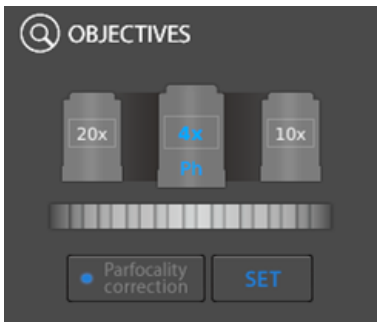
Automated Parfocality Correction with the CELENA® S

Introduction

Parfocal distance refers to the distance between the mounting position of an objective and the focal plane of the specimen. In theory, if objectives of different magnifications have the same parfocal distance, focus is maintained when switching from one magnification to the next. Most microscope companies, including Olympus and Zeiss, manufacture objectives with the parfocal distance of 45 mm. Nikon recently introduced CFI60 objectives that have a longer parfocal distance of 60 mm. Although manufacturers try to produce objectives with the same parfocal distance across different magnifications, it is difficult to obtain perfect parfocality. High magnification objectives (above 40X) have a depth of field that is less than 5 µm, meaning that parfocal distance accuracy within 5 µm for perfect parfocality between objectives. This is a challenging feat when considering the precision required to manufacture an objective lens, and parfocality deviations across different objective lenses are normal.

Automated microscope systems with a motorized Z drive offer the convenience of automated parfocality correction. The CELENA® S Digital Imaging System from Logos Biosystems has a parfocality correction feature that automatically adjusts for the parfocal deviations that normally occur across different objectives. The CELENA® S has a motorized Z stage fitted with a precision ball screw and stepper motor system for repetitive positioning accuracy and the intuitive user interface makes setting up parfocality correction quick and simple.



OBJECTIVES panel in the CELENA® S user interface.

Setting Parfocality Correction

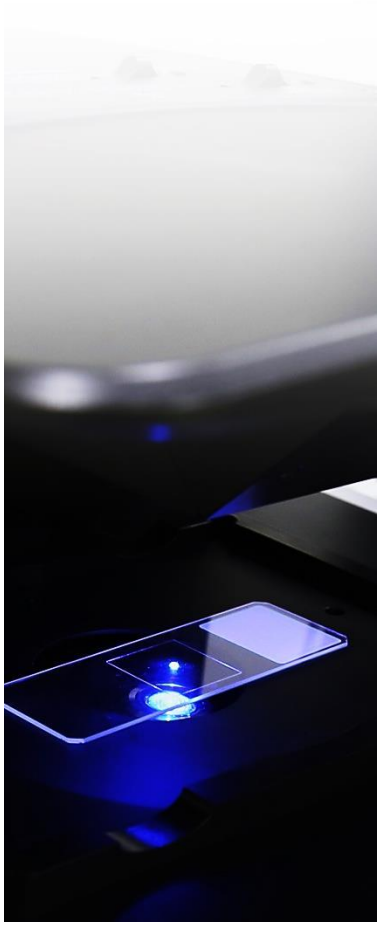
The CELENA® S is precalibrated for the objectives installed at the time of order. The objectives should be calibrated when you add or change objectives.

To calibrate:

1. Click LIVE.
2. Turn off Parfocality correction in the OBJECTIVES panel.
3. Place a slide onto the stage.
4. Select an objective.
5. Focus as sharply as possible on the sample and click Set.
6. Repeat steps 4-5 with all objectives.

Using Parfocality Correction

1. Turn on Parfocality correction.
2. Place a sample onto the stage.
3. Focus on the sample.
4. Select a different objective and wait 1 second.
   The Z-stage will adjust automatically to maintain focus.



Notes

! The parfocality correction feature calculates and adjusts for the relative distance between different objectives. When used properly, this helps you maintain focus when switching to a different objective. If the focal position of the currently selected objective is not correct, switching to a different objective will not correct the focus. Focus correctly with the selected objective prior to switching objectives.

! This feature can be used with objectives that are corrected for the same vessel bottom thickness.

Specifications

Imaging methods	Epifluorescence & transmitted light (brightfield & phase contrast)
Illumination	LED filter cubes with adjustable intensity (>50,000 hr. lifespan)
Channels	3 fluorescence channels and 1 transmitted light channel
Objectives	Long working distance (LWD) and coverslip-corrected; 1.25X-100X
Turret	5 positions
Condenser	47 mm LWD condenser; 3-positions
Stage	Mechanical X/Y stage & motorized Z stage; accommodates an onstage incubator
Computer	Built-in dual core CPU, 128 GB SSD internal storage
Camera	1.3 MP monochrome CMOS with 1280 x 1024 pixels
Images	8 or 16-bit TIFF, JPG, BMP, or PNG

Ordering Information

CELENA® S Digital Imaging System		
CS20001	CELENA® S Digital Imaging System	1 set
CS20002	CELENA® S Digital Imaging System Starter Kit	1 set
Onstage Incubation System		
I10501	Universal Heating System	1 set
I10502	Gas Incubation System for CO_2	1 set
I10503	Gas Incubation System for CO_2/O_2	1 set
Objectives		
I10030	UPLFLN 4X	1 unit
I10031	UPLFLN 10X2	1 unit
I10034	LUCPLFLN 20X	1 unit
I10035	LUCPLFLN 40X	1 unit
I10038	UPLFLN 4XPH	1 unit
I10039	UPLFLN 10X2PH	1 unit
I10042	LUCPLFLN 20XPH	1 unit
I10043	LUCPLFLN 40XPH	1 unit
I10046	PLAPON 1.25X	1 unit
I10047	PLAPON 2X	1 unit
I10052	UPLXAPO 60XO	1 unit
I10051	UPLXAPO 100XO	1 unit
LED Filter Cubes		
I10101	DAPI (Ex375/28, Em460/50)	1 unit
I10102	EGFP (Ex470/30, Em530/50)	1 unit
I10103	RFP (Ex530/40, Em605/55)	1 unit
I10104	mCherry (Ex580/25, Em645/75)	1 unit
I10105	ECFP (Ex436/20, Em480/40)	1 unit
I10106	EYFP (Ex500/20, Em535/30)	1 unit
I10107	DSRed (Ex530/40, Em620/60)	1 unit
I10108	Cy5 (Ex620/60, Em700/75)	1 unit
I10109	Cy7 (Ex710/75, Em810/90)	1 unit
I10110	Cy3/TRITC Long Pass (Ex530/40, Em570lp)	1 unit
I10111	GFP Long Pass (Ex470/40, Em500lp)	1 unit
I10112	Cy5 Long Pass (Ex620/60, Em665lp)	1 unit
I10113	Custom Filters	1 unit
Vessel Holder Frames		
I10201	Universal Holder	1 unit
I10202	25 mm x 75 mm Slide Holder, Two Positions	1 unit
I10203	35 mm Cell Culture Dish Holder, Four Positions	1 unit
I10204	60 mm Cell Culture Dish Holder, Two Positions	1 unit
I10205	100 mm Cell Culture Dish Holder, One Position	1 unit
I10206	25 cm^2 Nunc T-25 Flask Holder, Two Positions	1 unit
I10207	75 cm^2 Nunc T-75 Flask Holder, One Position	1 unit
I10208	25 cm^2 BD/Greiner T-25 Flask Holder, Two Positions	1 unit
I10209	75 cm^2 BD/Greiner T-75 Flask Holder, One Position	1 unit
I10210	Glass Hemocytometer Holder, One Position	1 unit

HEADQUARTERS
USA
FRANCE
E-mail : info@logosbio.com
E-mail : info-usa@logosbio.com
E-mail : info-france@logosbio.com
Tel : +82 31 478 4185
Tel : +1 703 622 4660
Tel : +33 (0)3 74 09 44 35