Innovate with larger specimens in our largest chamber size

Mimicking clinical Radiotherapy imaging and treatments, the SmART+ brings a highly sophisticated expandable platform to the field of Preclinical Research.

The fully shielded cabinet design allows for installations in almost any laboratory space, and features high precision electromechanics and advanced imaging modalities, including fully integrated Bioluminescence imaging, for unprecedented targeting accuracy.

SmART+ uses the superior Pilot software, developed by the esteemed scientific team at Princess Margaret Cancer Centre, to offer a full suite of tools for acquiring images, guiding the targeting system, delivering therapy, and system calibrations.

Upgrade your system with SmART Advanced Treatment Planning (ATP) for state-of-the-art Monte Carlo calculation algorithms to rapidly devise treatment plans with gold standard accuracy for static beams, arcs, and even non-coplanar treatments across single and multiple isocenters. Image SmART, Plan SmART, Treat SmART.

Key Features

- Designed to image, target and irradiate small animals up to rabbits
- Cone-Beam CT and μCT automated image guidance
- Fully integrated Bioluminescence imaging module
- Pilot software suite, including Co-Pilot for multi-modal image registration
- SmART Advanced Treatment Planning (ATP) system
Cabinet Features

- No additional shielding required
- Flexible design - for installation in almost any laboratory space
- Rotational gantry: 360°, 0-3 RPM, 6 arc minute repeatability
- X-Y-Z Animal Stage: 150mm travel in X, Y and Z, 150 mm/sec velocity (adjustable), +/- 2 micron repeatability
- Cabinet port to introduce anaesthesia and cables to the chamber
- Complies with US and International regulations for Cabinet X-ray systems (US FDA regulation 21 CFR 1020.40)

Cabinet Specification

- Overall dimensions:
  W 66"(170cm) x D 41"(103cm) x H 76.5"(196cm)
- Weight: 5060lbs (2300kg)
- Power: 1N PE 110/208VAC +/- 10%, 40A, 50/60Hz or 3N PE 230/400VAC +/- 0 10%, 15A per phase, 50/60Hz

Irradiation Performance

- Irradiation Energy: 10 - 225KVp, 3000 W (4500 W optional)
- Dose Rate: 1 - >600 cGy/min (depending on x-ray settings, beam filtration and collimation)
- Beam Filtration: User interchangeable slides - 2 HVL's provided (2.0mm Al, 0.3mm Cu), others optional
- Collimation: Conformal Collimators available in sizes from 1mm to 100mm round, rectangular, and custom shapes
- Beam Orientation: Static or Dynamic 0 – 360 degrees
- Isocentre Distance: 30cm typical
- Image Guided Targeting Precision: up to 0.05mm

CT Imaging Performance

- Volumetric Imaging Resolution: 0.1mm (nominal)
- Volumetric Field of View: 10cm x 10cm without moving couch
- Acquisition Time: Customizable
- Imaging Dose: 0.1 cGy to 10 cGy (scan-dependent)

Optical Imaging Performance

- Camera Resolution: 0.2mm
- Filters Available: 562 nm, 591 nm, 624 nm, 655 nm
- CT Registration Accuracy: 0.2 mm
- Optical Targeting Accuracy: <1 mm

Software Suite

- Pilot® image acquisition and reconstruction, 3D alignment and targeting. Licensed by Princess Margaret Cancer Centre, Toronto
- PilotCal system calibration control software
- Co-Pilot registration software for Multi-Modality Image Guidance
- Windows® 64 Bit OS with remote diagnostics + support capability
- DICOM importable and exportable image data
- Database Management Tools for easy management of images, treatments and studies by each researcher

System Components

- X-ray Power Supply:
  Comet iVario 225kV, 4.5kW, 100% Duty-Cycle
- X-ray Tube: Comet (600/3000W) Optional (600/4500W)
  Focal spot sizes are correct
- X-ray Cooling System:
  Water-to-Water or Water-to-Air options included with system. Up to 4000W cooling capacity
- Optical Camera: EMCCD Sensor
  9.7cm FOV at imaging isocenter
  0.2mm resolution
  Filter Wheel for support of multiple wavelength acquisition
  Fully integrated inside cabinet - easy registration with CT imaging
- Imaging Panel: XRD 0820 AN3-ES
  Active pixels: (1024 x 1024)
  Pitch: 200µm
  Total Area: 20cm x 20cm
  Capture Speed: 15 fps (30 fps with 2x2 binning)

Options

- Bioluminescent Imaging System
- SmART ATP – Advanced Treatment Planning
- Multi-Modality Image Fusion Module Co-Pilot
- Automated Adjustable Collimator and Fixed Collimators
- Animal Rotation Stage for Non-Coplanar Irradiation
- Isofluorance-based Anesthesia System
- Environmental Chamber Systems
- Internal and External Dose Verification
- Specimen Turntable
- Up to 5 Year Extended Warranty