Nm1 Portable Field Microscope

INSTRUCTIONS

NM1 400
NM1 600
NM1 1000

FOR MORE ON THE NEWTON VISIT WWW.NEWTONMICROSCOPES.COM

INTRODUCTION

The 'Newton' microscope Nm1 is the first in a range of field microscopes under development in Cambridge in response to requests for a powerful hand portable low cost field microscope. The Newton was extensively laboratory tested during various stages of its development, and also extensively and scientifically field trialled in Gambia

The Nm1 is a miniaturised scientific instrument with high precision mechanical and optical parts offering comparable optical performance to that of a good quality bench microscope.

The optical system and mechanical movements use robust die-cast and precision CNC machined and anodised Aluminium parts, protected by a rubber coated injection moulded outer casing.

The Newton optical system is based on the RMS standard tube length and offers the traditional range of objective magnifications and eyepiece interchangability. To achieve a compact form the microscope has an inverted monocular format and uses miniature objectives, three dimensional folded optics, simplified mechanics, and a built in LED illumination system. The Nm1 can be attached to smart phones and digital cameras, and is also tripod mountable for bench operation

SPECIFICATION

- Inverted monocular design
- 3D folded optical path
- RMS standard optical tube length
- Miniature objectives corrected for 0.17 mm cover slip
- Rotating objectives carrier holds up to 3 miniature objectives
- Nm1 400 = x10 N/A 0.25 and x40 N/A 0.65
- Nm1 600 = x10 N/A 0.25, x40 N/A 0.65, x60 N/A 0.80
- Nm1 1000 = x10 N/A 0.25, x40 N/A 0.65, x100 oil N/A 1.25
- Standard RMS eyepiece fitment x10 wide field
- Built-in white LED illumination source
- Variable illumination output
- External USB power connectable
- Internal power 3 x AAA battery pack
- Built in battery power saver
- Battery life approximately 1,000 hours at minimum continuous power
- Battery life approx 300 hours at maximum continuous power.
- 2 x standard tripod mounting features.
- All Newton models supplied fitted with XY slide indexer and slide clip accessory as standard.
- Cavity (fluids) slide as standard
- Digital camera attachable - see website for accessories
- Mobile phone camera attachable - see website for accessories
- Precision focusing attachment
- Die-cast and CNC machined optical chassis
- Hardened bearing surfaces
- Die-cast Aluminium stage
- Injection moulded rubber coated PC/ABS casing
- Weight (with slide clips fitted) - 476 grams
- Weight (with XY fitted) - 598 grams
- Size (main body) – Length 133mm, width 110mm, height 49mm
- Size (max overall) – Length 154mm, width 122mm, height 66mm

QUICK START GUIDE

1. Remove battery lid (underneath), carefully retract battery holder and insert 3 x AAA cells observing correct polarity.
2. Using the magnification changer knob (underneath/centre), rotate the lens barrel until the x10 objective is positioned at 6 o'clock. This is the optical centre.
3. Lift up the lighting arm and place a specimen slide with slide cover-slip facing down, so that the specimen area is above the centre of the objective. NB. Slide retention will be determined by slide clip or XY indexer fitment. This is the typical sequence for other magnifications.
4. Adjust the illumination brightness wheel (underneath/front) to minimum.
5. Press down the illumination button (top/back/left), lower the lighting arm to slightly above horizontal, view through the eyepiece, and rotate the focus knob (right) in either direction to focus the image.
6. To increase magnification rotate the magnification changer clockwise to the next lens and re-focus. Higher magnifications require more light and the lighting arm in the fully down position. Remember to reduce the brightness first before using the lowest magnification. NB. for Nm1 1000 it is advisable to lower the level of the lens holder using the focus wheel before bringing the x100 objective into position.
7. The illumination system has an automatic cut out timer to save on battery life. Just re-press the button if the light goes out, or plug in the USB cable to an external power source to disable the cut-out function.

TOP

CONTROLS & FEATURES

1 Illumination ▸ The illumination source is a built-in white LED. The LED is located in an adjustable arm that positions the beam directly over the specimen. The arm can be incrementally raised or lowered for various lighting and contrast effects, or swivelled upwards to the vertical for clear stage access.

The LED is switched on using the illumination button. A single press for on, and a single press for off. The LED will automatically switch off after approximately 20 minutes, and the light can be switched on again with a single button press. The timer can be bypassed when an external power source is connected and allows continuous illumination at the control of the button. Higher powers require increased illumination.

Generally the lowest lighting level is sufficient for the x10 and x40 objectives, and a fresh top grade battery pack can deliver over 1000 hours illumination. At maximum power battery life will be reduced by up to 70%. **CAUTION**: When using the x10 objective ensure the illumination is initially set to minimum.

2 Focus ▸ The Focus control wheel is an endless bi-rotational control, delivering the full focus range within a single 360 rotation in either direction. Focus therefore can be achieved quickly regardless of which direction the wheel is turned. The press-on fine focus adaptor is particulary useful for the high magnifications.

BASE

CONTROLS & FEATURES

3 Magnification ▸ Objective positions are numbered 1 to 3. position 1 is x10, position 2 is x40, and position 3 is the expansion option which may be a blanking plug, a x60, or x100 oil objective, depending on model.

The magnification power is marked on the top of each objective using the number and colour code convention. Objectives are selected by rotating the magnification knob located in the centre underneath the main body. The selected power clicks into position as the red dots align.

Final image magnification is calculated by multiplying the objective power by the eye piece power.

4 Illumination brightness ▸ The viewing brightness can be increased or decreased by rotating the thumb wheel underneath.

5 Mounting ▸ Tripod mounting is particularly useful for longer periods of investigation, especially when using the XY slide indexer or for mobile phone and digital camera photography.

ACCESSORIES

For the latest Newton accessories and News vist **www.newtonmicroscopes.com**

Guaranteed for 2 years against parts and labour defects from date of purchase. If you suspect your Newton is faulty contact **info@newtonmicroscopes.com**