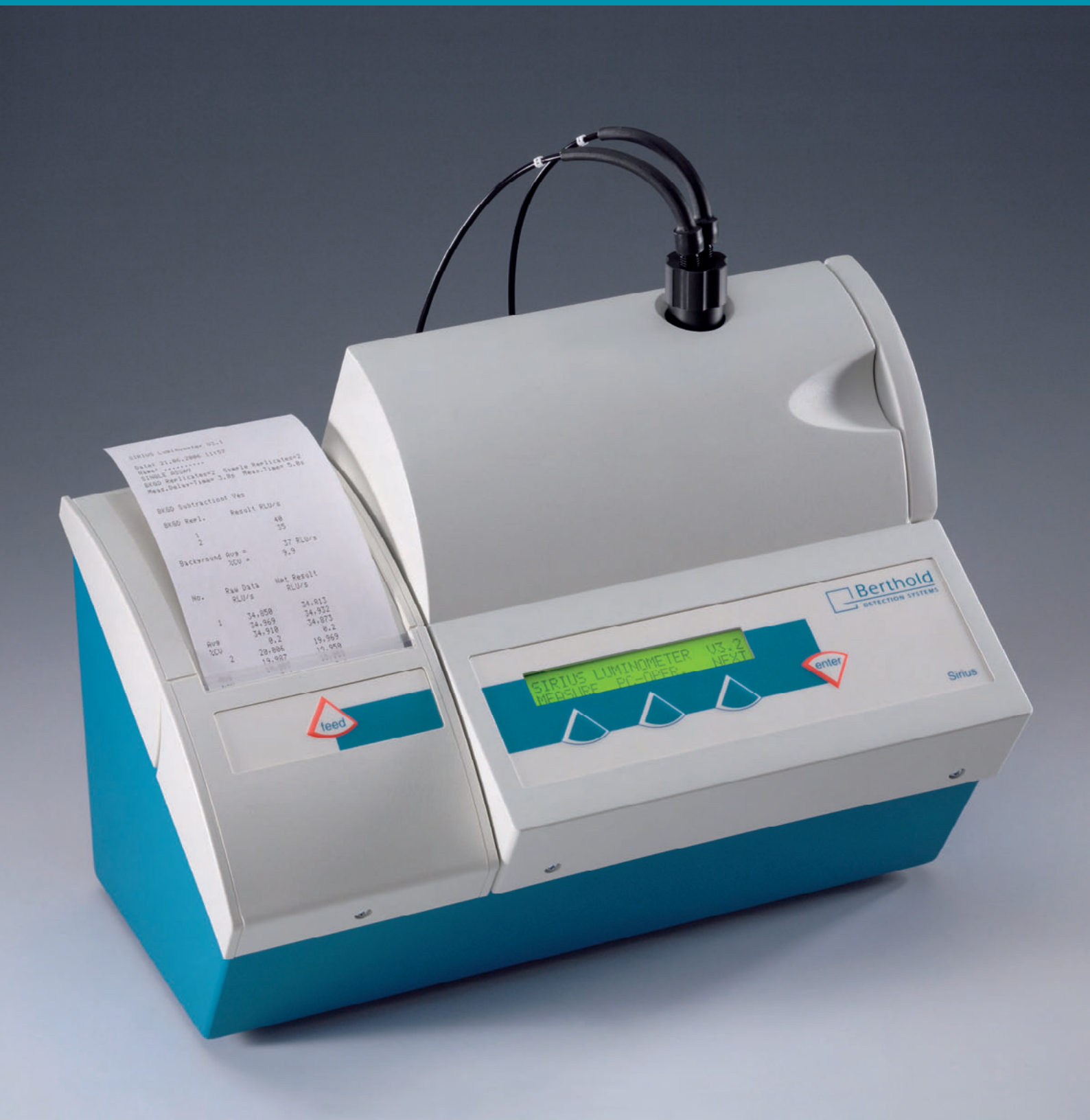
Short reagent lines and the back-pumping option guarantee the most economical utilization of valuable reagents. Sirius is equipped with reliable, bellow-type pumps. Selection of chemically inert materials assures the injectors are virtually maintenance-free. Sirius will detect presence of a sample vial prior to injection, to avoid unintended injection into an empty sample chamber.

Stand-alone Operation

Sirius is equipped with on-board microprocessor software for instrument control, data calculation and printer output. In stand-alone mode Sirius supports four protocols designed to meet the needs of state of the art luminescence assays.

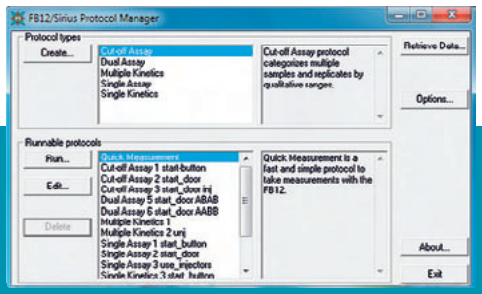
In addition to the Raw Data protocol, which allows standard measurements in a row, Single Assay, Dual Assay and Cut-off Assay are available, supporting predefined measurement sequences, data evaluation and printer output.

Sirius is the perfect choice for all luminescent flash and glow applications

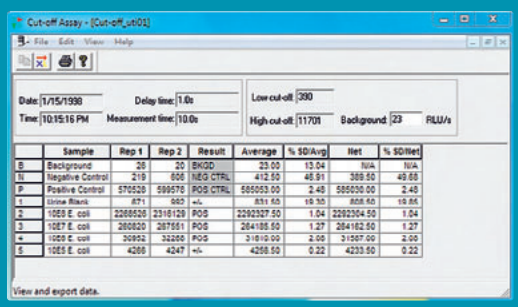


Sirius Intuitive & Powerful PC Software

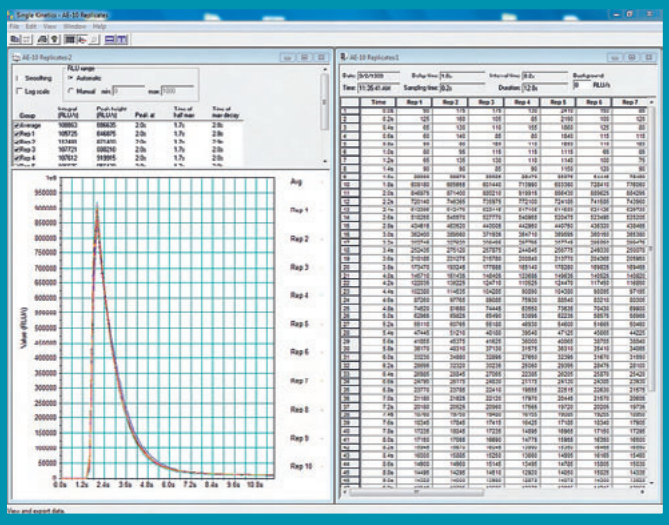
Basic Module Protocol Manager



Measurement screen



On-line display of both data table and graph



Program Structure
The PC program is structured in protocol format. This allows automation of all steps from the definition of measurement parameters to the reporting of final results. The user can define customized protocols for immediate use or store them for later availability.
The measurement results are presented as tables and graphs (where applicable), both on screen and as printouts. You may save results, export them as text files, or import them into Microsoft® Excel.

Basic Module
The basic module includes the Protocol Manager and the standard function Quick Measurement. The protocol is always ready to measure. The delay and measurement time settings are the only functions that may be modified from the default menu. Data is transferred into a single column spreadsheet and may be saved in different formats and printed out in a report.

Additional protocol types

Single Assay
Protocol allowing measurement of several samples, with replicates, calculation of average and precision. Automatic background subtraction is available. The background applied can be measured or entered manually.

Dual Assay
Protocol allowing measurement of one sample with two reagents, such as a dual luciferase assay and ATP measurements with standard spiking.
The two measurements are the basis for the final result, which is calculated by a selectable mathematical operation (5 options).

Single Kinetics
Protocol allowing measurement of the time trend of a luminescent reaction; for one sample, with or without replicates. Measurement results are presented as data table and graph. Additional graph functions: Smoothing, logarithmic scale or selectable scale, integration in zoomed range.

Multiple Kinetics
Protocol used to measure several samples in parallel. It is designated for kinetics lasting several minutes and longer. The Software guides the operator through samples change procedure. It rearranges the individual data points into data tables and graphical displays.

Cut-off Assay
Measurement results are categorized, typically with reference to positive and negative samples, into positive, negative and ±.

Sirius Technical Data

Single Tube Luminometers with USB and serial connection – available only from Berthold Detection Systems

Luminometer

Sample Format	Tubes up to 12 mm in diameter up to 75 mm length, microfuge tubes, 35 mm culture dishes, liquid scintillation vials up to 20ml. Injection operation with tubes of 12 mm diameter x 75 or 55 mm.
Detector	Photomultiplier tube with bialkali cathode, effective spectral range 300–600 nm (extended range on request), operated in photon counting mode.
Measurement Chamber	Retractable drawer with interchangeable reflectors and sample adapters.
Sensitivity	2 attomole ATP.
Dynamic Range	More than 6 decades without gain switch ensuring best linearity over the entire range.
Printer	Thermal matrix printer with 40 characters per line.
Operating Software (Microprocessor)	Operation via three softkeys. · Measuring and delay time settings in increments of 0.1 s. · Data output in RLU/sec. · Injector volume and injection delay time settings, flexible priming procedure. · Singe and dual measurement mode. · Protocols: Raw Data, Single Assay, Cut-off Assay, Dual Assay. · Background subtraction and replicate management (up to 9). · Calculation of average and CV.
Interfaces	Serial interface (RS-232) and USB interface for PC.
Power Requirements	DC 12 V, 2.5 A supplied through mains adapter (included).
Dimensions	H: 25 cm, W: 32 cm, D: 20 cm.
Weight	3.9 kg including two injectors.
Injectors	Microprocessor controlled bellow-type injectors for optimal control of injection profile.
Number of Injectors	0, 1, 2 (upgrading possible).
Injection Volume	20–300 µl in increments of 10 µl.
Precision	20 µl: ±1%; 100 µl: < ±0.5 %; 300 µl: < ±0.1 %.
Accuracy	±3 µl.
Tubing	Chemically inert PTFE tubing and connections (PTFE or KEL-F).

PC Software

Platform/Required Hardware	Windows® compatible computer, Pentium-like processor, one available serial or USB port.
Operating System	Windows® XP, Windows® Vista, Windows® 7.
Additional Software (optional)	Microsoft® Excel™ 2000 or higher.
Standard Configuration	Protocol Manager, Quick Measurement.
Additionally Available	Single Assay, Dual Assay, Single Kinetics, Multiple Kinetics, Cut-off Assay.

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