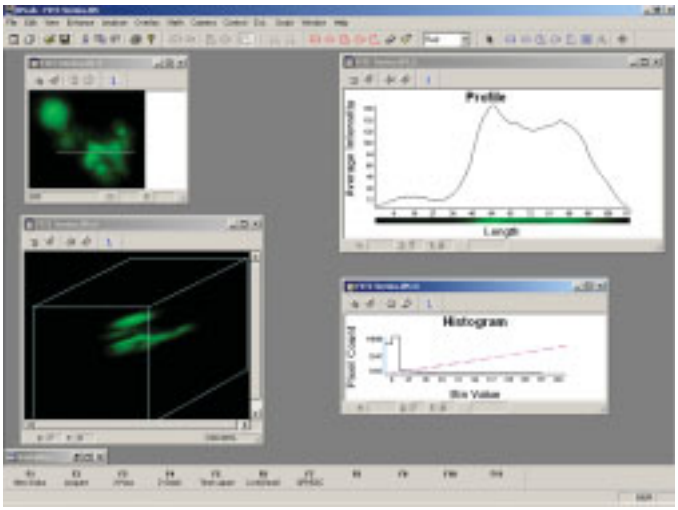
IPLab

Imaging and Automation for Science

Scientific Imaging & Analysis Software for Windows and Macintosh, Proven Worldwide in Thousands of Laboratories

COMPLETE IMAGING PACKAGE



IPLab is a complete imaging package: IPLab handles the acquisition, processing, and analysis of scientific images. IPLab directly supports the acquisition of images and time-lapse series. Sophisticated imaging processes or even simple routines can be automated down to the push of a single button through the use of the intuitive scripting tool. There is no need to learn Visual Basic or other programming languages when you want to automate your imaging routines. Also, fully integrated extensions easily automate microscope control by driving motorized microscope hardware.

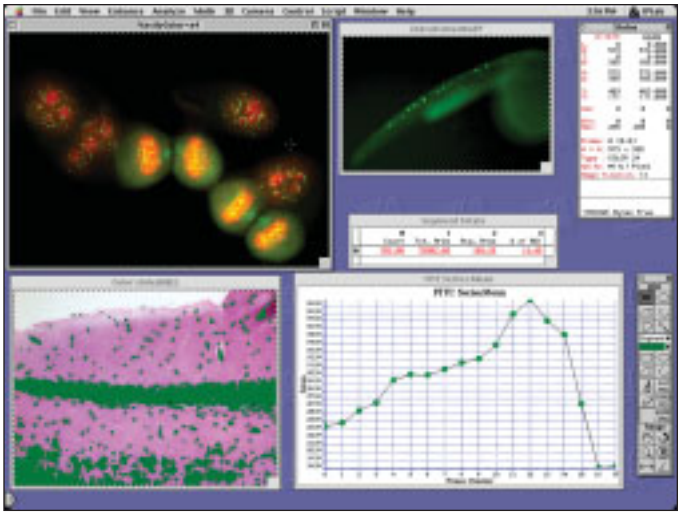
Our team of scientists and engineers designed IPLab to include the full set of tools needed to build imaging, analysis, and automated solutions for the laboratory. Take a closer look to see how IPLab can improve your image acquisition and analysis by downloading the evaluation version from our website: http://www.scanalytics.com.

IPLab is a proven solution worldwide, and can be found in hundreds of citations in the most prestigious journals every year. Since its creation, thousands of scientists have incorporated IPLab into their research.

ACQUISITION/CAMERA SUPPORT

IPLab ships with a full suite of acquire modules for integrating IPLab with the most powerful and popular digital and video cameras worldwide. As new devices are supported, we freely distribute the new acquire modules through our website.

IMAGE PROCESSING



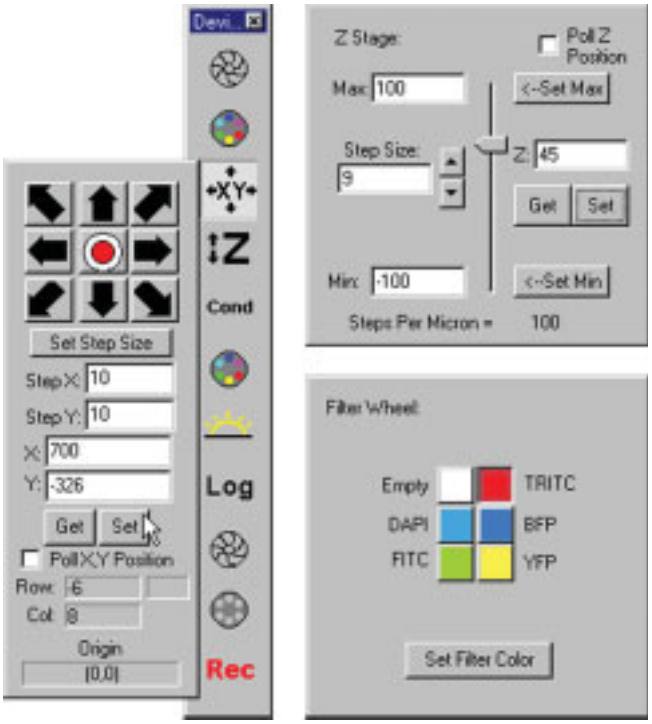
IPLab includes a full suite of image processing features and tools. Not only do these tools allow you to enhance image quality when necessary, but they also make it easy to analyze the image by separating objects or areas of interest from the background.

With IPLab, you can easily combine multiple image sequences and readily blend grayscale (*e.g.* DIC) images with fluorescence image sequences. IPLab also gives you the ability to process and visualize 3D images with the included 3D extension. The 3D visualization tool renders sequences of images in the X or Y plane, or in a tumble mode. You can pseudocolor the rendered image for enhanced image visualization.

ANALYSIS

Using spatially calibrated images with the automated measurement tools, scientists can quickly and easily perform dozens of image processing tasks. The resulting data can be saved in IPLab, or opened in a spreadsheet program such as Excel for further analysis. User definable plots and histograms are also included to present the data as desired.

IPLab also includes densitometry measurements that can be used to plot an analysis such as mean intensity over time. IPLab supports the measurement of individual objects, regions of interest, and entire images. IPLab performs batch analysis of images and sequences using file lists and indexed files.



AUTOMATION

Using IPLab's highly integrated user interface, you can move seamlessly between controlling hardware, acquiring images, and processing and analyzing data. With the appropriate automated hardware and extensions, IPLab fully automates many imaging routines. This includes the acquisition of time-lapse images, Z-stacks, and multi-dimensional images.

EXTENSIONS EXPAND THE CAPABILITY OF IPLAB

- **Motion Control:** Allows IPLab to control motorized microscope hardware, letting you automate your experiments. In addition, Motion Control acquires, processes, and analyzes images from multi-well/microtiter plates, tissue arrays, live-cell assays, live/dead assays, and others.
- **Shutters and Filters:** Lets you automate motorized filter switchers and shutters, without requiring the entire Motion Control package. "Filter switchers" include filter wheels, wavelength switchers using rotating gratings, and liquid crystal tunable filters.
- **MultiProbe:** Interactively creates a color image from as many as 7 different images. When merging images, you can use a DIC or phase (or other grayscale) image for position referencing. Five to six fluorescence images can be layered on top, each in its own color channel.
- **Ratio Plus:** Enables you to acquire, process and analyze dual wavelength image data from fluorescently labeled cells. Ratio Plus enables you to perform ratiometric experiments using scientific-grade cameras and wavelength switching systems.

EASY HARDWARE INTEGRATION

IPLab combines the control of hardware, such as shutters, filter wheels, stages, and motorized microscopes, into an easy-to-use environment. IPLab will direct you through the setup of the most complicated image acquisition protocols. Automated and repeatable processes lead you to increased productivity.

SUMMARY OF IPLAB FEATURES

Multi-Fluorescence:	Capture images from multiple wavelengths, overlay colors, and quantify intensities.
Time Lapse:	Capture images at specified time intervals. Measure and plot intensities over time.
Normalization:	Enhance brightness and contrast, and apply a gamma curve to the displayed image data.
Batch File Processing:	Create a list of files to process all at once. Indexed files provide automatic file naming and numbering.
Animation:	Create a movie loop from your time lapse and 3D images. Play it in IPLab or export it as movie files: QuickTime on the Mac and AVI on Windows.
Merge Color Channels:	Build a 24- or 48-bit color image out of three separate image files or sequences. Blend a fluorescent image or sequence with a DIC or other grayscale image.
Split Color Channels:	Split any 24- or 48-bit color image into the separate components. View the separated images in their corresponding colors. Operate on the color component images as you would any grayscale image.
Shading Correction:	Easily perform flat-fielding to correct for lighting and sensor non-uniformities.
Segment Morphology:	Erosion, dilation, opening, and closing filter operations, with user-definable kernels.
Enhance:	Choose from built-in sharpening, smoothing, and median filters; pseudocolor tables, contrast enhancements, and tools for geometric re-sizing.
Custom Filters:	Define your own linear filter kernels.
Cut, Copy, Paste:	Exchange image data with other programs through cut-and-paste.
Image Registration:	Add registration marks to several images and let IPLab automatically rotate, scale, and shift the images to bring them into alignment.

Image Arithmetic:	Combine and compare two images on a pixel-by-pixel basis. Perform background subtraction and image averaging to reduce noise. Mask certain frequencies in the Fourier domain.
Edit Color Table:	Complete control over the color lookup table to pseudo-color images, equalize histograms, and stretch the image contrast.
Geometric Transforms:	Arbitrary rotation, scale and translation with sub-pixel accuracy. Choose nearest neighbor or bilinear interpolation methods. Also transpose and flip images to view them differently.
Complex Arithmetic:	Complex multiplication of Fourier spectrum real and imaginary components. Convert between real-imaginary and magnitude-phase.
FFT and Cosine Transformations:	Forward and inverse 1-D and 2-D Fast Fourier transform with results in either real-imaginary or magnitude-phase. Forward and inverse cosine transform. All transformations are done with floating-point values for best accuracy.
Point Functions:	Choose from an extensive list of built-in mathematical operations to apply to each pixel for analysis and enhancement.
Quantify:	Count objects and measure density, shape, position, and intensity moments for individual objects and for groups. Limit measurements to specific regions and/or value ranges. Automatically label measured items. Export results to spreadsheets.
Image Ratios:	Compute optical density, perform accurate ratios of images taken at different wavelengths.
Row/Column Averages:	Plot the average value or the sum of all the pixels along a row or column of a rectangular or polygonal region.

IPLab Features...

Calibrate Units:	Calibrate measurements in units of your choice-- microns, mm, cm, inches, *etc.*
Segmentation:	Interactively select thresholds to separate objects from their background.
Densitometry:	Integrated and mean densities, RMS and standard deviation, max and min values.
Histogram:	Plot image data using color histograms. Customizable or automatic binning.
Slices and Object Boundaries:	Plot data values along a slice through the image, or list the (x,y) coordinates and data values at each point along the boundary of an object.
QGraph™ / Plot:	Our integrated graphing functions produce publication quality graphs of your data and analysis results.
Measurements:	IPLab has a long list of measurements you can perform, for measuring density, shape, position, and intensity moments. Limit measurements to specific regions and/or value ranges.
Interactive Measurement:	Click the mouse to measure lengths and angles.
Scripting:	Record your own macros to automate your experiments. Run reproducible protocols as if they were a single command. Assign your most common scripts to keyboard function keys. Turn complex procedures into a sequence of labeled key-presses. There is no scripting language to learn; just point and click.

Set Pattern:	Horizontal and vertical ramps, Gaussian and uniform random noise.
Custom Extensions:	Customize IPLab further by programming your own algorithms. The manual gives complete instructions and examples for including your own code and dialogs written using CodeWarrior for Macintosh and Visual Studio Visual C++.
Mosaic:	Capture multiple images and place them together in one large montage.
Image Annotation:	Non-destructive overlays let you draw text and graphics on top of your images without destroying the underlying data values. IPLab saves both the overlay and image data.
Transfer Attributes:	Easily transfer information from one image to another, including the ROI and Object definitions, Color Table, overlays, and units.
File I/O:	Read and write files in a number of formats: TIFF, Text, FITS, and our own EPR (*.raw & *.psf) and IPLab formats from both Mac and Windows. IPLab/Mac also handles PICTs. Import image foreign files in almost any file format. Easily export results to Microsoft Excel.
Print:	Print images as halftones to any PostScript printer or QuickDraw compatible printer. Make a PostScript file of your image data.
View As Text:	Switch easily between a text view and a standard image view of your data.

SYSTEM REQUIREMENTS

Macintosh

Any PowerPC, G3, or G4
Mac OS 8.0 or greater
128 MB RAM to allocate to IPLab

Window

Windows 98, NT, 2000, or XP
At least 128 MB of RAM
Display card and monitor set to 24/32 bit color and a resolution of at least 800 x 600.

Scanalytics, Inc.

8550 Lee Highway, Suite 400
Fairfax, VA 22031 USA
(P) 703-208-2230 (F) 703-208-1960
(Email) info@scanalytics.com
(Web) www.scanalytics.com

rev 011127b