

Explore the World of Oil Immersion Objective Lenses

Scanning with PL Apo 100x/1.4 n.a. Oil Objective



1.40 n.a.Oil Objective Lens

Apochromatic objective lens:Made of special glass and calcium fluoride, the structure of this lens is complicated, and the lens is marked as "Apo" on its shell.This objective lens is capable of correcting not only the chromatic aberration of Red, Blue and Green, but the spherical aberration of Red and Blue as well. Due to its perfect correction of aberrations, and its larger numerical aperture (N.A.) than response ratio achromatic objective lens, it exhibits a higher resolution, better image quality, and higher effective magnification. Therefore a Apochromatic lens is a high performance product suitable for advanced analytical inspection and micro-photography.

Numerical Aperture is the product of refractive index (of the media between lens and object) and sin function of the half of field angle of lens. Its formula is stated as: $NA = n \cdot \sin \alpha$, whereas the field angle is labeled as "lens angle", which is the angle between objective point on the optical axis and the effective diameter of the lens. The larger the field angle, the larger of the flux entering the lens that is proportional to effective diameter and inversely proportional to the focal length of the lens.

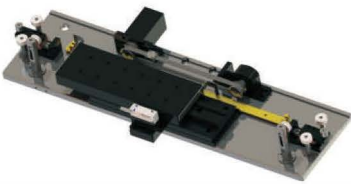
Objective lens category						
Magnification power	Achromatic		Flat Field Calcium Fluoride		Flat Field Apochromatic	
	n.a.	Resolution (um)	n.a.	Resolution (um)	n.a.	Resolution (um)
4x	0.1	2.75	0.13	2.12	0.2	1.375
10x	0.25	1.1	0.3	0.92	0.45	0.61
20x	0.4	0.69	0.5	0.55	0.75	0.37
40x	0.65	0.42	0.75	0.37	0.95	0.29
60X	0.75	0.37	0.85	0.32	0.95	0.29
100X	1.25	0.22	1.3	0.21	1.4	0.1

There are multiple options of oil lenses: 60x APO n.a. 1.4 and 100x APO n.a. 1.4 and the highest resolution is 0.1 um.



Fast Scanning

Equipped with the camera using the fastest CMOS chip to date, combining with real time image compression technology, this instrument may sample 163 to 300 frames of 5 million-pixel photos every second. Using 60X or 100X lens it may scan the whole 20mmx50mm slide in 2 min and 3 min, respectively. [for 15mm X 15mm region, 60X and 100X oil lens scan time are 30s and 60s, respectively]



Vibration Free XY Scan

- Patented high speed stable X axis: the random variation in height is less than 0.2 μm when it transports at 20 cm/s.
- Patented stable Y axis: the random variation in height is less than 0.2 μm for any transport.
- Vibration Free XY Scan platform guarantees the accuracy of scanning image of oil lens [depth of focus of oil lens is less than 0.5 μm].



High Accuracy, High Frequency Scanning Z Axis

- Patented piezoelectric ceramics driven Z axis, step resolution is 0.1 μm , and scanning frequency is 600 Hz.



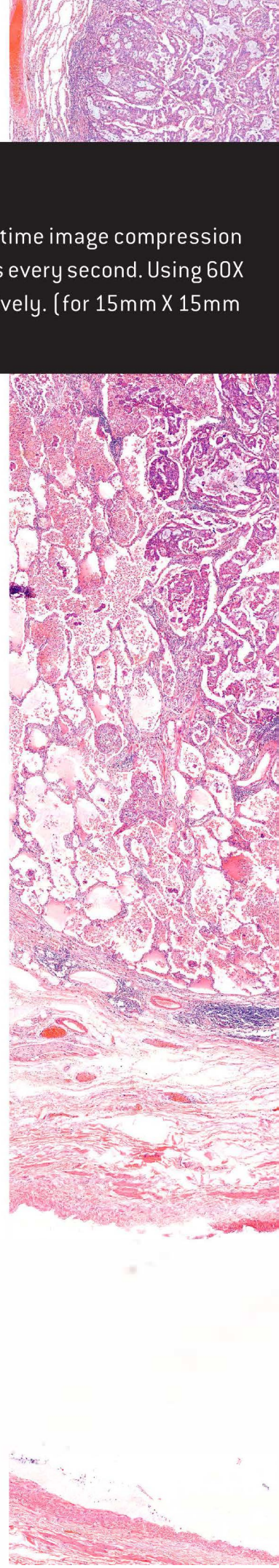
Five-Lens Electric Driven Objective Lens Disc

- Electric driven objective lens disc may quickly switch objective lenses. There are 5 objective lens positions, among those, two are for oil lenses and other three are for dry lenses.



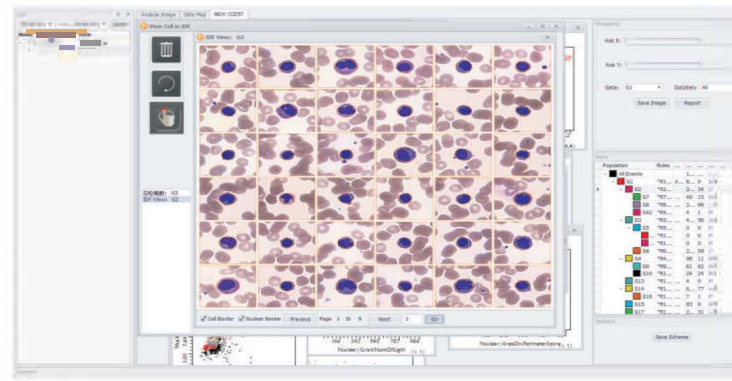
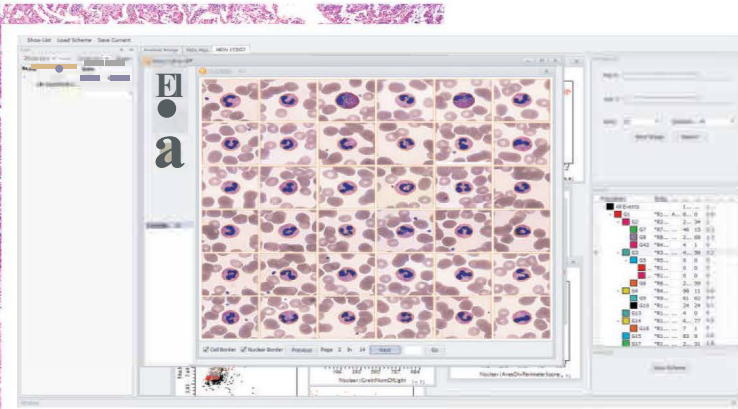
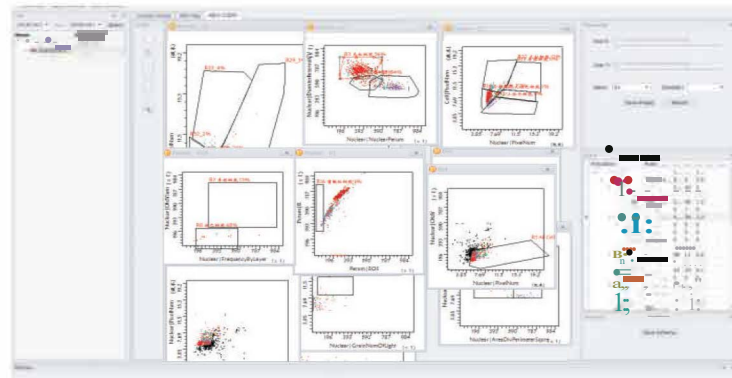
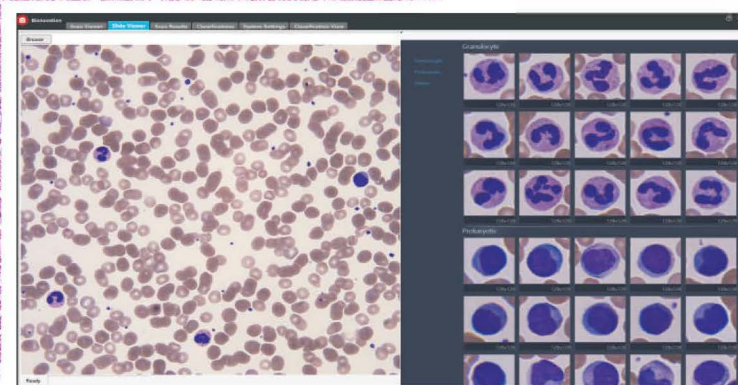
Automatic Oil Dropping

- When the oil objective switches, the automatic oil dropping mechanism will drop the oil to the bottom of the lens.



Real Time Deep Learning Image Processing

The images are processed in real time by 4 high performance deep learning GPU workstations. It may process and analyze more than 4000 cells quantitatively per second.



Annotated Sample Library for Deep Learning

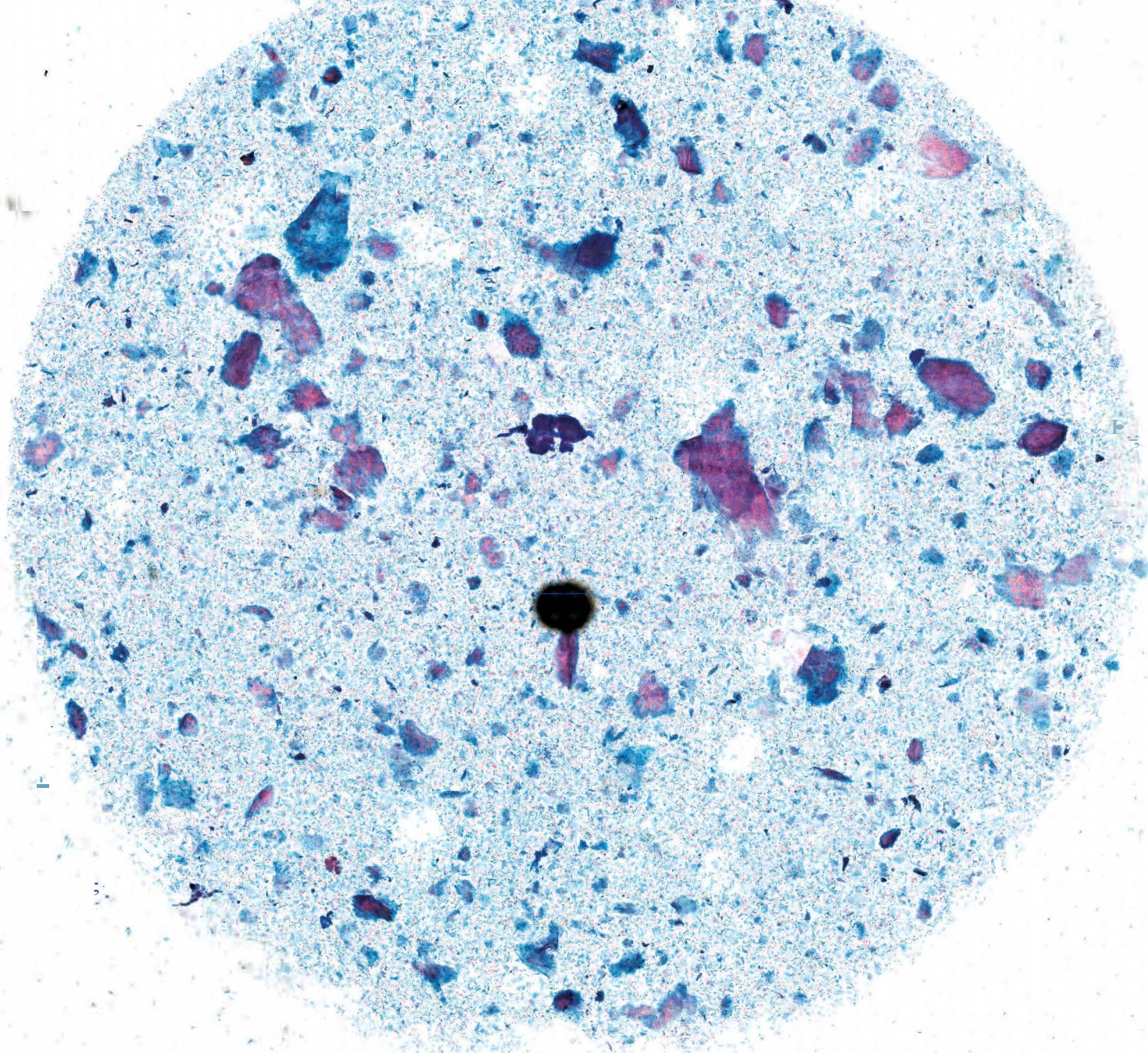
The libraries are set up according to the diagnostic classifications of hematology, cytology, microbiology and pathological morphology. Users can append all kinds of annotated sample data to the corresponding catalog and upload them to the central server. The data will be put into the training database after they are identified by the pathologist.

Other Products and Services

Customized service for scanning hardware of OEM; Collection of Sample Database; Collection of Annotated Training Data and the Exploration of Corresponding Algorithm for Deep Learning; Customized Service of Algorithm for Image Processing and Deep Learning.

Technical Specifications

Slide Type	25mm x 75mm
Loading Capacity of Slides	2
Lens Adapter	0.5x or 0.35x (Can be switched manually)
Electric Nospiece	5 objective lens mounting positions
0.5x Reducing Lens, Suggestion on lens mounting	20x oil n.a. 0.8
	40x dry n.a. 0.65
	60X dry n.a. 0.75
	60x oil n.a. 1.4
	100x oil n.a. 1.4
0.35x Reducing Lens, Suggestion on lens mounting	40x dry n.a. 0.65
	60X dry n.a. 0.75
	60x oil n.a. 1.3
	100x oil n.a. 1.3
Optical Resolution	Lens 100x n.a. 1.3 0.26um, 0.35x Reducing Lens, Camera 0.1um
	Lens 60x n.a. 1.3 0.26um, 0.35x Reducing Lens, Camera 0.17um
Camera speed	5MP, 3.45um, 163FPS
	5MP, 3.45um, 320FPS (coming soon)
	7MP, 4.5um, 400FPS (coming soon)
Focusing speed	Focusing with 8 to 20 points, ≤ 25 seconds
Scanning speed	20mm x 50mm Whole Slide Scanning
	100x Oil Lens 0.35x Reducing Lens, ≤ 3 minutes (Resolution: 0.1um)
	60x Oil Lens 0.35x Reducing Lens, ≤ 2 minutes (Resolution: 0.17um)
	40x Dry Lens 0.35x Reducing Lens, ≤ 1 minutes (Resolution: 0.25um)
Storage of Computer	Dry Lens Scanning Workstation: 2T solid state drive plus 12T Hard Drive Disk
	Oil Scanning Workstation: 80-100T Hard Drive Array
Capacity of Computation	Scanning Workstation: Single GPU, Solid State Drive
	Deep Learning Workstation: Double GPU, 32 Thread, 4GPU Array
Operation (computation) Software	Deep Learning, Training and Executing utility module, Completely quantitative analysis module; Algorithm of deep learning for discriminating the normal and abnormal, slight differences between cells obtained through analyzing the high-dimensional data with completely quantitative analysis module



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