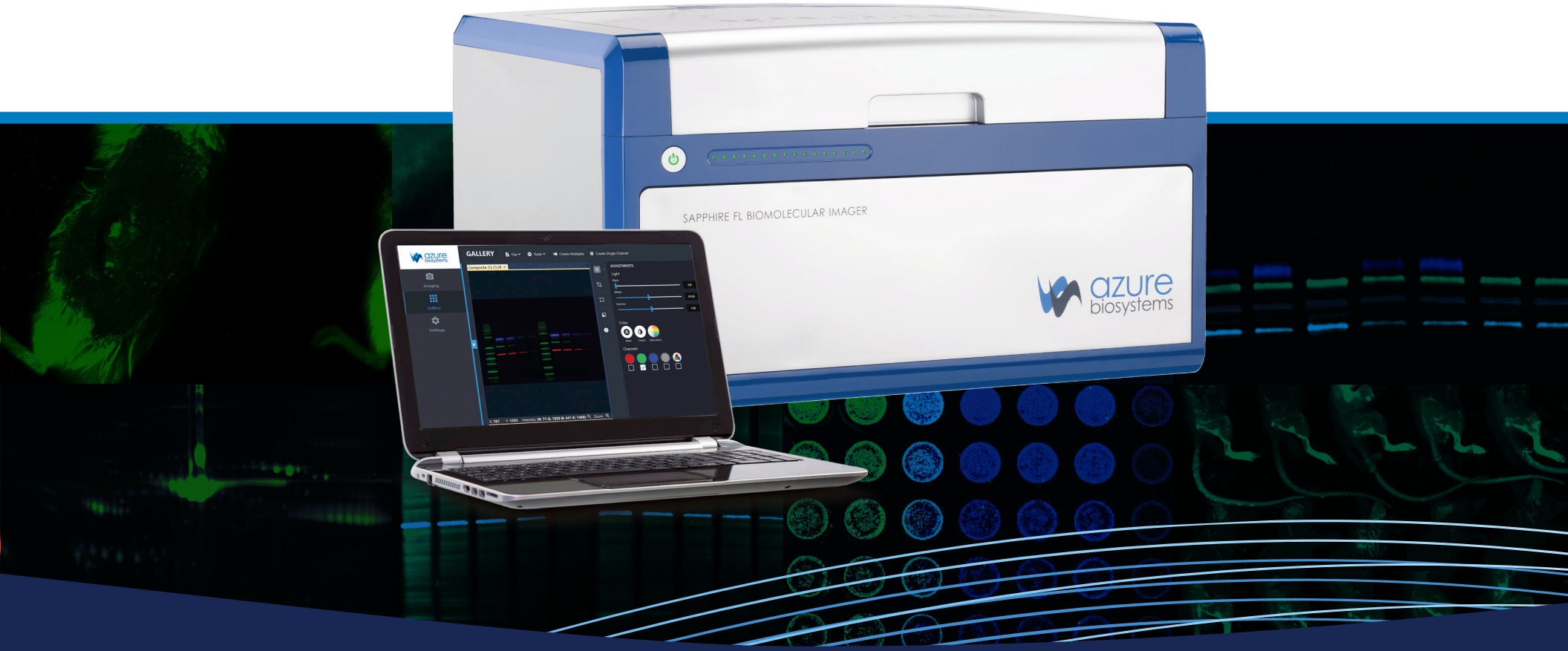
azure biosystems

SAPPHIRE™ FL BIOMOLECULAR IMAGER

UNLIMITED POSSIBILITIES, UNCOMPROMISING PERFORMANCE



SAPPHIRE FL BIOMOLECULAR IMAGER

Flexibility with uncompromising performance – From in vitro molecular assays to in vivo imaging

The Sapphire FL is the ultimate biomolecular imager for **FLEXIBILITY**. With customizable and user-changeable laser and filter modules, the Sapphire FL easily adapts to a lab's changing needs and advancing research.

The Sapphire FL offers customizable and user-changeable optical modules, 5–1000 µm resolution scans, a Z-plane range from -1.0 to +6 mm, 5 anesthesia ports for imaging living animals, chemiluminescence detection through the Chemiluminescence Module, and much more.

APPLICATIONS

Southern blots | Northern blots | Western blots | Multiplex Westerns
Quantitative Westerns | Total protein normalization | In-cell Westerns
Cell-based assays | Agar plates/Clonogenic assays | Multi-well plate imaging
Protein arrays | Microarrays | ELISAs | Immunohistochemistry
Lateral flow immunoassay development | Thin layer chromatography imaging
Electrophoretic mobility shift assays (EMSA) | 2D DIGE | Densitometry
Gel documentation | In-gel imaging | DNA gel imaging | RNA gel imaging
Protein gel imaging | Coomassie imaging | Silver stain imaging
Fluorescent gel stain imaging | Gel autoradiography
Membrane autoradiography | Tissue section autoradiography
Tissue section imaging | Plant bioluminescence imaging
Phosphoprotein studies | Glycoprotein assays | Reporter gene assays
GFP expression in model organisms | Small animal imaging

APPLICATION FLEXIBILITY

IMAGE ALL THE SAMPLES YOU CAN IMAGINE

Innovation-driving performance – High resolution imaging and wide depth of field enable imaging of many sample types

4 CM CLEARANCE

Enables imaging of samples with depth

5 ANESTHESIA PORTS

Compatible with standard anesthesia kits

LARGE 25 cm X 25 cm FIELD OF VIEW

Get More Done – Scan as many as six membranes (9 x 7 cm) or six 96-well plates at a time. 4 cm of clearance above the glass allows for small animal imaging and tissue imaging.

SAMPLE TYPES

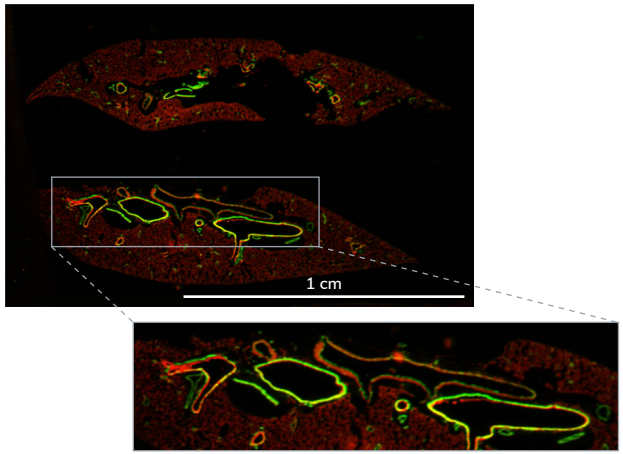
PVDF Membranes | Nitrocellulose membranes | 384-well plates
96-well plates | 12-well plates | 6-well plates | Agarose gels
SDS page gels | Native gels | 2D gels | Slides | Tissue sections
Microarrays | Small animals | Organs | Plants | Agar plates

SAMPLE FLEXIBILITY

HIGH RESOLUTION IMAGING – UP TO 5 MICRON RESOLUTION

Whole Slide Imaging – Screen slides before microscopic analysis by imaging multiple slides at a resolution of 5 microns. The adjustable focal plane enables scanning of thick samples.

A

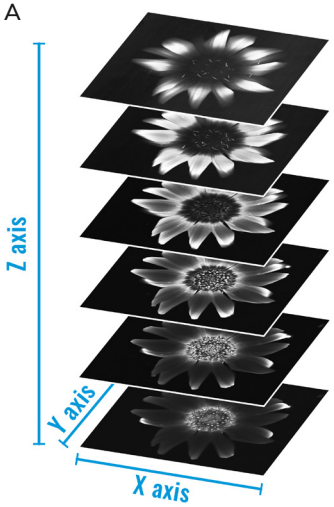


A. Mouse lung tissue slide probed for vascular endothelial (VE)-cadherin (AzureSpectra 550 nm secondary antibodies) and smooth muscle actin (SMA) (AzureSpectra 650 nm secondary antibodies). Imaged on the Sapphire FL using the 532 and 638 Standard Optical Modules (red and green, respectively) at 5 µm.

Z PLANE ADJUSTMENT FOR SAMPLES WITH MULTIPLE FOCAL PLANES

Find the Best Data- Adjustable laser focus from -1 mm below to +6 mm above the glass surface. The adjustable focal plane allows for optimal imaging of your sample, even when offset from the glass.

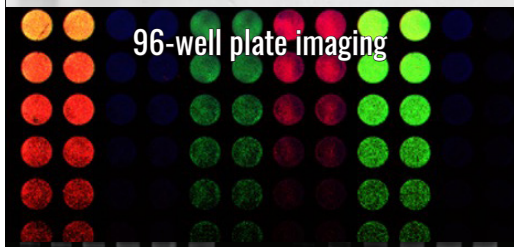
A

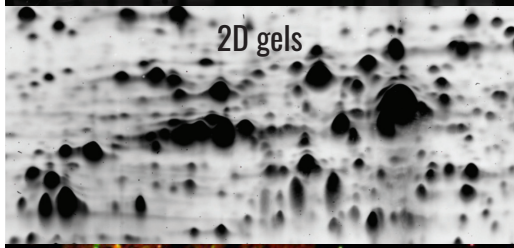


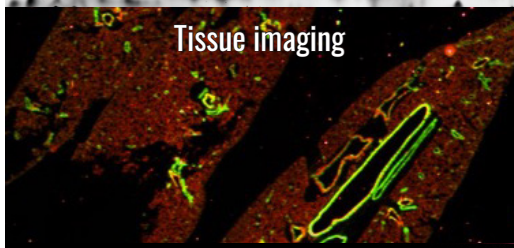
B

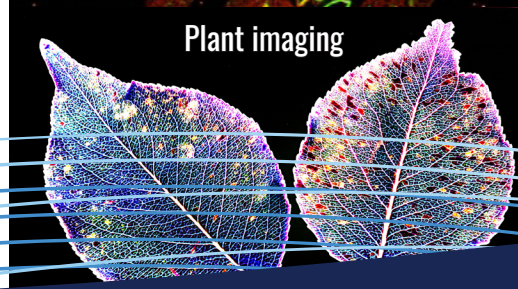
Merged Image

A. A 50 µm scan of a flower was taken from 0 to 5 mm with 1 mm adjustments. B. The image was merged in the Sapphire FL Capture Software to view all areas of focus at once.









WHERE WILL YOUR RESEARCH TAKE YOU TODAY?

Customization and upgradability – Pick the modules that support your research

NO LIMITS – EASILY SWAP LASERS AND FILTERS FOR EXPANDED DYE FLEXIBILITY

A

B

C

A. Remove optical module from system. B. Remove and replace filter. C. Load new laser and filter combination into the system.

Optical Modules

IS4030	375 Standard Optical Module
IS4031	450 Standard Optical Module
IS4001	488 Standard Optical Module
IS4032	488 (YFP) Standard Optical Module
IS4002	532 Standard Optical Module
IS4033	532 (Propidium Iodide) Standard Optical Module

IS4003	638 Standard Optical Module
IS4057	658 Standard Optical Module
IS4004	685 Standard Optical Module
IS4066	730 Standard Optical Module
IS4005	784 Standard Optical Module
IS4006	Phosphor Standard Optical Module

More options available upon request.

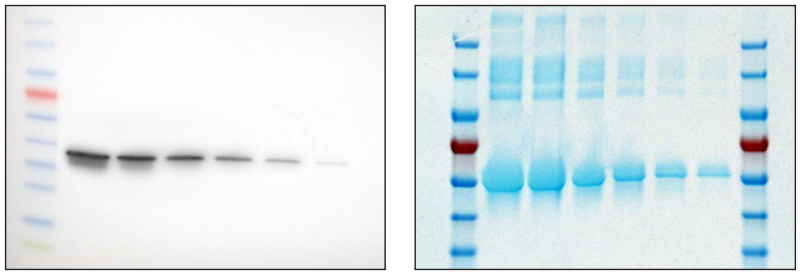
CHEMISTRY AND DYE FLEXIBILITY

CHEMILUMINESCENCE WHEN YOU NEED IT

Upgrade to the **Sapphire FL Chemiluminescence Module**.

A

B



A. Sapphire FL and Sapphire FL Chemiluminescence Module. B. Chemiluminescent blot with color marker and Coomassie gel imaged on Sapphire FL Chemiluminescence Module.

NIR FLUORESCENCE

AzureSpectra™ 700 | AzureSpectra 800 | Cy® 5.5 | Cy7 | Alexa Fluor® 680
Deep Purple™ | DyLight™ 650 | DyLight 680 | DyLight 755 | DyLight 800
ECL Plex™ | Ethidium Bromide | GelStar® | IRDye® 650 | IRDye 680LT
IRDye 680RD | IRDye 700DX | IRDye 750 | IRDye 800CW | IRDye 800RS
Ponceau | Qdot® 525 | Qdot 565 | Qdot 585 | Qdot 605 | Qdot 705 | Qdot 755

VISIBLE FLUORESCENCE

AzureRed™ | AzureSpectra 488 | AzureSpectra 550 | AzureSpectra 650
Alexa Fluor 488 | Alexa Fluor 546 | Alexa Fluor 555 | Alexa Fluor 633
Alexa Fluor 647 | Bodipy™ FL | Bodipy PC | CellTracker™ Green
CellROX® Deep Red | Cy2 | Cy3 | Cy5 | DyLight 488 | DyLight 550
DyLight 633 | DyLight 650 | FAM | Flamingo™ | Fluorescein | GelRed®
GFP | MCherry | SYBR® Green | SYBR Gold | SYBRSafe | SYPRO® Orange
SYPRO Red | SYPRO Ruby | SYPRO Tangerine | TMRE | TotalStain Q

CHEMILUMINESCENCE

Horseradish Peroxidase (HRP) | Alkaline Phosphotase | Radiance® ECL
Radiance Plus | Radiance Q | SuperSignal™ West Substrates
Pierce™ ECL Western Blotting Substrate
Pierce ECL Plus Western Blotting Substrate | Amersham™ ECL Prime
WesternBright™ Quantum HRP Substrate
WesternBright ECL Spray HRP Substrate

PHOSPHOR IMAGING

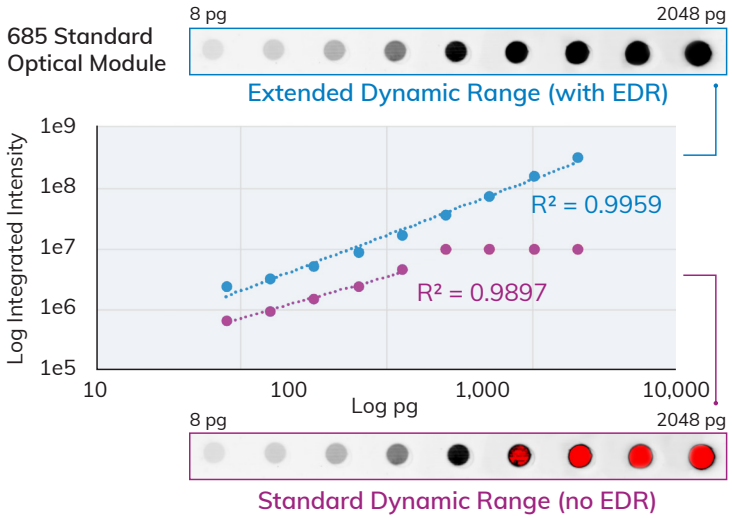
14C | 18F | 32P | 35S | 68Ga

WHAT CAN YOU SEE?

Broad dynamic range and exceptional sensitivity enable enhanced quantitative data generation

DISTINGUISH SUBTLE DIFFERENCES IN EXPRESSION WITH EXTENDED DYNAMIC RANGE (EDR)

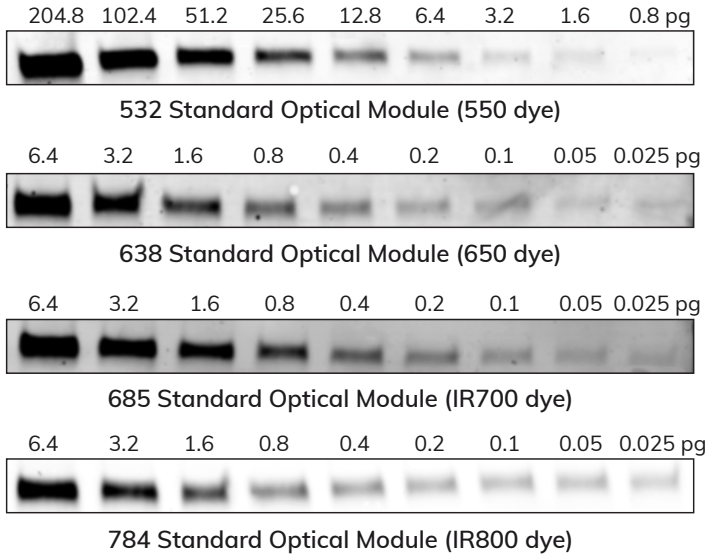
Extended dynamic range, when selected, allows imaging of both bright and weak bands without experiencing saturation. This is ideal for samples that feature strong and weak expressing proteins. EDR extends dynamic range to 24 bits of data.



Extended dynamic range. A dot blot was scanned with (top image) and without (bottom image) EDR. Without EDR, the top four dots saturate and cannot be quantified. Scanning with EDR demonstrates quantifiable linearity over the entire range of sample concentrations.

SENSITIVE FLUORESCENT DETECTION

High sensitivity allows femtogram detection of proteins labeled with common fluorescent dyes.

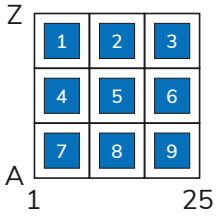


Bovine serum albumin (BSA) conjugated to AzureSpectra dyes, separated by SDS-PAGE, and transferred to membranes. Blots were imaged at 50 µm on the Sapphire FL. Loaded amounts of dye-conjugated-BSA are given.

PERFORMANCE WITHOUT COMPROMISE

REPRODUCIBILITY AND UNIFORMITY – CV LESS THAN 3%

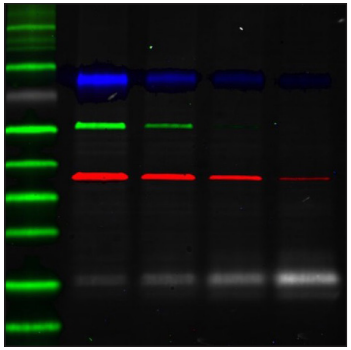
Be confident that every scan will be accurate and reproducible.



2-fold dilution dot blot scanned across nine separate regions of the imaging area, as shown. CV of individual dot intensities was less than 3% across the imaging area.

4-CHANNEL FLUORESCENT IMAGING – SEE MORE IN A SINGLE SAMPLE

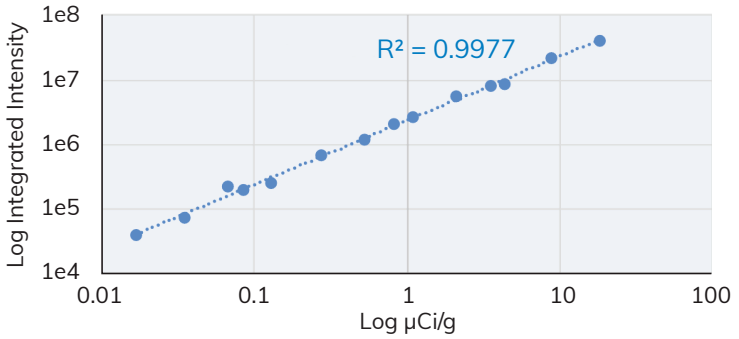
Quickly and easily swap optical modules to create 4-channel images.



Four-color Western blot imaged at 50 µm on the Sapphire FL with the 488, 532, 685, and 784 Standard Optical Modules. Transferrin and RNase A were conjugated to AzureSpectra 490 nm and 550 nm, respectively, then spiked into HeLa lysate and separated by SDS-PAGE. Standard Western blotting procedure was followed. Blots were probed with anti-Tubulin and anti-GAPDH primary antibodies with AzureSpectra IR700 and IR800 fluorescent secondary antibodies, respectively.
Transferrin-490 (blue) | RNase A-550 (grey) | Tubulin-IR700 (green) | GAPDH-IR800 (red)

PHOSPHOR IMAGING – IMAGE STORAGE PHOSPHOR SCREENS WITH HIGH SENSITIVITY

Storage phosphor screens are imaged, digitized and ready for quantitation.



American Radiolabeled Chemicals Carbon-14 Standard exposed to storage phosphor screen for three hours, then imaged at 200 µm on the Sapphire FL Biomolecular Imager. Limit of detection: 0.036 µCi/g.

CRISP GEL IMAGING

Laser-based scanning delivers sharp images across sample types.

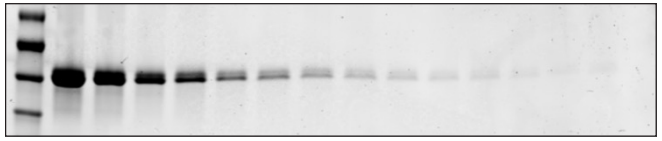


Image of Coomassie-stained gel taken on the Sapphire FL using the 685 Standard Optical Module. Purified BSA separated by SDS-PAGE and stained with Coomassie. Serial dilutions from 5 µg to 0.6 ng.

SPECIFICATIONS AND ORDERING INFORMATION

Sapphire FL Biomolecular Imager	Laser Based Scanning System
Part number	IS4000
Scanning area	25 cm x 25 cm
Scanning modes	Simultaneous, Sequential, Extended Dynamic Range (EDR)
Resolution	5 µm – 1000 µm
Image output	16-bit TIFF
EDR output	24-bit data
Maximum scanning speed	500 mm/s
Animal imaging	Compatible with commercially available anesthesia systems
Dimensions	59.3 cm (L) x 63.0 cm (W) x 39.9 cm (H)
Weight	43.5 kg (empty of optical modules; each optical module weighs 0.6 kg)
Power requirements	100 – 240 VAC ± 10%, 50/60 Hz
Computer options	Windows laptop computer (IS2011) or Windows desktop computer (IS2012)
Sample types	Membranes, plates, slides, gels, phosphor screens, small animals, and more

Part number	Standard Optical Modules
IS4030	375 Standard Optical Module
IS4031	450 Standard Optical Module
IS4001	488 Standard Optical Module
IS4032	488 (YFP) Standard Optical Module
IS4002	532 Standard Optical Module
IS4033	532 (Propidium Iodide) Standard Optical Module
IS4003	638 Standard Optical Module
IS4057	658 Standard Optical Module
IS4004	685 Standard Optical Module
IS4066	730 Standard Optical Module
IS4005	784 Standard Optical Module
IS4006	Phosphor Standard Optical Module

Custom Optical Modules available upon request

Part number	Standalone Laser Options (Does not include emission filter)	
IS4023	Sapphire FL 375 nm Laser	375 nm Laser Module
IS4024	Sapphire FL 450 nm Laser	450 nm Laser Module
IS4025	Sapphire FL 488 nm Laser	488 nm Laser Module
IS4055	Sapphire FL 488 nm (YFP) Laser	488 (YFP) Laser Module
IS4026	Sapphire FL 532 nm Laser	532 nm Laser Module
IS4027	Sapphire FL 638 nm Laser	638 nm Laser Module
IS4059	Sapphire FL 658 nm Laser	658 nm Laser Module
IS4028	Sapphire FL 685 nm Laser	685 nm Laser Module
IS4067	Sapphire FL 730 nm Laser	730 nm Laser Module
IS4029	Sapphire FL 784 nm Laser	784 nm Laser Module

Custom laser options available upon request

	Standalone Emission Filter Options (Does not include laser module)	
IS4056	Sapphire FL 424/SP Filter	424 nm shortpass emission filter
IS4008	Sapphire FL 452 nm Filter	430-475 nm emission filter
IS4011	Sapphire FL 494 nm Filter	477-511 nm emission filter
IS4012	Sapphire FL 513 nm Filter	505-522 nm emission filter
IS4010	Sapphire FL 534 nm Filter	524-544 nm emission filter
IS4049	Sapphire FL 572 nm Filter	558-586 nm emission filter
IS4013	Sapphire FL 624 nm Filter	604-644 nm emission filter
IS4009	Sapphire FL 676 nm Filter	657-695 nm emission filter
IS4058	Sapphire FL 710 nm Filter	690-730 nm emission filter
IS4046	Sapphire FL 720 nm Filter	708-723 nm emission filter
IS4068	Sapphire FL 809 nm Filter	769-850 nm emission filter
IS4047	Sapphire FL 829 nm Filter	798-860 nm emission filter

Custom emission filter options available upon request

Part number	Accessories	
IS1015	Sapphire Eraser	Designed to erase signal from phosphor imaging screens
IS4050	Anesthesia Nose Cone	Set of five 7 mm anesthesia nose cones for a tight fit with laboratory mice. For use with Anesthesia Tubing (IS4051).
IS4051	Anesthesia Tubing	18 inches of tubing with luer fittings for use with 7 mm Anesthesia Nose Cones (IS4050). Compatible with low-flow electronic vaporizers.
IS4052	Sapphire FL Chemiluminescence Module Ethernet Connection Kit	Connect to the Chemiluminescence Module via Ethernet
IS4053	Slide Holder	Holds up to 15 standard microscope slides
IS4054	Plate Holder	Holds up to four standard 96-well plates with optically clear bottoms

	System Upgrades	
IS4007	Sapphire FL Chemiluminescence Module	Add Chemiluminescence Module to Sapphire FL

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