IMAGING FOR LIFE

AnyScan®

triple modality molecular imaging system

The first human SPECT-CT-PET imager, a unique solution in the NM world

Mediso
Medical Imaging Systems

AnyScan® New hybrid imaging system

MEDISO Medical Imaging Systems with headquarters in Budapest, Hungary is a dynamic supplier to the health care industry in the world. The company is known for researching innovative NM technologies, manufacturing systems, providing services to help customers achieve tangible, sustainable, clinical and financial outcomes.

The invention of the **AnyScan®** SPECT-CT-PET Multi-Modality System demonstrates the commitment, Mediso has made to developing leading-edge technology that is responsive to the needs of Mediso's clinical partners.

AnyScan® SPECT-CT-PET Multi-Modality System delivers the current and future promise of nuclear medicine by maximizing molecular information in combination with precise anatomical detail. This technology will help our customers to spot the exact location, size, nature and extent of malignancy anywhere in the body.

AnyScan® SPECT-CT-PET triple modality system uniquely integrates Mediso's state-of-the-art new SPECT, PET and CT modules.

AnyScan® SPECT-CT-PET Multi-Modality System will serve as a key for early diagnosis and treatment for cancer, cardiac and neurological diseases. With a single scan this imaging technology quickly captures comprehensive, accurate diagnostic information both on the two-modality molecular and anatomical levels and will enable physicians to detect changes in molecular activity and verify them even before structural changes become visible.

With early and more exact diagnosis, planning of treatment becomes more effective and the efficiency of treatment can be monitored, reducing the risk of surgery. As an effect of this, care of the patient will be improved.

AnyScan® SPECT-CT-PET device is capable of high quality scans in both nuclear and radiological modalities – SPECT-PET and CT – and it will offer all the diagnostic and therapy planning and monitoring advantages for the patient reducing the number of necessary visits. Acquiring multiple studies during one appointment increases comfort and convenience for the patient.

The new imaging technology with **AnyScan®** SPECT-CT-PET system will enable clinicians to utilize the device in five ways to perform five separate studies - SPECT-CT-PET, SPECT-CT, PET-CT, SPECT, multi-slice CT, - all with a single system.

FROST & SULLIVAN
2008 BEST PRACTICES AWARD
European Medical Imaging Entrepreneurial Company of the Year Award

European Medical Imaging
Entrepreneurial Company of the Year Award

AnyScan®'s small footprint will make it possible to integrate the system into different clinical settings. In addition, the flexible modular system architecture allows Mediso to offer variety of models within the **AnyScan®** family.

Owing to the modular build-up, the new **AnyScan®** is a flexible and variable system with easy combination of modalities.The system combinations may easily follow the needs of the NM-clinics or departments.

Several upgrade paths are available:
Starting from a single detector standalone SPECT, upgraded to dual detector SPECT or SPECT-CT or even SPECT-CT-PET according to the growing need for modalities.
Start with a SPECT-CT-PET to be upgraded to PET-CT and standalone SPECT for increased throughput.

AnyScan® offers multi-slice CT configurations with diagnostic CT options with speed of up to 0,4 seconds per rotation, allowing acquisition of a high quality CT scan in a few seconds. This will enable physicians to obtain a functionally accurate, anatomically precise SPECT or PET-CT study faster with precise attenuation correction.

Non-diagnostic CT options are also available for no-compromise ultra-low dose attenuation correction and high performance anatomical localization.

The integration of **InterView™** FUSION, Mediso's unique software platform into the **AnyScan®** system also offers a common intuitive user interface and enables easy access to patient data. **InterView™** FUSION, with its multimodality implementation, is uniquely suited for hybrid imaging systems like **AnyScan®**.

As a result of an extensive work performed together with academic partners and qualified engineers, Mediso proudly presents its extended **Tera-Tomo™** product family which is the organic part of **AnyScan® SC**. The new **Tera-Tomo™** engine represents state-of-the-art solutions to achieve superior image quality even with ultra-low-dose acquisitions. The **Tera-Tomo™ 2D Planar**, **3D SPECT**, **3D CT** and **3D PET** reconstruction and image enhancement modules provide superior image quality in the clinical routine.

HUNGARIAN
DESIGN AWARD
2009

AnyScan® System introduction

IMAGING TABLE | SPECT | CT | PET

AnyScan® a unique solution in the Nuclear Medicine

- The first triple modality human NM imaging system of the world
- Free architecture of NM and CT modalities
- Flexible system combinations due to "building block" system
- Modular flexibility with different parameters of system components
- All NM examinations performed on one equipment without patient repositioning
- Custom tailored technical parameters due to modular subsystem
- Easy (field) system upgrade
- Easy (field) quality upgrade
- Diagnostic or non-diagnostic CT options
- Multiple upgrade paths:
  - Add-on upgrade from single unit to triple modality which covers all NM diagnostic procedures with a single device in a single room.
  - Splitting upgrade from triple modality to more units in order to achieve a higher throughput of the NM department.
- Made for NM departments and covers all NM procedures

Basic system combinations

AnyScan®

AnyScan® SC

AnyScan® PC

AnyScan® S

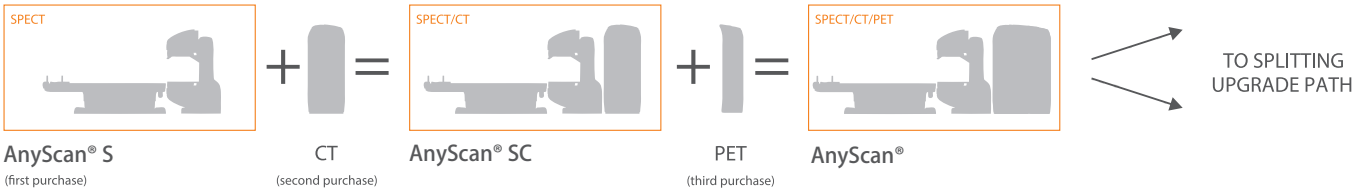
AnyScan® C

Upgrade path

Multiple **AnyScan®** upgrade path are possible*

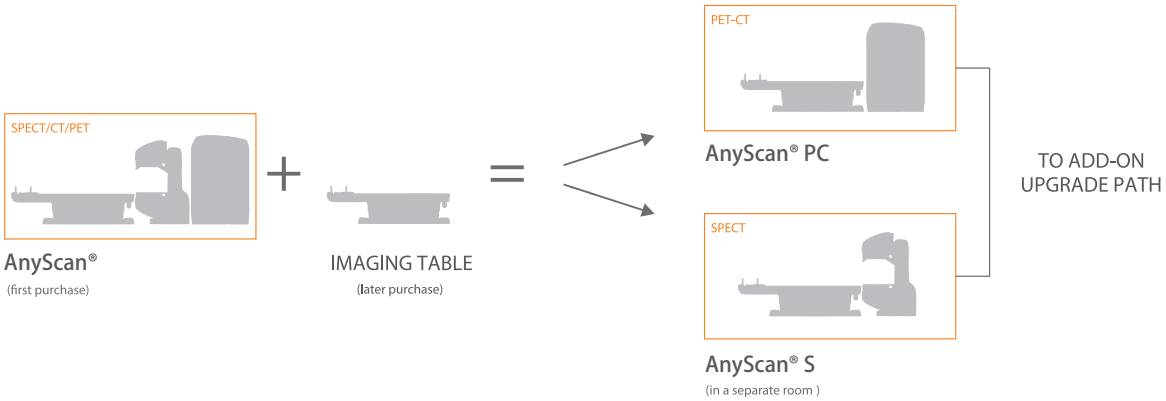
Add-on upgrade path for equipment that grows with the practice

- Starts with a purchase of **AnyScan® S** (SPECT)
- With addition of a CT unit the system is upgraded to **AnyScan® SC** (SPECT/CT)
- Further addition of a PET unit upgrades the system to **AnyScan® SCP** (SPECT/CT/PET) triple modality system and all NM examinations can be performed in the same room



Splitting upgrade path for increased throughput

- Starts with a purchase of **AnyScan®** (SPECT/CT/PET) triple modality system
- When patient flow increased and requires higher throughput, it might be achieved by splitting the unit into an **AnyScan® PC** (PET/CT) and an **AnyScan® S** (SPECT) with a purchase of an additional imaging table. The **AnyScan® S** (SPECT) can operate in a separate room, doubling the throughput of the department.



* For investment safety upgrade paths are warranted for 10 years.

SPECT Components

Digital Detector

The two rectangular jumbo FOV high stability detectors are characterized with high optical performance and excellent mechanical quality are available in two quality options:

- The **HP** (High Performance) detector is designed to perform standard NM examinations
- The **UHP** (Ultra High Performance) detector with **Tera-Tomo™ 3D SPECT-Q** quantitative reconstruction engine performs absolute tracer uptake quantitation SPECT analysis

The thickness of the 585 x 470 mm NaI(Tl) scintillation crystal is either 9.5 mm or 15.9 mm is also available in true rectangular option.

There are either 56/60 pcs of high quantum efficiency PMT characterized by improved energy resolution, magnetic shielding and long-term stability.
The thickness of the lead shielding is 12-32 mm, covering the range of high energy isotopes.

Detector Electronics

The detector electronics are built on a compact, highly integrated, one-box, easily serviceable construction without tuning potentiometers.

- 1 ADC/PMT detector electronics
- Outstanding single FPGA/ASIC detector electronics design
- High precision preamplifier electronics
- Computer-controlled PMT autotuning for fast PMT gain stabilization and adjustment
- Digital electronics assembled from parts of the latest technology
- Active high voltage bleeder with integrated HV module

SPECT Gantry

The gantry has a small footprint, it was designed with improved safety factor to ensure high stability.

- 180, 101 or 90 degree variable angle head positions with high precision positioning
- Industry standard CAN connected automation computer
- Hand controller located on the gantry monitor, the optional additional hand controller is located on the opposite side of the gantry
- Pre-programmed robotic gantry motions
- Detector integrated infrared body contouring option
- 90 degree detector positioning with online body contouring for cardiac examination
- Full automatic motion calibrations
- Maintenance-free mechanical design
- Patient Aperture: 75 cm

AnyScan® S
Detector integrated infrared body contouring

NEMA Specifications

Detector	HP*	UHP**	UHP** Typical
Size of detector FOV:	max. 545 mm x 405 mm		
Energy range:	40–960 keV		
Intrinsic energy resolution for ^{99m}Tc	9.7%	9.5%	8.9%
Intrinsic flood field uniformity			
Differential CFOV	1.9%	1.4%	1.2%
Differential UFOV	2.4%	1.9%	1.2%
Integral CFOV	2.4%	1.9%	1.6%
Integral UFOV	2.9%	2.4%	1.6%
Intrinsic spatial resolution			
CFOV (FWHM)	3.6 mm	3.1 mm	2.9 mm
CFOV (FWTM)	7.2 mm	6.1 mm	5.9 mm
UFOV (FWHM)	3.7 mm	3.2 mm	3.0 mm
UFOV (FWTM)	7.4 mm	6.2 mm	5.9 mm
Intrinsic spatial linearity			
Differential CFOV	0.18 mm	0.09 mm	0.03 mm
Differential UFOV	0.20 mm	0.10 mm	0.04 mm
Absolute CFOV	0.38 mm	0.28 mm	0.14 mm
Absolute UFOV	0.40 mm	0.30 mm	0.18 mm

Max. count rate with full correction	> 0.5 Mcps		
System spatial resolution with LEHR collimator			
Without scatter / with scatter (FWHM)	7.4 / 7.6 mm	7.3 / 7.5 mm	6.9 / 7.3 mm
Without scatter / with scatter (FWTM)	13.9 / 14.8 mm	13.4 / 14.5 mm	12.8 / 14.2 mm
System sensitivity (with LEHR collimator)	180 cpm/µCi		
Reconstructed spatial resolution with scatter & LEHR collimator			
Center	9.9 mm	9.8 mm	9.7 mm
Radial	9.9 mm	9.8 mm	9.7 mm
Tangential	7.5 mm	7.4 mm	7.3 mm

HP*= High Performance
UHP**= Ultra High Performance

SPECT Component

Collimators

A wide range of high quality collimators are available for the **AnyScan**®camera. All collimators are made of high quality micro-linear or micro-cast lead. The extremely precise level of manufacturing ensures excellent image quality.
Removable infrared auto body contour sensors, set on the collimator touch plates, ensure safety for the patient and improves the reproduction quality of a repeated studies. Detector integrated infrared body contouring is available as option.

Name	Hole length (mm)	Hole size (mm)	Septal Thickness (mm)	Nominal Energy (keV)	Septal Penetration at Nominal Energy	Resolution at 10 cm (FWHM mm)		Sensitivity (cpm/µCi) ±7%	
						Geometric	System	Geometric	System
LEHS (1)	26	2.5	0.30	140	2.1%	13.7	14.1	1000	840 (9)
LEGP (2)	35	1.9	0.20	140	1.1%	8.2	8.9	340	290 (9)
LEHR (3)	35	1.5	0.16	140	1.0%	6.5	7.4	210	180 (9)
LEUHR (4)	40	1.4	0.16	10	0.4%	5.4	6.5	140	110 (9)
MEGP (5)	35	2.5	1.2	300	1.9%	11.1	11.6	330	220 (10)
HEGP (6)	55	3.4	1.6	364	5.9%	11.6	12.2	340	90 (11)
LEFB (7)	25	1.4	0.18	140	1.2%	6.4	7.3	340	300 (9)
HEPH (8)	~200	4	-	364	-	7.2	7.3	70 (11)	
		6				10.2	10.2	140 (11)	
		8				13.2	13.2	230 (11)	

(1) Low Energy High Sensitivity collimator
(2) Low Energy General Purpose collimator
(3) Low Energy High Resolution collimator
(4) Low Energy Ultra High Resolution collimator
(5) Medium Energy General Purpose collimator
(6) High Energy General Purpose collimator
(7) Low Energy Fan Beam collimator
(8) High Energy Pinhole collimator
(9) Measured with ^{99m}Tc in 20%-window
(10) Measured with ^{67}Ga in 20%-window
(11) Measured with ^{131}I in 20%-window

Multislice CT Component

AnyScan® system combines the power of nuclear medicine with the precision of 16/8 slices fast helical CT technology. **AnyScan®**'s CT module supplies precise data for the attenuation correction and provides excellent diagnostic imaging capability. **AnyScan®** family offers alternative choice of 16 or 8 slice diagnostic CT or 8 slice non diagnostic CT.
The CT module consists of a high resolution ceramic detector. The rotation speed is up to 0.4* sec with a 360-degree rotation.

CT-Gantry
- Patient Aperture: 70 cm
- Scan Field of View: 50 cm (70 cm for localization and corrections)
- Acquisition Times (360°): 0.4*, 0.5, 0.7, 1, 1.5 and 2 sec.

X-Ray Generator
- Power: 60 kW for diagnostic or ≤ 10 kW for non-diagnostic CT

X-Ray Tube
- Tube Voltage: 80 - 140 kVp
- X-Ray Tube Current: 5 - 500 mA for diagnostic or 5 - 100 mA for non-diagnostic CT
- Anode Heat storage capacity: 7.5 MHU
- Automatic dose control (with ultra-low-dose & pediatric protocols)

X-Ray Detector
- Ceramic Detectors
- Number of Detector Elements: 24 x 896
- Number of DAS Rows: 16 / 8 or 8
- Detector Width (Z Dimension): 20 / 10 mm or 10 mm

Image Reconstruction
- Reconstruction Matrix: 512 x 512 or 1024 x 1024

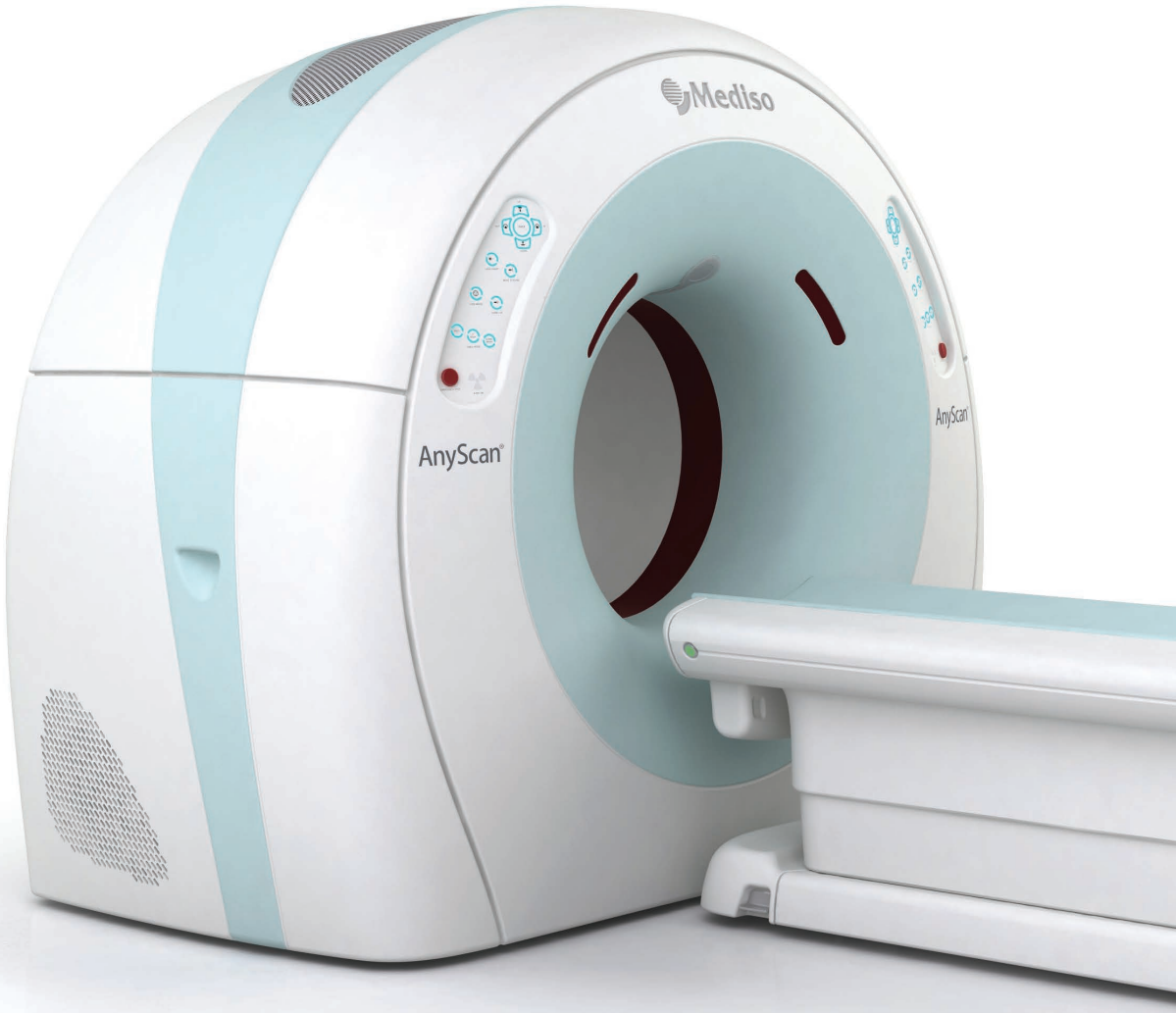
Scan Parameters
- Acquired Slice Thickness: 16 rows of 0.625 mm / 1.25 mm or 8 rows of 1.25 mm
- Displayed Slice Thickness: 0.625 (for diagnostic CT only), 1.25, 2.5, 5, 10 mm

*optional

PET Component

The PET module is carefully designed to integrate with the other modalities of **AnyScan®**. The high sensitivity and excellent resolution facilitate fast examination process and accurate clinical diagnosis.

- Molecular PET imager module with high resolution LYSO detector technology
- Independent gantry under common PET/CT gantry cover
- 70 cm gantry bore diameter
- 90.2 cm ring diameter
- High precision digital imaging electronics
- High spatial resolution
- Excellent volume sensitivity
- FBP-SSRB, 3DOSEM, 3DML and **Tera-Tomo™ 3D PET** reconstruction
- Different FOV options for increased sensitivity
- The selected FOV may be extended with a later purchase (Field upgradable)



Specification of PET Module

Description	Unit	Basic field	Extended Field
Crystal		LYSO	
Number of detectors		24	
Crystal size	mm	3.9x3.9x20	
Number of pixels		26448	39672
Number of PMT		288	432
Transversal resolution 1 cm (NEMA 2007)	mm	4.1	
Transversal resolution 10 cm (NEMA 2007)	mm	4.9	
Axial resolution 1 cm (NEMA 2007)	mm	4.2	
Axial resolution 10 cm (NEMA 2007)	mm	5.1	
Axial FOV	cm	15.2	23.0
Transaxial FOV	cm	50	
System sensitivity	cps/kBq	5.8	9.1
Coincidence window	nsec	5	
Peak noise equivalent count rate	kcps	77	150
Electronic timing resolution (ps)	ps	100	
Gantry aperture	cm	70	
Ring diameter	cm	90.2	

AnyScan® PC

Shared Components

Triple Modality Imaging Table

The carbon fiber dual section imaging table can be extended extremely long, ensuring safe support for corpulent patients as well.

- Intelligent CAN connected industry standard interface to gantry
- Dual tabletop
- Motorized vertical and whole body movements
- Motorized whole body motion
- Low attenuation (< 8%) carbon fiber pallet
- Horizontal moving range is 374,5 cm (Max. scan length: 235 cm)
- Height of the patient pallet is variable between 46-83 cm, optionally 95 cm
- Max. 229 kg patient weight
- Accessories: arm-holder for WB-, arm-head-holder for heart-, head holder for brain examinations,
- Optional integrated ECG gating unit

Nucline™ Acquisition Console Workstation

Acquisition workstation with dual and touch screen monitor for image acquisition, settings, gantry and patient positioning.

- Intel® Core™ i7 3.0 GHz multi-core processor by **Nucline**™ workstation
- 16 GB RAM
- 6 TB hard disk drive
- CD-DVD-RW drive
- Keyboard, mouse
- Full DICOM 3.0 compatibility (send/ receive, print, query/retrieve)
- 24" high resolution (1920x1200) and 17" (1280x1024) touch screen LCD monitor
- Integrated Gigabit Ethernet controller
- Windows 7 64 bit Ultimate operating system (multiuser/multitasking)
- UPS power supply 3.2 KVA (optionally)

Integrated SPECT data acquisition module
- 64 independent energy channels
- Multi-channel analyzer up to 1024 channels
- 4096 x 4096 pixel image processing
- Digital corrections:
  - Direct addressing TS® simulation linearity correction with FOV increasing technology
  - Improved energy correction
  - Uniformity correction without count rate loss
  - Automatic real-time uniformity cross-correction for the different collimators
  - Advanced on the fly gantry and detector alignment (COR) correction

InterView™ FUSION Ultimate Processing Workstation

- Intel® Core™ i7 3.4 GHz 6-core processor
- 32 GB RAM
- 12 TB hard disk drive with RAID for safe archiving
- Multi-GPU engine for fast image processing & post-reconstruction
- CD-DVD-RW drive
- Keyboard, mouse
- Full DICOM 3.0 compatibility (send/ receive, print, query/retrieve)
- Dual 27" high resolution (2560x1440) LCD monitor
- Integrated Gigabit Ethernet controller
- Windows 7 64 bit Ultimate operating system (multiuser/multitasking)

InterView™ FUSION Processing Workstation

- Intel® Core™ i7 3.0 GHz multi-core processor
- 16 GB RAM
- 6 TB hard disk drive
- CD-DVD-RW drive
- Keyboard, mouse
- Full DICOM 3.0 compatibility (send/ receive, print, query/retrieve)
- 27" high resolution (2560x1440) LCD monitor (optional second 27" monitor)
- Integrated Gigabit Ethernet controller
- Windows 7 64 bit Ultimate operating system (multiuser/multitasking)

Software solutions

Nucline™ all modality acquisition software

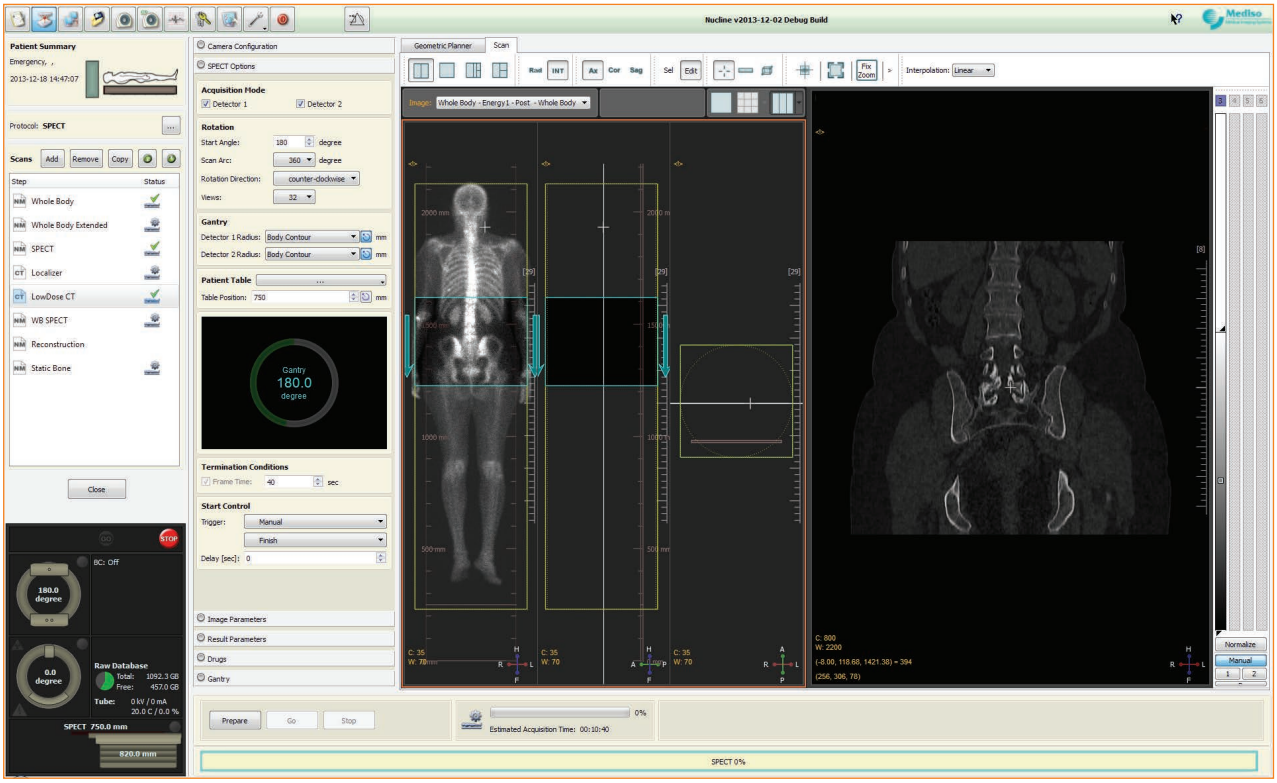
Nucline™ is a fully configurable acquisition software framework, which offers standardized acquisition workflows for all modalities in one common platform. Due to the common software framework Nucline provides fully integrated true hybrid imaging solutions for all camera products of Mediso.

The new advanced 3D Geometric Planner of **Nucline™** allows operators to use any kind of already acquired images as a reference for the next acquisition in a smooth and intuitive visualization framework.

The human and pre-clinical acquisition line is fully covered by **Nucline™,** which makes the whole system standardized and intuitive. This way **Nucline™** provides easy operation for users working in the field of both clinical and pre-clinical routine.

Main features of **Nucline™**

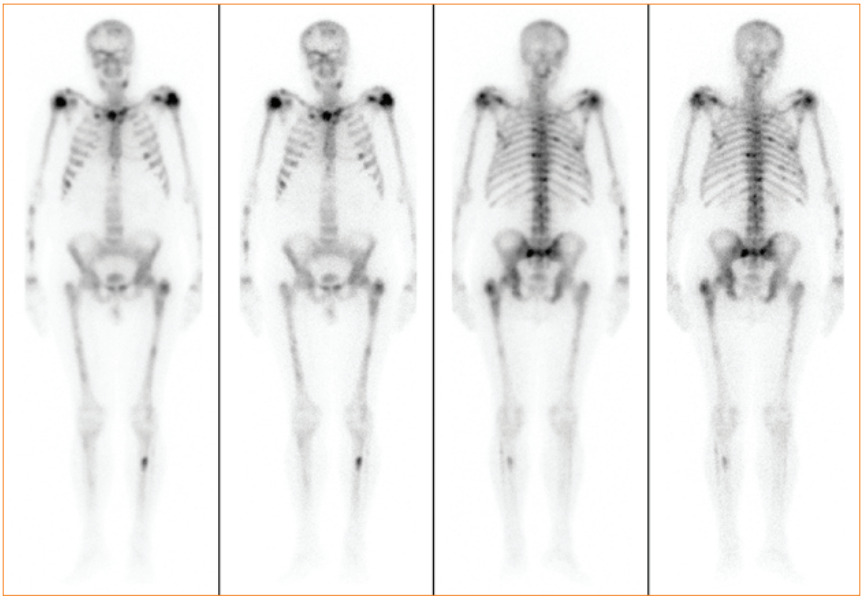
- Provides a common software framework of all camera products of Mediso
- Provides a common platform for all imaging modalities
- Supported modalities: NM, CT, PET, MRI.
- Uniform UI through all modalities
- Product lines: Human and small animal (preclinical)
- Timeline planning (automatic connected steps)
- Protocol steps with predefined parameters (medical examination)
- Geometric planning (using previous images)
- Bolus trigger and bolus tracking for CT acquisitions
- Extended **Tera-Tomo™ 2D Planar, 3D SPECT, 3D SPECT-Q (optional), 3D CT and 3D PET** engine



*SPECT preparation protocol step during SPECT-CT acquisition in **Nucline™***

Tera-Tomo™ 2D Planar Image Enhancement Module

Tera-Tomo™ 2D Planar Image Enhancement Module is a dedicated solution for planar image enhancement. The module operates with state-of-the-art algorithms to enhance the image quality and detail of half-dose or double scan speed planar images to the level of standard acquisitions. **Tera-Tomo™ 2D Planar** Image Enhancement package is fully automated due to its robust case specific analysis module, which adaptively fits the parameters to every case in order to achieve optimal image quality.



*Comparison of **Tera-Tomo™ 2D Planar** enhanced half-time and unprocessed normal scan time planar acquisitions (patient study, 615 MBq, 72 kg, 180 cm, Images acquired by **AnyScan® S**)*

(a) ***Tera-Tomo™ 2D Planar*** *7.5 min. scan*

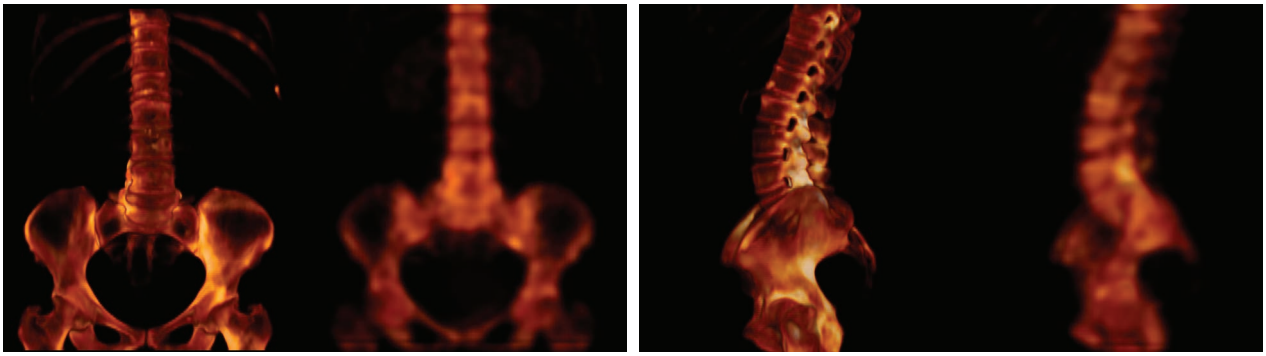
(b) Unprocessed 15 min. scan

(c) ***Tera-Tomo™ 2D Planar*** *7.5 min. scan*

(d) Unprocessed 15 min. scan

Tera-Tomo™ 3D SPECT Bone Enhancement on CT resolution

Tera-Tomo™ 3D SPECT Bone is a dedicated solution for enhancing bone structures of SPECT scans to provide superior SPECT image quality. The module operates on a bone SPECT acquisition, reconstructed on the resolution of the CT. The fine details of the bone SPECT image is achieved by considering automatically segmented local bone structure information of the CT. Due to the above approach the bone enhanced SPECT image represents an outstanding image quality. The module is optional for **Nucline** and **InterView XP**.



(a) ***Tera-Tomo™ 3D SPECT*** *Bone Enhancement (512x512 volume rendering),*

(b) ***Standard OSEM*** *(128x128 volume rendering),*

(a) ***Tera-Tomo™ 3D SPECT*** *Bone Enhancement (512x512 volume rendering),*

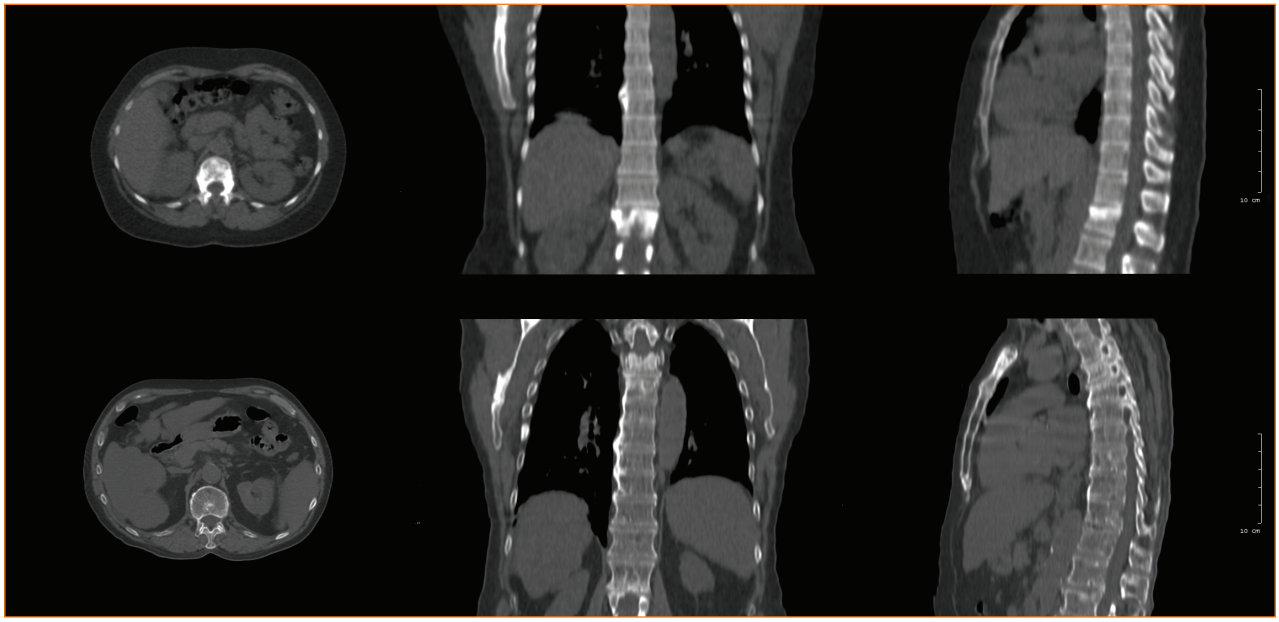
(b) ***Standard OSEM*** *(128x128 volume rendering),*

*Comparison of **Tera-Tomo™ 3D SPECT** Bone Enhancement and **Standard OSEM** reconstruction (patient study, 608 MBq, Images acquired by **AnyScan® SC** Research Edition)*

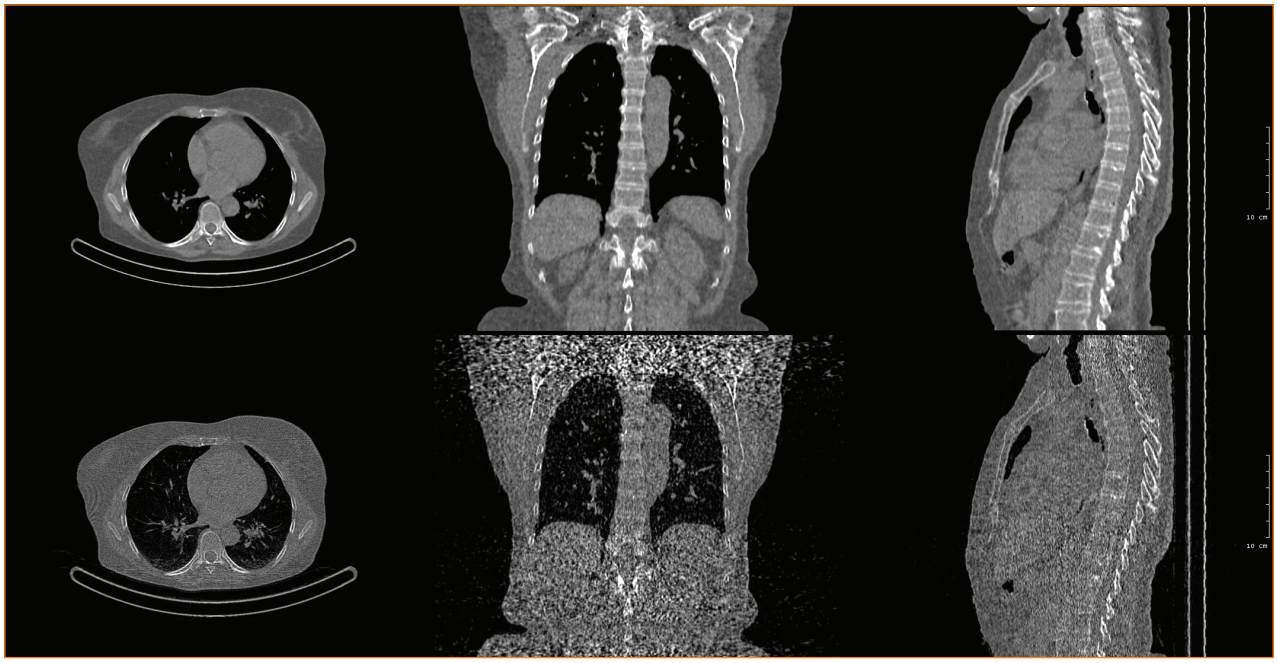
Software solutions

Tera-Tomo™ 3D CT Reconstruction Module

The **Tera-Tomo™ 3D CT** reconstruction engine implements a novel multi-material reconstruction method, which produces optimal patterns for all specific tissues in the body. In addition, the engine also handles metal artefacts, since they are also handled as separate materials during reconstruction. The engine contains an advanced streak reduction as well as a novel edge-preserving noise compensation module. The **Tera-Tomo™ 3D CT** reconstruction is operated on multiple GPUs (Graphics Processing Units) for optimal performance [2,3,4]. The reconstruction engine, supplied with all the above solutions, allows ultra-low-dose CT acquisitions with excellent image quality without compromises, meaning radical dose reduction for patients.



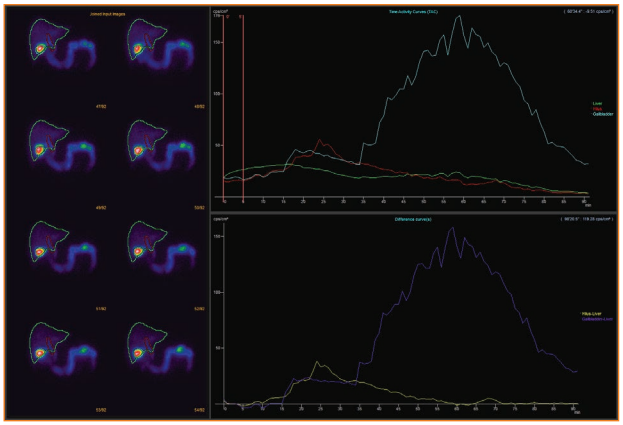
*Top: **Tera-Tomo™ 3D CT** reconstruction of an ultra-low-dose, 10 mAs acquisition*
Bottom: Standard FBP reconstruction of a 50 mAs CT acquisition
*(Images acquired by **AnyScan® C**)*



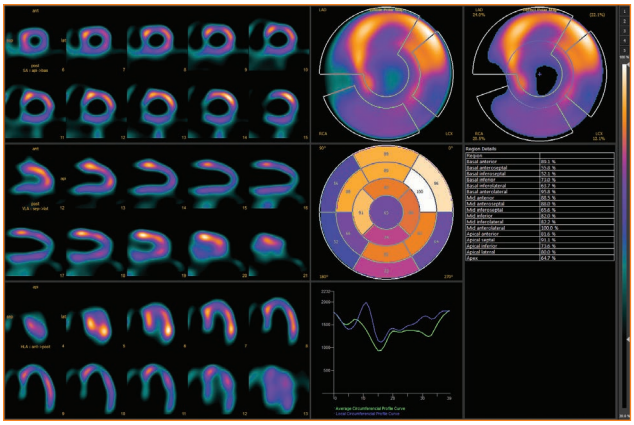
*Top: **Tera-Tomo™ 3D CT** reconstruction of an ultra-low-dose, 10 mAs acquisition*
Bottom: Standard FBP reconstruction of the same CT acquisition (patient study, 10 mAs, 83 kg, 178 cm
*Images acquired by **AnyScan® C**)*

InterView™ XP Planar, whole body & SPECT processing software

- Complete collection of organ-specific dedicated planar, whole body and SPECT-Procedures:
  - Cardiology
  - Endocrinology
  - Exocrinology
  - Gastroenterology
  - Hepatology
  - Mammography
  - Nephrology
  - Neuroendocrinology
  - Neurology
  - Osteology
  - Pulmonology,
  - Preclinical studies
  - General Evaluation
  - Tools
- Procedures with step-by-step wizard style for standardized workflows
- Intelligent image role-driven evaluation
- Highly automated processing tools
- Complete support for evaluating static, dynamic and gated studies
- Factory-default and user-defined variants of procedures
- Easy operation due to simplified, smooth GUI
- Unified report framework for easy report generation
- Several tools for evaluation: Motion correction, filters, reconstructions
- Fusion and automated co-registration of reconstructed images with CT images
- Extensive filter database supporting user-defined filter definitions for dedicated use
- 2D- and 3D-image viewers, polar maps, histograms, time activity viewers, profile curve viewers
- Multi-format image presentation in excellent quality
- Modern, simplified GUI for easy operation
- Data exchange with standard compliant nuclear medicine workstations, using DICOM protocol
- **Tera-Tomo™ 2D** Image Enhancement Module (option)
- **Tera-Tomo™ 3D SPECT**
- **Tera-Tomo™ 3D SPECT-Q** Quantitative Reconstruction Engine (option)



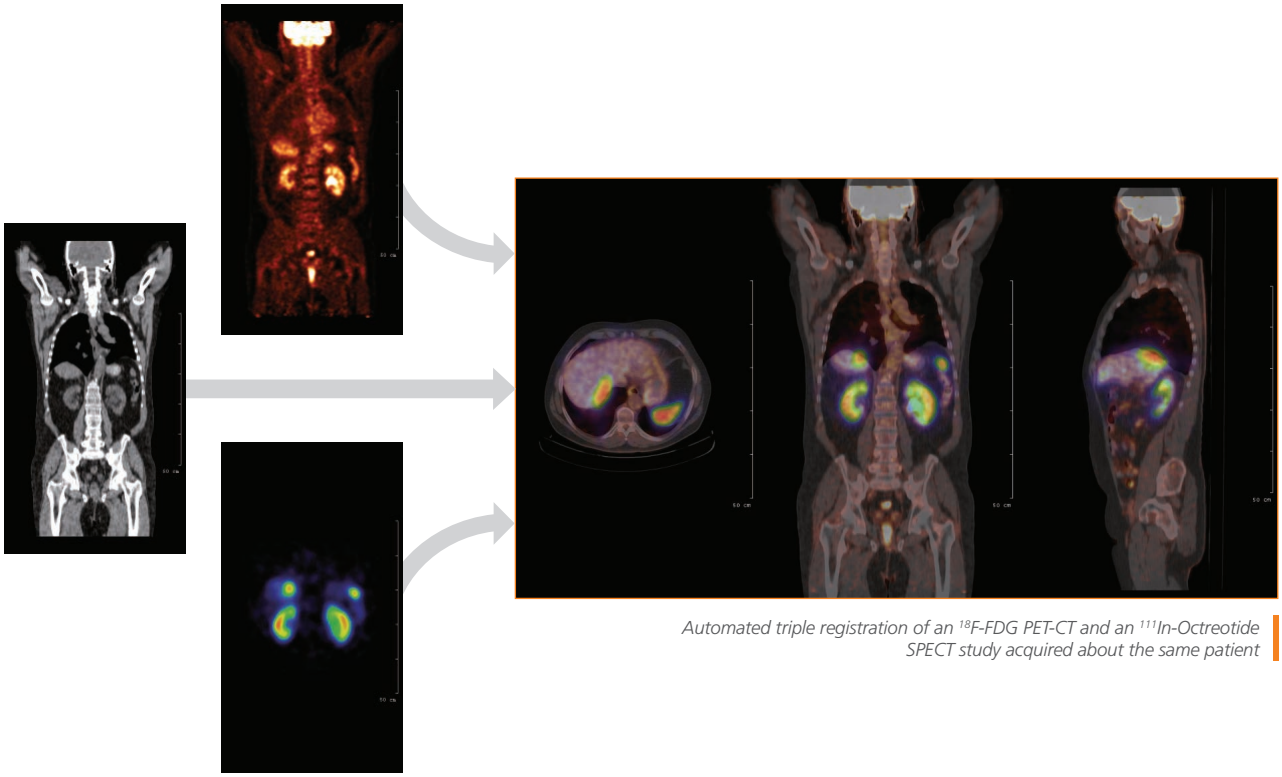
Gallbladder evaluation of a dynamic planar acquisition



Cardiac SPECT evaluation of a reoriented gated cardiac SPECT acquisition with polar maps

Software solutions

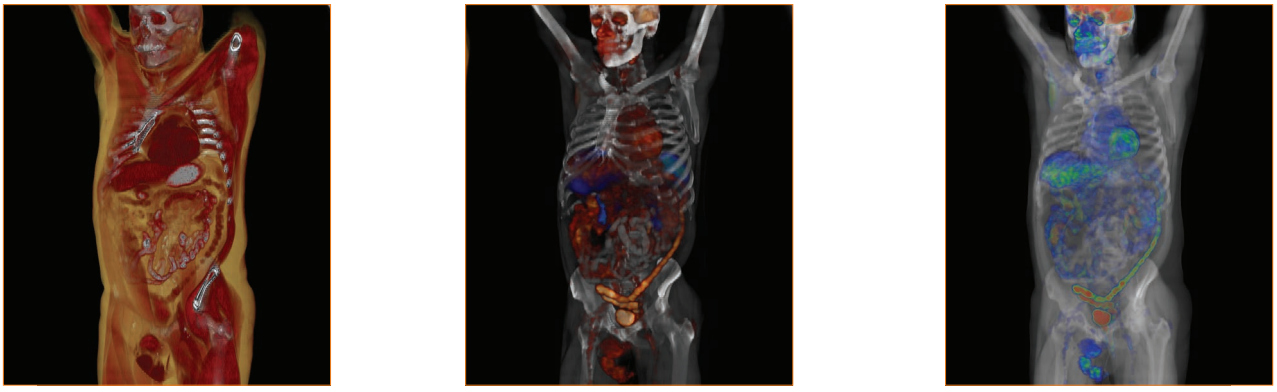
The nuclear studies are right there. Anytime. From Anywhere.
The software tools that drive the solutions...



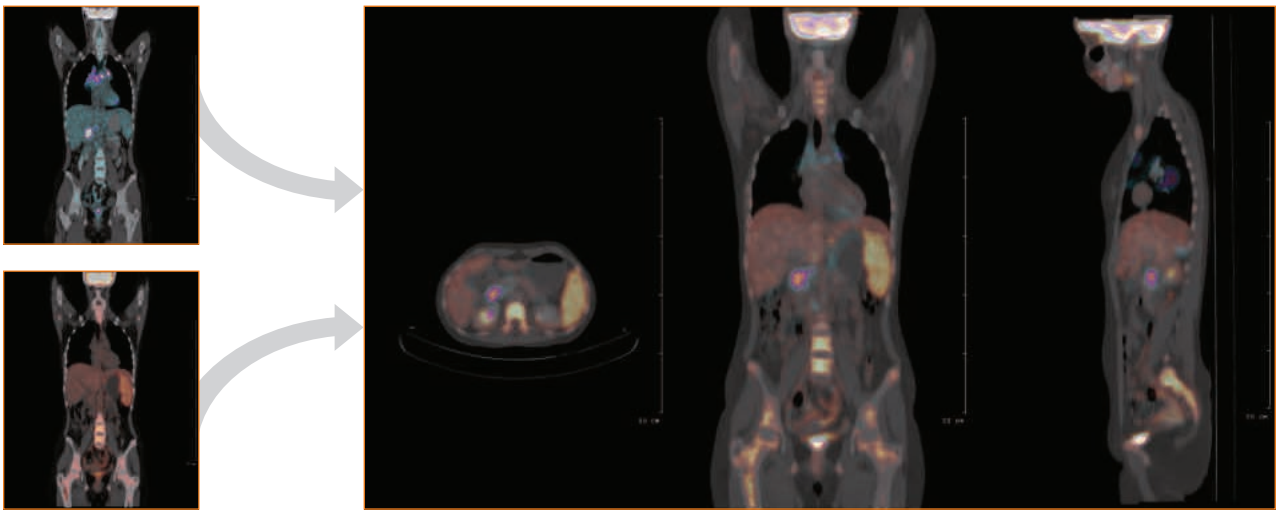
Automated triple registration of an ^{18}F-FDG PET-CT and an ^{111}In-Octreotide SPECT study acquired about the same patient

InterView™ FUSION Multimodality Processing Software

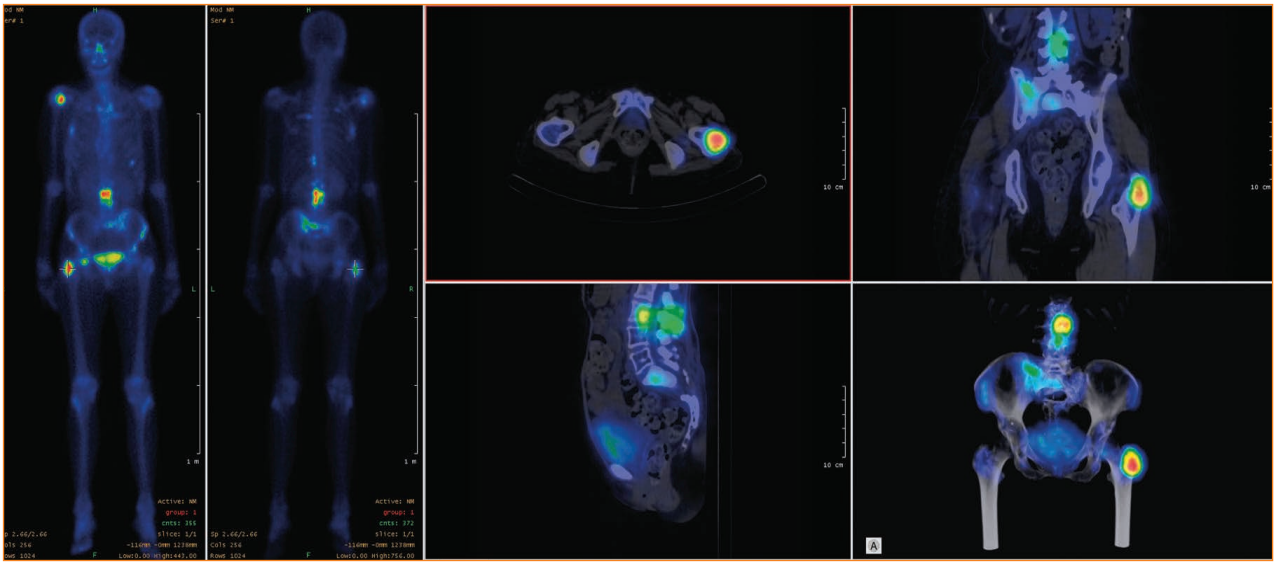
- Dual / triple / quad fusion display of multi-modality studies (SPECT-CT-PET-MRI)
- Multiple types of image and non-image viewers (2D-, 3D- and 4D- viewers, TAC and Profile Curve viewers)
- Multi-workspace architecture: 16 virtual screens
- Single, comparative and follow-up layouts
- Registration of images (automatic affine, automatic nonlinear, semi-automatic landmark nonlinear and affine manual)
- Segmentation of images (PET lesions, SPECT sentinel lymph node, CTA coronaries, etc.)
- Arithmetic operations between images (add, subtract, multiply, absolute difference, min, max, mean)
- Dynamic series support (Time and Spatial domain in viewers, time frame merging, etc.)
- Extended measurement functionality;
  - Many kinds of definable ROIs and VOIs
  - novel SUV and non-SUV based statistical calculations (e.g. Heterogeneity, Entropy)
  - ROI/VOI arithmetic operations (Union and Intersection)
  - DICOM RT support
  - Excel-compatible calculation board definition / save / load for daily QC and research
- Support of DICOM services and DICOM servers (loading and saving)
- Flexible, simplified user interface
- **Tera-Tomo™ 3D SPECT** Bone Enhancement Module



Left: 3D VR of a CT with surface cut plane. Middle: 3D VR of a ^{18}F-FDG PET-CT with non-linear alpha functions
Right: 3D VR of the same PET-CT with different alpha functions and palettes.



Automated quadruple registration of a primary and interim ^{18}F-FDG PET-CT image pairs

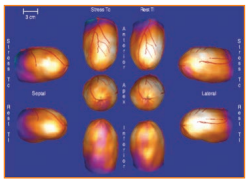


^{99m}Tc MDP Whole Body bone SPECT AP - PA acquitions and their corresponding reconstructed SPECT/CT fusion with spatially aligned synchronized cursors

Dedicated Cardiac Packages

Emory Cardiac Toolbox

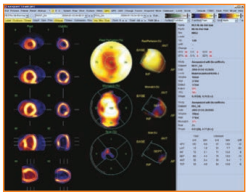
The software package provides physicians with a tool that processes, displays, interprets and analyzes cardiac PET and SPECT studies. HeartFusion™ is able to fuse CT coronaries with perfusion 3D display and provides vessel cross-sectional area.



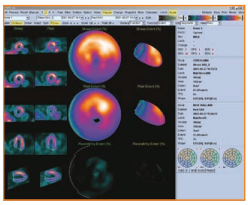
Cedars Sinai

Dedicated evaluation package to analyze quantitative blood-pool SPECT, cardiac perfusion and gated SPECT and PET studies and compare to normal databases.

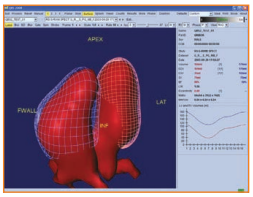
Cedars Sinai Quantitative Gated SPECT
- Automated processing of myocardial perfusion SPECT and gated SPECT data
- Left ventricular ejection calculation
- 3D beating image displays
- Volume curves and polar maps



Cedars Sinai Quantitative Perfusion SPECT
Standalone interactive application for:
- Automatic segmentation
- Quantification
- Analysis and display of static short axis myocardial perfusion SPECT



Cedars Sinai Blood Pool Gated SPECT
Standalone interactive application for:
- Automatic segmentation
- Quantification of gated static short axis blood pool SPECT



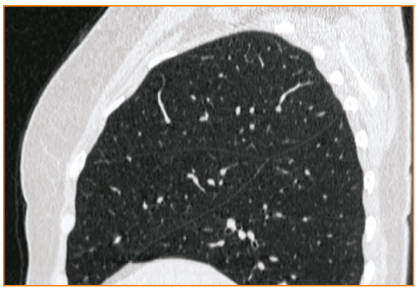
Documentation

Automated bi-level macro-controlled printing and reporting. High quality inkjet colour and b/w hardcopy
- On normal paper
- On premium photo paper
- 2400 dpi print quality
- Special printing software for faithful printing

CT Software

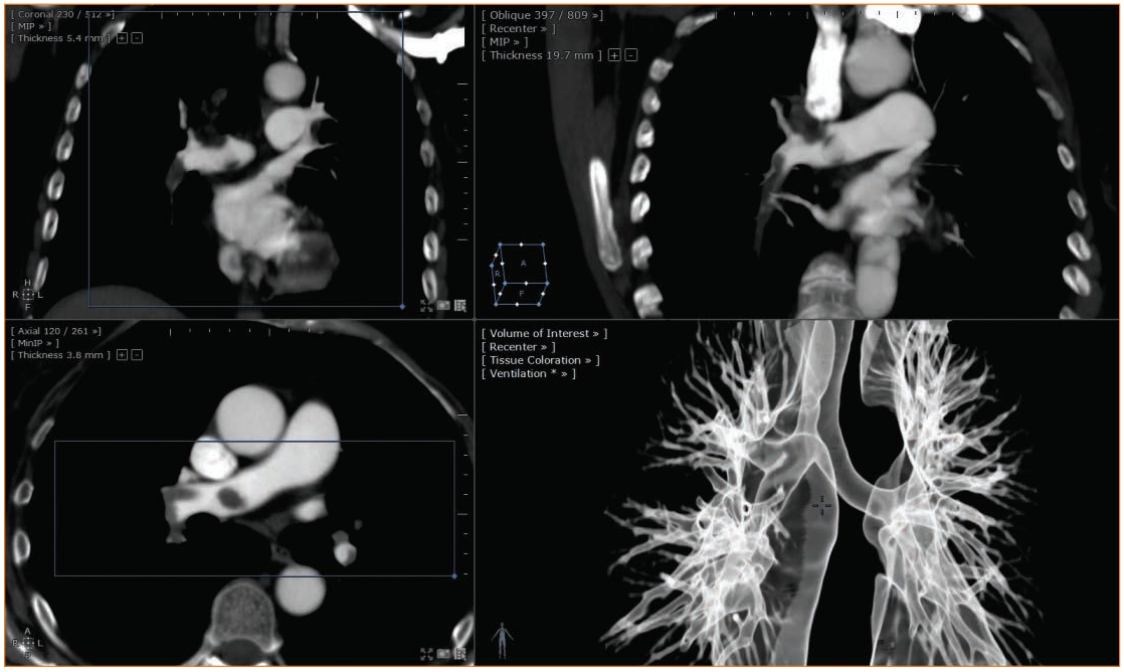
InterView™ CT Expert

3D-solution for processing and analysis of medical images
- Optimised patient CD management
- Standard and cine mode display
- Key images selection
- DICOM and Windows printing
- MPR
  - Axial / Coronal / Sagittal reconstructions
  - Oblique
  - Thick Slab creation (average)
  - Thick Slice (MIP/MinIP)
  - New MPR series creation
  - Parallel, curved or radial
- Wide range of toolboxes
- Dynamic color palette
- Region of interest 2D-editing tool
- Whole volume 3D
- MIP
- Volume rendering
- Surface rendering
- Conversion of digital images into DICOM format
- Exam comparison
- Multimedia report creation
- Visual selections and automated bone masking



Pulmonary MPR section

Bronchial tree volume rendering



Pulmonary Angiography MIP views and Bronchial tree VRT view

Dedicated CT Software

InterView™ CT Dedicated Analysis Suite

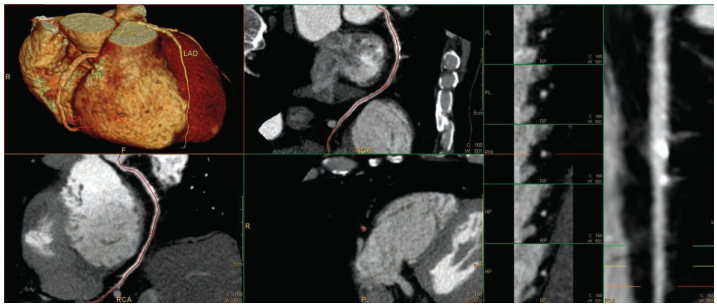
Includes the following modules:

InterView™ CT Cardiac CT Analysis
InterView™ CT Calcium Score Analysis
InterView™ CT Cardiac Cath Analysis
InterView™ CT 3D Viewer includes cardiovascular analysis capabilities
InterView™ CT CT Colonoscopy Analysis

InterView™ CT Cardiac CT Analysis

Comprehensive Cardiac CT analysis system:

- Automatic segmentation of the heart into its comprising parts
- Complete coronary and functional assessment of the patient's heart
- Intuitive 3D coronary artery presentation
- Virtual IVUS special view
- Easy-to-use, time saving

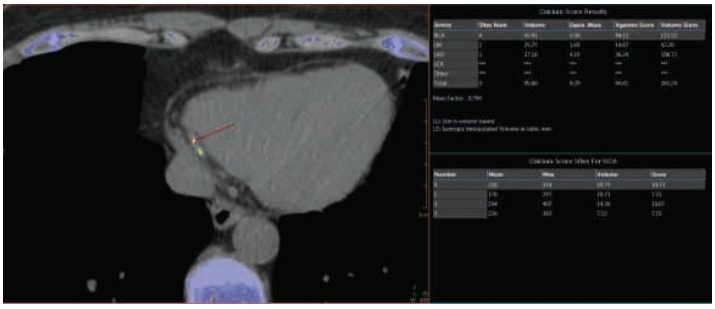


Cardiac CT analysis and 3D coronary artery presentation

InterView™ CT Calcium Score Analysis

Highly automated Calcium Scoring analysis module:

- Automatic segmentation
- Calcium Score calculations
- Identifies the different arteries
- Scores the calcified plaque areas
- Agaston score and plaque volume indication
- Total plaque burden calculation
- Workflow to Approve findings



Auto Calcium Scoring

InterView™ CT Cardiac Cath Analysis

Cardiac CT integrated with Coronary Angiography in the cathlab

- Helps to understand the 3D-nature of vessel and the stenosis
- Real-time visualization capabilities
- Correlates CT tissue data (e.g. plaque, wall) on the angiogram image
- Recommends optimal C-arm orientation for best demonstration of the stenosis area
- Suggests stent size and positioning
- Shows the vessel's pathway and stenosis composition in CTO cases

InterView™ CT 3D Viewer with Cardiovascular Analysis

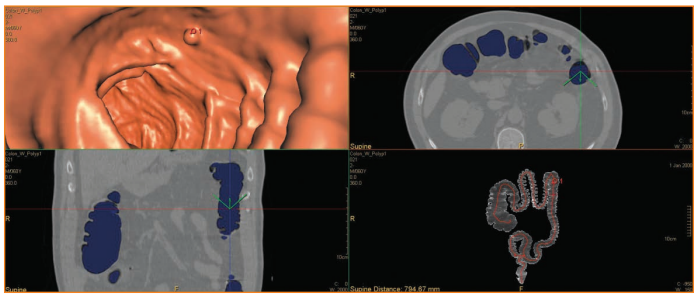
High level, simple-to-use 3D-viewer and vascular imaging and analysis tool

- Comprehensive general purpose 3D-medical image viewer
- CT vascular analysis tools
- Assessment of carotids, renal arteries and other peripherals
- Views and classifies plaque areas along the vessels
- Automatically identifies suspicious plaque and stenosis sites
- Supports CT, MR, PET, and XA data
- 2D-viewing mode
- Slab viewing mode
- 3D-viewing mode
- Endovascular viewing

InterView™ CT Virtual Colonoscopy Analysis

Specialized CT virtual colonoscopy application

- Automatic and interactive navigation through the colon
- Volume rendering of the colon
- Includes automated and fast processing tools such as:
  - Colon segmentation
  - Centerline extraction
  - Bowel cleansing
- Pre-processing of study
- Synchronized 2D- and 3D-views
- Clinician analysis tools:
- 3D-measurements
- Automated fly-through
- Polyp manual marking and measurement
- Supports flexible pricing models (pay-per-use, concurrent licenses, etc)
- Intuitive user interface (minimal training required)



Automatic Colon Segmentation and Endoscopy view

Special Options

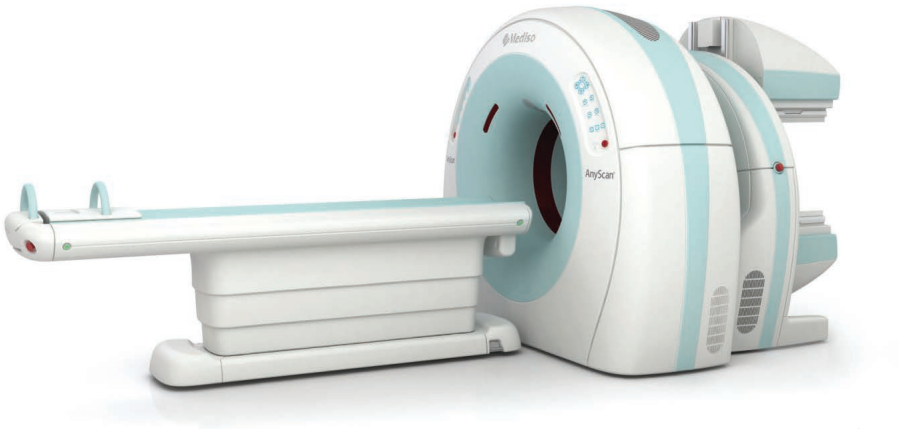
AnyScan® S SINGLE single head SPECT camera

- Designed for AnyScan ® Evolving Concept
- Cost effective system for starting laboratories
- Backup imaging solution for sophisticated SPECT/CT
- Matching your growing imaging needs through add-on upgrade to:
  - Dual head SPECT
  - SPECT/CT
  - SPECT/CT/PET
- Entry level investment for high end imaging solutions
- "Dual-head like" imaging performance with **Tera-Tomo™ 3D SPECT** and **Tera-Tomo™ 2D** Image Enhancement package

AnyScan® S SINGLE

AnyScan® SC CT FIRST special SPECT/CT option, available only from Mediso

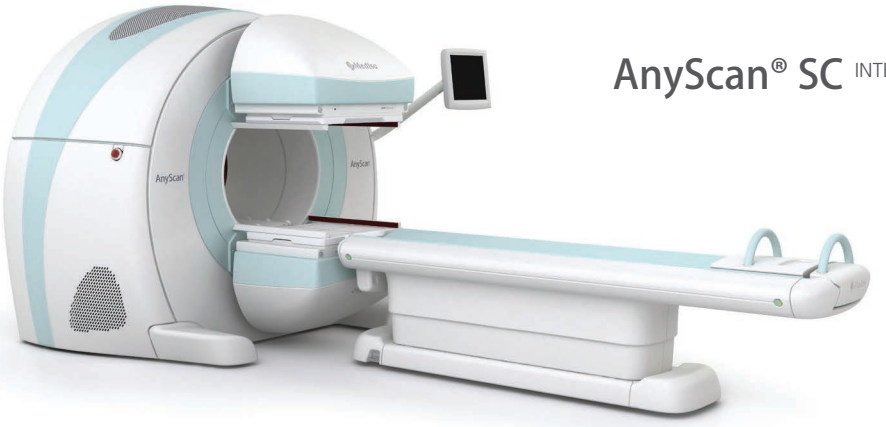
- It is an indispensable solution when:
- SPECT, SPECT/CT and diagnostic CT are used alternatively
- Frequent use of diagnostic CT is required
- Superior imaging quality, both for SPECT/CT and diagnostic CT
- Patient and user-friendly solution for contrast CT scans
- Recommended for Nuclear Medicine and Radiology combined department



AnyScan® SC CT FIRST

Single gantry and Flexible detector movement

The **AnyScan® SC** SPECT/CT system combines SPECT and CT modalities in a single gantry placed in a common gantry housing under the control of a single Nucline™ workstation, providing an optimal workflow solution for SPECT/CT multimodal applications. Precise matching of the two modalities is ensured by an accurate alignment method. An advanced reconstruction software is responsible for the accuracy of data, gained from the multimodal procedure.



AnyScan® SC INTEGRATED GANTRY

AnyScan® S FLEX and AnyScan® SC FLEX options

Due to its flexible detector movement **AnyScan® S** SPECT and **AnyScan® SC** SPECT/CT are suitable for all demanding scan procedures.

- Acquisition in PA and AP positions with standing patient
- Examination of patient sitting on wheelchair or sitting on a chair between the detectors
- Acquisition on gurney in supine and semi-supine position
- Cardiac acquisition with online body-contouring

Examination of patient sitting on wheelchair. Detector in outer-room position

Sitting on a chair between the detectors. Simultaneous AP and PA acquisition

Cardiac acquisition with online body-contouring. Detectors are in 90° relative position

Acquisition on gurney in supine position Detectors are in 0° relative position

Acquisition on gurney in semi-supine position. Detectors are in different relative position

System Components and Physical Parameters

System Components

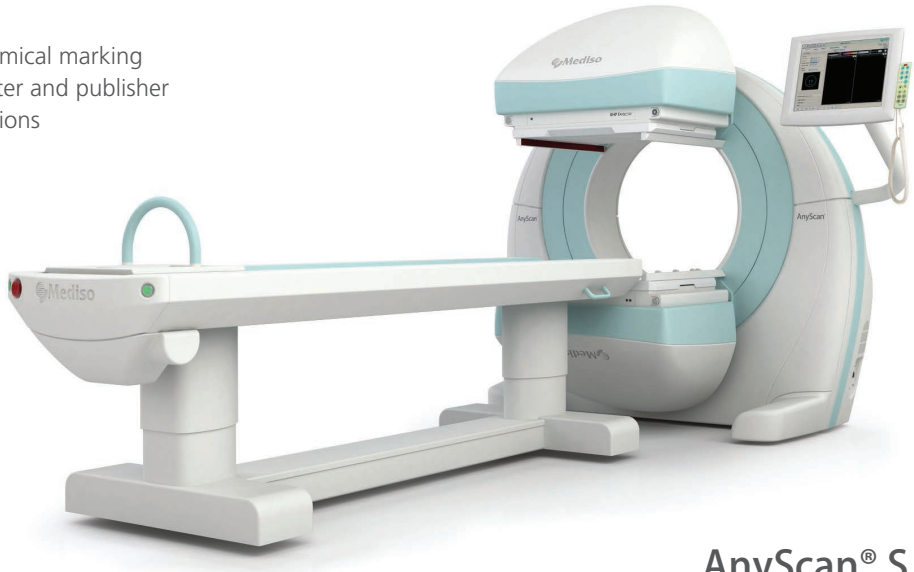
- SPECT Gantry
- CT Gantry
- PET Gantry
- SPECT/CT/PET Imaging Table
- Multimodality acquisition console
- Power Distribution Unit

Dimensions, weights

Components	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
SPECT gantry	1139	1714	1632	2100
CT gantry	778	2116	1916	1350
PET gantry	400	2116	1948	400
Imaging Table	2580	670	850	330
Collimators	685	562	46-68	70-125
Collimator Carts	750	560	1250	70
Power Distribution Unit	1000	600	1490	450

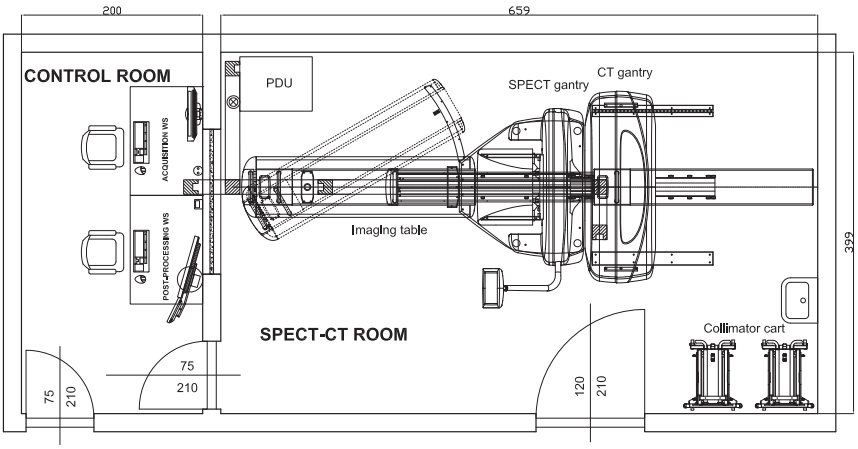
Optional Accessories

- SPECT-only imaging table
- CT or PET/CT Pre-upgrade Kit for **AnyScan® S**
- PET Pre-upgrade Kit for **AnyScan® SC**
- Processing workstation
- Collimators and carts
- Integrated ECG triggering device for cardiac gated studies
- Color laser printer
- CODONICS dry film imager
- Tuning and test phantoms
- Refillable isotope pen for anatomical marking
- One Click CD/DVD burner, printer and publisher
- Head holder for brain examinations
- Child hugger
- Scintimammography pallet
- Flat pallet for radiotherapy
- Additional hand controller

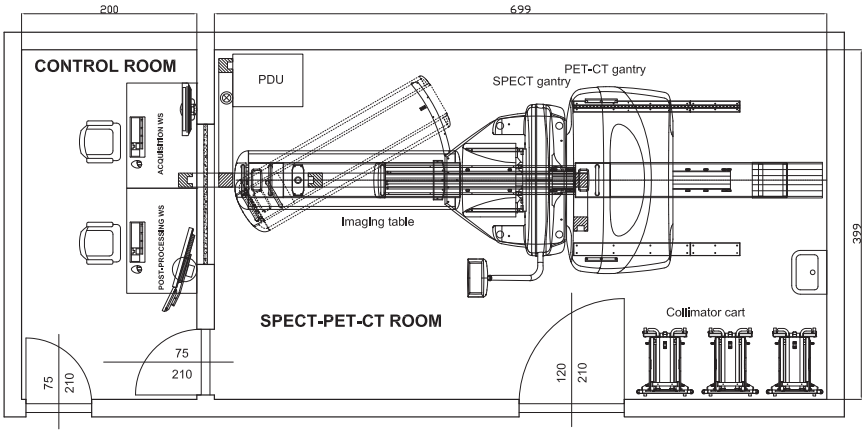


AnyScan® S
with SPECT-only imaging table

Room Layout



Minimal room layout for **AnyScan SC®**



Standard room layout for **AnyScan®**

Power Supply Requirements

SPECT-component

- Mains Voltage: 115/230 V (1 phase)
- Mains frequency: 45-63 Hz
- Max. power: 2.4 kVA

CT-component

- Mains Voltage : 400/480 V (3 phase)
- Mains frequency: 45-63 Hz
- Max. power: 65 kVA (diagnostic CT)
  ≤ 10 kVA (non-diagnostic CT)

PET-component

- Mains Voltage: 115/230 V (1 phase)
- Mains frequency: 45-63 Hz
- Max. power: 2.2 kVA

Environmental Requirements

Constant room temperature and humidity rate required for 7 days / 24 hours

- Room temperature: 20 ± 2° C (68° F ± 3.5° F)
- Max temperature change rate: 5° C/hour (7° F/hour)
- Relative humidity: 35 - 70% non condensing
- Atmospheric pressure: 70 - 106 kPa
- Dew point < 17° C (63° F)

References

1: PCT/HU2012/000066
2: Gábor Jakab, Tamás Huszár, Balázs Csébfalvi: Iterative CT Reconstruction on the GPU. In: VI. GRAFGEO Conference. Budapest, Hungary, 02.21. 2012-02.22. 2012. pp. 124-131.
3: Jakab Gábor, Rácz Attila, Bükki Tamás, Németh Gábor: Fully GPU Based Real Time Corrections and Reconstruction for Cone Beam Micro CT. In: IEEE - High Performance Medical Imaging (HPMI): Science Symposium Conference Record (NSS/MIC). Orlando, USA, 2009.10.24-2009.11.01. Orlando: IEEE, pp. 4068-4071.
4: Gabor Jakab, Laszlo Szirmay-Kalos: Hybrid Monte Carlo CT Simulation on GPU. In: Lecture Notes of Computer Science (LSSC'13), 2013.

Conformance Statement

Quality management system operated by Mediso Medical Imaging Systems complies with Council Directive 93/42/EEC Annex II. The multimodality molecular imaging system was approved by a Notified Body.

Product design, development, production and services comply with EN ISO 13485 and EN ISO 14971. Medical device design and safety testing has been performed in accordance with EN IEC 60601-1 and EN IEC 60601-1-2 standards.

Safety labels are attached to appropriate places on equipment and appear in all operation manuals.

The supplied software complies with DICOM standard.

The technical information provided here is not a detailed specification.

For details and up to date information please contact your local distributor or Mediso Medical Imaging Systems.

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InterView™ FUSION, **InterView**™ XP, **InterView**™ CT
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Medical Imaging Systems

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