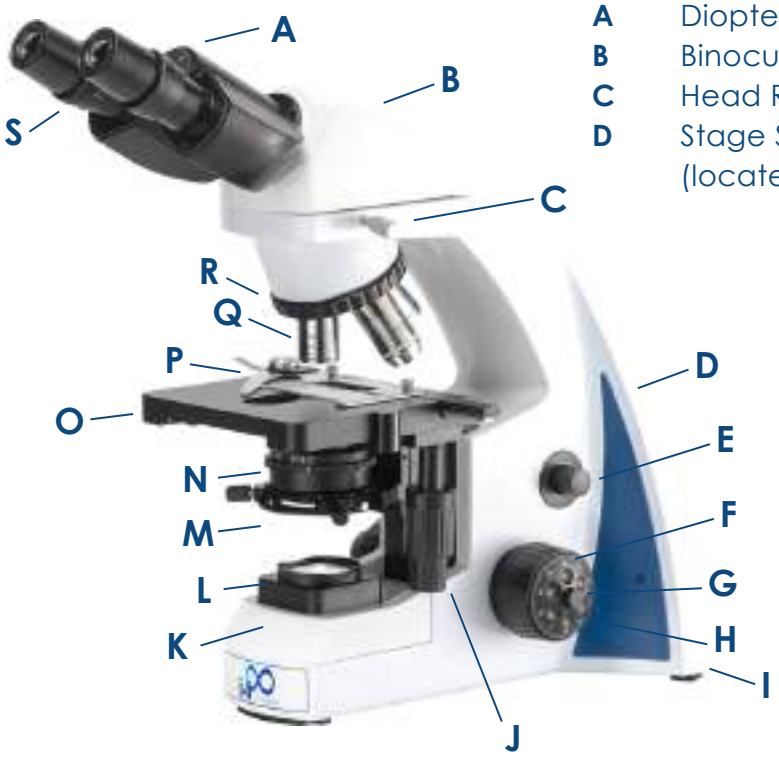
LW Scientific

i4 Infinity Microscope

Instruction Manual





A	Diopter Adjustment	**E**	Brightness Control
B	Binocular Head	**F**	Focus Friction Control
C	Head Retention Screw	**G**	Coarse Focus
D	Stage Stop Lever (located on left side)	**H**	Fine Focus
		I	On/Off Switch (located on rear)
		J	X/Y Axis Stage Controls
		K	Base Condenser
		L	Filter Holder
		M	Substage Iris Diaphragm
		N	Substage Abbe Condenser
		O	Stage
		P	Slide Holder
		Q	Objectives
		R	Nosepiece
		S	Eyepieces

Introduction

The LW Scientific i4 microscope features exceptional optical quality with an infinity optical system, like found on the most expensive laboratory microscopes, but at a fraction of the price. The ergonomic narrow design allows users to rest their arms flat on the table and easily operate all controls. The binocular eye tubes can also be rotated upward to achieve an additional 2 inches of height for taller users. LED lighting produces "daylight" color, with a cool temperature and long life. Comfort, durability, dependability, and superior imaging make the i4 a great value for labs, physicians, vets, and universities. The i4 microscope is intended for use as a biological microscope in a professional environment in accordance with the guidelines set forth in this operation manual.

Phase and Dark Field

100X Dry PLAN Objective

Camera Attachments

Recommended **Upgrades:**

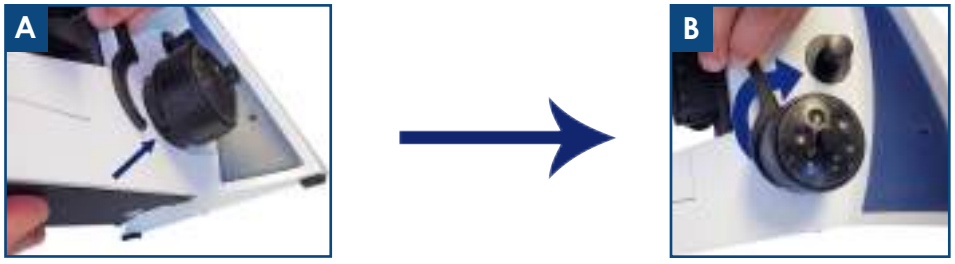
Ask your authorized LWS dealer about additional accessories

Unpacking and Setup

1. Remove the body of the microscope and place it on a sturdy, dust-free surface. Remove the plastic plugs in the nosepiece. Install the objectives in such a way that when you turn the nosepiece clockwise, you are moving from the 4x, to 10x to 40x and finally the 100x objective. Insert the 10x eyepieces.
2. Remove the microscope head from the Styrofoam carton and pull off the protective covers from the eyepiece tubes and head mount. Insert the head mount into the upper arm of the body, taking notice that the "groove" in the flange beneath the head must line up with a "tab" in the mounting ring on the scope (turn the head toward the side to line up). The "groove" system is a safety feature to keep the head from falling off if the retention screw is loosened. Once the head seats, then tighten the head retention screw to secure the head in place. Note: Do not over-tighten.
3. Remove plastic covers and packing material covering the stage, the condenser and lower light assembly

Operation

1. Once you have assembled all the parts and allowed your microscope to come to room temperature, plug the power cord into the microscope and then into the appropriate AC outlet. Note: excess cold can fog lenses.
2. Turn the light on using the black on/off switch on the rear of the scope. Next adjust the light intensity using the brightness control wheel located on the right side of the scope.
3. In order to become acquainted with the controls, choose a specimen slide with which you are familiar. For example, an old hematology slide or a commercially prepared slide. Place the slide into the slide holder by pushing back on the thumb guard to open the slide finger. The slide finger closes slowly to eliminate the possibility of chipping the corner of your slide when it closes.
4. Move the slide to the center of the stage, by turning the stage control knobs, located just below the stage. These knobs allow you to move the slide on the X-Y axis (forward/backward and left/right).
5. The sub-stage iris should then be set to match the aperture of the objective for maximum resolution under each objective power. There are numbers on the iris ring to show the correct setting for each objective power. You should begin with the 4x or 10x objective. Only use the iris wide open when under the 100x oil objective. Closing down the iris on smaller objective powers will improve resolution, contrast, and depth of field.
6. Place the filter of your choice onto the lower light assembly. Note that many customers prefer to use the blue filter for routine use, or no filter at all.
7. Once you are comfortably seated, look into the oculars and move the eyepiece tubes together or apart until you see only one complete circle of light. You have now adjusted your interpupillary distance. The I-4 binocular eye tubes can also be rotated completely from low position to top position, which raises the eyepieces nearly 2 inches higher for tall users.
8. Using the 4x or 10x objectives and the coarse and fine adjustment knobs, bring the specimen into focus. Now, move the 40x objective into place. You will feel a "clicking" action when the objective is seated properly. Again, adjust focus for best image. You should also adjust the iris diaphragm (as described in step 5) for the best contrast and resolution.
9. **Diopter Adjustment:** Since you are using a binocular microscope, you have to adjust the normal difference in vision between your two eyes. ***This is a simple but critical adjustment!*** Close your left eye and look into the right ocular with your right eye. Adjust the focus to give you the best image. Now look at the ocular tube on the left. You will see that the left ocular tube has a built-in adjustment ring. Now close your right eye and look with your left eye into the left ocular. Using the diopter adjustment ring on the left ocular tube, adjust the focus until you see a clear, focused field.
10. **Friction Adjustment:** With repeated use and wear, the stage may drift downward out of focus. If this happens, you need only to tighten the friction control ring located on the right side of the microscope between the coarse adjustment and the body of the microscope (Picture A). If the coarse focus is hard to turn, you may choose to loosen the friction adjustment. There is a black plastic friction wrench in your packaging that will engage the friction control ring to help you turn it (Picture B).



11. **Stage Stop Lever:** To help prevent the stage from hitting the objectives, the I-4 Microscope is equipped with an adjustable stage stop. Rotate the 100X oil objective into place and put a slide into the slide holder. Slowly raise the stage, stopping when the slide makes contact with the objective. Now, turn the stage stop lever in a clockwise direction toward you to lock the stage from going any higher. The stage stop lever is located on the left side of the microscope between the coarse adjustment and the body of the microscope.

Using your Trinocular Head and Camera (Optional)

1 To set up your trinocular head, locate the Prism Pull Rod from your packaging.

2 Insert the Prism Pull Rod into the right side of the trinocular head and thread it until secure. Once tight, pull the Prism Pull Rod outwards to move the prism into place allowing light to flow through to the camera. The Prism Pull Rod can be left out permanently or it can be pushed in when not using the camera for extended periods.

3 To make your camera ***parfocal*** with your eyepieces, first locate the hex key included in your package. Now bring a specimen into focus while looking through your eyepieces. **Note** This is typically done using the 40x objective.**

4 Next, acquire an image on your camera screen. Insert the hex key into the "LOCK" set screw and loosen it slightly (1 turn) to unlock the lens **(A)**. Then insert the hex key into the "FOCUS" set screw and begin to rotate clockwise ***or*** counterclockwise until your samples come into focus on the camera screen **(B)**. The camera image should be in focus similar to your eyepiece image.

5 Lock the camera focus by tightening the "LOCK" set screw.

Maintenance

1. Always cover your microscope with the dust cover when not in use. When cleaning the lenses, use lens paper or a cotton swab dipped in lens cleaning solution.

2. Excess oil should be cleaned off your 100x objective and stage at once. An alcohol pad is best for removing oil from the stage and on the other metal parts but is not recommended for use on the lenses. Use lens cleaning solution and lens paper to clean off your objectives.

3. Dust in the nosepiece or ocular tubes should be blown out using filtered air. Air dusters work well for this job.

4. Whenever you remove an objective, we recommend that you place it back into the original plastic shipping vial until ready to be placed back on the microscope. **SCREW THE OBJECTIVE SECURELY INTO THE CAP OF THE HOLDER - DO NOT DROP OBJECTIVE LOOSELY INTO CONTAINER.**

5. To keep your microscope in top condition for years, LW Scientific recommends that you have the microscope professionally serviced once a year.
Warning: The 40x objective is not sealed for oil immersion. Damage to the 40x objective due to oil immersion is not covered under warranty.

Specifications

Nosepiece
Reverse quadruple hole multiple ball bearing

Head
Binocular (Seidentopf)
Inclined 30°, rotates 360°
Diopter adjustment
10X/18 wide-field eyepieces
10X/20 High-Point super-wide eyepieces available
Trinocular available

Illumination
Moveable Abbe Condenser (NA 1.25)
Iris Diaphragm
Blue and green filters
LED light

Construction
Rugged alloy

Stage
Mechanical stage (140 mm x 130 mm)
– coaxial drive controls
Range of traverse is 78 mm x 50 mm
Acid and reagent resistant finish

Operating Environment
Indoor Use Only
Ambient temperature: 5˚ to 40˚C (41˚ to 104˚F)

Power:
Input: AC 100-240V / 50-60 Hz
Lamp: S-LED W1
Fuse: T250V 500mA

*If you suspect faulty electronics, call LW Scientific's technical service department at 800-726-7345.

Objectives
Infinity Semi-Plan, Infinity Plan Achromat Objectives
4X N.A. 0.10
10X N.A. 0.25
40XR N.A. 0.65
100XR N.A. 1.25 (oil immersion)
50X oil Plan Infinity available

Adjustment Controls
Eyepiece: Interpupillary distance adjustment 48-75 mm
Stage Controls: Knobs allow movement of slide on X-Y axis
Etched vernier scales
Coarse Adjustment: Range of 30 mm
Fine Adjustment: Graduation of 2µm
Variable Light Adjustment

Dimensions and Weight
Weight: 16 lbs / 7.3 kg
Height: 14.1" / 267 mm
Length: 10.7" / 267.5 mm
Width: 6.1" / 152.5 mm
Shipping weight: 17 lbs/ 8kg

Objectives: The following numbers are based on use with 10x/18 eyepieces.

Size	N.A.	Mag.	Field of View
4X	0.10	40X	4.5mm
10X	0.25	100X	1.8mm
20X	0.40	200X	0.9mm
40XR	0.65	400X	0.45mm
50XR	0.95	500X	0.36mm
60XR	0.85	600X	0.3mm
100XR	1.25	1000X	0.18mm