

# Sorcerer

## Image Analysis System

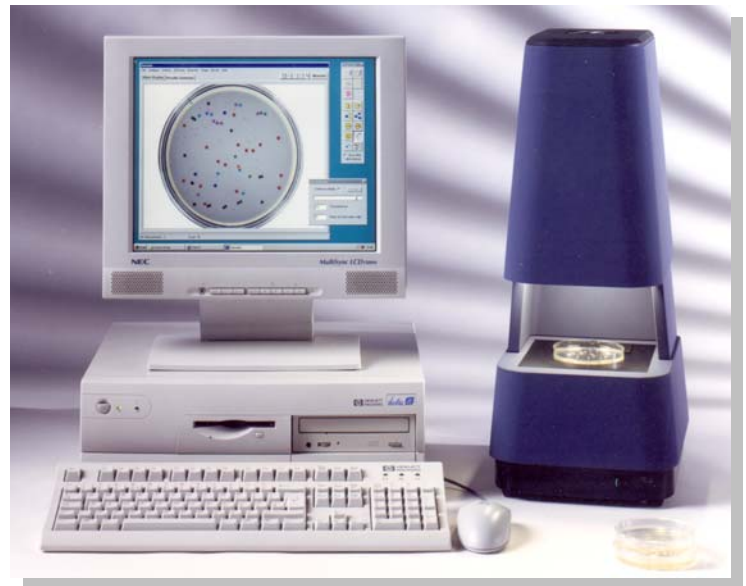
### Life Science Applications include:

- ◆ Ames testing
- ◆ Antibiotic Inhibition zones
- ◆ Autoradiograph Grain counting
- ◆ Bone Morphology
- ◆ Chemotaxis
- ◆ Colony counting and sizing
- ◆ Direct Epi-fluorescent filter technique
- ◆ Elispot assay
- ◆ Inhibition zones / Viral plaques
- ◆ MIC assays
- ◆ Mouse lymphoma assay
- ◆ Unscheduled DNA synthesis

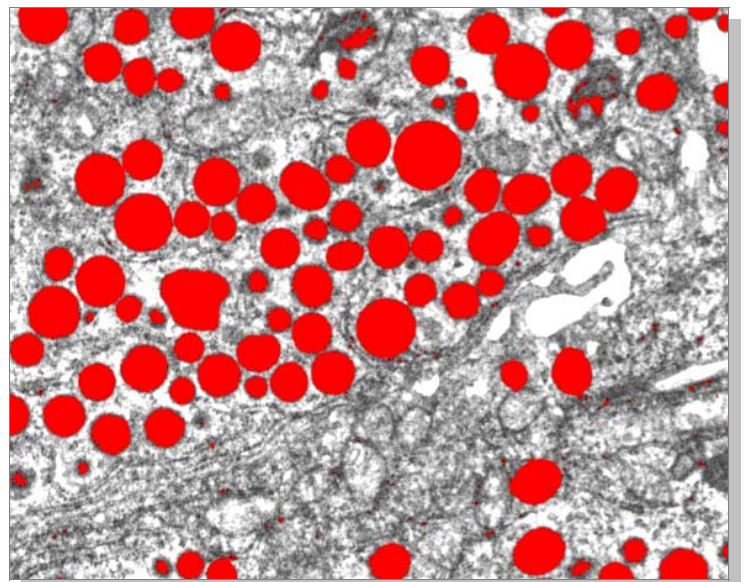
### Materials Science application include:

- ◆ Composite materials
- ◆ Contamination in hydraulic fluid
- ◆ Corrosion analysis
- ◆ Etch pit analysis
- ◆ Inclusion analysis
- ◆ Nuclear track counts
- ◆ Particle size and shape analysis
- ◆ Porosity
- ◆ Print quality
- ◆ Pulp and Paper quality
- ◆ Spray droplet sizing

**Sorcerer** is a versatile Video Camera based Image Analysis system. Utilized in the Biological and Materials Sciences, the unit has application in R & D and Quality Control environments.



Sorcerer system with Petriviewer



Digital image display of detected objects

## Sorcerer Features:

- ◆ Program settings are saved in named configuration files for subsequent use.
- ◆ Multiple configurations can be saved for different applications. For example, Colony counting, Residual ink analysis, Particle sizing, Zone reading, Print quality.
- ◆ A video window displays a live sample image, together with status and tool bars.
- ◆ Sorcerer links directly to Microsoft Excel spreadsheet via OLE and data can be processed via Excel macros.
- ◆ Field and Feature specific measurements are generated.
- ◆ Field measurements include Total Count, Total Area, Total Perimeter, Gray level and PPM.
- ◆ Feature measurements relating to individual objects include Area, Diameter, Longest dimension and Position.
- ◆ Measurement data can be filtered using logical And / Or combinations of any measurement parameters).
- ◆ Size classification tables (up to 50 classes in any progression) can be user defined and saved.
- ◆ Images captured by the video camera can be saved to disk for future retrieval or transfer to document processing software.
- ◆ Measured data can be saved to Microsoft Excel or ASCII (comma separated value) format files.
- ◆ High speed Image Analysis Hardware and Software runs under Windows 98 / NT4 / 2000 / XP operating systems.
- ◆ Samples are imaged by a high-resolution monochrome CCD Video camera coupled to a Microscope, Petri-plate viewer or Macroviewer.
- ◆ Optical and illumination techniques are available to ensure that optimal images are presented for analysis.
- ◆ Objects are detected for measurement by virtue of contrast differences within the image.
- ◆ A resolution of 768 x 576 synchronized square pixels (optional 1300 x 1030 pixels) and 256 gray level range ensure accurate measurements.
- ◆ Microscopic particles as small as one micron can be accurately counted and sized.
- ◆ A new Matrix detection algorithm compensates for objects within the image having different contrast levels.
- ◆ Video invert allows reversal of the image where objects to be analyzed appear lighter than the background.
- ◆ Circular, Rectangular or User-defined measurement frames can be set to suit the sample type.
- ◆ Simple macro commands allows rapid creation of a sequence of measurement operations for a particular analysis. An editor allows single step replay to assist macro development.
- ◆ Simple Calibration routines allow multiple microscope / Macroviewer optical magnifications to be saved.

## Sorcerer Input Devices

Sorcerer's video camera will couple to any light microscope having an available C mount adapter.

Illumination modes include:  
Reflected, Transmitted, Bright field,  
Dark field and Phase.

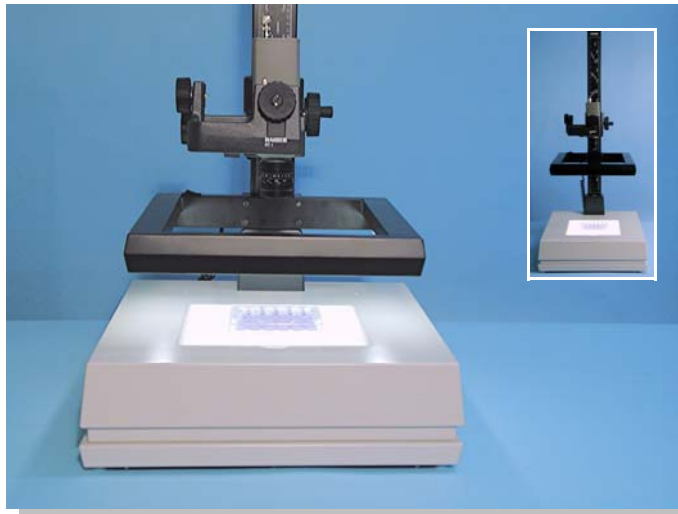
Applications include:

Cell counts  
Etch pit density  
Particle sizing  
Print quality  
UDS



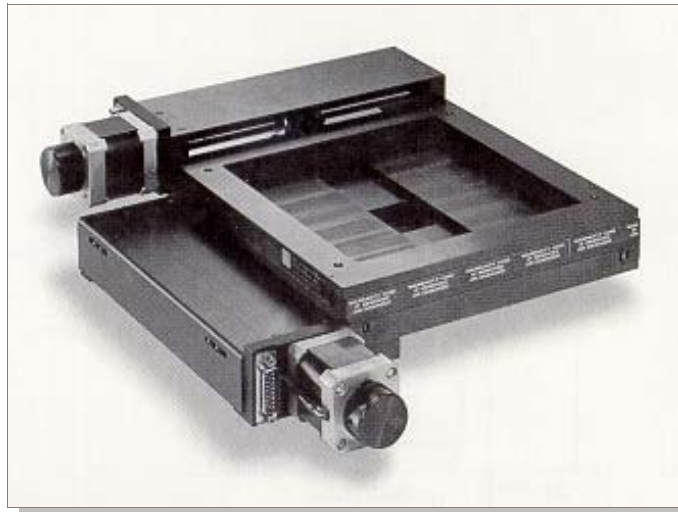
A general purpose Macroviewer with Transmitted and Reflected illumination facilitates the analysis of many different sample formats and applications including:

100 / 150 mm Petri plates  
Multi-well plates  
Prints / Negatives / X-ray plates  
Contamination in Paper products  
Colony counts / Zones of Inhibition  
Membrane filters / 3M Petri-film



Some Image Analysis applications require many fields of view to be scanned in order to generate statistically valid sample data.

A digital stepping motor driven sample stage and controller is available for the Sorcerer Image Analysis system to automate sample movement on a light Microscope or Macroviewer.



# Sorcerer

# Sorcerer Specifications

<b>Scanning device</b>	High performance monochrome CCD video camera.
<b>Sensitivity</b>	256 gray levels.
<b>Resolution</b>	Standard Resolution 768 x 576 pixels. High Resolution 1300 x 1030 pixels.
<b>Measurement times</b>	Between 1 to 2 seconds per field of view.
<b>Video invert</b>	Selectable for objects darker or lighter than the background.
<b>Detection algorithms</b>	Binary and Matrix. Matrix detection algorithm eliminates object gray level variations within samples.
<b>Gray scale histogram</b>	256 gray level histogram displayed on screen.
<b>Measurement frames</b>	Circular, Rectangular, Exclude and User defined.
<b>Field Measurements</b>	Field Count, Field Area, Frame Area, No. of objects excluded, Field PPM, Field Perimeter, Mean Gray Level, Total Object Area, Total Object Perimeter, Total Object EBA, Mean Object Gray Level, Total Object PPM.
<b>Feature Measurements</b>	Position, Area, Filled Area, Perimeter, Longest Dimension, Fibre Length, Fibre Width, Axial Ratio, X Feret, Y Feret, 45 Feret, 135 Feret, Equivalent Diameter, Circularity, Mean Gray Level, Equivalent Black Area (EBA).
<b>Filters</b>	Feature measurement parameters can be used as Include / Exclude filters singly, or as logical And / Or .
<b>Image display</b>	Live or Frozen 256 gray scale image of sample on screen with optional color coding of detected objects. Count flags on separated objects.
<b>Image editing</b>	Object measurement within user defined frames. Inclusion / Exclusion of individual detected objects via the mouse. Point & shoot facility measures individual objects via the mouse.
<b>Image processing</b>	Binary Remove, Erode, Dilate, Separate and Hole fill. Variable gray level sharpening. Matrix shade compensation.
<b>Calibration</b>	Multiple calibration factors can be saved for different microscope objectives and macro lenses.
<b>Macro facility</b>	Simple to use editor creates measurement macros for specific tasks. Includes single step replay to assist development. No programming skills are required.
<b>Size Classification</b>	Up to 50 size classes in any progression for any parameter. Unlimited number of tables can be saved for routine use.
<b>Data tables</b>	Configurable data tables using Microsoft Excel. Data are transferred to Excel via OLE link. Standard Sorcerer / Excel template file includes: Field, Feature, Histogram, Particle Size Analysis, Summary, User defined, ASCII file save and Output tables.
<b>Data file format</b>	Microsoft Excel and ASCII comma separated value. Direct OLE linking to Excel.
<b>Configurations</b>	Multiple configurations can be saved for different applications. For example, Colony counting, Residual ink analysis, Particle sizing, Zone reading, Print quality.
<b>Headings</b>	Data tables can be customized with up to six printout / file headings.
<b>Image capture</b>	Images can be Saved and Retrieved as Windows Bitmap files.
<b>Security</b>	Supervisor and User levels of access, with password protection.
<b>Operating system</b>	Microsoft Windows 98 / NT4 / 2000 / XP.
<b>Computer</b>	Minimum 733 MHz Pentium III, 128 MB RAM, 10GB / 1.44 MB drives, SVGA 1024 x 768 graphics, Microsoft compatible 2 or 3 button mouse, Microsoft Excel.

## Optomax

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