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
** 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 6 membranes (9 x 7 cm) or 6 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
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. 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. 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.

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

Optical Modules

<table>
<thead>
<tr>
<th>IS4001</th>
<th>488 Standard Optical Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS4002</td>
<td>532 Standard Optical Module</td>
</tr>
<tr>
<td>IS4003</td>
<td>638 Standard Optical Module</td>
</tr>
<tr>
<td>IS4004</td>
<td>685 Standard Optical Module</td>
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<tr>
<td>IS4005</td>
<td>784 Standard Optical Module</td>
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<tr>
<td>IS4006</td>
<td>Phosphor Imaging Standard Optical Module</td>
</tr>
<tr>
<td>IS4030</td>
<td>375 Custom Optical Module</td>
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<tr>
<td>IS4031</td>
<td>450 Custom Optical Module</td>
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<tr>
<td>IS4032</td>
<td>488 (YFP) Custom Optical Module</td>
</tr>
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<td>IS4033</td>
<td>532 (Propidium Iodide) Custom Optical Module</td>
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</tbody>
</table>

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

Alexa Fluor 488 | Alexa Fluor 546 | Alexa Fluor 555 | Alexa Fluor 633
Alexa Fluor 647 | Bodipy™ FL | Bodipy PC | CellTracker™ Green
CellROX® 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.

SENSITIVE FLUORESCENT DETECTION

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

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.

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.
Reproducibility and Uniformity – CVs Less Than 5%

Be confident that every scan will be accurate and reproducible.

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Phosphor Imaging – Image Storage

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

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## SPECIFICATIONS AND ORDERING INFORMATION

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<thead>
<tr>
<th>Sapphire FL Biomolecular Imager</th>
<th>Laser Based Scanning System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
<td>IS4000</td>
</tr>
<tr>
<td>Scanning area</td>
<td>25 cm x 25 cm</td>
</tr>
<tr>
<td>Scanning modes</td>
<td>Simultaneous, Sequential, Extended Dynamic Range (EDR)</td>
</tr>
<tr>
<td>Resolution</td>
<td>5 μm – 1000 μm</td>
</tr>
<tr>
<td>Image output</td>
<td>16-bit TIFF</td>
</tr>
<tr>
<td>EDR output</td>
<td>24-bit data</td>
</tr>
<tr>
<td>Maximum scanning speed</td>
<td>250 mm/s</td>
</tr>
<tr>
<td>Animal imaging</td>
<td>Compatible with commercially available anesthesia systems</td>
</tr>
<tr>
<td>Dimensions</td>
<td>593 mm (L) x 630 mm (W) x 399 mm (H)</td>
</tr>
<tr>
<td>Weight</td>
<td>43.5 kg (empty of optical modules; each optical module weighs 0.6 kg)</td>
</tr>
<tr>
<td>Power requirements</td>
<td>100 – 240 VAC ± 10%, 50/60 Hz</td>
</tr>
<tr>
<td>Computer options</td>
<td>Windows laptop computer (IS2011) or Windows desktop computer (IS2012)</td>
</tr>
<tr>
<td>Sample types</td>
<td>Membranes, plates, slides, gels, phosphor screens, small animals, and more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part number</th>
<th>Standard Optical Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS4000</td>
<td>488 Standard Optical Module</td>
</tr>
<tr>
<td>IS4002</td>
<td>532 Standard Optical Module</td>
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<tr>
<td>IS4003</td>
<td>638 Standard Optical Module</td>
</tr>
<tr>
<td>IS4004</td>
<td>685 Standard Optical Module</td>
</tr>
<tr>
<td>IS4005</td>
<td>784 Standard Optical Module</td>
</tr>
<tr>
<td>IS4006</td>
<td>Phosphor Imaging Standard Optical Module</td>
</tr>
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</table>

Additional custom optical modules available upon request.
<table>
<thead>
<tr>
<th>Part number</th>
<th>Standalone Laser Options (Does not include emission filter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS4023</td>
<td>Sapphire FL 375 nm Laser 375 nm Laser Module</td>
</tr>
<tr>
<td>IS4024</td>
<td>Sapphire FL 450 nm Laser 450 nm Laser Module</td>
</tr>
<tr>
<td>IS4025</td>
<td>Sapphire FL 488 nm Laser 488 nm Laser Module</td>
</tr>
<tr>
<td>IS4026</td>
<td>Sapphire FL 532 nm Laser 532 nm Laser Module</td>
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<tr>
<td>IS4027</td>
<td>Sapphire FL 638 nm Laser 638 nm Laser Module</td>
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<tr>
<td>IS4028</td>
<td>Sapphire FL 685 nm Laser 685 nm Laser Module</td>
</tr>
<tr>
<td>IS4029</td>
<td>Sapphire FL 784 nm Laser 784 nm Laser Module</td>
</tr>
</tbody>
</table>

Custom laser options available upon request

<table>
<thead>
<tr>
<th>Part number</th>
<th>Accessories</th>
<th>System Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS1015</td>
<td>Sapphire Eraser</td>
<td>Designed to erase signal from phosphor imaging screens</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standalone Emission Filter Options (Does not include laser module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS4008</td>
</tr>
<tr>
<td>IS4009</td>
</tr>
<tr>
<td>IS4010</td>
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<tr>
<td>IS4011</td>
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<td>IS4012</td>
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<tr>
<td>IS4013</td>
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<tr>
<td>IS4046</td>
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<tr>
<td>IS4047</td>
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<tr>
<td>IS4049</td>
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