

Data file 29-1467-19 AA

Super-resolution microscopy

DeltaVision[™] OMX SR

The DeltaVision OMX SR system is a compact multimode imaging platform that delivers super-resolution images of live cells. Incorporating proven SIM technology, the DeltaVision OMX SR is capable of dynamic high-speed 2D- and 3D-SIM, TIRF, widefield, and localization microscopy making physiologically relevant super-resolution imaging a reality.

DeltaVision OMX SR microscope

Traditional microscopes do not have the precision, alignment, or stability required to optimally perform super-resolution imaging. The DeltaVision OMX SR microscope has been developed and specifically optimized to create a highly stable, multichannel imaging platform to reliably deliver outstanding image quality for advanced microscopy applications.

Table 1. DeltaVision OMX SR system specifications

Illumination modalities supported	2D-SIM 2D-SIM TIRF 3D-SIM Total internal reflection fluorescence (TIRF) Photokinetics/photoactivation (PK/PA) Widefield
Optical block	Extremely stable optical platform optimized for super-resolution imaging and multi-camera operation
Standard objective lens	Certified 60× PLAPON objective lens, 1.42 NA
Electronics cabinet	Electronics housed in rack mount cabinet below main optical block Supports multiple camera computers and control chassis
Vibration isolation	Integrated isolation platform Six pneumatic isolators
System enclosure	Total system enclosure with laser interlock for safety operation



Fig 1. DeltaVision OMX SR is a compact super-resolution imaging platform for physiologically relevant live-cell imaging.



 $\ensuremath{\mathsf{Fig}}\xspace$ 2. The DeltaVision OMX SR optical block provides the stability required for super-resolution imaging.

UltimateFocus hardware autofocus module Sample stage



 $\ensuremath{\mathsf{Fig}}\xspace$ 3. The UltimateFocus hardware autofocus module tracks samples and improves precision.

The UltimateFocus hardware autofocus module is standard on all DeltaVision OMX systems. The laser based hardware quickly brings a sample in to focus then locks on to track the focal position long term. The module provides:

- Laser based autofocusing.
- Seamless integration into specimen location and the automated scanning workflow.

 Table 2. UltimateFocus hardware autofocus module specifications

Focus precision	25 nm
Response time	< 70 ms read cycle < 350 ms response time
Laser	785 nm

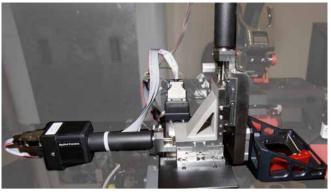


Fig 4. The DeltaVision OMX SR sample stage enables high-speed positioning of samples.



 $\ensuremath{\mbox{Fig}}$ 5. DeltaVision OMX SR sample holders are suitable for slides, dishes, and coverslips.

Incorporating our Nanomover™ motor, the DeltaVision OMX SR sample stage offers high-precision control and accuracy. The z-axis control has an additional piezoelectric drive for highspeed positioning during z-stack acquisition.

Table 3. DeltaVision OMX SR sample stage specifications

Stage range (xy)	22 × 48 mm
y flatness	< 1 µm/mm*
x flatness	< 1 µm/mm*
xyz Nanomover repeatability	10 µm/25 mm travel
z piezo step resolution	5 nm
xyz Nanomover step resolution	20 nm†
Sample holder types	Standard 75 × 25 mm slides 35 mm dishes Multichamber coverslips

* Determined at factory and installation.

[†] Minimum manual step via software is 100 nm.

DeltaVision Blaze Structured Illumination Module (SIM)



Fig 6. The Blaze SIM enables high-speed 2D and 3D super-resolution imaging in live cells.

Simple line gratings cannot generate the necessary pattern to allow full 3D super-resolution reconstruction or full optimization of each excitation wavelength. The Blaze SIM uses an optomechanical light pattern generator incorporating high-speed galvanometers for manipulating the light beams necessary to generate the 3D-SIM pattern.

The Blaze SIM offers:

- 3D-SIM imaging at 110 to 160 nm lateral and ~ 340 to 380 nm axial resolution (wavelength and optics dependent).
- 2D-SIM and 2D-SIM-TIRF imaging at 110 to 160 nm lateral, axial resolution ~ 450 to 600 nm (wavelength and optics dependent).
- An exclusive high-speed galvanometer controlled structured illumination pattern generating system.
- Full optimization of the SIM pattern for each excitation wavelength giving optimal resolution at each wavelength.

Table 4. Blaze SIM Module (third generation) specifications

SIM modes	2D-SIM (3 phases × 3 rotations) 2D-SIM-TIRF (3 phases × 3 rotations in TIRF plane) 3D-SIM (5 phases × 3 rotations)
SIM scan speed	800 ms, 120 frame cycle.
Pattern phases	2D-SIM, 2D-SIM-TIRF: 3 phase 3D-SIM: 5 phases
Image to image phase interval	~ 4 ms
Pattern rotation	3 rotation angles per slice
Image to image rotation interval	~ 8 ms between angles

SIM resolution

The DeltaVision OMX SR offers optimized resolution for SIM at each excitation wavelength the system utilizes (Table 5).

 Table 5. Expected resolutions based on current system performance and optical design

Excitation wavelength (nm)	2D/3D-SIM XY resolution (nm)	Expected 3D SIM Z resolution (nm)
405	110 +/- 5	340 +/- 10
488	120 +/- 5	340 +/- 10
568	135 +/- 5	350 +/- 15
640	160 +/- 5	380 +/- 20

Notes

Resolutions are wavelength and optics dependent. Values obtained using the central region of the field of view. Results may vary due to optical characteristics of the sample used.

Ring-TIRF/PK Module

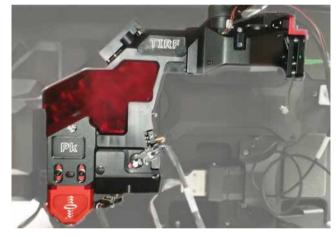


Fig 7. The Ring-TIRF/PK Module provides highly uniform illumination for TIRF and photokinetic based applications.

The DeltaVision OMX SR system can be fitted with an optional Ring-TIRF/PK Module that positions and rotates the laser beam within the back focal plane of the objective lens. This generates the TIRF field almost simultaneously from multiple points resulting in a highly uniform TIRF illumination. The Ring-TIRF/PK Module also incorporates an optical path that allows focusing and position control of the laser for photokinetic (PK) applications. Features of the Ring-TIRF/PK Module include:

- High speed galvanometer controlled beam steering module, 300 Hz rotation speed.
- Rapidly adjustable beam rotation to optimize TIRF depth penetration.
- Fast switching between TIRF and PK operation.

Table 6. Ring-TIRF/PK Module specifications

TIRF scan speed	300 Hz, scan diameter adjustable
PK spot size	1 μm at 60×
PK position control	Galvonometer control allows for point or rectangle pattern bleaching within sample
TIRF to PK switch time	~ 12 ms
Included lens	Objective TIRF 60× APON 1.49 NA
Optional TIRF objective lens	Objective TIRF 100× UAPON 1.49 NA

Brightfield illumination system

Brightfield imaging with DeltaVision OMX SR uses a specially designed transilluminator arm assembly that incorporates a long-life white light LED rated as 100 Lumens at 350 mA. An optional brightfield condenser can be mounted on the illumination arm allowing differential interference contrast (DIC) imaging and other transmitted light modes to be selected.



Fig 8. The transilluminator assembly included with the DeltaVision OMX SR enables a range of imaging modes.

Scientific CMOS camera

The DeltaVision OMS SR system offers the choice of between one and four high-performance scientific CMOS (sCMOS) cameras, each providing the high speed and low-light sensitivity required for live-cell super-resolution imaging. The camera package includes a sCMOS camera, cabling, computer, and interface board plus all the necessary components to integrate the camera into the DeltaVision OMX SR system.

Table 7. pco.edge sCMOS Camera Package specifications

Manufacturer	PCO
Chip type	Front illuminated sCMOS
Chip size	2560 × 2160 pixels*
Pixel size	6.5 μm
Readout speeds	95 MHz, 286 Mhz
Readout modes	Rolling shutter, global shutter
Camera interface	Camera-link
Bit depth	15 bit
Quantum efficiency	~ 60%
Dynamic range	1:15 000
Read noise	1.5 e at 33 fps 2 e at 100 fps
On-chip binning	Not supported

 $^{*}~$ It is recommended that the working area of the chip operates from 512 \times 512 up to 1024 \times 1024 pixels for SIM, widefield, and TIRF imaging.

Table 9 Dolta Vision OMY CD camora computer specifications*

Table 8. DeltaVision OMX SR camero	i computer specifications*	
CPU	Intel™ Pentium G3420	
Clock speed	3.2 GHz	
Memory	8 GB DDR3 1600 MHz Non-ECC	
Power supply	250 W	
Drives	1× Intel 80 GB SSD (OS) 2× Samsung™ 128 GB SSD (data)	
RAID	N/A	
Video card	Intel onboard graphics	
VRAM	N/A	
Video bus	N/A	
Monitor	N/A	
Resolution	N/A	
Operating system	Windows® 7 64 bit (for embedded systems)	

* Computer specifications are subject to change without notice.

⁺ Not available separately, included in the sCMOS camera package.

Table 9. Camera pixel size for 2D-SIM and 3D-SIM applications*

Camera type	Camera pixel size	Optical configuration	Image pixel size
sCMOS	6.5 µm	60× objective magnification + 1.3× intermediate tube lens	80 nm

 Pixel size is constrained for 2D-SIM and 3D-SIM applications to 80 nm lateral and for 3D-SIM to 125 nm z step size for sampling purposes.

Table 10. DeltaVision OMX SR operational speed for SIM imaging

Parameter	Expected value range	Notes
3D-SIM Imaging	< 800 ms per 1 µm stack	512 × 512 pixels, 1 ms exposure, 125 nm step, 8 z slices, 15 images per slice (120 images total, ~ 180 fps)
3D stack reconstruction time	< 11 s per 1 µ per channel*	512 × 512 pixels, 5 ms exposure, 125 nm step, 8 z slices, 15 images per slice (120 images total), 1 color
2D-SIM Imaging	< 45 ms per slice	512 × 512 pixels, 1 ms exposure, 0 nm step, 1 z slices, 9 images per slice, 1 color ~15 reconstructed fps
2D-SIM reconstruction time		512 × 512 pixels, 1 ms exposure, 0 nm step, 1 z slice, 9 images per slice, 1 color

* Reconstruction time determined by system load on the computer hardware and software configurations. Experience may vary.

High-speed widefield imaging

The DeltaVision OMX SR system is capable of high-speed widefield imaging through the simultaneous operation of up to four sCMOS cameras.

- Imaging speeds >300 fps per channel at 512 × 512 pixels field-of-view.
- Optional widefield illumination via the Ring-TIRF/PK Module.
- Widefield resolution diffraction limited.

Table 11. Widefield imaging acquisition speed with sCMOS cameras

Conventional mode

ROI	95 MHz readout (fps)	Single frame (ms)	286 MHz readout (fps)	Single frame (ms)
256 × 256	210	4.8	420	2.4
512 × 512	120	8.30	280	3.6
1024 × 1024*	65	15.3	169	6.0
Rolling shutter mode				
256 × 256	240	4.2	561	1.8
512 × 512	130	7.7	337	3.0
1024 × 1024*	68	14.7	188	5.3

* 1 ms exposure, no z move or time delay. Operational speed determined by system load and activity. Results may vary.

Note

Multi-camera acquisition at high speed will be limited by the slowest channel exposure time and the requirement to synchronize cameras.

Table 12. Widefield resolution*

Excitation wavelength (nm)	Widefield XY resolution (nm)	Widefield Z resolution (nm)
405	210 +/- 10	400 +/- 20
488	250 +/- 10	500 +/- 20
568	300 +/- 10	580 +/- 20
647	350 +/- 10	660 +/- 20

* Resolutions are wavelength and optics-dependent. Values presented are nominal expected values.

Table 13. Pixel size for widefield and TIRF applications

Camera type	Camera pixel size (µm)		60× objective pixel size (nm)	100× objective pixel size (nm)
sCMOS	6.5	120	80	48*

 Pixel size is oversampled which can lead to increased noise which may be undesirable for localization imaging.

DeltaVision OMX SR laser system

The DeltaVision OMX SR system supports four lasers meeting a wide variety of fluorophore types and application needs. The lasers provide illumination for all modes of imaging including SIM, TIRF, and widefield.

Table 14. DeltaVision OMX SR lasers and specifications

		Las	er	
	405 nm	488 nm	568 nm	640 nm
Shutter system	Electronic	Electronic	AOTF	Electronic
Туре	Diode	Diode	DPSS	Diode
Wavelength (nm)	405 ±2	488 ±2	568 ±1	640 ±2
Power output from fiber (mW)	>61	> 61	> 61	>61
Spatial mode	TEM∞	TEM∞	TEM∞	TEM∞
Beam Diameter (mm, 1/e2)	1	1	0.7	1
Beam divergence (mRAD)	< 1	< 1	< 1.3	< 1
M² (typical)	< 1.2	< 1.2	< 1.1	< 1.2
Beam circularity	0.9-1.1	0.9-1.1	0.9-1.1	0.9-1.1
Pointing stability (µRAD/°C)	< 5	< 5	< 10	< 5
Power stability (over 24 h)	< 5%	< 5%	< 5%	< 5%
Polarization orientation	Vertical	Vertical	Vertical	Vertical
Polarization extinction ratio	> 100:1	> 100:1	> 100:1	> 100:1
RMS noise (10 Hz to 10 MHz)	< 0.2%	< 0.2%	< 0.25%	< 0.2%
Input power (W) (head)	< 24	< 24	< 60	< 24
Communication	USB	USB	USB	USB
IEC/EN 60825-(1) compliant	Yes	Yes	Yes	Yes
RoHS compliance	Yes	Yes	Yes	Yes

Emission filter wheel

Depending on the system configuration, the DeltaVision OMX SR system can be fitted with one or two multiposition filter wheels to allow additional flexibility in emission wavelength choice.

Table 15. Emission filter wheel specifications

Filter wheel type	8-position interchangeable
Filter size	25 mm
Switching time	250 ms between adjacent positions

Optical filters

DeltaVision OMX SR optical filters are designed specifically to enable SIM applications where phase control is critical in addition to TIRF and widefield imaging.

System enclosure

Stabilizing the surrounding environment is critical when imaging at the sub-micron level. The DeltaVision OMX SR system is therefore housed in a compact enclosure that helps control temperature fluctuations, airflow vibrations, and acoustic noise levels. The enclosure combined with simple cabling requirements allows the system to be operated in a standard laboratory setting without the need for a darkroom or other special facilities.

Table 18. System enclosure specifications

Dimensions	34 × 39 × 62 in, 864 × 991 × 1575 mm (wdh)
Power requirement	120/220 V auto-switching power systems and region-specific cabling
Heat output	2050 BTU
Rear cooling vent	6 in (15 cm)

Table 16.	Emission	filter	choices	and	specifications
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Channel	Center wavelength (nm)	Bandwidth (nm)	Absolute transmission (%T)	Blocking range (nm)
DAPI	435.5 ± 2.0	31.0 ± 2.0	≥90	300-410, 461-710
AF488	528.0 ± 2.0	48.0 ± 2.0	≥90	300-494, 562-710
mCherry, AF568	609.0 ± 2.0	37.0 ± 2.0	≥90	300-580.5, 637-710
Су™5	683.0 ± 2.0	40.0 ± 2.0	≥90	300-653
CFP	477.5 ± 2.0	35.0 ± 2.0	≥90	300-450, 505-710
YFP	541.0 ± 2.0	22.0 ± 2.0	≥90	300-520, 562-710

Table 17. Polychroic filter choices and specifications

Region	Channel	Band (nm)	Absolute transmission (%T)	Average transmission (%T)	Laser line (nm)	Phase band (nm)	Phase control (degrees)
Transmission #1	DAPI EM	421-450	> 80	> 90	-	-	-
Reflection #1	DAPI EX	382-409	< 20	< 10	405	403-407	≤30
Transmission #2	AF488 EM	505-549	> 80	> 90	-	-	-
Reflection #2	AF488 EX	462-492	< 20	< 10	488	487-488	≤30
Transmission #3	AF568 EM	591.5-626.5	> 80	> 90	-	-	-
Reflection #3	AF568 EX	561-580	< 20	< 10	568	561-569	≤ 30
Transmission #4	Cy5 EM	664-702	> 80	> 90	-	-	-
Reflection #4	Cy5 EX	639-652	< 20	< 10	640	639-644	≤30
Transmission #3	mCherry EM	591-627	> 80	> 90	-	-	-
Reflection #3	mCherry EX	563-586	< 20	< 10	568	567-569	≤ 30

Note

For more specific details about sizes, weights, and power requirements please contact our Service department for a copy of the *DeltaVision OMX SR Site Preparation Guide*, which is available upon request.

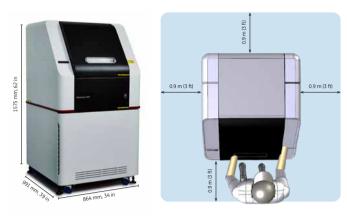


Fig 9. The DeltaVision OMX SR system has a small footprint and does not require a large working area.

Integrated electronics and laser control cabinet



Fig 10. The system electronics are housed in a dedicated enclosure that also contains the laser module, computers and interface controllers.

To enable faster control of the system timing and trigger events the DeltaVision OMX SR system utilizes a custom programmable gate array that allows simultaneous control and activation of multiple system events. The result is extremely low operational overhead and superior event timing control that allows the system to operate at speeds beyond typical microscopes. General electronics control systems include:

- Components housed in a laser table electronics rack
- Camera control computers (number depends on system configuration)
- OMXIC chassis
- Nanomotion controller
- Laser module with user initiated self-calibration
- Network switch
- Power interface
- Galvanometer control chassis

Workstation

A workstation is supplied with the DeltaVision OMX SR system.

Table 19. DeltaVision OMX SR workstation hardware specifications*

CPU	Intel Core™ i7 processor
Clock speed	3.4 GHz
Memory	16 GB DDR3 1333 MHz ECC
Power supply	500 W
Drives	1 TB SATA boot drive
RAID	3×1 TB SATA in RAID5 configuration
Video card	NVidia™ NVS300
VRAM	512 MB
Video bus	PCIE
Monitor panel size	24 in (60.96 mm) viewable area
Resolution	1920 × 1200
Operating system	CentOS 6 or later

* Computer specifications are subject to change without notice.

Monitor

A standard monitor is supplied with the DeltaVision OMX SR system.

Table 20. Monitor specifications

Model	Dell™ U2412M or equivalent
Panel size	24-inch (60.96 mm) viewable area
Aspect ratio	Widescreen (16:10)
Panel type	In-plane switching (IPS)
Optimal resolution	1920 × 1200 at 60 Hz
Contrast ratio	1000:1 (typical)
Dynamic contrast ratio	200 000:1 (max.)
Brightness	300 cd/m² (typical)
Response time	8 ms (gray to gray)
Typical max. viewing angle	178° vertical /178° horizontal
Color support	16.78 × 10 ⁶ colors
Color gamut	82% (CIE 1976)
Pixel pitch	0.27 mm

DeltaVision softWoRx[™] software

The DeltaVision OMX SR system is controlled using the AcquireSR Acquisition control software running on the workstation under the CentOS 6 operating system. Image reconstruction and analysis is performed using our softWoRx software package running on the same workstation. Included in the softWoRx software are the algorithms necessary to reconstruct the 3D-SIM and 2D-SIM super-resolved images as well as our proprietary quantitative deconvolution algorithms for widefield images.

In addition, softWoRx includes a variety of visualization and routine analysis tools for viewing acquired data and performing quantitative analysis.

Table 21. softWoRx software specifications

Image acquisition	AcquireSR Acquisition control software
Image reconstruction and analysis	softWoRx 6 or higher
General softWoRx functionality	SIM reconstruction algorithms 3D volume viewer Brightness, contrast, color LUTs Histogram viewer Volume rendering and 3D visualization Data analysis and export to spreadsheet via CVS file format
Exported image formats	JPG, TIFF
Exported video formats	AVI, Quicktime
Measuring tools	Line profile, polygon analysis, intensity plots

System options DeltaVision Localization Microscopy System

The DeltaVision Localization Microscopy System is an advanced imaging option for the DeltaVision Elite and DeltaVision OMX platforms. It employs TIRF imaging in combination with laser activation control to acquire frames of fluorophore images. These images are analyzed using multiple-Gaussian fitting to find the locations of fluorophores within a sample; the fluorophore locations are used to reconstruct a super-resolution image.

- Provides 2-D resolution between 20 and 50 nm*.
- Compatible with photoactivation, photoconversion, and photoswitching fluorophore systems.
- DSSI algorithm can resolve overlapping signals from fluorophores spaced closer than the diffraction limit in dense fields, thereby enabling localization at higher densities.

* Requires appropriate sample preparation, labeling density, and localization precision.

Table 22. DeltaVision Localization Microscopy System specifications

2D localization precision	~ 20 nm*
2D lateral resolution	< 50 nm [†]
Fluorophore system	Photoactivation, photoconversion, and photoswitching
Lasers supported	405 nm, 488 nm, 568 nm, 640 nm
Laser intensity control	Direct laser control
Activation laser control	Laser intensity adjustable during acquisition. Pulse duration fixed for experiment
Cameras supported	pco.edge sCMOS
Objective lenses	60× objective
Acquisition pixel size	80 nm with 60× objective

* Localization precision is dependent on the number of photons collected.

Requires appropriate sample preparation and labeling density. Achievable under ideal conditions

Environmental Control Module

The DeltaVision OMX SR system can be used with an optional multifunction Environmental Control Module to maintain and control optimal temperature, gas, and humidity conditions for the duration of a live-cell imaging experiment. The module is software controlled from the main workstation and the hardware is accommodated within the DeltaVision OMX SR housing.

The Environmental Control Module provides:

- Three-channel temperature control and monitoring.
- Gas mixing capability for CO₂, air, and nitrogen.
- A heated humidifier for humidity control with sensor.
- A sample heater plate with inserts.
- An objective lens heater.

Table 23. Environmental Control Module specifications

Temperature range	Ambient +20°C, ±0.3°C
Gas control	 Three input lines CO₂ at 30 psi N₂ at 30 psi Clean dry air (CDA) at 30 psi Gas mix stable ±0.5% set point value
Sensors	Temperature (max. 45°C) CO ₂ : 0–30% O ₂ : 0–20% (normal air), Humidity: ambient–100% ±2%
Gas flow rate	0–400 ml/min
Sample holders	3×1 in (75 \times 25 mm) slides
Chamber slides	35 mm dishes

Brightfield condenser

The DeltaVision OMX SR system can be used with an optional Brightfield condenser to help identify cell morphology and structure with imaging techniques such as DIC. DIC is based on polarized light and requires the use of a DIC capable lens in conjunction with optical components placed in the Brightfield condenser/trans-illuminator assembly and between the objective lens and the viewer or camera.



Table 24. Brightfield condenser specifications

Туре	Universal long working distance (LWD) condenser
Numerical aperture	0.55 NA
Working distance	27 mm
Wheel settings	5 position wheel, (3 $ imes$ 30 mm, 2 $ imes$ 38 mm)
Optional DIC components	Shift type DIC slider Lens-specific DIC prisms (20×, 40×, 60×, 100×)* Condenser and filter wheel polarizers

* Will require appropriate objective lens.

Note

DIC prisms can be purchased in conjunction with a brightfield condenser or added to an existing condenser.

Offline SI Workstation

Offline SI Workstations provide additional computing power for large tasks. Optional offline workstations have the same specifications as the DeltaVision OMX SR workstation and are supplied with the appropriate licensing for 3D-SIM reconstruction.

Table 25. Offline SI Workstation specifications*

CPU	Intel Core i7 processor	
Clock speed	3.4 GHz	
Memory	16 GB DDR3 1333 MHz ECC	
Power supply	500 W	
Drives	1 TB SATA boot drive	
RAID	3×1 TB SATA in RAID5 configuration	
Video card	NVidia NVS300	
VRAM	512 MB	
Video bus	PCIE	
Monitor	24 ln	
Resolution	1920 × 1200	
Operating system	CentOS 6 or later	

* Computer specifications are subject to change without notice.

Software

softWoRx Explorer is an optional multiplatform based file viewer with a limited range of image manipulation tools. Alternatively, softWoRx Suite provides a more advanced visualization and analysis package which includes batch deconvolution reconstruction capabilitie.

Fig 11. The optional Brightfield condenser enables DIC imaging on the DeltaVision OMX SR.

Ordering information

Description	Code number
DeltaVision OMX SR system	29-1154-76
Blaze SIM Module (includes 60× 1.42 NA PSF objective)	29-1330-65
Ring-TIRF/PK Module (includes 60× 1.49NA TIRF objective)	29-1330-66
Standard objective lens 60× 1.42 OIL PLAPON6 PSF (If desired for TIRF only configurations)	52-852175-116
TIRF objective lens, 100× UAPON 1.49 NA (Alternate TIRF lens option)	34-018019-119
sCMOS Camera Package	29-1342-18
DeltaVision Localization Microscopy System (for new DeltaVision OMX SR systems)	29-0876-63
DeltaVision Localization Microscopy System (upgrade for existing DeltaVision OMX SR systems)	29-0892-96
Environmental Control Module and Live-Cell Kit	29-1330-64
Universal Long Working Distance (LWD) Condenser Assembly with DIC Prism Hold Ring (Includes condenser, DIC prism shift slider, and polarizer)	29-1330-63
DIC Nomarski Prism for LWD condenser. Matched for 20×/0.75 objective lens. 30 mm	34-018019-135
DIC Nomarski Prism for LWD condenser. Matched for 40×/1.3 objective lens. 38 mm	34-018019-132
DIC Nomarski Prism for LWD condenser. Matched for 60×/1.42 objective lens. 38 mm	34-018019-133
DIC Nomarski Prism for LWD condenser. Matched for 100×/1.4 objective lens. 38 mm	34-018019-134
Offline SI Workstation	53-853053-000
softWoRx Explorer 2	29-0398-97
softWoRx Suite	29-0293-41

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GE Healthcare UK Limited Amersham Place Little Chalfont Buckinghamshire HP7 9NA UK