

EduBlue

BlueLine series



Introduction

With your purchase of a EduBlue range stereo microscope you have chosen for a quality product. The EduBlue range stereomicroscopes are developed for use at schools and laboratories.

The stereo microscope consists of two separate microscope tubes which are combined as a unit, in order to focus them simultaneously on the object. Each tube has prisms, achromatic objectives and a pair of widefield eyepieces in order to obtain a large, flat field of view. Both eyes are looking at the object under a different angle to reach a deep stereoscopic image.

The maintenance requirement is limited when using the stereomicroscope in a decent manner.

This manual describes the construction of the stereomicroscope, how to use the stereomicroscope and maintenance of the stereomicroscope.

Please read this manual carefully before using this product to ensure correct and safe usage

- The contents of this manual are subject to change without notice
- The appearance of the actual product can differ from the models described in this manual
- Not all equipment mentioned in this manual has to be part of the set you have purchased
- All optics are anti-fungus treated and anti-reflection coated for maximum light throughput

Contents

General safety instructions	3
Dangers associated with the operation	3
Photobiological safety LED, important safety instructions	3
Prevention of biological and infectious hazards	3
Disinfection and decontamination:	4
Model with rechargeable batteries	5
Environment, storage and use	5
Models	6
Objectives	6
Components of the stereomicroscope	6
Assembling Steps	7
Operation	8
Eyepieces	8
Adjusting the focusing tension	9
Illumination & brightness adjustment	9
Safety device (on pillar versions)	9
Revolver of Dual Magnification models	10
Revolver of Triple Magnification models	10
Moveable object stage (EVO models only)	10
Maintenance and cleaning	10
Cleaning the optics	10
Maintenance of the stand	10
Changing the batteries of the EduBlue	11
Digital models and cameras	11
Accessories and spare parts	12
Notes	12

General safety instructions

Intended use: a non-medical device

This microscope is intended for general observation of cells and tissues, with transmitted/reflected illumination and with the specimen fixed on a slide

Dangers associated with the operation

- Improper use could result in injury, malfunction or damage to property. It must be ensured that the operator informs every user of existing hazards
- Danger of electrocution. Disconnect the power to the entire lighting system before installing, adding or changing any component
- Not to be used in corrosive or explosive environments
- Avoid direct exposure of eyes to the collimated light beam or direct light from the light guides or fibres
- To avoid a hazard to children, account for all parts and keep all packing materials in a safe place

Photobiological safety LED, important safety instructions

- Avoid direct eye exposure to any LED light source while switched on
- Before looking through the eyepieces of the microscope, lower the intensity of the LED illumination
- Avoid long and high-intensity exposure to LED light because this may cause acute damage to the retina of the eye

Prevention of biological and infectious hazards

Infectious, bacterial or viral biohazard substances under observation may be a risk to the health of humans and other living organisms. Special precautions should be taken during in vitro medical procedures:

- **Biological hazards:** keep a logbook of all the biological substances or pathogenic microorganisms that were under observation with the microscope and show it to everybody before they use the microscope or before they do some maintenance work on the microscope! Agents can be bacterial, spores, enveloped or non-enveloped virus particles, fungi or protozoa
- **Contamination hazard:**
 - A sample that is properly enclosed with a cover glass never comes in direct contact with the microscope parts. In that case prevention of contamination lies in the handling of the slides; as long as the slides are decontaminated before use and are undamaged and treated normally, there is virtually zero risk of contamination
 - A sample that is mounted on a slide without cover glass, can come in contact with components of the microscope and may be a hazard to humans and/or the environment. Therefore, check the microscope and accessories on possible contaminations. Clean the microscope surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation
 - Microscope operators could be contaminated from other activities and cross-contaminate components of the microscope. Therefore, check the microscope and accessories on possible contaminations. Clean the microscope surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation. It is recommended to wear sterile gloves when preparing the slides and handling the microscope in order to reduce contamination by the operator
- **Infection hazard:** direct contact with the focusing knobs, stage adjustments, stage and eyepieces/tubes of the microscope can be a potential source of bacterial and/or viral infections. The risk can be limited by using personal eyeshades or eyepieces. You can also use personal protections such as operation gloves and/or safety goggles, which should be changed frequently to minimize the risk
- **Disinfectant hazards:** before cleaning or disinfecting, check if the room is adequately ventilated. If not, wear respiratory protective gear. Exposure to chemicals and aerosols can harm human eyes, skin and respiratory system. Do not inhale vapours. During disinfection, do not eat, drink or smoke. Used disinfectants must be disposed of according to local or national regulations for health and safety

Disinfection and decontamination:

- Exterior casing and mechanical surfaces must be wiped with a clean cloth, dampened with a disinfectant
- Soft plastic parts and rubber surfaces can be cleaned by gently wiping a clean cloth, dampened with a disinfectant. Discoloration can occur if alcohol is used
- The front lens of eyepieces and objectives are sensitive to chemicals. We recommend not to use aggressive disinfectants but to use lens paper or a soft fibre-free tissue, dampened in cleaning solution. Cotton swabs may also be used. We recommend you use personal eyepieces without eyeshades in order to minimize risk
- Never immerse or dip the eyepiece or objective into a disinfectant liquid! This will damage the component
- Never use abrasive compounds or cleaners that may damage and scratch optical coatings
- Properly clean and disinfect all possible contaminated surfaces of the microscope or contaminated accessories before storing for future use. Disinfection procedures must be effective and appropriate
- Leave the disinfectant on the surface for the required exposure time, as specified by the manufacturer. If the disinfectant evaporates before the full exposure time, reapply disinfectant on the surface
- For disinfection against bacteria, use a 70% aqueous solution of isopropanol (isopropyl alcohol) and apply for at least 30 seconds. Against viruses, we recommend to refer to specific alcohol or non-alcohol based disinfection products for laboratories

Before returning a microscope for repair or maintenance through a Euromex dealer, an RMA (return authorization form) together with a decontamination statement must be filled in! This document - available from Euromex for any reseller- must be shipped together with the microscope at all times

Reference documents:

World Health Organisation:

<https://www.who.int/ihr/publications/biosafety-video-series/en/>

Robert Koch Institut:

<https://link.springer.com/content/pdf/10.1007/s00103-013-1863-6.pdf>

US Centre for Disease Control and prevention

<https://www.cdc.gov/infectioncontrol/guidelines/disinfection/index.html>

Handle with care

- This product is a high quality optical instrument. Delicate handling is required
- Avoid subjecting it to sudden shocks and impacts
- Impacts, even small ones, can affect the precision of the instrument

Handling the LED

Note: Always disconnect the power cord from your microscope before handling the LED bulb and power unit and allow the system to cool down approximately 35 minutes to avoid burns

- Never touch the LED with your bare hands
- Dirt or fingerprints will reduce the life span and can result in uneven illumination, lowering the optical performance
- Use only original Euromex replacement LEDs
- The use of other products may cause malfunctions and will void warranty
- During use of the microscope the power unit will get hot; never touch it while in operation and allow the system to cool down approximately 35 minutes to avoid burns

Dirt on the lenses

- Dirt on or inside the optical components, such as eyepieces, lenses, etc., affects the image quality of your system negatively
- Always try to prevent your microscope from getting dirty by using the dust cover, prevent leaving fingerprints on the lenses and clean the outer surface of the lens regularly
- Cleaning optical components is a delicate matter. Please, read the cleaning instructions further on in this manual

Model with rechargeable batteries

- Always disconnect the power cord from the microscope before you replace the rechargeable batteries
- The rechargeable batteries must not be thrown away as regular trash but should be taken to special waste collection sites, according your local or national regulations
- Risk of explosion: when removing the rechargeable batteries, do not throw the batteries into fire or any other heat source
- Do not replace the rechargeable batteries with non-rechargeable batteries
- Avoid extreme environmental conditions and temperatures which could affect the rechargeable batteries and lead to fire, explosion or leakage of hazardous substances
- If the rechargeable batteries have leaked, avoid contact of the chemicals with skin, eyes and mucous membranes
- When in contact with the chemicals, flush the affected areas immediately with plenty of fresh water and seek medical attention

Environment, storage and use

- This product is a precision instrument and it should be used in a proper environment for optimal use
- Install your product indoors on a stable, vibration free and level surface in order to prevent this instrument to fall thereby harming the operator
- Do not place the product in direct sunlight
- The ambient temperature should be between 5 to +40°C and humidity should be within 80% and 50%
- Although the system is anti-mold treated, installing this product in a hot, humid location may still result in the formation of mold or condensation on lenses, impairing performance or causing malfunctions
- Never turn the right and left focus knobs in opposite directions at the same time or turn the coarse focus knob past its farthest point as this will damage this product
- Never use undue force when turning the knobs
- Make sure that the microscope system can dissipate its heat (fire hazard)
- Keep the microscope away from walls and obstructions for at least approximately 15 cm
- Never turn the microscope on when the dust cover is in place or when items are placed on the microscope
- Keep flammable fluids, fabric, etc. well out of the way

Disconnect power

Always disconnect your microscope from power before doing any maintenance, cleaning, assembling or replacing LEDs to prevent electric shocks

Prevent contact with water and other fluids

Never allow water or other fluids to come in contact with your microscope, this can cause short circuiting your device, causing malfunction and damage to your system

Moving and assembling

- This microscope is a relatively heavy system, consider this when moving and installing the system
- Always lift the microscope by holding the main body and base of the microscope
- Never lift or move the microscope by its focusing knobs, stage or head
- When needed, move the microscope with two persons instead of one

Models

The EduBlue range stereomicroscopes are standard equipped with two widefield eyepieces WF10x (O) and 2 or 3 achromatic objectives mounted in one revolving nosepiece, as mentioned below in table

Please note: On www.euromex.com you can find the latest updates about EduBlue models and accessories

Objectives

The total magnification can be calculated by multiplying the magnification of the eyepiece with the magnification of the objective. The magnifications are displayed in the table below:

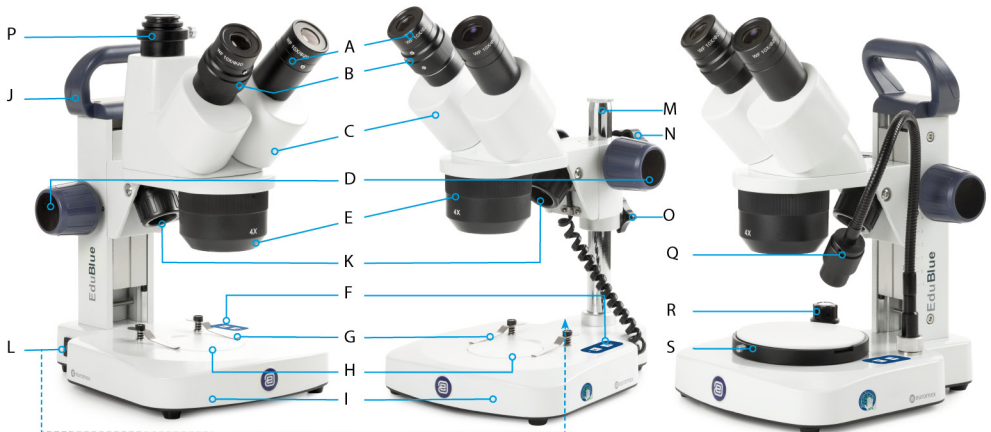
Eyepiece	Objective	Magnification
10x	1x	10x
10x	2x	20x
10x	3x	30x
10x	4x	40x

Components of the stereomicroscope

The names of the several parts are listed below and are indicated in the picture

A	Widefield eyepiece	J	Handle
B	Diopter adjustment	K	Incident illumination
C	Prism housing	L	On/off switch
D	Focusing knob	M	Pillar
E	Revolver (objective changer)	N	Fixing screw
F	Illumination adjustment	O	Safety device
G	Object clip	P	Photo tube
H	Stage plate	Q*	Flexible light arm
I	Stand foot with built-in illumination	R*	Brightness adjustment flexible arm
		S*	Moveable object stage

* Evo models only



Preparing the EduBlue stereomicroscope for use

Carefully remove the items from its packaging and place them on a flat, firm surface. Please do not expose the stereomicroscope to direct sun light, high temperatures, damp, dust or acute shake. Make sure the table or surface is flat and horizontal. When moving the stereomicroscope, use the left hand to hold the transport handle and hold the base of the stereomicroscope with the right hand



Hold the stereomicroscope at the top of the Pillar or handle when it should be moved
Holding the stereomicroscope by its focusing knob will damage the stereomicroscope



Caution! If the bacterial solution or water splatters over the stage plate, objective or head, pull out the power cord immediately and dry the stereomicroscope

Assembling Steps

Euromex Microscopes BV always try to keep the number of assembly steps for their customers as low as possible but in some cases there are some steps to be taken. The steps mentioned below are often not necessary but described for your convenience nonetheless

Placing the eyepieces

The microscopes are equipped with WF10x eyepieces (A) which are locked with a screw. In case alternative eyepieces are to be installed into the microscope; please unlock the screw first before taking out the eyepiece. This is to prevent damage to the tube(s)



Locking the eyepieces

To lock the eyepieces please find the screw as indicated in picture (A). Please note that location can be slightly rotated from model to model

The eyeshades

Each eyepiece has its rubber eyeshade. This prevents damage to the lens, and prevents stray light. The eyeshade can simply be slipped over the eyepiece

Connecting the power adapter

The EduBlue series stereomicroscopes supported a wide range of operating voltages: from 100 to 240V. Please use a grounded power connection

1. Make sure the power switch is off before connecting
2. Insert the plug of the adapter into the EduBlue power socket, and make sure it connects well
3. Insert the other connector into the mains socket, and make sure it connects well

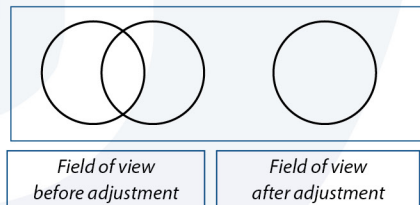
Do not bend or twist the power cord from the adapter, it will get damaged. Use the power adapter that is supplied by Euromex. If it's lost or damaged, choose one with the same specifications

Operation

Insert the plug of the power supply adapter into the mains supply and switch on the illumination with the On/off switch (L) and place the eyeshades onto the eyepieces. Place a sample on the object plate, sit comfortably down behind the stereomicroscope and take a relaxed position while viewing through the eyepieces (A)

Eyepieces

In order to obtain a smooth “compound” image, we recommend you to go through the below steps



1. The interpupillary distance

The correct interpupillary distance is reached when one round image is seen in the field of view (see image below). This distance can be set by either pulling the tubes towards each other or pulling them away from each other. This distance is different for each observer and thus should be set individually. When more users are working with the stereomicroscope it is recommended to remember your interpupillary distance for a quick set up during new microscopy sessions

2. The correct eye point

The eye point is the distance from the eyepiece to the user's pupil. To obtain the correct eye point, move the eyes towards the eyepieces until a sharp image is reached at a full field of view

3. Adjusting the diopter

In order to obtain the right interpupillary setting, one should go through the below steps

- Turn to the highest magnification
- Turn the diopter adjustment ring of the left eyepiece tube until the scale shows the same reading as on the indicator
- Close the right eye and focus the left tube by means of the coarse adjustment knobs
- Close the left eye and focus the right tube with the diopter adjustment ring

This procedure should be followed by each individual user. When more users are working on the same stereomicroscope it is recommended to remember your own diopter setting for a quick set up during new microscopy sessions

Adjusting the focusing tension

When the system lowers itself by its own weight, the tension of the focusing knob (D) should be adjusted. This is done by turning the two focusing knobs in opposite (clockwise or counterclockwise) directions (see image on the right)

Illumination & brightness adjustment

All models have a transmitted (diascopic) and incident LED illumination. With the tip-touch buttons (F) both illuminations can be switched ON and OFF and adjusted in intensity

The tip-touch button closest to you is used to adjust the bottom illumination, the one furthest away is used to adjust the top illumination

The illumination has the following specifications:

LED:

1W LED

External power supply:

Primary AC 100 - 240 Volt 50/60Hz.

Focusing

With the focusing knobs (D) the object can be sharply focused. After working distance (distance between front of objectives to top of object) is about 60 mm

Safety device (on pillar versions)

The fixing screw (N) locks the stand arm into its position. When loosening the fixing screw, one can adjust the holder in height depending of the volume/height of the object. After adjustment the fixing screw should be tightened again and the safety device (O) repositioned and secured in order to avoid that the arm stand can fall down unexpectedly



Revolver of Dual Magnification models

The models with two magnifications are equipped with two pairs of achromatic objectives mounted in one revolver (objective changer). By turning this revolver another magnification is set. Turn the nosepiece until it clearly “clicks” into position

Revolver of Triple Magnification models

The models with three magnifications are equipped with three pairs of achromatic objectives mounted in one revolver (objective changer). By turning this revolver another magnification is set, turning it again selects the next magnification. Turn the nosepiece until it clearly “clicks” into position

Moveable object stage (EVO models only)

The build-in moveable object stage can easily be adjusted and rotated in all directions



Maintenance and cleaning

Always place the dust cover over your EduBlue stereomicroscope after use. Always keep the eyepiece mounted on the stereomicroscope to avoid dust entering the instrument

Cleaning the optics

When the eyepiece lens are dirty, they can be cleaned by wiping a piece of lens paper over the surface (circular movements). When this does not help put a drop of alcohol on the lens paper and wipe it. Never put xylol or alcohol directly on the lens! Please note that Euromex offers a special microscope cleaning kit: PB.5275

It is not necessary – and not recommended – to clean the lens surfaces at the inner side of the objectives. Sometimes dust can be removed with high pressured air



Caution

Cleaning cloths containing plastic fibers can damage the coating of the lenses!

Maintenance of the stand

Dust can be removed with a brush. In case the stand or base plate is really dirty then you can clean the surface with a non-aggressive cleaning product

Changing the batteries of the EduBlue

At first use, the batteries should be charged. Connect the cable of the charger to the inlet at the back side of the stereomicroscope base, and connect the charger to the mains supply. The first charging will take about 20 hours to reach full capacity



Caution:

Always remove the power cable from the mains supply!

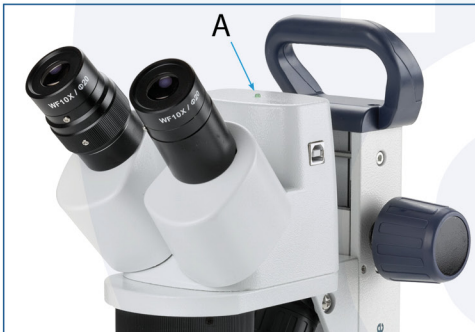
- Remove the battery compartment cover from the bottom plate (see image next page)
- Replace the three batteries (AA type) in the correct order and replace the battery cover

Digital models and cameras

Digital models are equipped with a build-in digital camera. Connect the supplied USB cable to the camera and follow the dedicated software manual for use. The LED which is placed on top of the camera (A) will start to blink when activated in the software

Digital cameras can be used in combination with a standard binocular microscope. Simply remove the eyepiece (unscrew) and place the camera adapter ring inside the eyepiece tube. Then place the camera with mounted c-mount adapter into the eyepiece tube. Focus the digital image with the coarse controls of the stereomicroscope

Follow the manual that comes with the camera for camera operation





EduBlue binocular with camera replacing the original eyepiece



The EduBlue trinocular head. To adjust the height of the camera, loosen the screw (A), then turn the top part (B) up or down. Retighten the screw

Accessories and spare parts

For current accessories and spares, please check our website www.euromex.com

Notes
