User Manual of Product 1:

AmScope M150C-I 40X-1000X All-Metal Optical Glass Lenses Cordless LED Student Biological Compound Microscope



User's Manual

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Introduction

Congratulations on the purchase of your new AmScope microscope!

This manual is designed for the M150 series microscopes.

Please be sure to take a few minutes to familiarize yourself with the features and functions of your new AmScope microscope.

If you'd like more information on microscopes, parts, or accessories, please visit our website at:

www.iScopeCorp.com

We highly recommend you study this manual thoroughly before operating the microscope, and that you keep it on hand for future reference.

If you have additional questions or need assistance, please send us an email at:

info@amscope.com

Safety Precautions

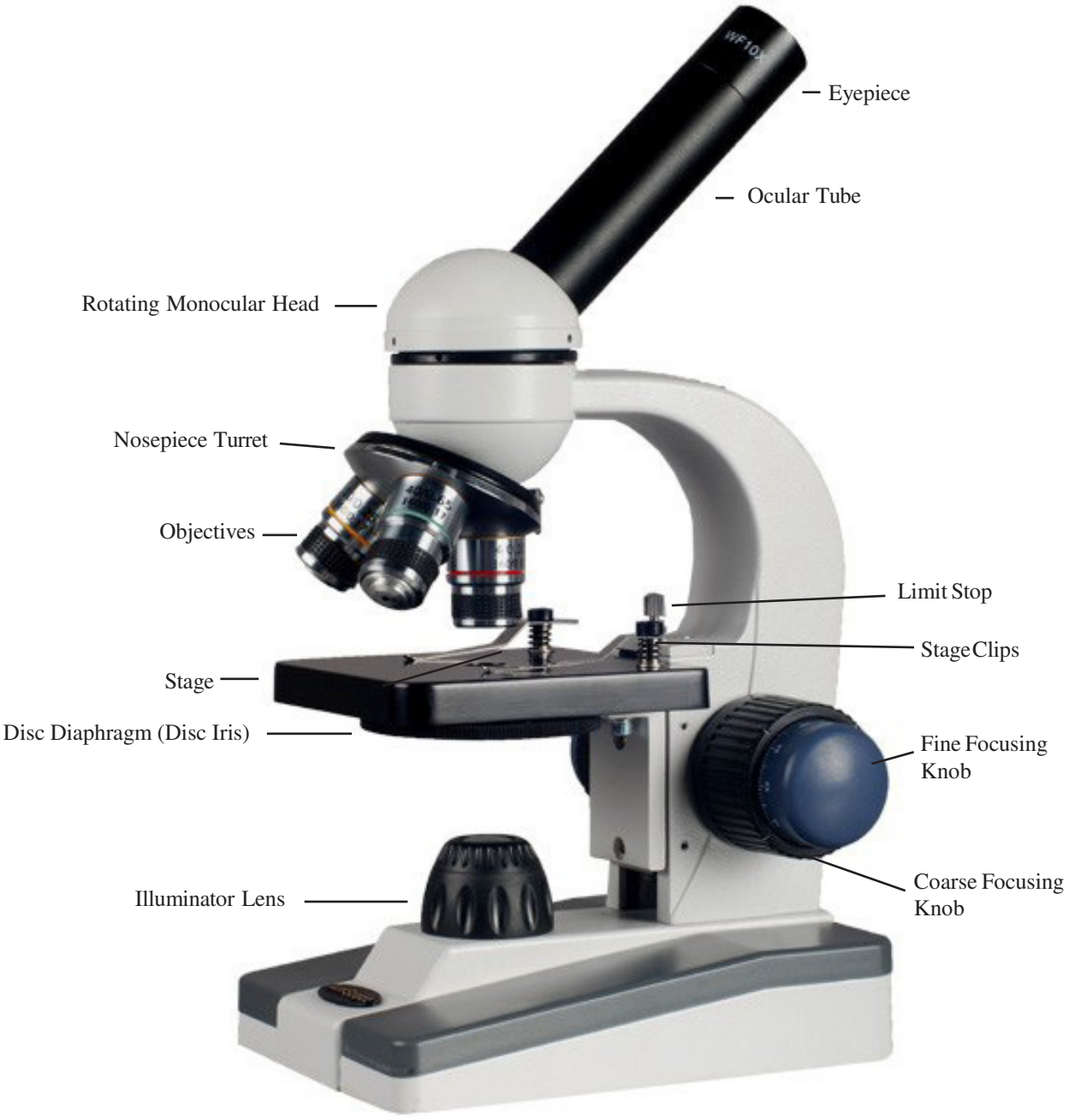
1. As the microscope is a precision instrument, always handle it with care, avoiding impact or abrupt movement during transportation. Do not shake the package.

2. Do not place the microscope in direct sunlight or in high heat. Keep it indoors in a dry and clean place with temperatures between 32-100 degrees F (0-40 degrees C), and in maximum relative humidity of 85%.

3. Avoid touching the lenses on the objectives and the eyepieces so that oil and dirt from your fingerprints do not obstruct your view.

4. Before turning the power on, make sure that the power supply voltage is consistent with the voltage of your microscope.

M150


WF10X
Eyepiece
Ocular Tube
Rotating Monocular Head
Nosepiece Turret
Objectives
Limit Stop
Stage Clips
Stage
Disc Diaphragm (Disc Iris)
Fine Focusing Knob
Coarse Focusing Knob
Illuminator Lens

Definition of Parts

Base Illuminator Lens
Directs the light source towards the slide

Focusing Knob
Used to bring the slide into the sight and focus

Disc Iris Diaphragm
Controls the amount of light that hits the slide from the base illuminator

Dimmer
Controls the amount of light that escapes from the base lens

Limit Stop Knob
Limits the upward movement of the mechanical stage in order to avoid damaging the slide and objective

Nosepiece
Houses the objective lenses

Rotating Monocular Head
Houses the eyepiece and optics of the microscope

Assembly

1. First, take the styrofoam container out of the cardboard carton and lay it on its side, paying attention to which side is labeled up. Remove the tape and open the container carefully so as to avoid dropping and damaging the optical items. Check carefully to ensure that all parts and accessories are intact.

2. Check the packing list to ensure that you're received all items:
- One Monocular Microscope Body & Head
- Three Objectives (4x, 10x, 40x)
- 10x Widefield Eyepieces
- 16x Widefield Eyepieces (for -A models only)
- 20x Widefield Eyepieces (for -B models only)
- 25x Widefield Eyepieces (for -C models only)
- One Dust Cover

Note: LED models do not have a spare bulb, as the LED bulbs do not need replacing.

3. Remove the microscope body from the box and remove the plastic protective covering. The body of the microscope is composed of the base, the stage, the arm, and the nosepiece.

4. Screw the objectives into the microscope nosepiece from the lowest magnification to the highest, again avoiding touching the lenses.

5. Plug in the microscope and turn it on. If no light emerges from the light source, adjust the dimmer knob on the side of the base.

Setting Up

1. Place the specimen to be studied on a glass slide (or use a prepared slide). Place it on the stage, holding it snugly in place with the metal slide holders (clips) of the mechanical stage.

2. Center the specimen over the stage opening, lining it up with the light and the objective lens.

3. To adjust the illumination, slowly turn the dimmer on the right side of the base until the desired intensity of light is achieved.

Focusing

1. Turn the nosepiece to choose an objective. It is easiest to use the lowest magnification first (4x objective) to locate and focus on the specimen. As you move up in magnification you may need to refocus the image a little each time.

2. Being focusing by first looking with one eye through the eyepiece without the diopter. Close your other eye. Use the coarse focusing knob to adjust the height of the stage until the sample comes into clear focus.

Note: You may loosen the limit-stop knob (located on the read of the stage) in order to give yourself the full range of motion for fine tuning the focus.

3. Once the image is clear in your field of view, you will want to use the fine focusing knob to tune it for best results.

Note: Please be careful when moving the mechanical stage if you need to re-center the sample, or if moving the stage very close to the objectives. The limit stop is designed to prevent impact between objective and slide, so when it is off you will be able to damage the microscope.

Adjusting the Diaphragm

1. By changing the aperture (hole size) of the iris diaphragm, you can adjust the background brightness. Adjust the aperture of the iris diaphragm by rotating the disc underneath the stage to the desired aperture.

Attaching a Camera / Changing Eyepieces

1. To remove the 10x eyepiece included on the microscope, you will need to remove the small metal screw on the ocular tube just under where the eyepiece connects to the tube. To do so, you will need a 1mm flathead precision screwdriver (much like what you would use to adjust eye glasses).

Setting the Stage's Stop-Limit

1. To adjust the stop limit on the stage, unlock it by unscrewing the lower nut. The stop limit is located at the rear of the stage.

2. Once tension is released on the nut by rotating it counter clockwise, you may adjust the upper thumb screw to move the limit up or down as desired.

3. Lock the limit stop nut back into place after the desired stage height is achieved.

Maintenance/Precautions

- All glass surfaces must be kept clean. Fine dust on the optical surface should be blown off using a can of compressed air or gently wiped off with a soft lens paper tissue/nonabrasive lint free cloth.

- Carefully wipe off oil or fingerprints on the lens surfaces using tissue moistened with a small amount of lens cleaner (we recommend Sparkle brand optical cleaner).

- Do not use Sparkle to clean other elements of the microscope. Use a neutral detergent on any plastic or painted surfaces.

- Do not assemble or disassemble the microscope's electrical components yourself without advisement from one of our technicians. Doing so will void your warranty unless by advisement of one of our technicians to do so.

- After use, cover the microscope with the provided dust cover.

- Keep your AmScope microscope in a dry, clean location in order to prevent rust or other damage.

- To change batteries with this unit, use the included allen wrench (hexagonal shaped L-tool) to undo the door hex screw on the base. Use 3 AAA batteries with the unit.

- The unit can be used as a recharger for AAA batteries specified as rechargeable only. Please do not use standard batteries in the unit with the charger plugged in to avoid damage.

150 Series Specifications

Parts	Specifications	M149	M149A	M149B	M149C
WF Eyepiece	WF10X/18mm				
	WF10X/18mm w/ Pointer	x	x	x	x
	WF10X/18mm w/ Reticle				
	WF16X/18mm		x		
	WF20X/18mm			x	
	WF25X18mm				x
Plan Eyepiece	P5X				
	P10X				
	P16X				
DIN Achromatic Objectives	4X/0.10	x	x	x	x
	10X/0.25	x	x	x	x
	40X(spring)/0.65	x	x	x	x
	60X(spring)/0.85				
	100X(spring, oil)/1.25				
Plan Objectives	4X				
	10X				
	40X(spring)				
	100X(spring, oil)				
45 Degree Viewing Head	Binocular Sliding, 360 Degree Swiveling				
	Trinocular Sliding, 360 Degree Swiveling				
	Monocular, 360 Degree Swiveling	x	x	x	x
Diaphragm	Iris Diaphragm Disc	x	x	x	x
Illumination	Halogen Light w/ Dimmer				
	LED Light w/ Dimmer	x	x	x	x
Lamp	6V/20W				
	6V/30W				
	LED	x	x	x	x
Filter	Blue/Yellow/Green				

Optional Accessories

Parts	Description	Model #	Purpose
Eyepiece	5X	EP5X23	Obtaining 20x, 50x, 200x, and 500x magnification powers
	20x	EP20X23	Obtaining 80x, 200x, 800x, and 2000x magnification powers
	25x	EP25X23	For obtaining 250x and 2500x magnification powers
	10x w/ Pointer	EP10X23P	For easier identifying of objects
	10x w/ Reticle	EP10X23R	For measuring objects
Objective	2X	A2X	For obtaining 20x and 32x magnification powers
	5X	A5X	For obtaining 50X and 80X magnification powers
	20X	A20x	For obtaining 200x and 320x magnification powers
	60X	A60X	For obtaining 600x and 960x magnification powers
	Plan 4X	PA4X	For obtaining higher clarify in images
	Plan 10X	PA10X	For obtaining higher clarify in images
	Plan 40X	PA40X	For obtaining higher clarify in images
	Plan 100X	PA100X	For obtaining higher clarify in images
Camera	CMOS Digital	MU035 (350k) MU130 (1.3mp) MU300 (3mp) MU500 (5mp) MU800 (8mp) MU900 (9mp) MU1000 (10mp)	To capture images, video, or view live display on a computer (PC/Mac OS X)
	Calibration Micrometer	MR400	To calibrate the camera software for on screen measurements
	CCD TV/Video (Trinocular Only)	CCD-NP	To view live display on a television (RCA)
Case	Aluminum Case	AC-B100	For carrying microscope around safely

Objectives

Type	Magnification	Numerical Aperture (N.A.)	Medium	Parfocal Distance (mm)	Magnification Marks (Color Ring)
DIN Achromatic Objective (195mm)	4X	A2X	Air	45	Red
	10X	A5X	Air	45	Yellow
	40X	A20x	Air	45	Light Blue
	60X	A60X	Air	45	Deep Blue
	100X	A100X	Cedar Oil	45	White
Plan Objective (195mm)	Plan 4X	PA4X	Air	45	Red
	Plan 10X	PA10X	Air	45	Yellow
	Plan 40X	PA40X	Air	45	Light Blue
	Plan 100X	PA100X	Cedar Oil	45	White

Eyepieces

Type	Widefield Eyepiece Medium			Plan Eyepiece		
Magnification	10X	15X	20X	5X	10X	16X
Field of View	Φ18	Φ13	Φ11	Φ18	Φ18	Φ15

Electrical System

There are two options for electrical systems for this series of microscope. The light source is an LED system.

1. 220V~240V power supply: 220V~240V ±10%, 50Hz
   This electrical system is CE and GS certified

2. 100V~120V power supply: 100V~120V ±10%, 60Hz
   This electrical system is UL certified.

All units come standard as 110V units unless an upgrade to a 220V system is requested. Upgrade fee is dependent on which unit is purchased.

This unit is also capable of using batteries and charging rechargeable batteries. It uses 3 AAA batteries. When plugged in with batteries in the unit, the batteries will be charged.

Note: Please do not use the recharging feature with standard batteries, as damage to your unit can occur.

Technical Terms & Concepts

Total Magnification

Total magnification of a microscope is calculated by the magnification of the objective multiplied by the magnification of the eyepieces.

-Ex: (10x Eyepieces) x (4x Objective) = 40x Total Magnification

Field of View

Linear field of view of the eyepiece divided by the magnification of the objective

Numerical Aperture (N.A)

Calculated by n Sin α (max), the Numerical Aperture (N.A) is an important parameter that marks the features of the objective and condenser's image quality and resolution. The "n" is a refractive index of the medium (air or immersion cedar oil) between the objective lens and the specimen. The "α" is 1/2 of the angle between the aperture on the objective and path of light. The larger the N.A, the higher the resolution of the objective (and better quality of the image) is.

Object to Primary Image Distance

The distance between the object plane and the primary image plane. The conjugate distance is fixed.

Mechanical Tube Length

The distance between the objective shoulder and the ocular shoulder

Common Issues

Symptom	Cause	Remedy
	OPTICAL ISSUES	
One side of the field of view is darker	The nosepiece if misaligned	Turn the nosepiece until it clicks into place
	Stains or dust has accumulated on the objective, eyepieces, or base lens	Clean all lenses with lens cleaner or a lint free non-abrasive cloth
Obstructions are observed in the field of view	Stains, dust, or dirt has accumulated on the specimen	Clean the slide or use a new specimen if sample is destroyed
	Stains, dust, or dirt have accumulated on the lens	Clean the lens
Unclear Image	There is no cover slip on the slide	Add a cover slip. The objectives are designed for use with a 0.17mm cover slip, so it is a requirement to use one for proper images.
	The cover slip is not standard sized	Replace the cover slip with the appropriate 0.17mm thickness slip
	The aperture is not open to an appropriate diameter	Adjust the aperture to have the light just larger than the size of the condenser
	Stain or dust has accumulated on the lens in the inlet of the head	Clean the lens with lens cleaner or a nonabrasive lint free cloth, as well as spray with compressed air
One side of the field of view is dark or the image moves while focusing	The specimen slide is not fixed	Secure the slide to the stage with clips
	The nosepiece is not in the right position	Turn the nosepiece until it clicks into place
The field of view is not bright enough	The iris disc diaphragm is not big enough	Rotate the iris disc diaphragm to allow more light to travel
	Stains, dust, or dirt has accumulated on the condenser, objective, eyepieces, or base lens	Thoroughly clean tall lenses with lens cleaner or a lint free nonabrasive cloth

Common Issues (Continued)

Symptom	Cause	Remedy
	OPTICAL ISSUES	
The color of the image is not accurate	The brightness adjustment knob is not in the right position	Adjust the brightness knob to a higher or lower setting for color clarity
	No filter is used or filter is in use	Remove color filter if natural light is desired, or insert desired filter
	MECHANICAL ISSUES	
The objective touches the cover slip	The cover slip is not standard sized	Replace the cover slip with the appropriate 0.17mm thickness slip
	The limit-stop is set too high or not engaged	Be careful to avoid contact between objective and the slide when the limit stop is not engaged. To reengage, focus the sample, then lock the limit stop into place to set max height at a safe but usable distance.
Unable to move the slide smoothly	The slide is not secured correctly	Adjust the slide to use the stage clips and secure the sample
	The mechanical stage is not properly secured	Tighten the mechanical stage screws to better secure the stage
Focus knob does not turn	The tension knob is too tight	Loosen it by adjusting the tension ring inside the coarse focus knob counterclockwise (close to the arm of the microscope on the left of the microscope)
Stage declines by itself	The tension knob is too lose	Tighten it by adjusting the tension ring inside the coarse focus knob clockwise (close to the arm of the microscope on the left of the microscope)
The focusing knob won't raise the stage	Limit-stop is engaged	Disengage the limit stop on the rear of the stage of the microscope
	ELECTRICAL ISSUES	
The bulb/light source flickers	The bulb is close to burning out	Please contact us in regards to this issue. LED lights do not burn out, so there may be another electrical issue
The microscope does not light up	The microscope is unplugged	Insert the plug into the wall socket to achieve electrical illumination