SmartMicroOptics S.r.l.

DIPLE

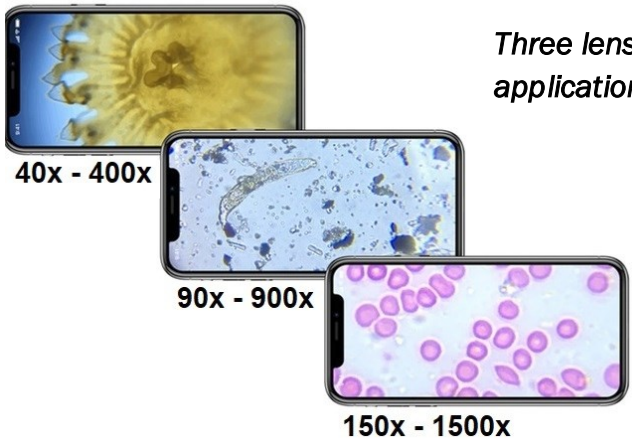
DIPLE RS/RGS/RGBS - Technical Datasheet - V.1.2

About SMO

SmartMicroOptics S.r.l. is a startup of of the Italian Institute of Technology (IIT) with the mission to provide everyone with the tools to explore the micro-world. SMO-US Corp. is its subsidiary in the US.

DIPLE is the new kit of powerful and portable microscopes for smartphone and tablet designed and manufactured by SmartMicroOptics.

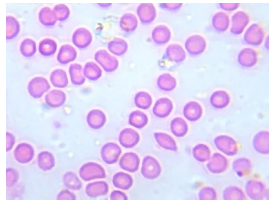
Since 2020 SmartMicroOptics (SMO) has shipped thousands kits around the World. Prestigious educational institutes already use DIPLE for their courses of Science subjects, as they recognized the unique mix of performance -portability -affordable price.



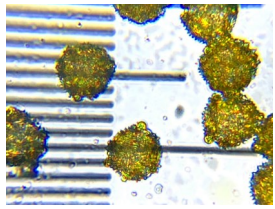
Three lenses for different applications in brightfield

DIPLE

The revolutionary microscope for any smartphone



Human blood cells



Dandelion pollens

- Resolution: 0.7 micrometers
- 0.5-0.7Kg
- Usable with any smartphone or tablet
- For bright-field microscopy

PATENTED

DIPLE RGBS / DIPLE RGS /DIPLE RS

The DIPLE kits with standard stage differ for the lenses inside each kit. The model RGBS has all the lenses, while the model RS is the "entry level" kit, with the red lens only.

The most suitable kit depends on the final use.

Many accessories are in the box, to facilitate scientific applications.

Il kit contiene:

- 1 Red Lens 40x (in the RS, RGS and RGBS models)
- 1 Grey Lens 90x (in the RGS and RGBS models)
- 1 Black Lens 150x (in the RGBS model)
- 1 Standard Stage
- 1 set of slides for microscopy (3 prepared glass slides and two plain slides)
- 1 box with 100 coverlips (thickness 0.13– 0.17mm)
- 2 adjustable feet (to support tablets or large phones)
- 1 pipette
- 1 Tweezers
- 1 LED light source (batteries included)

DIPLE LENSES

The DIPLE lenses are objective lenses for bright-field microscopy designed with one or more internal optical components, and are made of plastic and glass.

The outer side of the DIPLE lenses is made of flat glass. For this reason, they can be used in water immersion. In some cases, the water immersion can improve the performance and increase the working distance.

The high optical power of the DIPLE lenses gives short depth of field. In order to properly manage the focusing distance, an M3–DIN464 screw is provided to control the elevation of each lens.

A black rubber ring is on the top of each lens to ensure a good grip with any phone model, while a magnetic plate is on the rear side of each tile, for a stable positioning over the DIPLE stage.

The approximated, equivalent numerical apertures (NAs) of the three objective lenses are 0.7, 0.55 and 0.4, respectively.

Model	Working distance	Magnification level (approx.)	Optical Resolution (micrometers)	Field of view (mm)
Black	0.3 mm	150x	0.7	0.2
Grey	0.6 mm	90x	0.9	0.6
Red	1.9– 2.1 mm	40x	2-2.5	0.8 - 0.9

STANDARD STAGE:

This supporting stage for slides must be positioned inside the box, with the central hole aligned with the LED light placed under it. The lens must be positioned with the magnetized end above a step of the central block, selecting the step of the appropriate height: for the red lens, generally the highest or intermediate step is used; for the grey lens the intermediate step; for the black lens, the middle or lowest step.

The two side blocks are used to give stability to the metal plate with the lens, and can be tightened after positioning the lens, using the supplied screwdriver.

The screw with knob of the metal plate with the objective lens must be placed over the non-passing hole, near one end of the stage. By turning the screw, the lens raises or lowers.

The slide with the subject to be observed must be positioned above the hole, where the light passes.

VIDEO TUTORIAL FOR THE USE WITH STANDARD STAGE: LINK

LIGHT SOURCE:

A LED light source permits the illumination through the sample placed on the glass slide, for bright-field microscopy

Power source: two CR2032 batteries (included)

Certificates of Conformity: Rohs, UL4200A and EN 62471:2008

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