

**OPTIKA<sup>®</sup>**  
M I C R O S C O P E S  
I T A L Y

## B-190 Series



**Advanced Biological Microscopes For Students**

# Fulfill the Next Generation Learning Challenges

## DEPENDABLE TEACHING IN A MODERN AND ERGONOMIC DESIGN

- » Designed for secondary schools and educational labs
- » 18 mm field number for a wide observation area
- » High eyepoint eyepieces for glasses wearers
- » Sturdy and durable for extended lifetime; compact and intuitive
- » External power supply for enhanced safety and convenient servicing

## WINDOWS TABLET PC - ONLY AVAILABLE AT OPTIKA

- » A completely new, revolutionary experience for unparalleled comfort
- » Responsive and smooth control for accurate results in few clicks
- » Large touch screen with 360° rotating and tilting holding solution
- » Simultaneous camera and power connection for long-term operation
- » Easily detachable to be used as a laptop (keyboard sold separately)



# Inventors Of A New Way To Teach Microscopy

## 100X OIL/WATER OBJECTIVE - ONLY AVAILABLE AT OPTIKA

- » Same objective for oil and water use
- » Oil represents the best media for high numerical aperture
- » Water combines results with convenience for educational purposes
- » Save time - forget about tedious cleaning and maintenance
- » Save money - no additional expenses due to inappropriate cleaning

**100x Oil**

**100x Water**

## X-LED<sup>2</sup> FOR 65,000 HOURS OF OPERATION - ONLY AVAILABLE AT OPTIKA

- » State-of-the-art illumination system for incomparable light intensity
- » Exclusive lens & collector design, unmatched uniformity & brightness
- » Excellent color fidelity, constant pure-white color temperature
- » Money & energy saving, cutting electricity bills by 90%
- » More efficient brightness than a 30 W halogen lamp

**Halogen**

**X-LED<sup>1</sup>**



Multi-plug power supply



## B-190 Series

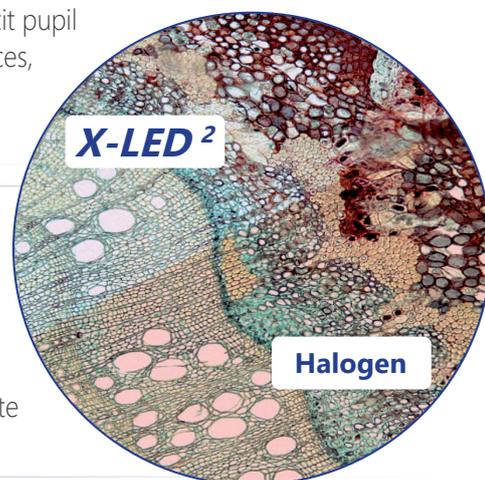
Valuable configurations of modern microscopes ideal for teachers and secondary schools, with four achromatic lenses, FN 18 high eyepoint eyepieces, finite optical system, coaxial focusing, mechanical stage and powerful, uniform, white color temperature 3 W X-LED<sup>2</sup> illumination. Slim and easy to carry, all the models are equipped with long lasting LED illumination to provide over 20 years of use

### High eyepoint eyepieces for glasses wearers

These eyepieces are designed in such a way that the exit pupil is further away from the eye lens than standard eyepieces, being well suited for eyeglasses wearers

### X-LED<sup>2</sup> State-of-the-art illumination system for incomparable light intensity

Provided with an exclusive lens & collector design, OPTIKA X-LED technology ensures unmatched uniformity & brightness (more than a 30 W halogen lamp) for excellent color fidelity with constant pure-white color temperature



### 100x oil/water objective: same objective for dual use

This new, revolutionary objective is something you've never seen before! Oil ensures the best performance achievable; water represents the most convenient solution as eliminates tedious cleaning

### A completely new, revolutionary experience for unparalleled comfort

B-190TBPL includes built-in camera and Windows tablet PC with large touch screen for a smooth and responsive control, with dependable results in few clicks, and providing an extremely comfortable solution for open discussions

### External power supply for enhanced safety and convenient servicing

OPTIKA's safety first approach drives to the use of a low voltage, multi-plug, external power supply in order to prevent any risk of electric shock and heatflow inside the unit

# Advanced Biological Microscopes For Students And Teachers

## Optimum And Unparalleled Comfort In Use

The B-190TBPL offers you a unique, incomparable solution. It includes a built-in camera of 3.1 MP and a Windows tablet with large touch screen, for a responsive and smooth control. Simultaneous camera and power connection ensure long-term operation, with dependable results in one click. It provides a reliable and comfortable solution for open discussion: 360° rotating and tilting tablet, easily detachable, that can be used as a laptop.



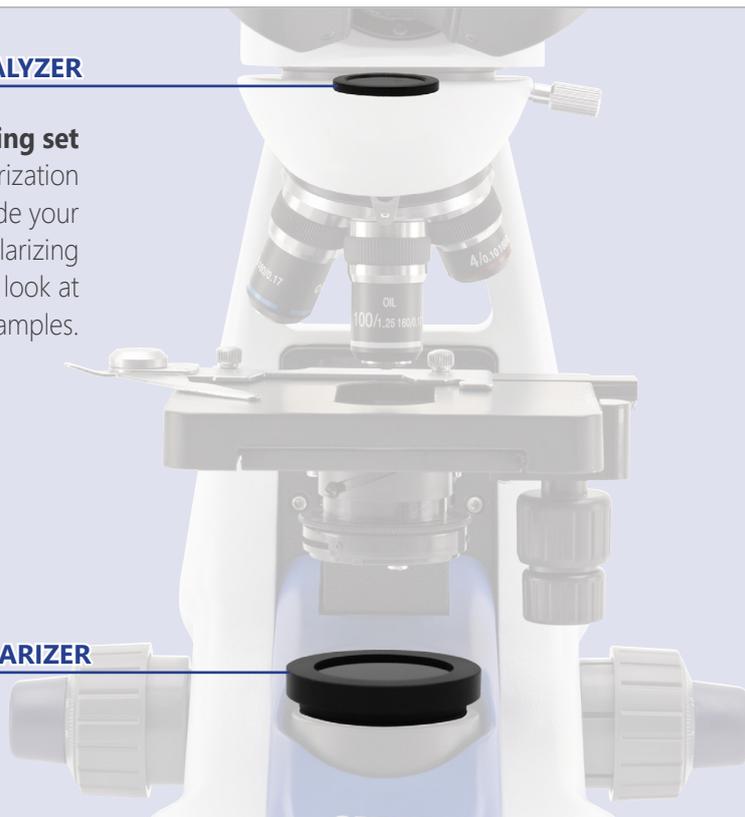
## Get the most out of our accessories

### ANALYZER

**M-174 - Polarizing set**  
Set for simple polarization analysis. Upgrade your B-190 to a polarizing microscope and look at birefringent samples.



### POLARIZER



# 1 B-190 Series - Range

Educational

## B-191sPL



Monocular microscope ideal for teachers and secondary schools, with four N-PLAN objectives (600x), FN 18 high eyepoint, finite optical system, coaxial focusing, mechanical stage, Abbe condenser and powerful, uniform, white color temperature 3 W **X-LED<sup>2</sup>** illumination. Slim and easy to carry, yet sturdy and resistant, it is equipped with all the main controls to start learning how to use an advanced microscope and with long lasting LED illumination to provide over 20 years of use

**Head:** Monocular, 30° inclined; 360° rotating.

**Eyepiece:** WF10x/18 mm, high eyepoint, secured by screw.

**Nosepiece:** Quadruple ball bearings revolving nosepiece, reversed.

**Objectives:**

- N-PLAN objective 4x/0.10
  - N-PLAN objective 10x/0.25
  - N-PLAN objective 40x/0.65
  - N-PLAN objective 60x/0.85
- All with anti-fungus treatment.

**Specimen stage:** Mechanical stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1 mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, focusable, with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and brightness control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

## B-191PL



Monocular microscope ideal for teachers and secondary schools, with four N-PLAN objectives (1000x), FN 18 high eyepoint, finite optical system, coaxial focusing, mechanical stage, Abbe condenser and powerful, uniform, white color temperature 3 W **X-LED<sup>2</sup>** illumination. Slim and easy to carry, yet sturdy and resistant, it is equipped with all the main controls to start learning how to use an advanced microscope and with long lasting LED illumination to provide over 20 years of use

**Head:** Monocular, 30° inclined; 360° rotating.

**Eyepiece:** WF10x/18 mm, high eyepoint, secured by screw.

**Nosepiece:** Quadruple ball bearings revolving nosepiece, reversed.

**Objectives:**

- N-PLAN objective 4x/0.10
  - N-PLAN objective 10x/0.25
  - N-PLAN objective 40x/0.65
  - N-PLAN objective 100x/1.25 (Oil/Water)
- All with anti-fungus treatment.

**Specimen stage:** Mechanical stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1 mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, focusable, with iris diaphragm.

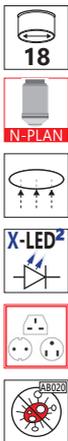
**Illumination:** X-LED<sup>2</sup> with white 3 W LED and brightness control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

# B-190 Series - Range

1

Educational

## B-192sPL



Binocular microscope ideal for teachers and secondary schools, with four N-PLAN objectives (600x), FN 18 high eyepoint, finite optical system, coaxial focusing, mechanical stage, Abbe condenser and powerful, uniform, white color temperature 3 W **X-LED<sup>2</sup>** illumination. Slim and easy to carry, yet sturdy and resistant, it is equipped with all the main controls to start learning how to use an advanced microscope and with long lasting LED illumination to provide over 20 years of use

**Head:** Binocular, 30° inclined; 360° rotating.

**Dioptric adjustment:** Left eyepiece.

**Eyepieces:** WF10x/18 mm, high eyepoint, secured by screw.

**Nosepiece:** Quadruple ball bearings revolving nosepiece, reversed.

**Objectives:**

- N-PLAN objective 4x/0.10
  - N-PLAN objective 10x/0.25
  - N-PLAN objective 40x/0.65
  - N-PLAN objective 60x/0.85
- All with anti-fungus treatment.

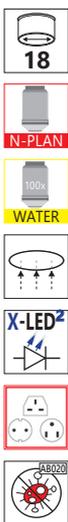
**Specimen stage:** Mechanical stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1 mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, focusable, with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and brightness control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

## B-192PL



Binocular microscope ideal for teachers and secondary schools, with four N-PLAN objectives (1000x), FN 18 high eyepoint, finite optical system, coaxial focusing, mechanical stage, Abbe condenser and powerful, uniform, white color temperature 3 W **X-LED<sup>2</sup>** illumination. Slim and easy to carry, yet sturdy and resistant, it is equipped with all the main controls to start learning how to use an advanced microscope and with long lasting LED illumination to provide over 20 years of use

**Head:** Binocular, 30° inclined; 360° rotating.

**Dioptric adjustment:** Left eyepiece.

**Eyepieces:** WF10x/18 mm, high eyepoint, secured by screw.

**Nosepiece:** Quadruple ball bearings revolving nosepiece, reversed.

**Objectives:**

- N-PLAN objective 4x/0.10
  - N-PLAN objective 10x/0.25
  - N-PLAN objective 40x/0.65
  - N-PLAN objective 100x/1.25 (Oil/Water)
- All with anti-fungus treatment.

**Specimen stage:** Mechanical stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1 mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

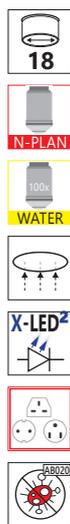
**Condenser:** Abbe N.A. 1.25, pre-centered, focusable, with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and brightness control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

# 1 B-190 Series - Range

Educational

## B-193PL



Trinocular microscope for camera connection ideal for teachers and secondary schools, with four N-PLAN objectives (1000x), FN 18 high eyepoint, finite optical system, coaxial focusing, mechanical stage, Abbe condenser and powerful, uniform, white color temperature 3 W **X-LED<sup>2</sup>** illumination. Slim and easy to carry, yet sturdy and resistant, it is equipped with all the main controls to start learning how to use an advanced microscope and with long lasting LED illumination to provide over 20 years of use

**Head:** Trinocular (split ratio: 50/50), 30° inclined; 360° rotating.

**Dioptric adjustment:** Left eyepiece.

**Eyepieces:** WF10x/18 mm, high eyepoint, secured by screw.

**Nosepiece:** Quadruple ball bearings revolving nosepiece, reversed.

**Objectives:**

- N-PLAN objective 4x/0.10
  - N-PLAN objective 10x/0.25
  - N-PLAN objective 40x/0.65
  - N-PLAN objective 100x/1.25 (Oil/Water)
- All with anti-fungus treatment.

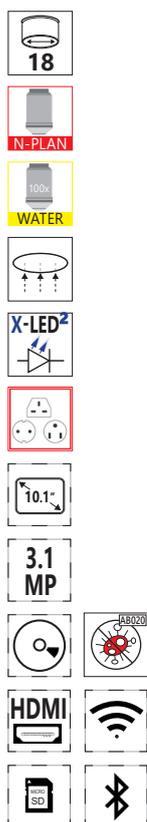
**Specimen stage:** Mechanical stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1 mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, focusable, with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and brightness control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

## B-190TBPL



Digital binocular microscope ideal for teachers and secondary schools, with four N-PLAN objectives (1000x), FN 18 high eyepoint, finite optical system, coaxial focusing, mechanical stage, Abbe condenser and powerful, uniform, white color temperature 3 W **X-LED<sup>2</sup>** illumination. The 3.1 MP CMOS camera ensures excellent colour reproduction and is connected to a Windows tablet PC with vivid color graphic display for unparalleled comfort and performance. The tablet represents a 2-in-1 solution as it can be disconnected and used as a real PC, being Windows-based, with powerful Intel processor and large touch screen of 10.1" for fast, responsive and smooth control

**Head:** Binocular with integrated 3.1 MP camera, 30° inclined; 360° rotating. Detachable Windows tablet PC included, rotating and tilting.

**Dioptric adjustment:** Left eyepiece.

**Eyepieces:** WF10x/18 mm, high eyepoint, secured by screw.

**Nosepiece:** Quadruple ball bearings revolving nosepiece, reversed.

**Objectives:**

- N-PLAN objective 4x/0.10
- N-PLAN objective 10x/0.25
- N-PLAN objective 40x/0.65
- N-PLAN objective 100x/1.25 (Oil/Water). All with anti-fungus treatment.

**Specimen stage:** Mechanical stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1 mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, focusable, with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and brightness control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

# B-190TBPL - Digital Microscope with Camera & Tablet

The latest OPTIKA digital microscopes with Windows tablet PC open new microscopy horizons, combining high-end optics with innovative digital technology for microscopic imaging. B-190TB includes a 3.1 MP camera with a 10.1" Windows tablet. View, capture, analyze and share your images with simplicity and reliability.

## Intuitive, Yet Powerful Software

Simple and user-friendly, ideal for students and experienced users.

**PATENTED**



### Unique Features

- > Simultaneous camera & power connection
- > Equipped with the latest **Windows OS & Intel** processor
- > Easily detachable, can be used as a laptop (keyboard sold separately)

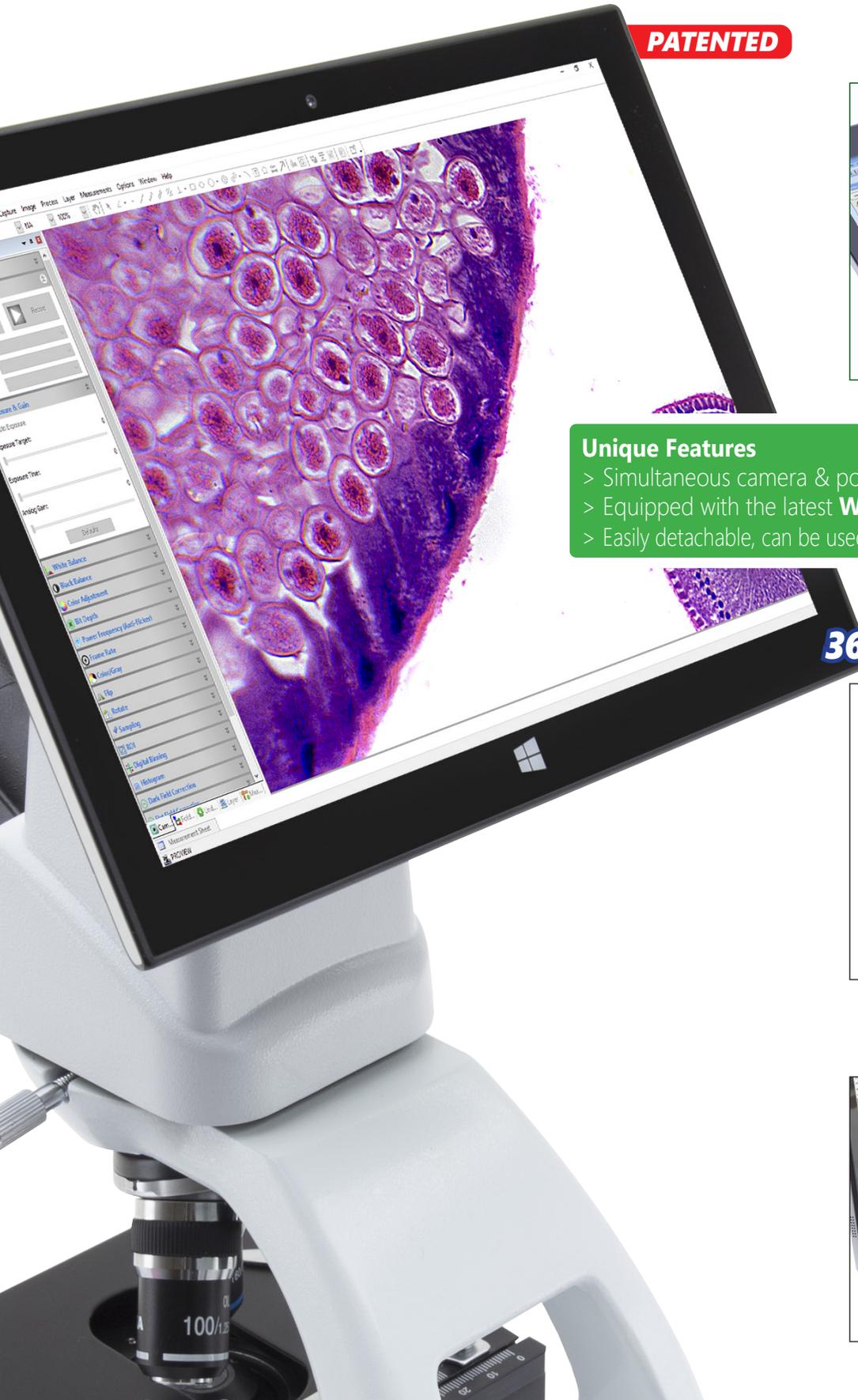
## 360° Rotating & Tilting



## Detachable



TB-KBD2 - Accessory keyboard for tablet



# B-190TBPL - Digital microscope with camera & tablet

**Tilting**



| TABLET TECHNICAL SPECIFICATIONS |  |
|---------------------------------|--|
| Operating system                | Windows 10 (64Bit)   |
| CPU                             | Gemini-Lake, N4100   |
| CPU speed                       | 1.10 GHz   |
| Graphic card                    | Intel® HD Graphics 600   |
| RAM                             | Ram 6 GB LPDDR3  |
| Display size                    | LED 10.1" IPS Multi Touch Screen                                     |
| Display resolution              | 1920x1200  |
| Storage                         | Hdd 128 GB   |
| Network                         | WiFi (2.4G / 5G) - Bluetooth 5.0                                     |
| Input ports                     | USB-C (1 USB2.0 for battery charge, 1 USB3.0) - Micro SD card reader |
| Output ports                    | Microphone - Headphone - Micro HDMI                                  |
| Battery Type                    | Lithium-ion  |
| Battery capacity                | 6500 mAh   |
| Power consumption               | 24.05W   |
| Power supply                    | 12V 2A EU  |
| Dimensions (mm)                 | 261 x 167 X 9  |
| Weight (Kg)                     | 0.53   |
| Language                        | Multilanguage  |
| Weight                          | 530 g  |
| Tablet accessories included     | USB cable USB-B to USB-A (0.5m)                                      |

| CAMERA TECHNICAL SPECIFICATIONS |                                     |
|---------------------------------|-------------------------------------|
| Digital camera resolution       | 3.14 MPixel                         |
| Signal output                   | USB 2.0                             |
| Sensor Size                     | 1/2.5"                              |
| Sensor technology               | CMOS                                |
| Image format                    | 4\3                                 |
| Full Image size                 | 2048 x 1536                         |
| Pixel size                      | 2.2 x 2.2 micron                    |
| Frame rate full resolution      | 5 frames\sec                        |
| Frame rate other resolutions    | 8 FPS (1280x1024) - 30FPS (640x480) |
| Automatic White Balance         | Auto - Man                          |
| Automatic Gain Control          | Auto - Man                          |
| Automatic Back light control    | Auto - Man                          |
| Exposure control                | Auto - Man                          |



# B-190 Series - Optical performance

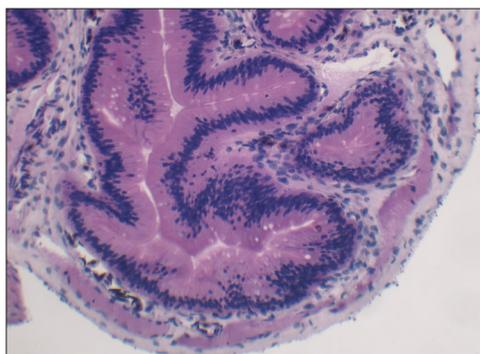
| Eyepiece          |                  | 10x (M-002.1) |                     |                    | 16x (M-003)         |                    |
|-------------------|------------------|---------------|---------------------|--------------------|---------------------|--------------------|
| Field number (mm) |                  | 18            |                     |                    | 12                  |                    |
| Objective         | N.A.             | W.D (mm)      | Total magnification | Field of View (mm) | Total magnification | Field of View (mm) |
| 4x                | 0.1              | 15.2          | 40x                 | 4.5                | 64x                 | 3                  |
| 10x               | 0.25             | 5.5           | 100x                | 1.8                | 160x                | 1.2                |
| 20x               | 0.4              | 3.5           | 200x                | 0.9                | 320x                | 0.6                |
| 40x               | 0.65             | 0.45          | 400x                | 0.45               | 640x                | 0.3                |
| 60x               | 0.85             | 0.45          | 600x                | 0.3                | 960x                | 0.2                |
| 100x              | 1.25 (oil/water) | 0.13          | 1000x               | 0.18               | 1600x               | 0.12               |



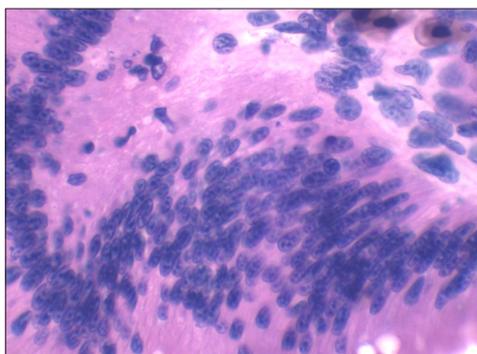
## N-PLAN

**OPTIKA N-PLAN** objectives ensure bright, clear images with excellent flatness and compensation for chromatic aberration.

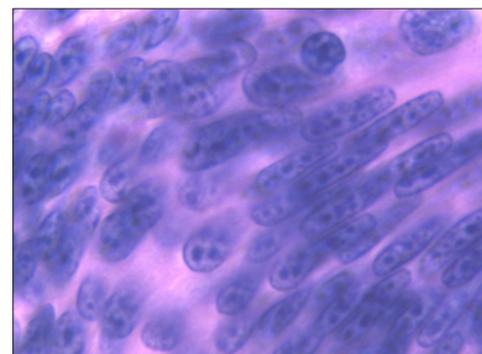
## B-190 Series - Zoom comparison



Frog small intestine - B-193PL - 10x objective



Frog small intestine - B-193PL - 40x objective



Frog small intestine - B-193PL - 100x Oil objective

## B-190 Series - Comparison chart

| Model            | Head   | Eyepiece(s)         | Nosepiece           | Objectives                | Stage  | Focusing                         | Condenser   | Illuminator                                 |
|------------------|--|---------------------|---------------------|---------------------------|--|----------------------------------|---|---|
| <b>B-191sPL</b>  | Monocular, 360° rotating, 30° inclined         | Wide Field 10x/18mm | Quadruple, reversed | N-PLAN 4x, 10x, 40x, 60x  | Double layer, 125x115 mm with 70x30mm X-Y moving range | Coaxial coarse and fine focusing | N.A. 1.25 Abbe type with adjustable height and iris diaphragm | 3 W X-LED <sup>2</sup> , brightness control |
| <b>B-191PL</b>   | Monocular, 360° rotating, 30° inclined         | Wide Field 10x/18mm | Quadruple, reversed | N-PLAN 4x, 10x, 40x, 100x | Double layer, 125x115 mm with 70x30mm X-Y moving range | Coaxial coarse and fine focusing | N.A. 1.25 Abbe type with adjustable height and iris diaphragm | 3 W X-LED <sup>2</sup> , brightness control |
| <b>B-192sPL</b>  | Binocular, 360° rotating, 30° inclined         | Wide Field 10x/18mm | Quadruple, reversed | N-PLAN 4x, 10x, 40x, 60x  | Double layer, 125x115 mm with 70x30mm X-Y moving range | Coaxial coarse and fine focusing | N.A. 1.25 Abbe type with adjustable height and iris diaphragm | 3 W X-LED <sup>2</sup> , brightness control |
| <b>B-192PL</b>   | Binocular, 360° rotating, 30° inclined         | Wide Field 10x/18mm | Quadruple, reversed | N-PLAN 4x, 10x, 40x, 100x | Double layer, 125x115 mm with 70x30mm X-Y moving range | Coaxial coarse and fine focusing | N.A. 1.25 Abbe type with adjustable height and iris diaphragm | 3 W X-LED <sup>2</sup> , brightness control |
| <b>B-193PL</b>   | Trinocular, 360° rotating, 30° inclined        | Wide Field 10x/18mm | Quadruple, reversed | N-PLAN 4x, 10x, 40x, 100x | Double layer, 125x115 mm with 70x30mm X-Y moving range | Coaxial coarse and fine focusing | N.A. 1.25 Abbe type with adjustable height and iris diaphragm | 3 W X-LED <sup>2</sup> , brightness control |
| <b>B-190TBPL</b> | Binocular, digital 360° rotating, 30° inclined | Wide Field 10x/18mm | Quadruple, reversed | N-PLAN 4x, 10x, 40x, 100x | Double layer, 125x115 mm with 70x30mm X-Y moving range | Coaxial coarse and fine focusing | N.A. 1.25 Abbe type with adjustable height and iris diaphragm | 3 W X-LED <sup>2</sup> , brightness control |

# B-190 Series - Accessories

## Eyecups & Eyepieces

|         |  |
|---------|--|
| M-001   | Huygens 5x eyepiece                            |
| M-002.1 | WF10x/18 eyepiece, high eyepoint               |
| M-004   | WF10x/18 micrometric eyepiece, high eyepoint   |
| M-008   | WF10x/18 eyepiece, high eyepoint, with pointer |
| M-003   | WF16x/12 eyepiece                              |
| M-162   | WF20x/10 eyepiece                              |

## Objectives

|       |                                  |
|-------|----------------------------------|
| M-164 | N-PLAN objective 4x/0.10         |
| M-165 | N-PLAN objective 10x/0.25        |
| M-166 | N-PLAN objective 20x/0.40        |
| M-167 | N-PLAN objective 40x/0.65        |
| M-168 | N-PLAN objective 60x/0.85        |
| M-169 | N-PLAN objective 100x/1.25 (oil) |

## Condensers & Filters

|       |                                      |
|-------|--------------------------------------|
| M-174 | Polarising set (filters only)        |
| M-974 | Blue filter, 32 mm diameter          |
| M-976 | Green filter, 32 mm diameter         |
| M-978 | Yellow filter, 32 mm diameter        |
| M-988 | Frosted glass filter, 32 mm diameter |

## Camera Adapters

|       |   |
|-------|---|
| M-115 | 0.35x C-Mount projection lens                                       |
| M-114 | 0.5x C-Mount projection lens  |
| M-118 | 0.75x C-Mount projection lens                                       |
| M-173 | C-Mount projection lens for APS-C/full frame reflex cameras (trino) |

## Miscellaneous

|         |  |
|---------|--|
| 15104   | Cleaning kit   |
| 15008   | Immersion oil, 10ml  |
| 15009   | Immersion oil, 100ml   |
| DC-002  | Plastic dust cover, medium, 490(l)x490(h) mm (except for B-190TB)    |
| DC-003  | TNT dust cover, medium, 600(l)x550(h) mm (only for B-190TB)          |
| TB-KBD2 | Keyboard for tablet (only for B-190TB)                               |
| M-005   | Micrometric slide, 26x76mm, with 2 scales (1mm/100 & 10mm/100)       |
| M-069   | Solar charger  |
| M-971   | Plane-concave mirror, with base                                      |
| VP-190  | IQ/OQ/PQ manual for B-190 series                                     |
| VP-TB   | IQ/OQ/PQ manual for TB series  |
| AB-020  | Antibacterial surface treatment, only for newly purchased microscope |

## M-069 - Solar charger

Included battery: rechargeable – Lithium-Poly. Capacity: 2500 mAh.  
Output voltage: 5 Vdc. -  
Autonomy: over 6 hours at medium intensity (X-LED<sup>3</sup>).  
Charging models: with solar panel (12h),  
with external USB power supply (2.5h)



## 15104 - Cleaning kit

It cleans glass quickly and effectively,  
without leaving residue or odor.  
Ideal for precision lens or prism cleaning.



## How to connect the cameras to our microscopes.

Please refer to the Adapter reference list on Digital section.

v 7.5 - OPTIKA reserves the right to make corrections, modifications, enhancements, improvements and other changes to its products at any time without notice.

## Headquarters and Manufacturing Facilities

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