

## 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. Canned 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  
20 watt quartz halogen light (12v 20w JC-G4 bulb)  
LED light option available  
Input 110v or 220v / 50-60Hz switchable

**Construction**  
Rugged alloy; acid and reagent resistant finish

**Stage**  
Mechanical stage (140 mm x 130 mm)  
– coaxial drive controls  
Range of traverse is 73 mm x 43 mm

**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: Lateral and forward/reverse positioning;  
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



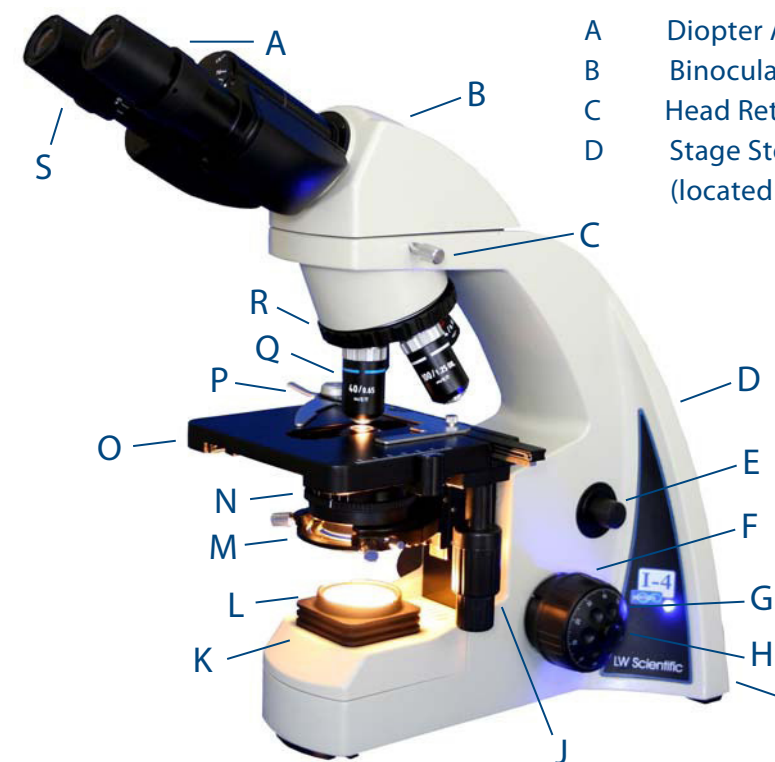
# i4 Infinity

## Instruction Manual



Model pictured:  
i4 Infinity

Not all features available on all models - see back page for model specifications.



- A Diopter Adjustment
- B Binocular Head
- C Head Retention Screw
- D Stage Stop Lever (located on left side)
- E Brightness Control
- F Focus Friction Control
- G Coarse Focus
- 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 I-4 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 head also can be rotated to the top for an additional 2 inches of height for taller users. Optional LED lighting produces "daylight" color, with a cool temperature and long life. Comfort, durability, dependability, and superior imaging make the I-4 a great value for labs, physicians, vets, and universities.



Phase and Dark Field



Eyepieces



Objectives



Camera Attachments

Recommended  
Upgrades:

Ask your authorized LWS dealer about additional accessories

## Unpacking and Setup

LW Scientific packs each I-4 Microscope with utmost care. Examine the outer and inner containers for any visual damage. Retain all of the packing material until you have examined and tested your new microscope. If there is damage, please contact the shipping company, as our warranty does not

cover shipping damage. If you are uncertain who the shipper is, contact the distributor where you purchased the microscope. Please retain all packaging material for future use. Carefully unpack\*\* your I-4 Microscope using the following checklist for all the parts and accessories:

- |   |   |
|---|---|
| 1 - Microscope body with Abbe condenser           | 2 - 0.5 amp replacement fuses   |
| 2 - 10x eyepieces                                 | 1 - Power cord  |
| 1 - Binocular head (Seidentopf style)             | 1 - Warranty card   |
| 1 - Friction adjustment wrench (for coarse focus) | 1 - Immersion oil   |
| 2 - Filters (blue & green)                        | 1 - Dust cover  |
| 4 - Objectives 4X, 10XR, 40XR, 100XR (oil)        | **Note - Some parts may be packed in the outer recesses of the styrofoam blocks |

## Assembly

- 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.
- 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
- 4 Insert the 10x eyepieces.
- 5 Attach the power cord.

## Lamp Replacement

Ensure that the power switch is in the OFF position and that the power cord is removed. Remove the magnetic base condenser to expose the LED light. Unscrew black top to remove protective glass cover and set aside. Raise the stage as high as possible to allow better access to the LED assembly. \*BE CAREFUL WHEN RAISING THE STAGE NOT TO DAMAGE THE OBJECTIVE.

Next, take a small Philip's Head screwdriver and remove the 2 screws that secure the LED light. Set

them aside in a secure place. Using a soldering iron, gently melt the solder on the positive and negative connections and detach the wires. Note which color wire corresponds to the positive and negative wires.

Gently use a small flat head screwdriver to remove the LED disk from the heat conductive tape. Once removed, discard the old LED light.

Take the new LED light and place it onto the adhesive tape, just as the old LED light was placed. Be sure to keep the wire connections exposed as they will need to be connected to the new LED light.

Once the new LED light is secured to the tape and centered, solder the two wires back to the corresponding positive and negative contact pads on the LED light. Use the two small Philip's Head screws to secure in place. Allow 5 minutes for solder to set.

Plug back in the power cord to the back of the microscope, place the base condenser back on the microscope, and cut the microscope on to test LED light connection. If connection is good, screw the protective glass cover back onto the LED assembly and lastly, place the magnetic base condenser back into position.

## Power

There are no user repairable parts in the electronics package in the rear of the scope. If you suspect faulty electronics, call LW Scientific's technical service department at 800-726-7345.

INPUT: AC 110 or 220 / 50-60 HZ. There is a switch on the rear of the scope to switch from 110 to 220.

OUTPUT: 12v output supports either a 20w quartz halogen G-4 bulb (LWS replacement part R3-12V20W) or LED assembly.

FUSE: One 0.5-amp fuse protects the scope from electrical overload. The fuse is located on the rear of the scope. Spare fuses were included with your scope. When replacing the fuse, always install a new one of the same size and amperage.

## Operation

- 1 Once you have assembled all the parts and allowed your microscope to come to room temperature, plug the power cord into the appropriate AC outlet. Note: excess cold can fog lenses and cause lamp to fail.
- 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. Note: Rapid, repeated changes in light intensity will dramatically shorten the life of the quartz halogen lamp.
- 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 i4 binocular 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 listed above) for the best contrast and resolution.
- 9 Diopter Adjustment: Since you are using a binocular microscope, you need to adjust for the normal difference in vision between your two eyes. This is a simple but critical adjustment! First, make sure that the diopter adjustment on the right eyetube is set to the midpoint of travel, with the "O" mark lined up with the white dot near the bottom edge of the eyetube. Close your right eye and look into the left eyepiece with your left eye. Adjust the fine focus to give you the best image. Now close your left eye and look with your right eye into the right ocular. Using the diopter adjustment ring on the right ocular tube, adjust the focus until you see a clear, focused field. Now both eyes should see a perfectly focused image.
- 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). 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.
- 11 Stage Stop Lever: To help prevent the stage from hitting the objectives, the i4 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.
- 12 Parfocality: All LW Scientific microscopes are manufactured to be parfocal – meaning that when you change objectives or magnification, the specimen will remain very close to being in focus, with only a fine adjustment needed.

## Warranty

The I-4 is covered by a lifetime warranty on materials and workmanship, and a 1-year warranty on electronics from date of purchase. If there is any indication of a problem, contact LW Scientific. Operating the unit after noticing a problem could compound a simple problem and cause an unnecessary expense to the owner. LW Scientific support staff will trouble shoot problems over the phone, and attempt to solve problems in the most expedient manner. This

may include sending parts that can easily be installed by the user, or directing the user through a simple adjustment to the unit. Making repairs to the unit without authorization from LW Scientific will void the warranty.

If the unit must be shipped in for repair, LW Scientific will issue a Return Merchandise Authorization (RMA) number. You will need to provide the serial number and have either a warranty card on file at LW Scientific, or proof of purchase.

