

Modulus™



A multifunctional single tube instrument for fluorescence, luminescence, and absorbance.

The Concept

The Modulus™ is a multifunctional single tube instrument designed to give you the utmost **flexibility** for measuring fluorescence, luminescence, and absorbance. The Modulus operates as a dedicated fluorometer, a dedicated luminometer, or a combination fluorometer/luminometer. With the optional Absorbance Module, absorbance measurements are available in the visible wavelength spectrum. Modulus allows you to buy what you need now, and to add what you want later.

Fluorescence

Fluorescent measurements with the Modulus are simple. Several Optical Kits are available for the most common fluorescent applications. The optics are factory installed into an Optical Kit that snaps into the Modulus. Each kit contains a light source, an excitation filter, and an emission filter to yield the highest performance.



Fluorescence Optical Kit

Optical Kit	Commonly Used Fluorophores
Blue	GFP, PicoGreen®, RiboGreen®, Fluorescein, Quant-iT™ Protein
UV	Hoechst dye, 4-MU
Green	Rhodamine, Cy3, RFP
Red	Cy5, Quant-iT™ RNA

Custom Optical Kits are available upon request.

Luminescence

The Luminescence Module accommodates luminescent assays such as ATP measurements, gene expression using luciferase or other bio- and chemiluminescent measurements. Change the module to switch between fluorescence and luminescence.



Luminescence Module

Absorbance

A snap-in Absorbance Module facilitates absorbance measurements. For example, measure protein concentration using standard assays such as Bradford, BCA, or Lowry. Filter paddles allow you to select the right wavelength for your assay.



Absorbance Module

Features

Flexible Sample Compartment

accommodates 1.5 mL microfuge tubes (luminescence only), 10 x 10 mm cuvettes (fluorescence and absorbance) and minicell vials (fluorescence only).

Troubleshooting

Easy access to Help with the touch of a button.

Multiple Modes

Fluorescence - Fluorescent measurements can be made in direct concentration or raw fluorescence mode. Several different units of measure are available with the option of a 1 to 5 point calibration. Raw fluorescence provides fluorescent measurements where relative fluorescence is important.

Other Modes - Continuous (or kinetic) measurements are available for both fluorescence and luminescence.



Lid Start Adjust settings to start measurement immediately after the lid is closed.

Modules are easily interchangeable. Just snap them into the sample compartment.

Touchscreen simplifies use. It allows simple navigation between screen for calibrations. Stores up to 18 calibrations and data from the last 20 measurements.

Primary Applications

Fluorescent Applications

- DNA/RNA quantitation
- Gene expression assays
- Enzyme assays
- Protein quantitation

Luminescent Applications

- Luciferase assays
- ATP assays
- Chemiluminescent immunoassays

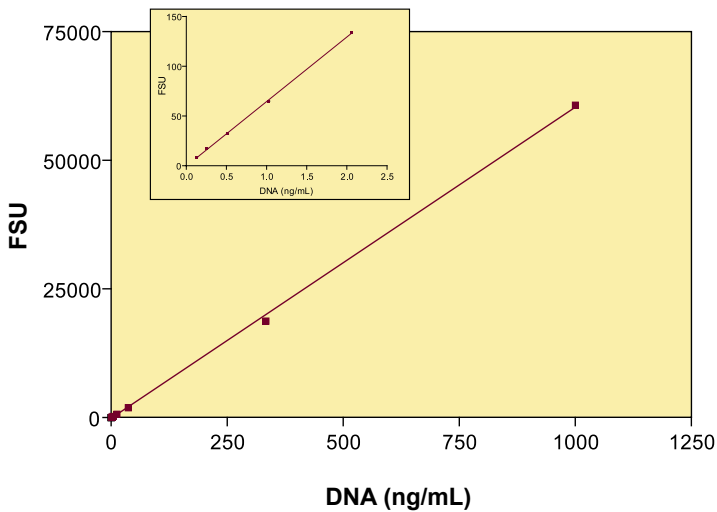
Absorbance Applications

- Protein quantitation
- Cell turbidity, OD 600

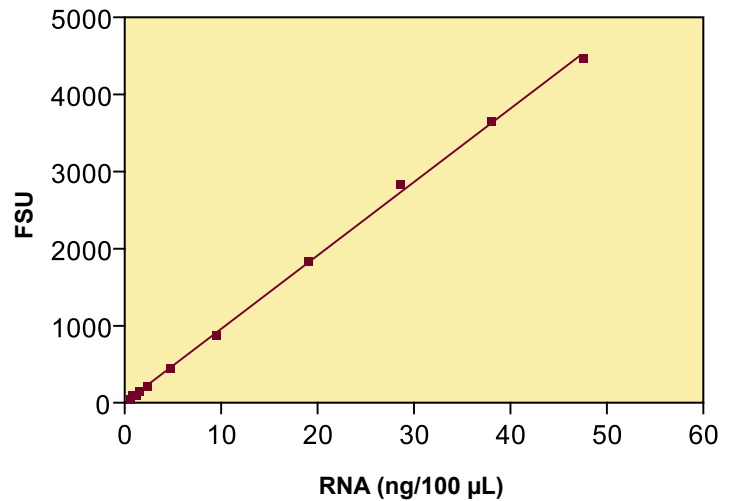
Modulus : Nucleic Acid Quantitation

The Modulus provides high **sensitivity** for fluorescent measurements of DNA and RNA. There are two options for measuring nucleic acids on the Modulus. Quantitate DNA via PicoGreen or Hoechst or quantitate RNA via RiboGreen or Quant-iT RNA. You can detect as little as 4.5 pg of dsDNA in 100 μ L using PicoGreen and the Minicell Adaptor. Use the Minicell Adaptor to minimize reagent volume and cost.

PicoGreen Assay



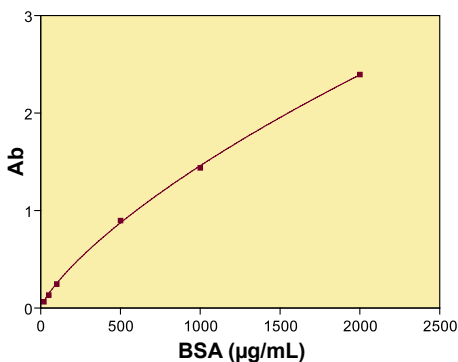
Quant-iT RNA Assay



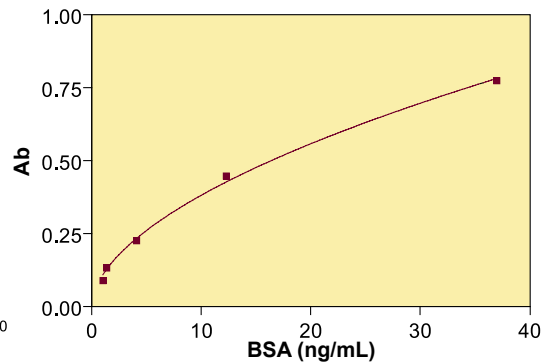
Modulus : Protein Quantitation

The Modulus provides **flexibility** for protein measurement. The two methods for measuring proteins on the Modulus are fluorescence or absorbance. Quantitate protein via Quant-iT Protein Assay using a Fluorescence Optical Kit. Alternatively, the Bradford, Lowry, and BCA assays are possible with the Absorbance Module.

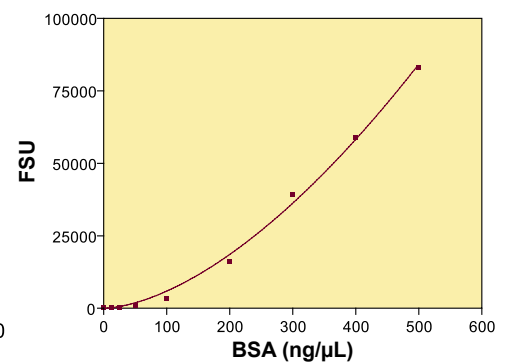
Absorbance BCA



Absorbance Bradford



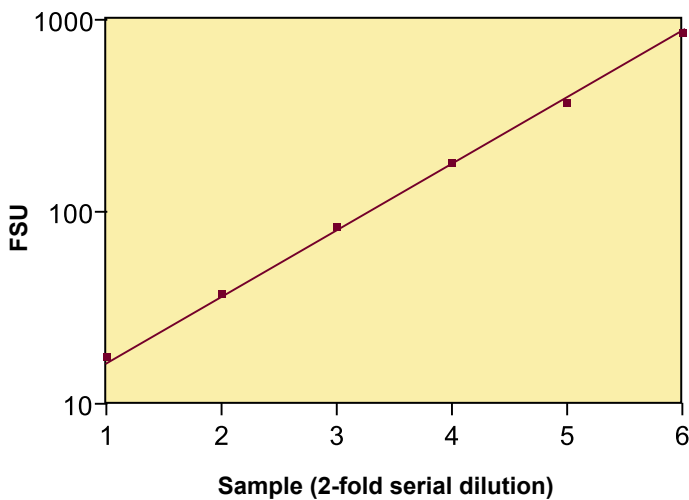
Fluorescence Quant-iT Protein Assay



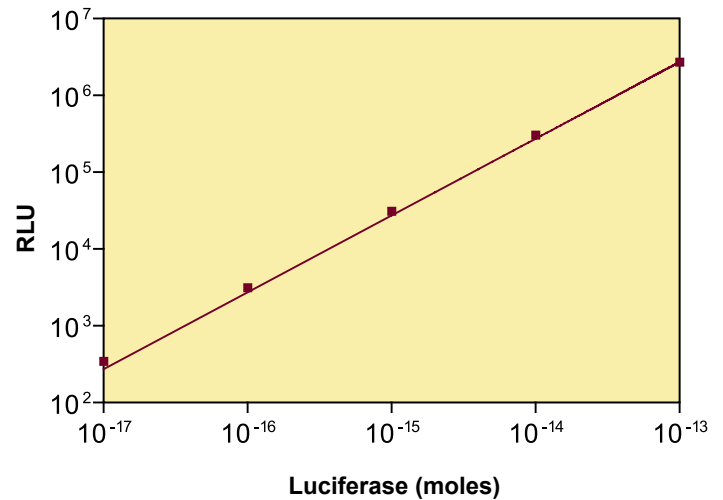
Modulus : Gene Expression

The Modulus provides *flexibility* for gene expression measurements. The two methods for measuring gene expression on the Modulus are fluorescence or luminescence. As a fluorometer, the Modulus is capable of measuring several different GFP variants. As a luminometer, the Modulus analyzes luciferase expression coupled to gene expression.

GFP Dilution Series



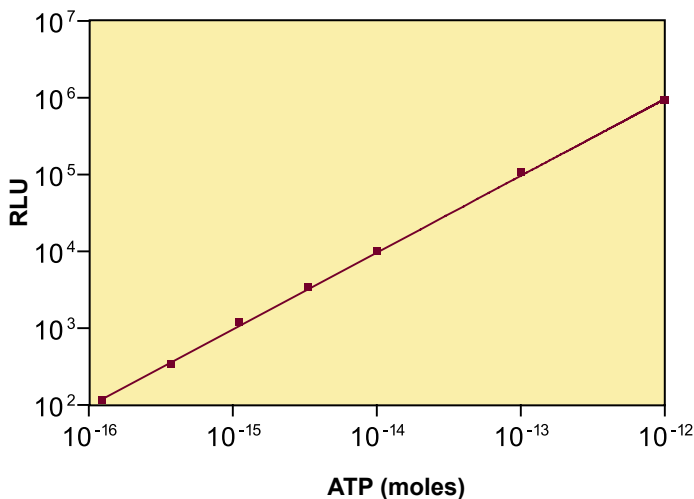
Luciferase Assay



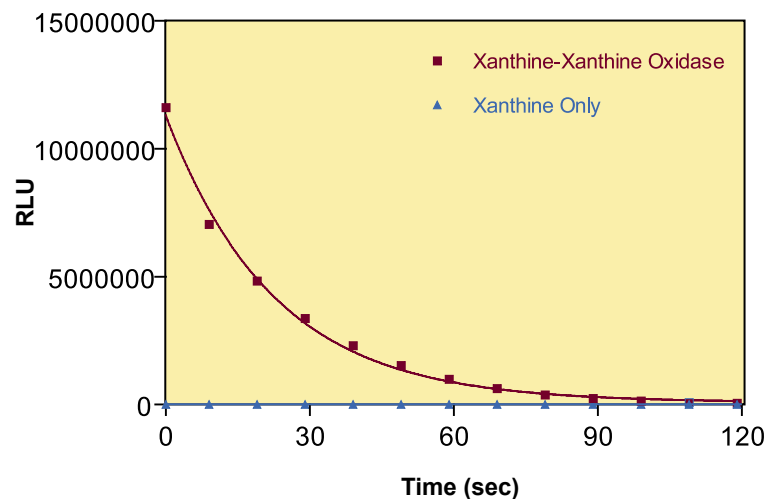
Modulus : ATP Measurements and Reactive Oxygen Species (ROS)

The Modulus as a luminometer measures cell viability through the use of ATP determination. Cell viability can also be measured using the ATP-dependent oxidation of luciferase. ROS assays that utilize chemiluminescent substrates such as luminol can also be measured on the Modulus.

ENLITEN ATP Assay



Superoxide Assay



Part Numbers

9200-000	Modulus - Fluorometer
9200-001	Modulus - Luminometer
9200-002	Modulus - Fluorometer/Luminometer Combination
9200-003	Modulus - Fluorometer/Luminometer/ Photometer Combination

Fluorescence Optical Kits

9200-040	Fluorescence Optical Kit - BLUE
9200-041	Fluorescence Optical Kit - UV
9200-042	Fluorescence Optical Kit - GREEN
9200-043	Fluorescence Optical Kit - RED
9200-044	Fluorescence Optical Kit - GFP-UV
9200-928	Minicell Adaptor Kit

Absorbance Module

9200-050	Absorbance Kit
9200-051	Absorbance Filter Paddle - 560 nm
9200-052	Absorbance Filter Paddle - 600 nm
9200-053	Absorbance Filter Paddle - 750 nm

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Specifications

Fluorescence Module Performance

Sensitivity: 6 ppt fluorescein, 4.5 pg DNA with PicoGreen Dye

Dynamic Range: 6

Detector: Photodiode

Light Source: UV LED 365–395 nm, Blue LED 465–485 nm, Green LED 495–525 nm, Red LED 620–645 nm

Sample Adaptor: Holds 10 x 10 mm cuvette or minicell vial (using the Minicell Kit)

Read Out: Direct concentration or Raw fluorescence

Calibration: 1 to 5 point calibration

Discrete Sample Average: Sample readings are averaged to improve accuracy

Luminescence Module Performance

Sensitivity: 100 attomole ATP

Dynamic Range: 5 decades

Detector: Photomultiplier Tube (PMT)

Sample Adaptor: Holds 1.5 mL microfuge tube

Spectral Response: 350–650 nm

Peak Wavelength: 420 nm

Absorbance Module Performance

Spectral Range: 360–1100 nm

Wavelengths: 560, 600, or 750 nm (others available upon request)

Photometric Measuring Range: 0.0 to 4.0 A

Photometric Accuracy: $\pm 0.7\%$

Photometric Precision: $\leq 0.5\%$ at 1 A

General Specifications

Data Output: 100% ASCII format through a 9-pin RS-232 serial cable at 9600 baud

User Interface: Requires Windows® 98 or later

Power: 12V 0.84A Max

Dimensions: 12.92" D x 10.44" W x 8.42" H
(32.82 cm D x 26.52 cm W x 21.39 cm H)

Weight: 8.1 lbs (3.65 kg)

Operating Temperature: 60–105 °F (15–40 °C)

Warranty: One year

Approvals: CE

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