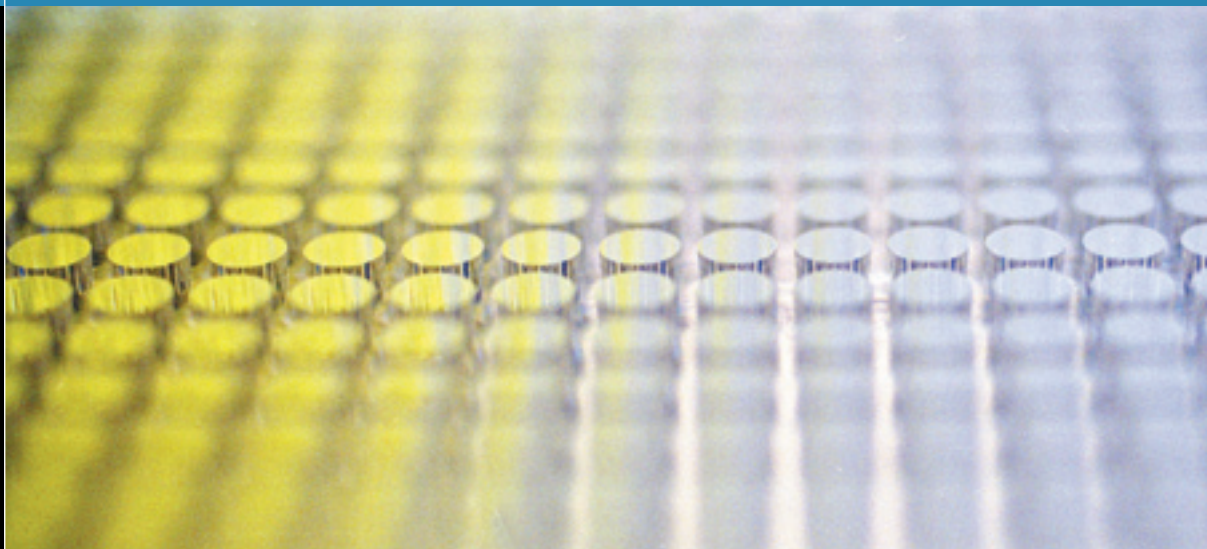


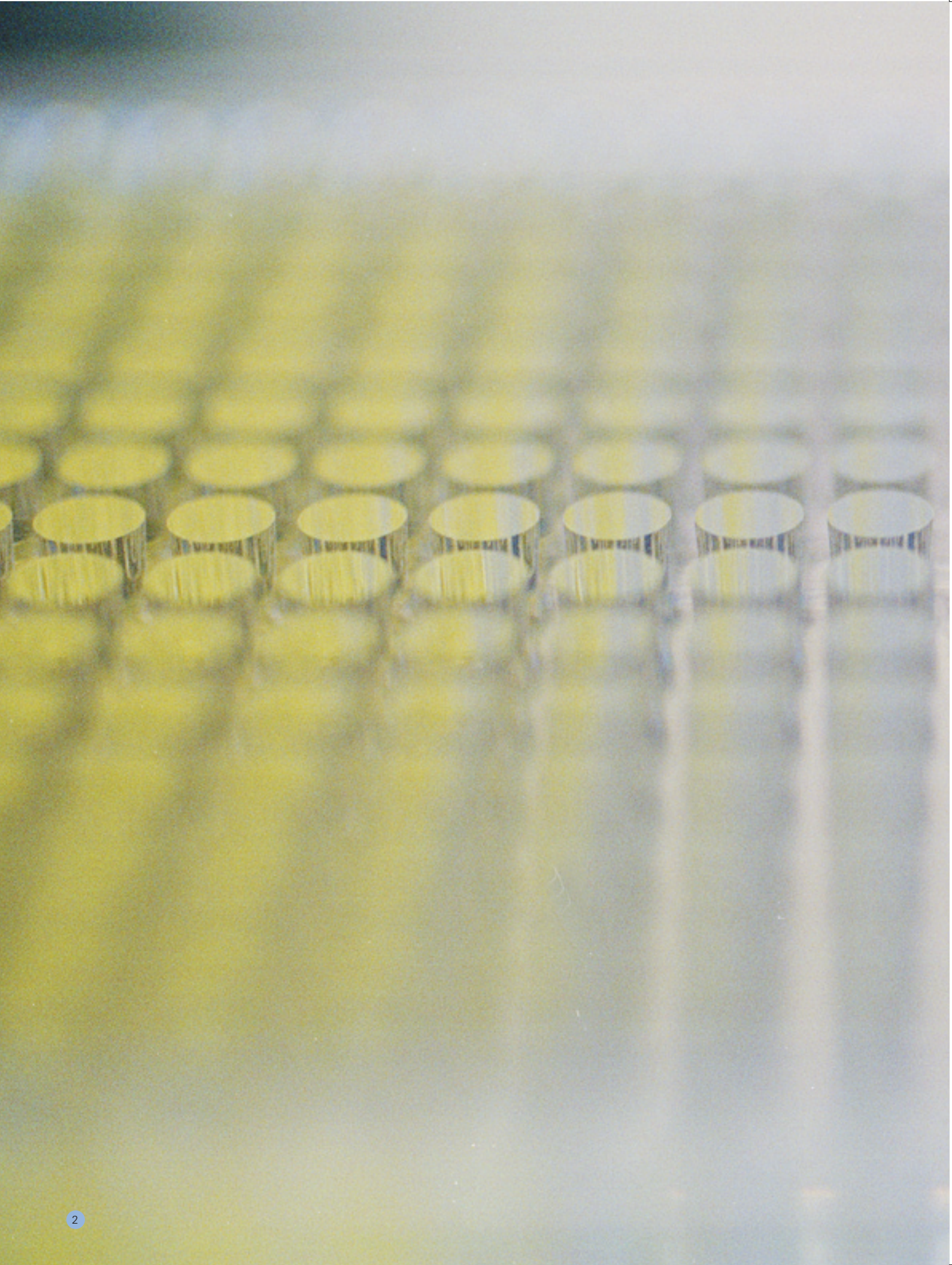
Ascent Family



**Your complete solution for
microplate fluorometry and
luminometry**

analyze • detect • measure • control™

Thermo
ELECTRON CORPORATION



Ascent Family & Ascent Software™



One software for all instruments

Highly visual assay setup and extremely
flexible results calculation

Easy and simple robotic integration

Ascent Software™: One software for all instruments

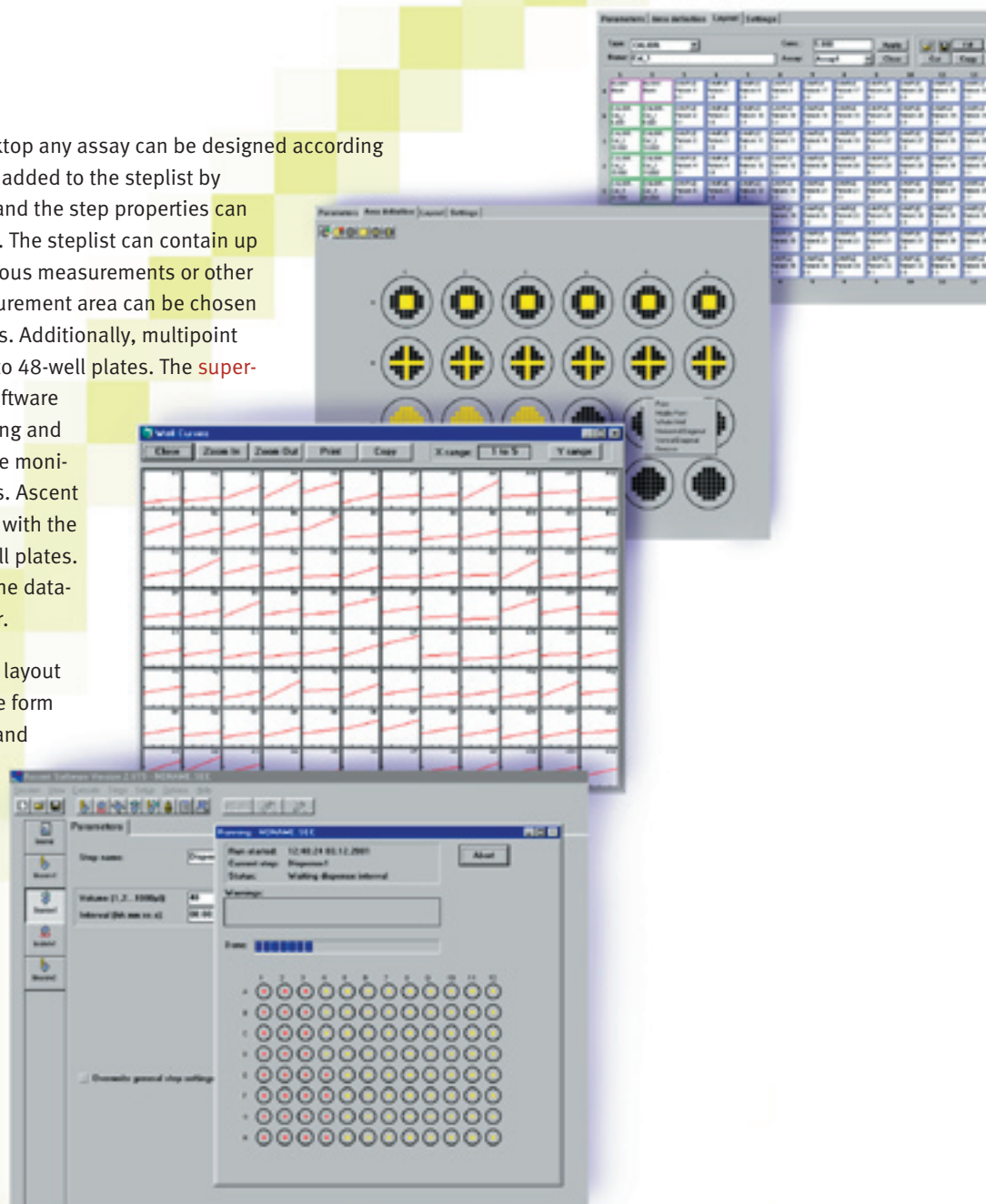
Windows™-based Ascent Software is designed to power all Thermo Labsystems' Ascent microplate research instruments. Whichever Ascent microplate instrument you use the highly visual Ascent Software always looks the same, providing familiar and flexible control. Add new high performance instruments from the Ascent family to your laboratory selection without the trouble of learning to use a new software.

Intuitive Procedure Desktop

In the highly visual Procedure Desktop any assay can be designed according to the user's needs. New steps are added to the steplist by clicking the appropriate step icon and the step properties can be modified to suit the application. The steplist can contain up to 85 steps and thus allows numerous measurements or other actions within an assay. The measurement area can be chosen freely by selecting the desired wells. Additionally, multipoint measurements are possible for 1- to 48-well plates. The superior dispensing system in Ascent Software also allows simultaneous dispensing and measurement of a well enabling the monitoring of fast flash kinetic reactions. Ascent Software also contains a database with the most commonly used 1- to 384-well plates. The user can add new plates into the database with the plate template editor.

Sample IDs can be imported to the layout from other systems. Plate IDs in the form of barcodes can also be imported and attached to the results.

The run time window with kinetic curves and the steplist enable the user to follow the run progress of the assay on the screen.



(Windows is a trademark of Microsoft Corp.)

The extremely flexible data reduction in Acent Software is performed in the Results Desktop. The familiar spreadsheet environment allows construction of almost any custom-made calculations or Quality Control formulas in addition to the comprehensive built-in results handling: The qualitative Cut-Off tool allows the user to define several limits with data interpretations. The quantitative Curve Fit provides different fitting alternatives, a choice of linear or logarithmic axes as well as the possibility to perform B/B_0 calculations. The Curve Fit parameters can be changed easily when optimizing an assay. The Kinetic Processors-command supplies 11 different tools for reduction of kinetic measurement data. Additionally, there is a tool for performing Single Point Normalization (both Ratio and Inhibition) automatically.

Custom-made reports can be created according to the user's needs. In addition, the powerful Graph-tool can be used to make illustrative and colorful data presentations. Such graphs can then easily be copied and pasted into any common word processing program, e.g. Microsoft Word, for use in reports and publications.



Excellence for fluorometric and luminometric measurements

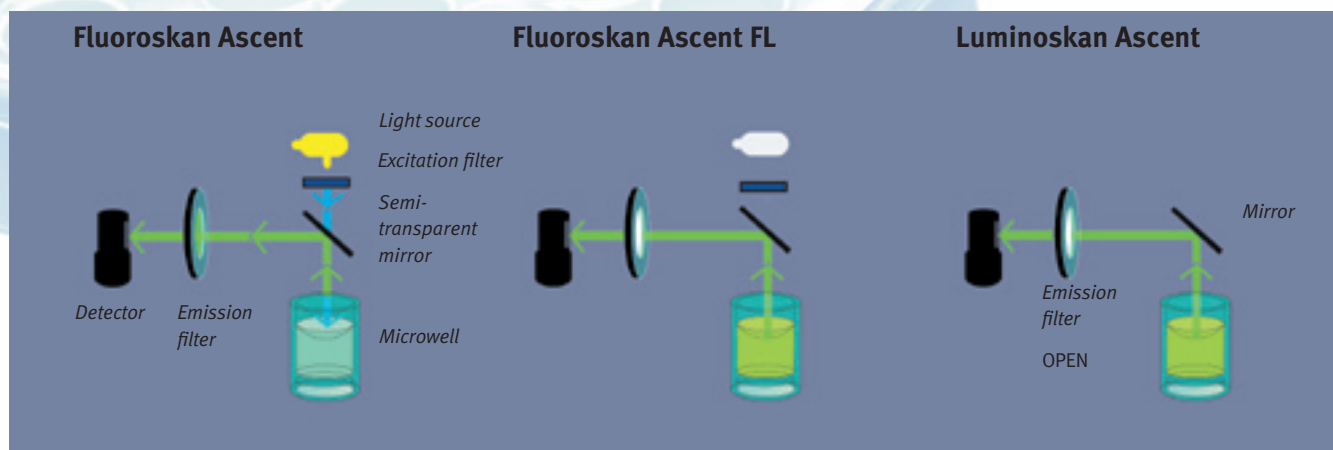
Thermo Labsystems' Ascent family covers both fluorometry and luminometry with instruments specially designed for effective research and high throughput screening. The superior usability and performance of these instruments provide easy access to both common and more challenging applications.

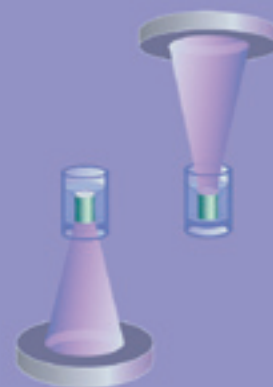
- **Fluoroskan Ascent – microplate fluorometer**
- **Luminoskan Ascent – microplate luminometer**
- **Fluoroskan Ascent FL – combined microplate fluorometer and luminometer**

High quality optical technology

Fiberless direct illumination optics ensures high sensitivity and is used to produce a highly focused light beam. This prevents crosstalk and ensures accurate reading during fluorescence measurements. The user selectable beam settings allow optimal reading of 1- to 384-well plates as well as PCR tubes or plates. The area scanning function allows multiple measurement points to be read per well which is specially important in cell based assays to guarantee the reading of the entire well bottom. Plate movement speed is also optimized separately for each plate type.

For luminometric measurements, automatic background correction guarantees accuracy of the results. Greater flexibility for advanced luminometric measurements, such as BRET assays, can be achieved by addition of special filters.





Top and bottom reading

Flexible top/bottom reading enables the user to select the optimal reading position. Top reading is generally the most sensitive reading position for homogeneous solutions.

Bottom reading is commonly the optimal position for cell-based assays providing a closer proximity to adherent cells and minimizing the interference of free dye in the medium. In addition, sterility is maintained during the entire procedure as the plate cover can be left on.

Versatile dispenser system

For easy and accurate reagent addition, up to three syringe dispensers can be installed on-board. Speed and precision are key features and dispensing volumes can be adjusted in 1 µl increments over a volume range of 1-1000 µl. Dispensing speed can be optimized according to the application requirements. Very low tubing dead volume is an important issue when using expensive reagents.

One dispenser is targeted at the measurement well enabling the system to dispense and measure simultaneously, which is essential for flash type luminescence reactions, fluorometric Ca^{2+} measurements and other rapid kinetic applications. The ability to add reagents and read in any order allows execution of sequential multistep assays, such as ATP and reporter gene applications.

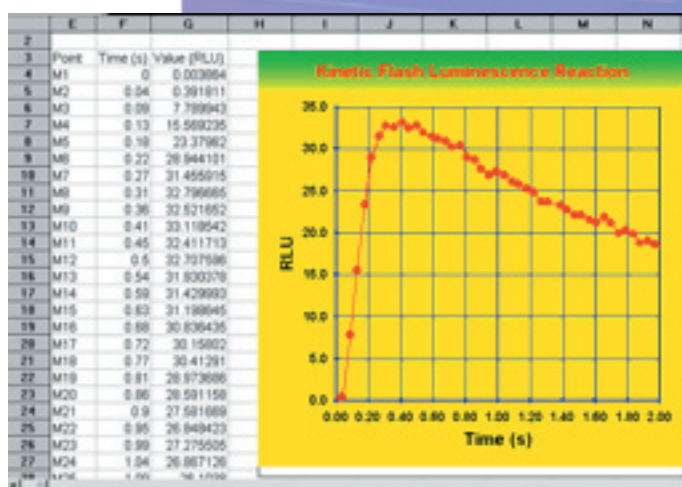
Fast reading times

The fast read time, just 15 seconds for a 96-well plate, is essential for kinetic applications such as enzyme kinetics and phagocytosis assays. It is also an important advantage when reading high density plates or when automating applications.

On-board incubation and orbital shaking

To maintain the optimal and constant reaction conditions, an incubator is available for cell biology, enzyme assays and other temperature critical applications. The built-in orbital shaker, another advanced feature, speeds up reaction times and ensures effective mixing. Shaking speed and diameter is freely adjustable according to the plate type selected.

Fluoroskan Ascent, Fluoroskan Ascent FL and Luminoskan Ascent have an easy to switch optical unit that allows top or bottom reading.



Specially designed for robotics

Both Ascent Software and all Ascent fluoro- and **lumino-meters** have special features that make them the ideal solutions for automation. The important target for the robotics design of these units is the freedom to choose any robotic system. Therefore Ascent instrumentation is easily integrated into almost all available high throughput screening systems.

Ascent Software Remote Control Interface

Ascent Software has a special Remote Control Interface for robotic use, which enables easy integration with robotics and HIS/LIMS systems. Using Ascent Software in Remote mode, predefined assays can be executed remotely by changing files between Ascent Software and the host system. When the measurement has been executed, the chosen data will be automatically stored in a given directory with an optional file name. Any type of data can be saved: raw data, Curve Fit/Cut-Off results or any custom-made report sheets.

Ascent Software Remote Control supports all common accessories and functions for robotic integration:

- Retrieval of bar code information from the plate (Plate ID's)
- Loading of individual Sample ID's into the plate layout
- Automatic saving of all measurement data
- Appending of the result data

Robotic friendly Ascent Instruments

All Ascent fluoro- and luminometers have a specially designed Universal Robotic Plate Carrier where the requirements for robotics have been taken into account. This plate carrier can be adjusted to any plate type and has both portrait and landscape robotic access with all plate types.



Easy access for automated plate handling systems.



Applications

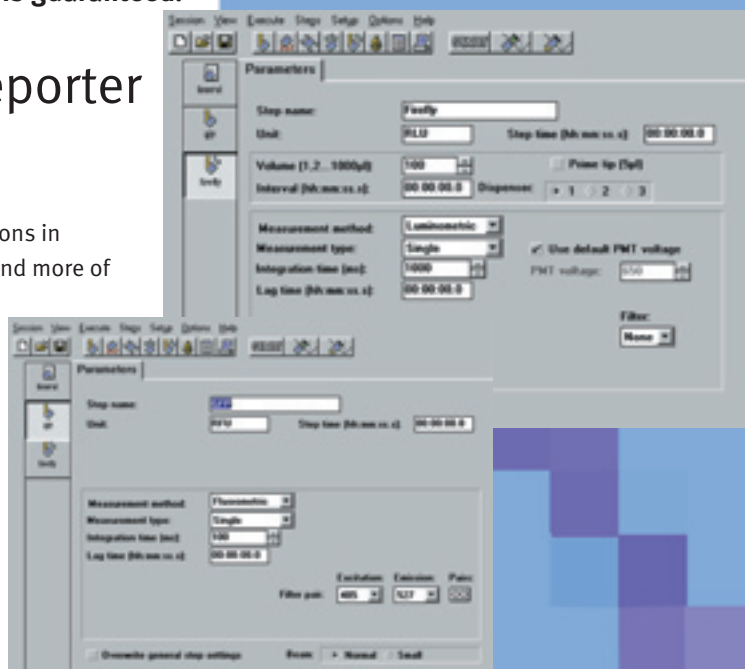


Ascent Software and Ascent instruments have the versatility to handle a wide variety of applications. Both routine and specialized, highly demanding applications can easily be set up, performed and analyzed with every member of the Ascent family. With Ascent instruments, excellent performance is guaranteed.

Ideal instrumentation for reporter gene assays

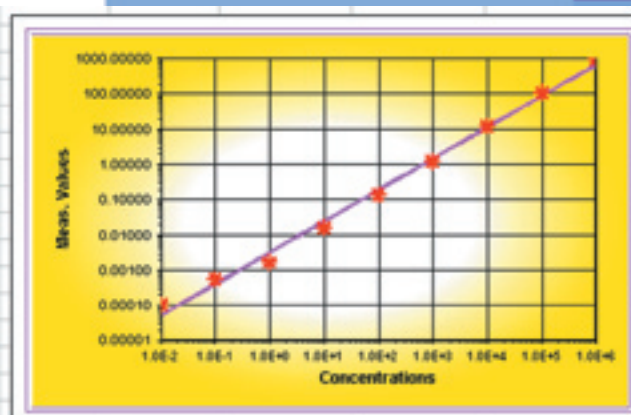
Reporter gene assays are one of the most common applications in present medical and scientific research laboratories. More and more of the reporter gene assays today are based on either **fluorometric** or luminometric detection. Typical examples are different fluorescent proteins such as EGFP (enhanced green fluorescent protein) and EYFP (enhanced yellow fluorescent protein), or luminescent firefly and Renilla luciferases. Other common reporter gene products are enzymes that can also be detected using fluorogenic or chemiluminescent substrates.

Ascent fluoro- and luminometers are the perfect choice for any reporter gene applications because of their extreme versatility in performing different actions. Any dispensing, measurement or other action can be separately targeted either to all samples or only to a defined group of samples.



The Ascent instruments have special features for reporter gene assays:

- **Fluoroskan Ascent provides both bottom reading for cellular assays and top reading for conventional FIA assays with black or white plates**
- **Luminoskan Ascent has been validated for Promega Dual Luciferase® Assay measuring firefly and Renilla luciferase activities from the same sample**
- **Fluoroskan Ascent FL has the unique feature of combining both fluorometric and luminometric measurement steps within the same assay**
- **Fluoroskan Ascent, Fluoroskan Ascent FL and Luminoskan Ascent can be equipped with up to three dispensers for automatic addition of all required reagents**



Status:	
Fit type:	Linear regression
Meas. transformation:	Log10
Conc. transformation:	Log10
Formula:	$y = 0.889 * x + -2.510$
Corr. coeff.:	0.994297394

*Dual Luciferase® is a registered trademark of Promega Corp.

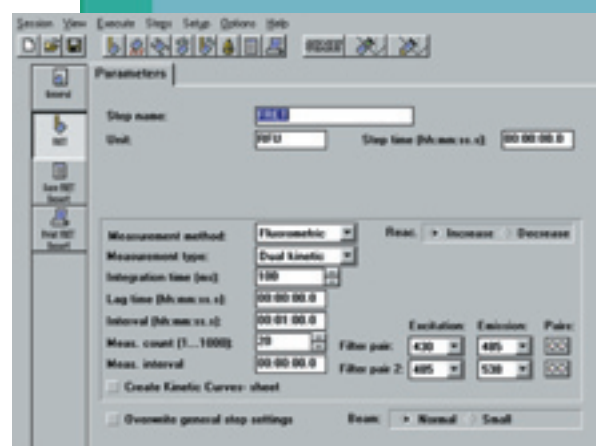
Ideal instrumentation for resonance energy transfer assays: FRET & BRET

Applications based on resonance energy transfer (RET) is a fast growing area in both fluorometry and luminometry. FRET (Fluorescence Resonance Energy Transfer) uses non-radiative transfer of energy from a donor fluorochrome to an acceptor molecule that is either a quencher or another fluorophore emitting light at its specific wavelength.

Donor and acceptor groups must be at a certain distance for the energy transfer and the absorption spectrum of the acceptor molecule must overlap the emission spectrum of the donor.

FRET is used to study SNPs using molecular beacons, nucleic acid hybridisations, automated DNA sequencing, in protease assays etc.

BRET (Bioluminescence Resonance Energy Transfer) is based on energy transfer from a bioluminescent donor to a fluorescent acceptor protein. The main application area for BRET is assays that study protein-protein interaction. In this technology Renilla luciferase (Rluc) is commonly used as the donor and a Green Fluorescent Protein (GFP) variant as the acceptor molecule. If the GFP is in close proximity to the Rluc, it absorbs the blue light energy and re-emits green light. The ratio between the two emitted light intensities is the required result of the assay.



The Ascent family has special features that make running FRET and BRET assays exceptionally easy and efficient:

- All instruments with a luminometric option can be equipped with filters for BRET
- The same filters can be used for fluorometric and luminometric assays
- Instruments can also perform dual assays with two different filters or filter pairs
- Pre-programmed ratio calculations will automatically perform the required results analyses
- With Fluoroskan Ascent FL it is possible to perform dual end point measurements using both fluorometry and luminometry within one assay

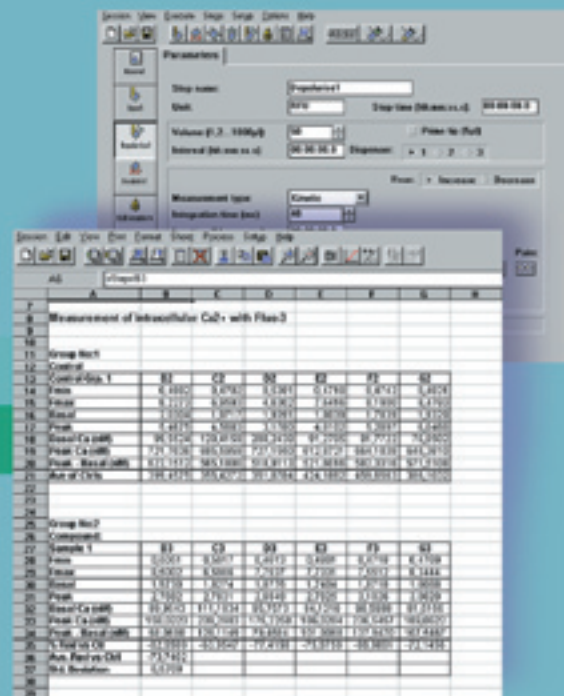
Sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	0.010	0.140	0.001	0.207	1.335	0.004	0.070	0.001	1.307	0.000	0.173	0.137	0.201	0.100
B	0.042	0.043	0.000	0.420	1.200	1.200	0.000	0.000	0.000	1.200	0.001	0.100	0.100	0.100
C	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
D	0.007	0.100	1.004	0.004	0.007	0.070	0.043	1.300	0.000	0.000	0.000	0.000	0.000	0.000
E	0.040	0.000	0.000	0.000	1.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
F	0.070	0.177	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
G	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
H	0.002	1.000	1.004	0.104	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
I	0.002	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
J	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
K	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
L	0.001	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
M	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
O	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Ideal instrumentation for signal transduction assays

Signal transduction is a very important area in basic cell biological research as well as in drug development. When choosing bottom reading, lidded plates can be used for closer proximity to the cells, and to maintain sterility.

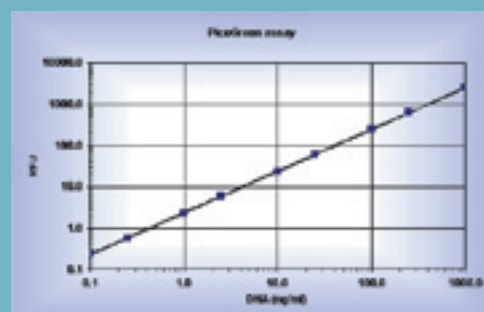
Fluorometric methods are available for e.g. kinase, adhesion and apoptosis assays. Another large application area is calcium signalling where Fluoroskan Ascent and Fluoroskan Ascent FL have proven their efficiency.

Calcium ion flux assays require fast looping of two kinetic measurements: The baseline fluorescence and the fluorescence after the addition of calcium flux affecting agents. This looping allows observation of even fast changes in the Ca^{2+} concentrations. The F_{max} and F_{min} fluorescences are then measured for all the wells, and all the data is calculated and collected in the report.



Signal transduction studies require certain important features. These features are provided with Ascent instrumentation:

- Simultaneous dispensing and measurement offers the possibility for rapid reactions
- Possibility to perform any actions as pre-programmed loops with Ascent Software
- Special measurement option for fast kinetic assays
- Constant temperature incubation capability with all instruments
- The area scanning option of Ascent Software gives the possibility to get several measurement points from one well



*PicoGreen is a registered trademark of Molecular Probes Inc. and AluQuant is a trademark of Promega Corp.

Ideal instrumentation for geno-/cytotoxicity and cell proliferation assays

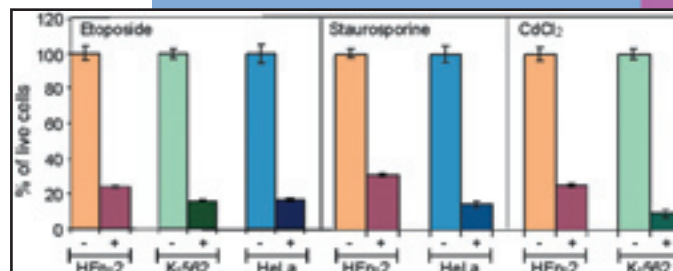
Existing cytotoxicity/cell proliferation assays include alternative fluorometric and luminometric assays.

These tests are used e.g. for screening of compound cytotoxicity during the early stages of drug discovery, to avoid unwanted side effects, or in the search for new drugs. Cytotoxicity assays can also be used for clinical purposes. Many of the assays are based on changes in membrane permeability of the dead or dying cells. When these membrane impermeable probes bind to exposed DNA the result is an increase in the measured signal.

The Vitotox™ Test System from Thermo LabSystems is a unique method for rapid and cost effective high-throughput geno- and cytotoxicity screening. Vitotox™ is optimally performed with Luminoskan Ascent with a fully automatic measurement and data analysis system, based on Ascent Software. This runs the kinetic Vitotox™ assay and then automatically analyses the data, draws the kinetic curves and generates a report with all the test results.

Important features provided by Luminoskan Ascent for geno-/cytotoxicity and cell proliferation assays:

- Automatic normalization based on any sample or control in Ascent Software
- Direct calculation of EC_{50} values
- Precise incubation for maintaining 30°C or 37°C
- Easy use of Ascent Software and Ascent instruments with robotics enables high volume assays
- Ascent Software contains ready-made sessions for all Thermo LabSystems' research reagent kits



Common fluorometric and luminometric applications

Compatibility table of different Ascent instruments			
Application	Fluoroskan Ascent	Fluoroskan Ascent FL	Luminoskan Ascent
Antibiotic sensitivity testing	X	X	X
Apoptosis assays	X	X	X
ATP assays		X	X
Bacterial biomass assays		X	X
BRET assays		X	X
Ca ²⁺ /Aequorin loading assays		X*	X*
Cell adhesion assays	X	X	
Cell proliferation assays	X	X	X
Chemokine assays	X	X	
Chlorophyll assays	X		
Connected enzyme assays via ATP		X*	X*
Cytotoxicity assays	X	X	X
DNA quantitation assays	X	X	X
Drug resistance testing	X	X	
Dual luciferase reporter gene assays		X	X
Dual technology reporter gene assays		X	
Enzyme activity assays	X	X	
Eukaryotic luciferase gene assays		X	X
Fluorescent immunoassays (FIA)	X	X	
FRET assays	X	X	
Gene activity with fluorescent substrates	X	X	
Gene activity with luminescent substrates		X	X
Green Fluorescent Protein	X	X	
Growth inhibition assays	X	X	X
Human specific DNA quantitation assay		X	X
Hygiene monitoring assays		X	X
Intracellular Ca ²⁺ assays	X*	X*	
Kinase activity assays	X	X	X
Live/Dead assays	X	X	
Luminescent immunoassays (LIA)		X	X
Migration assays	X	X	
Molecular beacons	X	X	
Phagocytosis assays	X	X	X
Prokaryotic luciferase gene assays		X	X
Protease assays	X	X	X
Protease inhibitor assays	X	X	
Protein quantitation	X	X	
Reactive oxygen assays	X	X	X*
RNA quantitation	X	X	
SNP assays	X	X	

X* = Requires automatic dispensing

Technical specifications

Instrument/Feature	Fluoroskan Ascent	Fluoroskan Ascent FL	Luminoskan Ascent
General specifications			
Measurement technologies	Fluorometry	Fluorometry/Luminometry	Luminometry
Measurement direction	Top/bottom reading	Top/bottom reading	Top/bottom reading
Plate types 1- to 384-well plates, Terasaki and PCR- plates. Can be programmed for non-standard configurations.	X	X	X
Measuring speed Minimum kinetic interval time 15 s for a 96-well plate	X	X	X
Shaker Orbital, speed 60-1200 rpm, diameter 1-50 mm	X	X	X
Dispensers 0 to 3 dispensers	X	X	X
Dispensing volume: 1-1000 µl in 1 µl increments	X	X	X
Accuracy*: ±3 µl average, for volumes 5 µl and above	X	X	X
Precision*: 5-19 µl < 5%, 20-1000 µl < 2%	X	X	X
Dispensing speed: 25 s per plate (96-well plate, 5 µl/well) *= for distilled water at RT	X	X	X
Incubator temperature range From RT (25°C) +3°C to +45°C when ambient temperature is 25°C	X	X	X
Weight Basic unit 21 kg, 3 optional dispensers add 3.5 kg	X	X	X
Dimensions (W x D x H) 420 mm x 420 mm x 340 mm	X	X	X
Fluorometric specifications			
Light source: Quartz halogen lamp, 30 W	X	X	
Detector: Photomultiplier tube	X	X	
Fluorometric measurement range: Up to approx. 5000 Relative Fluorescence Units	X	X	
Excitation wavelength range	From 320 to 700 nm	From 320 to 700 nm	
Emission wavelength range	From 360 to 800 nm	From 360 to 670 nm (optional from 360 to 800 nm)	
Maximum no. of filters in the excitation/emission filter wheels	Ex 8/Em 8	Ex 8/Em 6	
Excitation/emission filters included	Ex 355/Em 460, Ex 485/Em 538	Ex 355/Em 460, Ex 485/Em 538	
Excitation filter selection	320, 355, 390, 430, 440, 444, 485, 530, 544, 578, 584, 646 nm**. Other filters available upon request.		
Emission filter selection	405, 460, 485, 510, 518, 520, 527, 538, 555, 590, 604, 612, 620, 678 nm**, 680 nm**.		
	Other filters available upon request. ** Fluoroskan Ascent FL, only with Wide Wavelength Range PMT		
Theoretical sensitivity	2 fmol fluorescein/well in a black 96-well strip plate	2 fmol fluorescein/well in a black 96-well strip plate	
Dynamic range	> 6 decades	> 6 decades	
Luminometric specifications			
Detector: Photomultiplier tube		X	X
Spectral range: From 270 nm to 670 nm		X	X
Luminometric measurement range: Up to approx. 5000 Relative Light Units		X	X
Theoretical sensitivity		5 fmol ATP/well in a white 96-well plate	<1 fmol ATP/well in a white 96-well plate
Dynamic range		> 9 decades over whole gain setting area	> 9 decades over whole gain setting area
Ordering Information			
Instrument	Fluoroskan Ascent	Fluoroskan Ascent FL	Luminoskan Ascent
	5210470 Fluoroskan Ascent 100-240 V	5210450 Fluoroskan Ascent FL 100-240 V	5300160 Luminoskan Ascent 100-240 V
	5210480 Fluoroskan Ascent 100-240 V, with one dispenser	5210460 Fluoroskan Ascent FL 100-240 V, with one dispenser	5300170 Luminoskan Ascent 100-240 V, with one dispenser
Factory options	5210230 Additional Dispenser Option	5210230 Additional Dispenser Option	5210230 Additional Dispenser Option
		5210290 Wide Wavelength Range Option (PMT)	
Upgrade kits	2805620 1st Dispenser Kit	2805621 1st Dispenser Kit	2805621 1st Dispenser Kit
	2805630 Additional Dispenser Kit	2805630 Additional Dispenser Kit	2805630 Additional Dispenser Kit
		2805760 Wide Wavelength Range Kit (PMT)	

Ascent Software™ Technical Specifications

Features by Instrument	Fluoroskan Ascent FL	Fluoroskan Ascent	Luminoskan Ascent	Multiskan Ascent	Multiskan EX
Template editor for different plate sizes	yes	yes	yes	yes	no
Measurements					
Multipoint measurements	yes	yes	yes	no	no
Single	X	X	X	X	X
Dual	X	X	X	X	X
Kinetic	X	X	X	X	X
Dual kinetic	X	X	X	X	X
Scanning	X	X	X		
Monitor	X	X	X		
Dispensers					
Number of dispensers	0 to 3	0 to 3	0 to 3	0	0
Simultaneous dispensing and measuring	X	X	X		
Shaking					
Interval shaking	X	X	X	X	X
Adjustable shaking speed	X	X	X	X	X
Adjustable shaking diameter	X	X	X		
Incubation	RT+3°C - 45°C	RT+3°C - 45°C	RT+3°C - 45°C	RT+3°C - 50°C	
Kinetic Processing					
Average rate	X	X	X	X	X
Maximum rate	X	X	X	X	X
Time to maximum rate	X	X	X	X	X
Time to maximum rate / 2	X	X	X	X	X
Time to change	X	X	X	X	X
Maximum of well (Peak)	X	X	X	X	X
Maximum – Minimum	X	X	X	X	X
Time to maximum (Peak)	X	X	X	X	X
Time to maximum (Peak) / 2	X	X	X	X	X
Select Reading	X	X	X	X	X
Integral	X	X	X	X	X
Cut-Off analysis with 4 limits/5 interpretations	X	X	X	X	X
Curve Fits					
Linear regression (LLS)	X	X	X	X	X
Linear regression (SVD)	X	X	X	X	X
Quadratic polynomial	X	X	X	X	X
Cubic polynomial	X	X	X	X	X
Quartic polynomial	X	X	X	X	X
Point to point	X	X	X	X	X
Cubic spline	X	X	X	X	X
Four parameter logistic	X	X	X	X	X
Sigmoid logistic	X	X	X	X	X
Automatic ratio calculation	X	X	X	X	X
Sessions					
Execute session in group of	1 - 384-wells	1 - 384-wells	1 - 384-wells	96 & 384-wells	8,16 & 96-wells
Number of sheets in a session	85	85	85	85	85
Multiple curve fits in a session	X	X	X	X	X
Multiple reports in a session	X	X	X	X	X
Multiple graphs on a sheet	X	X	X	X	X
Manual and automatic data exporting	X	X	X	X	X
Remote control	X	X	X	X	X

System Requirements	
Hardware	IBM® PC compatible computer with Pentium®Processor, 128 MB RAM, SVGA display, CD ROM drive, 200 MB free hard disk,1 buffered (16550 AF) serial port
Operating System	Windows™, 98 and Me
	Windows™ NT 4.0
	Windows™ 2000, Windows XP Professional

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Windows is a registered trademark of Microsoft Corp.

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