

PhosphorImager SI

A faster alternative for film autoradiography

The sensitivity of the PhosphorImager™ SI system reduces exposure times by 90% for most samples versus an equivalent exposure to conventional X-ray film. The system's wide, linear response to exposure also simplifies accurate quantification. Storage phosphor screens capture latent images produced by ionizing radiation (β and γ emissions from radiolabelled blots, gels, TLC plates, tissues, or X-rays). Latent images are read by laser scanning and saved in digital format. Scan control and ImageQuant™ analysis software for Windows NT™ or Macintosh™ systems is included.

Components

- Laser scanner with built-in SCSI port
- SCSI cable and terminator
- Scan control software for Windows NT or Macintosh
- ImageQuant analysis software for Windows NT or Macintosh
- User's guide
- One-year warranty

Optional ImageQuant workstation

A premium Dell™ NT computer is connected to the scanner and tested for full compatibility and reliability. Computer specifications are updated periodically to reflect changes in the technology available. Please see your quotation for the latest computer specifications.

Specifications

Storage phosphor screens

Please refer to the storage phosphor information sheet for more details.

Detection threshold

Storage phosphor screens retain energy from beta particles, X-rays and gamma rays. The lower limit of detection for a one-hour exposure is less than 2 dpm/mm² for ¹⁴C. The lower limit of detection for ³²P is typically five to ten times lower than the limit for ¹⁴C.

Linear dynamic range: four orders of magnitude (10 000:1)

Linearity: $\pm 5\%$ relative standard deviation for entire dynamic range

Uniformity: $\pm 5\%$ over 18 x 23 cm area

Spatial resolution

Calculated with CTF (contrast transfer function) of 0.33

- ≥ 1.9 line pairs/mm for ¹⁴C autoradiography
- ≥ 2.1 line pairs/mm for focused X-ray exposure

Pixel size

200, 100, and 50 micron, selectable. The scanning beam is approximately 50 micron in diameter.

Absolute pixel error: $\pm 5\%$ across X-axis

Light source

- Type: 5 mW helium-neon laser
- Estimated average lifetime: > 10 000 hours (approximately five years normal operation)
- Wavelength: 632.8 nanometers

Scan times (20 x 25 cm)

- ~ 4 min. @ 200 μ pixel
- ~ 7 min. @ 100 μ pixel
- ~ 15.5 min @ 50 μ pixel

Data format: 16-bit (65 536 levels of signal intensity discrimination), TIFF

External interface: SCSI

Light measurement

Light is emitted from the storage phosphor screen in proportion to the amount of radioactivity in the sample upon laser-induced stimulation. Emitted light is collected and converted to an electrical signal by a photomultiplier. The electrical signal is digitized to permit image display and analysis. Data are stored in a 16-bit file format to provide the digital resolution required to characterize subtle signal intensity differences over the wide dynamic range of the system.

Power requirements

Excessive noise on the electrical line may cause failure to meet specifications. A surge protector is recommended, and more extensive line conditioning may be required in some environments.

PhosphorImager

- 100/120 V or 220/240 V (autoswitching)
- 50/60 Hz, < 300 Watts

Weight

PhosphorImager: 34 kg (75 lbs.)

Crated: 36 kg (79 lbs.)

Dimensions

PhosphorImager: 28 cm (height) x 41 cm (width) x 72 cm (depth)

Regulatory compliance: UL3101, CSA 22.2 No. 1010, EN61010



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