Motic
SWIFTLINE

SM100 Series Instruction Manual

WWW.MOTIC.COM

MOTIC HONG KONG LIMITED

MOTIC SWIFTLINE SM100 SERIES STEREO MICROSCOPE

The Motic Swiftline SM100 Series stereo microscope is a full size, well-balanced, stereoscopic instrument producing an erect, three-dimensional image with a large, comfortable field of view.

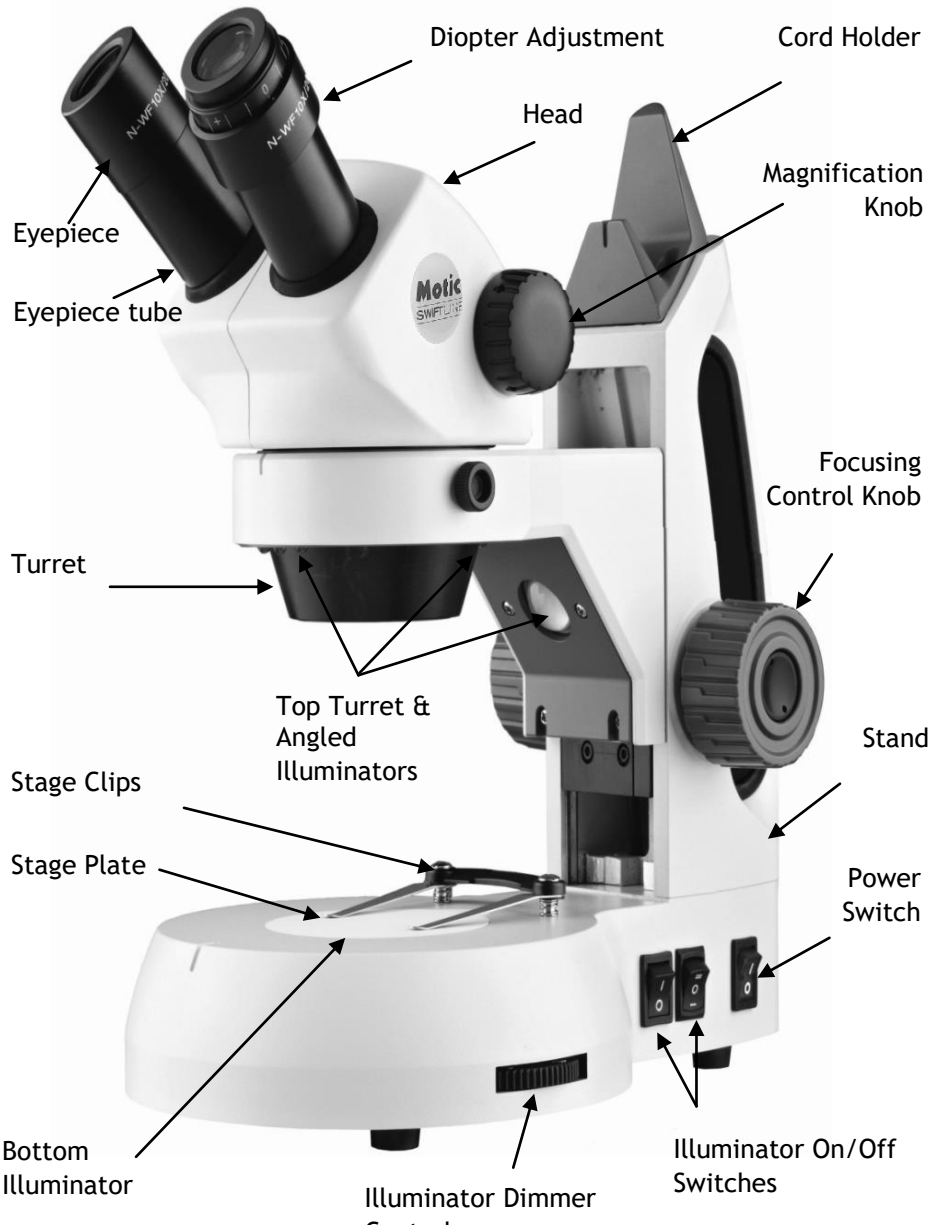
The SM100 Series incorporates features to enhance and provide maximum versatility for classroom and professional use. It is built to rigid optical and mechanical standards; the result of continuing progress from Motic Swiftline to provide a durable, modern instrument that meets today's stringent requirements.

SM100 CORDED SERIES STEREO MICROSCOPE SPECIFICATIONS

Model Number	SM101	SM102	SM105
Objectives	1X, 3X	2X, 4X	1X – 3X ZOOM
Eyepieces	N-WF10X/20	N-WF10X/20	N-WF10X/20
Total Magnification/ Field of View	10X / 20mm 30X / 6.5mm	10X / 10mm 40X / 5mm	10X / 20mm 20X / 10mm 30X / 6.5mm
Working Distance	77mm	77mm	77mm
Max Specimen Height	36mm	36mm	36mm
SM100 Illuminator (incident & transmitted)	Turret variable 6 x .06W LED, Top variable .5W, Bottom .5W LED. Corded Stand	Turret variable 6 x .06W LED, Top variable .5W, Bottom .5W LED. Corded Stand	Turret variable 6 x .06W LED, Top variable .5W, Bottom .5W LED. Corded Stand

SM100 CORDLESS SERIES STEREO MICROSCOPE SPECIFICATIONS

Model Number	SM101-C	SM102-C	SM105-C
Objectives	1X, 3X	2X, 4X	1X – 3X ZOOM
Eyepieces	N-WF10X/20	N-WF10X/20	N-WF10X/20
Total Magnification/ Field of View	10X / 20mm 30X / 6.5mm	10X / 10mm 40X / 5mm	10X / 20mm 20X / 10mm 30X / 6.5mm
Working Distance	77mm	77mm	77mm
Max Specimen Height	36mm	36mm	36mm
SM100 Illuminator (incident & transmitted)	Turret variable 6 x .06W LED, Top variable .5W, Bottom .5W LED. Corded Stand	Turret variable 6 x .06W LED, Top variable .5W, Bottom .5W LED. Corded Stand	Turret variable 6 x .06W LED, Top variable .5W, Bottom .5W LED. Corded Stand



USB Port (SM105-C Pictured)

COMPONENTS OF THE STEREO MICROSCOPE

BOTTOM ILLUMINATOR – This is the light source mounted in the base to provide trans-illumination.

DIOPTER ADJUSTMENT – Located on the left eyepiece tube of the SM100 Series. This adjustment is used to fine focus the optics to compensate for visual differences between the user's eyes.

EYEPIECE – The upper optical element that further magnifies the primary image of the specimen and brings the light rays in focus at the eyepoint.

EYEPIECE TUBE – This is the part of the head that holds the eyepieces in place. Set screws in the eyepiece tubes can be used to lock the eyepieces in place.

STAGE CLIP – Used to hold specimen in place.

FOCUSING CONTROL KNOB – The focusing control knobs located on either side of the stand are used to raise or lower the head to bring the specimen into focus. The control knobs incorporate a slip clutch system which prevents the head from traveling past both ends of the focusing range. When the focusing limit is reached, the clutch system begins to slip to prevent gear damage.

HEAD – The 360˚ rotatable component that contains all of the optical elements of the stereo microscope including the eyepieces, refracting mirrors and objective lenses. The head of the SM100 series is designed to allow users to adjust the interpupillary distance of the eyepieces for proper viewing.

CAMERA PORT - the top portion of the microscope (M3600 series) is equipped with an optional camera port. This port allows the end user to attach a digital camera (such the Moticam 2, X, X2, or BTW8 Tablet), with the purchase of the optional C-Mount camera lens (MA15604). Ask your microscope dealer for details. To remove the cap, a 1.5mm hex wrench is will be required **(not provided)**.

ILLUMINATOR DIMMER CONTROL – The intensity of the top (incident light) LEDs or bottom (trans-illumination) LED can be adjusted to the preferred brightness (0 through 10) by using the dimmer control located on the side of the base.

ILLUMINATOR ON/OFF SWITCHES – A tri-illumination system is incorporated into the stand. The illumination system is controlled by top (incident light) and bottom (trans-illumination) on/off switches located at the base of the stand. The incident illuminator is used for opaque specimens, while the trans-illuminator effectively illuminates the internal structure of transparent specimens. Translucent specimens may be seen in greater detail if both illuminators are used simultaneously.

MAGNIFICATION KNOB – Used to change the SM100 series magnification settings.

STAGE PLATE – Frosted glass, black and white stage plates are provided with the microscope stand. The frosted glass stage plate allows light from the bottom illuminator to pass through. The black and white stage plates can be used for additional contrast to the specimen that is being viewed.

STAND – Used to support the stereo microscope head. The height is adjustable which allows the head to change its focusing range. The stand also contains the top and bottom Illuminators.

TOP ANGLED ILLUMINATOR – The top .5W LED light source is fixed at a 45˚ angle.

TOP TURRET ILLUMINATOR – The top 6 x .06W LED light source is fixed in a downward in a vertical position to provide maximum illumination of the specimen.

TURRET – The round barrel that houses the objective lenses. The SM100 Series has magnifications that can be changed by rotating the black turret magnification knob to a different set of objective lenses.

USB Port – This port supplies 5VDC 500Ma for optional accessories. This port can be used to charge MP3 device or add-on USB lighting. **DO NOT USE TO CONNECT USB CAMERA – FOR LOW VOLTAGE DEVICES ONLY.**

OPERATING YOUR SM100 SERIES STEREO MICROSCOPE

1. Place the specimen onto the stage plate and select the type of illumination. If the specimen is transparent, turn on the bottom illumination. If the specimen is opaque, turn on the top illuminator.

2. The magnification knob is located on the right hand side of the microscope head. The knob is clearly marked with the optical magnification setting. To change magnifications, rotate the black magnification knob in one direction or in the opposite, as far as it will turn. This will place one pair of objectives in alignment for

viewing. The power that is in use is marked on the black magnification knob. Please start with the highest objective setting.

3. Look through the eyepieces and rotate the focus control knob to focus the specimen in the field of view.

4. Grasp the eyepiece tubes and move them either closer together or farther apart, to change the interpupillary distance to obtain a clear image. Note, if two separate images are observed, the eyepiece tubes are too far apart and should be moved together. If two overlapping images are seen, the eyepiece tubes are too close together and should be moved apart.

5. Close your left eye and adjust the focus controls so the image is in sharp focus, while viewing with the right eye only.

6. Close your right eye and while viewing with the left eye only, adjust the diopter ring on the left eyetube to bring the image of the specimen into sharp focus. The optical system is now adjusted to your particular vision.

7. Rotate the black magnification knob to lowest magnification. Only minor refocusing using the focusing control knob should be required. Your microscope is now parfocalled.

SERVICE AND CLEANING

Use and store your instrument in a dry environment. When not being used, microscopes should be stored with dust covers in place and illuminators turned off. Avoid direct sunlight, high temperatures, moisture, smoke, and fungus. Your Swift stereo microscope is designed to function satisfactorily with only ordinary maintenance. The instrument should be periodically serviced by a qualified, authorized service technician, who will clean, re-lubricate and perform routine adjustments. Eyepieces should be cleaned as often as necessary to allow unobstructed viewing. Clean the eyepieces by brushing away dust particles using a soft camel hair brush or with air pressure, then moistening the lens by breathing onto it. Wipe the lens carefully with quality lens tissue. If dirt or other foreign matter still remains, it may be necessary to use water or optical cleaner (eyeglass or camera lens). Note: the lens tissue should be moistened, not saturated, for cleaning, after which the lens should be dried using a quality lens tissue. Painted surfaces should be cleaned with soapy water or mild non-abrasive cleaners and a soft cloth. Do not use solvents on painted surfaces.
Unauthorized personnel should never disassemble lens assemblies or other precision components.

BULB REPLACEMENT

Unplug the stereo microscope from the electrical outlet and remove specimens from the stage before you attempt to replace an LED.

To prolong the life of the LED, you should always turn off the unit when not in use.

The extra long life LED incidental (top) illuminator bulbs (Swift MA14780 & MA14781) can be replaced by removing the five retaining screws holding on the Illumination plate (See Fig 1.). This will require the use of a short handle screw driver. They can then be unclipped and replaced (See Fig 2.).

The transmitted (bottom) illumination bulb is Swift MA14782 3.5V 150mA LED Bulb. The bottom bulb may be replaced by carefully laying your stereoscope on its side and using a Phillips screw driver remove the four screws securing the rubber feet and base plate to illuminator base. Remove four 3mm Phillips head screws securing lamp housing to lamp bracket (See Fig 3.); then remove lamp housing. Carefully unplug LED lamp connector. Replace LED lamp assembly and then, reverse the above process.
Picture in Fig 1 is SM105 series – SM101 and SM102 series do not have covers

Fig 1.

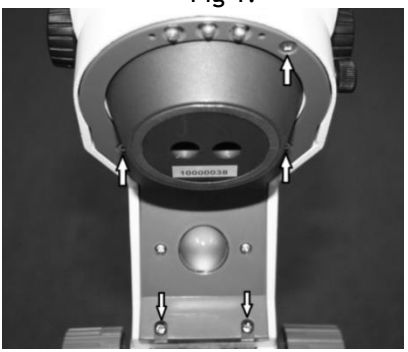
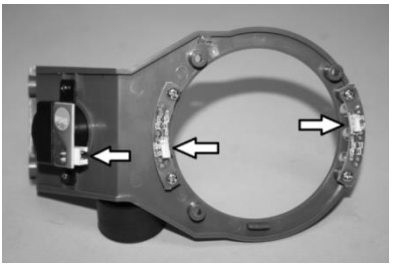


Fig 2.



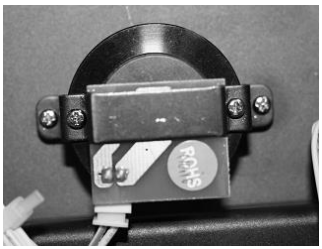
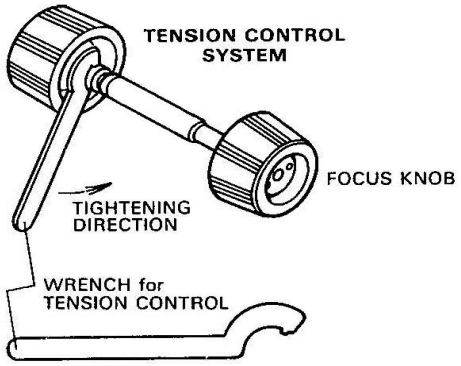


Fig 3.

TENSION CONTROL OF FOCUSING MOVEMENT

The focus tension is easily adjusted by using the adjustment wrench. This wrench fits the tension collar found on the focusing controls, between the knob and upright support. A clockwise turn of this collar moves it toward the upright support and increases tension, while a counter clockwise turn moves the collar toward the knob and decreases tension (see illustration).



ADDING A DIGITAL CAMERA TO TOP CAMERA PORT

The top port of your SM105-T microscope allows the attachment of a digital camera, such as the Moticam. The purchase of an optional C-mount camera lens is necessary for the conversion (MA15604). DO NOT PLUG INTO USB PORT OF MICROSCOPE

1. First take your Moticam camera and remove the dust cap from the bottom of the camera, being careful not to introduce dust.
2. Then take the MA15604 C-mount lens and attach it to the Moticam camera. Then set to the side.
3. Remove the top camera port cover of the microscope, by loosening the three 1.5mm hex screws. **1.5mm hex wrench purchased separately.**
4. Take the Moticam with attached C-Mount and slide down into the open top camera port.
5. Tighten the three 1.5mm hex screws back around the C-mount to secure it in place.
6. Then follow the camera instructions.

COMMON PROBLEMS IN MICROSCOPY

If you have a problem, you may be able to correct it yourself. Here are a few common problems and easy solutions you may want to try before calling for service.

CAUTION – Never disassemble mechanical or optical components. This servicing should only be done by an authorized Swift technician. The Limited Lifetime Warranty will be null and void if the mechanical or optical components are disassembled by a non-Swift dealer.

A. PROBLEM – The illuminator light does not come on
CORRECTION –
1. Make sure the microscope is plugged into a functional electrical socket.
2. Make sure the bottom illuminator dimmer control is set above "0"
3. The bulb may need to be replaced. See "Bulb replacement" on page 8.

B. PROBLEM – Unable to bring specimen into focus.
CORRECTION –
1. Eye lens of the eyepiece is partially unscrewed. Remove the eyepiece and screw the two sections together.
2. The black turret knob may need to be fully rotated to align the objective lenses into the correct position.
3. The specimen may not be centered properly on the stage and needs to be re-positioned to be in the optical path.

C. PROBLEM – Image of the specimen goes out of the focus all by itself.
CORRECTION - Use the tension control collar to tighten the focusing mechanism found on the focusing spindle.

D. PROBLEM – Focusing knobs turn with difficulty even with tension-collar loosened.
CORRECTION – Microscope should be disassembled, cleaned and re-lubricated by a qualified, authorized technician.

PARTS and ACCESSORIES

MA10589	N-WF10X/20 (single)
MA10590	N-WF10X/20 adjustable Diopter (single)
MA14780	3.5V 150mA LED Bulb (Top illuminator)
MA14781	3.5V 150mA LED Bulb (Arm illuminator)
MA14782	3.5V 150mA LED Bulb (Bottom illuminator)
MA14281	Power supply converter (100-240VAC in, 4.5VDC 1a out)
MA15604	C-Mount Adapter
MA19029	Rubber Eyeshields, pair
MA2620B	Black Stage Plate
MA2620W	White Stage Plate
MA2621	Frosted Stage Plate
MA533	Dustcover

Motic®

Motic Hong Kong Limited (HONG KONG)
Unit 2002, L20, Tower Two, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong Tel: 852-2837 0888 Fax: 852-2882 2792

Motic Instruments Inc. (CANADA)
130-4611 Viking Way
Richmond, B.C. V6V 2K9
Canada Tel: 1-877-977 4717
Fax: 1-604-303 9043

Motic Deutschland GmbH (GERMANY)
Christian-Kremp-Strasse 11, D-
35578 Wetzlar, Germany Tel:
49-6441-210 010 Fax: 49-6441-
210 0122

Motic Europe (SPAIN)
C. Les Corts 12, Pol. Ind. Les Corts. 08349 Cabrera de
Mar, Barcelona, Spain Tel: 34-93-756 6286 Fax 34-93-
756 6287