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Qty	Item Description
1	<b>Symbia Intevo Bold</b> The Symbia Intevo Bold is the latest in the Symbia Intevo family.  It is built on SPECT/CT technology providing seamless integration of two equal modalities. The Symbia Intevo Bold has state-of-the-art SPECT and high quality 16 slice diagnostic CT, providing this system full functionality for SPECT-only, SPECT/CT, or stand-alone CT diagnostic applications in Cardiology, Oncology, Neurology, and General Nuclear Medicine.  This system integrates a CT gantry which enables advanced CT features SAFIRE, iMAR, IVR, Fast 3D Align and Dual Energy.
2	<b>Low Profile 3/8 Detectors</b> The low profile high resolution, digital detector assembly includes a .95 cm (3/8 in.) thick NaI (TI) crystal.
1	<b>Caudal Tilt</b> Caudal tilt on Detector 2 allows for precise positioning of static and dynamic acquisitions.
2	<b>Low Energy High Res Collimator</b> Low energy (140 keV), high resolution, parallel hole collimator
2	<b>Medium Energy Collimator</b> Medium energy (300 keV), parallel hole collimator
1	<b>Pinhole Collimator</b> Pinhole collimator with a 4mm aperture
1	<b>6mm Aperture</b> The 6 mm aperture is a high sensitivity insert for the pinhole collimator.
1	<b>8 mm Aperture</b> The 8 mm aperture is a high sensitivity insert for the pinhole collimator.
1	<b>Symbia Productivity Pkg - Seismic</b> The productivity package automates collimator exchange and quality control increasing the productivity of the Symbia Intevo and Evo camera systems.

Qty	Item Description
1	<p>The Productivity Package Seismic Kit retains the collimators in the Integrated Collimator Changer in compliance with local earthquake requirements.</p>
1	<p><b>Collimator Cart</b></p> <p>The collimator cart is designed to hold collimators and allows collimator exchange without pivoting the bed.</p>
1	<p><b>AQC Web Based Training</b></p> <p>AutoQC web based training is available on the Siemens training website.</p>
1	<p><b>AutoQC source kit</b></p> <p>This source kit contains includes 1 - Gd-153 line and 1 - Co-57 point source required for the automatic quality control option.</p>
1	<p>Note: The site Radioactive Material License may need to be updated to receive this source.</p> <p><b>xSPECT Quant Bundle</b></p> <p>xSPECT Quant Bundle provides absolute, accurate and reproducible xSPECT quantification for:</p> <ul style="list-style-type: none"> <li>- Tc99m using the LEHR or LPHR collimators</li> <li>- I123 using the LPHR or MELP collimators</li> <li>- In111 using the MELP collimator</li> <li>- Lu177 using the MELP collimator</li> </ul>
1	<p>In addition, this bundle includes Broad Quantification which provides quantification for most tracer and collimator combinations.</p> <p><b>xSPECT Bone Bundle</b></p> <p>Advanced bone imaging reconstruction software that uses the CT as the frame-of-reference for the image reconstruction enabling CT-like anatomical clarity and resolution.</p>
1	<p><b>Internal ECG for Symbia</b></p> <p>The internal ECG gating system provides ECG triggering for the nuclear subsystem for nuclear cardiology examinations. In addition, for Symbia Intevo Excel, 2, 6 and 16, and T2, T6, and T16 cameras, the internal ECG gate provides ECG triggering to the CT subsystem for CT applications that require ECG gating.</p> <p>The ECG gate is built into the Symbia patient bed and is controlled by the Symbia acquisition workplace. The leads are AHA (American standard) color coded. They connect near the head of the patient bed and travel with patient, thus never interfering with scanning.</p>
1	<p>The ECG waveform is displayed on the touch-screen Patient Positioning Monitor.</p> <p><b>HeartView CT &amp; Calcium Scoring</b></p> <p>This package combines the Heartview CT option for ECG-controlled acquisition and reconstruction of artifact-free images of the heart with the Calcium Scoring application for the quantification of calcifications in CT images.</p>
1	<p><b>Extra Hand Controller</b></p> <p>This option provides an extra hand controller for the Symbia Intevo and T series scanners.</p>
1	<p><b>UPS for Symbia Camera Systems</b></p> <p>Uninterruptible power supply option that provides 10 minutes of back up power to the SPECT gantry enabling the proper shut down in the event of a power loss. Also provides noise filtering and transient suppression.</p>

Qty	Item Description
1	<p>Specifications:5.0 KVA Input configuration: 200-240 VAC, 50/60 Hz, L6-30P Output configuration: 208 VAC, L6-30R</p> <p><b>UPS for e.soft/c.cam (60 Hz)</b></p> <p>Uninterruptable power supply option that provides 10 minutes of back up power enabling the proper shut down of the system in the event of a power loss.</p>
1	<p><b>PHS Extended Pivot</b></p> <p>The PHS extended pivot option extends the range of pivot for the patient bed in gurney mode.</p>
1	<p><b>SPECT.CT Dual Monitor Software</b></p> <p>The option enables your Hybrid Acquisition Console to utilize 2 LCD or DICOM monitors.</p>
1	<p><b>2nd Monitor DICOM LCD</b></p> <p>This an additional DICOM LCD monitor for the Symbia acquisition workplace.</p> <p>The 19 DICOM Calibrated LCD monitor is designed to meet the demanding requirements of medical imaging. The display features high contrast even under high ambient light conditions that can be encountered in nuclear medicine viewing environments. The gamma curve is exactly matched to CIE/DICOM recommendation, enhancing the ability to display both color and gray scale images. Light output stability is ensured by continuous backlight control throughout the display's lifetime.</p>
1	<p><b>e.media option</b></p> <p>The e.media patient comfort and education package integrates high quality video and sound through the color touch screen patient positioning monitor.</p>
1	<p><b>e.media DVD Player</b></p> <p>The e.media patient education and comfort package plays high quality video and sound through the color patient positioning monitor via a built-in commercial DVD player. The small size and compact shape of the e.media DVD player allows convenient storage and easy access for changing media.</p>
1	<p><b>4 Quadrant Phantom</b></p> <p>A 4 quadrant 2.0-2.5.30.3.5 mm standard pattern slightly modified for use with Symbia Imaging Systems</p>
1	<p><b>Organ Processing for Symbia</b></p> <p>This upgrade will add organ processing capabilities to your acquisition workplace.</p>
1	<p><b>Planar 1/2 Time Imaging</b></p> <p>Planar 1/2 Time Imaging provides shortened Planar acquisition times.</p>
1	<p><b>Advanced 3D Features</b></p> <p>The Advanced 3D FeaturesImage Fusion package includes the 3D package, the Image Fusion package, and Automatic Image Fusion functionality.</p>
1	<p><b>FusedVision3D</b></p> <p>The advanced FusedVision3D is a Volume Rendering Technique that provides visualization of fused anatomical and functional volumes via projection of the volumes onto an arbitrary oriented plane in full screen mode or together with the 3-orthogonal fused datasets. This unique function allows precise localization of lesions while using either the Clip plane view or the Slab Plane view displays. The applications displays correlated rotating Maximum Intensity Projection (MIP), and special 3 x 3 layout to display correlated CT, PET and fused images.</p>
1	<p><b>Cardiology Engine 4DM</b></p> <p>The Cardiology Engine Corridor4DM assists in the diagnosis and quantitative assessment of coronary artery disease by enabling the visualization of SPECT studies as well as quantified perfusion assessment.</p>

Qt	Item Description
1	<p><b>Cardiology Engine Cedars</b></p> <p>The Cardiology Engine Cedars assists in the diagnosis and quantitative assessment of coronary artery disease by enabling the visualization of SPECT studies as well as quantified perfusion assessment.</p>
1	<p><b>Syngo Security Package</b></p> <p>The syngo Security Package provides enhanced security features including user management and audit trail functionality.</p>
1	<p><b>Co57 xSPECT Calibration Source</b></p> <p>This source kit contains one 3.15 mCi (+/- 15%) Co-57 precision source required for calibrating the xSPECT Quant Tc99m (LEHR or LPHR) or I123 (LPHR) options.</p> <p>Note: The site Radioactive Material License may need to be updated to receive this source.</p>
1	<p><b>Se75 xSPECT Calib/Peaking Source</b></p> <p>This source kit contains one 4.25 mCi (+/- 15%) Se-75 point source required for calibrating the xSPECT Quant Lu177, I123 and In111 options with MELP collimator. It also includes one 40 uCi (+/- 20%) Se-75 source required for peaking the camera system. Note: The site Radioactive Material License may need to be updated to receive this source.</p>
1	<p><b>10mCi Rectangular Source</b></p> <p>Model IPL-FL24R</p> <p>Large rectangular Co-57 flood source</p> <p>Activity: 10 mCi (370 Mbq)</p> <p>Active dimensions: 24 long x 16.5 wide</p> <p>Overall dimensions: 26 long x 18.5 wide</p> <p>For use with e.cam and Symbia imaging systems.</p> <p>The following license requirements are required for international orders:</p> <ol style="list-style-type: none"> <li>(1) Government seal on license document</li> <li>(2) Address of facility on license document</li> <li>(3) Valid dates of license</li> <li>(4) Radionuclide (&amp; activity) approved for receipt and use</li> </ol>
1	<p><b>Remote Diagnostic Services</b></p> <p>Smart Remote Services. A broadband VPN connection is required for full remote service functionality and optimal system uptime.</p>
1	<p><b>Under Floor PHS Cable</b></p> <p>Kit for routing the cable between patient bed and the Symbia Intevo or T series gantry under the floor.</p>
1	<p><b>Seismic Kit # California</b></p> <p>The Symbia Seismic kit anchors the Symbia gantry and bed in compliance with OSHPD in California, USA.</p>
1	<p><b>Symbia Hybrid US Installation</b></p> <p>This option includes the mechanical installation of the Symbia Intevo or T series scanner system.</p>
1	<p><b>teamply Basic</b></p> <p>Healthcare professionals, come together in teamply's rich Digital Marketplace to access both the metrics from their own imaging fleet and a vast shared pool of imaging data. As a community, you connect and collaborate in a secure environment with high data privacy and</p>

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**Item Description**

security standards. teamplay BASIC applications include Dose, Usage and Image data management functionalities free-of-charge.

Its easy onboarding allows you to register on teamplay's digital platform and download the needed software to set it up in your institution: Click > Try for free at [www.siemens.com/teamplay](http://www.siemens.com/teamplay)

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**xSPECT Edition**

xSPECT Edition expands the clinical functionality of the Symbia Intevo and Symbia Intevo Bold by providing xSPECT technology. xSPECT technology enables true integration of SPECT and CT. With xSPECT technology, the SPECT information is registered into the CT frame of reference providing the foundation for higher SPECT image resolution and accurate and reproducible quantitative results.

xSPECT Edition also enables the ability to order xSPECT Bone, xSPECT Quant and Broad Quantification features.

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**Additional System Manuals**

Additional user manual for the above selected MI system.

1

**SAFIRE and iMAR Bundle**

Sinogram Affirmed Iterative Reconstruction (SAFIRE) enhances spatial resolution, reduces image noise and increases sharpness by introducing multiple iteration steps in the reconstruction process. The resulting superior image quality enables reduced dose.

The iMAR metal artifact reduction algorithm combines three successful approaches to reduce metal artifacts: beam hardening correction (in sinogram regions of less severe metal attenuation), normalized sinogram inpainting (in sinogram regions of high metal attenuation), and frequency split (to mix back noise texture and sharp details that are potentially lost during inpainting).

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**Interleaved Volume Reconstruction**

CT Interleaved Volume Reconstruction (IVR), has been designed to detect even the smallest diagnostic details by using all available data at any pitch and improve spatial resolution for specific examinations. An automatic, optimized selection of reconstruction parameters are implemented for the dedicated 32-slice IVR protocols.

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**DoD Level Security - SPECT**

US Department of Defense Identifier

1

**Initial onsite training 32 hrs**

Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

1

**MI\_SYMB\_FOLLOWUP**

Up to (32) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

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**CT Cross Trainer (Printed Self Study)**

The CT CrossTrainer Program is a printed self-study course provided and administered by MIC and is intended for (1) imaging professional. StudyModules(tm) present CT in an easy to learn, interactive format with a comprehensive scope including physical principles, hardware and software, image parameters selection, image formation, safety, contrast administration,

Qty	Item Description
1	<p>artifact prevention, patient handling, routine and advanced imaging techniques, and an abundance of images and illustrations.</p> <ul style="list-style-type: none"> <li>- Target audience: Any technologist seeking to learn CT imaging. Prior CT experience is not required.</li> <li>- Specs: 6 StudyModules, 15 hours of study time, 17 Cat A CE credits</li> <li>- Time limited: A 6 month term of enrollment provides an opportunity to earn the associated CE credits starting on the date the course materials are shipped. Upon expiration of enrollment, unearned credits are forfeited without refund.</li> </ul>
1	<p><b>Additional CT onsite training 32 hours</b></p> <p>32 Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>xSPECT Onsite Training-12hrs</b></p> <p>Up to (12) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. This training will provide you with the knowledge required to unlock the potential of the excellent image quality and quantification capabilities provided by xSPECT technology. Training will cover agenda items on the ASRT approved checklist. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>MI SPECT Project Management</b></p> <p>A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemen's equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.</p>
1	<p><b>Low Contrast CT Phantom &amp; Holder</b></p>
1	<p><b>Symbia T / Intevo/T-Excel Complimentary Biomed Training</b></p> <p>This educational offering includes system training tuition for 1 clinical engineering professional on the Symbia T, Intevo, or T-Excel system, and the syngo multimodality workstation as applicable. The training curriculum depends on and is limited to the system purchased and may include multiple courses including classroom training in USA or an international site, and/or virtual and web-based training. Additional modality basics training may be required as a prerequisite to these courses and must be purchased separately. This system training includes a 15% discount. Travel and lodging are not included. This educational offering must be completed by the later of (12) months from purchase or install end date; if training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund. This forfeiture does not apply to Federal government agencies.</p>

Offset Part 14421656 Additional System Manuals

Offset MIS\_STIT\_BIOMD Complimentary Biomed Training

Initial onsite training 32 hrs Gov Offset

# Detailed Technical Specifications

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## Symbia Intevo Bold

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### Description

The Symbia Intevo Bold camera system consists of the following integrated features:

- Gantry
- Patient Bed
- Acquisition Workplace
- SPECT Acquisition Features
- CT Acquisition Features

#### Gantry

The gantry has two Variable Angle SPECT detectors and an open design with a 70 cm (27.6 in.) patient opening. The two low profile digital SPECT detectors can be configured at 76° or 90° for cardiac applications and at 180° or numerous other configurations for all other whole body and general protocols. The unobstructed gantry base permits planar imaging of seated and standing patients and patients on wheelchairs, or on standard imaging tables, gurneys and hospital beds. Optional caudal tilt of one detector allows for optimum detector positioning of static and dynamic acquisitions. The Ultra Fast Ceramic multislice spiral CT detector rotates at 120 RPM (0.5 sec per revolution).

The gantry supports circular and non-circular orbits. Autocontour, with infrared real-time body contouring, is a standard component which minimizes patient to collimator distance to 1.2 cm (0.45 in.) in Whole Body and SPECT non-circular orbit acquisition modes. All motorized motions of the system are controlled from hand controller which can be plugged into either side of the gantry.

The Patient Positioning Monitor is a touch screen flat panel which can be rotated for a wide range of user access and visibility. It is used for the following functions:

- Patient positioning with window and persistence adjustment
- Acquisition parameter display (elapsed time, time remaining, view number, count rate, etc.)
- Camera information (detector and bed positions)
- Gantry control (reconfiguration, collimator change, offset zoom, and adjusting the CT acquisition limits.)
- A fully integrated source holder is provided for quick and convenient quality control.

#### Patient Bed

The patient-oriented design of the imaging bed consists of 35.6 cm (14 in.) wide and 15 mm (0.6 in.) thin, carbon fiber pallet, supporting patient weights up to 227 kg (500 lbs). Minimum bed height is 53 cm (21 in.) for easy patient access.

Programmable table positions for wheelchairs and gurneys minimize the transport efforts of patients and staff. Integrated rulers on each side of the patient bed allow for

quick whole body set up. The bed also provides automatic, uninterrupted table feed for multi-rotation continuous CT volume scanning. The patient bed can be easily pivoted to the side for railfree access of sitting/standing patients, wheelchairs, imaging tables, gurneys and hospital beds.

#### Acquisition Workplace

The syngo-based high performance workstation provides a multimodality graphical user interface, keyboard and mouse. SPECT and CT acquisition, quality control, and display are integrated in a single workplace. Workflows for a wide variety of clinical protocols are included. The workplace offers customizable displays and full DICOM archiving and printing functionality.

#### SPECT Acquisition Features

##### SPECT Acquisition Modes

- Planar static and dynamic

## Description

- Whole Body
- SPECT
- Gated SPECT
- Dynamic SPECT
- Whole Body SPECT

### SPECT Features

#### Workflow Features:

The system combines acquisition, post-processing (optional), and display into user customizable workflows that automate many clinical routines, remembering parameters for each clinical protocol, the workflow will automatically print, archive, and distribute your results to other devices on your network.

#### Quality Control:

Automatic and manual motion correction features aids in the improvement of the quality of the acquired images. Besides correcting for motion, gated studies can be beat normalized and quality control images such as sinograms and linograms created to document the results.

#### 3D Orientation:

Reorient acquired SPECT volumes interactively to achieve the desired image orientation. Cardiac and general orientations are supported. If desired, the orientation applied to one volume can be automatically applied to up to 3 additional volumes.

#### Image Registration:

Multiple techniques provide accurate registration of acquired images including translation and rotation in three primary planes, optional automatic registration and landmark registration. The choice of output matrix size is a standard feature.

#### Reconstruction:

The reconstruction engine supports up to 5 multi-isotope studies concurrently. Standard SPECT as well as wholebody, dynamic and gated cardiac volumes can be created. Advanced techniques that provide high image quality come standard with our system:

- Flash Iterative Reconstruction  
Flash 3D is a 3D iterative image reconstruction solution which offers the best reconstruction resolution in the market today following NEMA requirements. Flash 3D reconstruction uses a measured 3D collimator beam model in the iteration process. Correct modeling of the collimator distributes the activity over the slices for more accurate reconstruction. With Flash, the spatial resolution of the collimator is modeled to maintain the precise shape of the lesion. As a result, images are reconstructed with more counts in the correct volume, increasing image contrast. The key components behind Flash 3D technology are:
  - Ordered Subset Expectation Maximization (OSEM) reconstruction algorithm using 3D collimator modeling to increase resolution and decrease noise, while maintaining the exact shape of organs and lesions, when compared to filtered back projection reconstruction.
  - CT Attenuation Correction that creates very precise attenuation maps from the high quality CT data to correct for attenuation and increase reading accuracy.
  - Scatter Correction that uses patient specific scatter projection estimates to form a generalized dual or triple energy window method to compensate for scatter during the iterative reconstruction process.

### CT Acquisition Features

#### CT Acquisition Modes

- Topogram, scanning perspectives: anterior-posterior (ap), posterior-anterior (pa), lateral (lat)
- Spiral CT, continuous volume scanning technique with uninterrupted table feed in the multi-rotation mode
- Sequential CT, incremental, slice-by-slice imaging mode with no table movement during data acquisition

### CT Features

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## Description

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### Fast kV:

Fast kV automatically recommends the optimal tube voltage for the individual patient and clinical indication. CT system adjusts mAs when the user changes the kV in order to maintain the same CTDIVol.

### CARE Dose 4D:

Care Dose 4D automatically determines the minimal x-ray dose level needed to obtain optimal image quality, for all scan modes. The initial or starting tube current for every axial slice position is determined from the topogram image. Then, during the data acquisition for each axial slice, the x-ray attenuation values are closely monitored and the tube current is adjusted, on a real time basis, to optimize the x-ray dose level for the specific organs and anatomy in the x-ray path.

Several clinical benefits are achieved with CARE Dose 4D:

- Significant x-ray dose reduction (up to 68 %) possible for all body regions scanned compared with standard sequence or spiral scanning
- Consistent, optimal image quality with the x-ray dose level unique for every patient and for every anatomical region
- Thinner axial slices and/or longer scan ranges possible because of reduced tube loading
- Ultra-low dose examinations for pediatric patients SureView™ – Multislice Image Reconstruction System
- Excellent Image Quality and no slice broadening at any pitch – IQ is kept constant for all scan speeds, independent of the selected range and scan time.
- Up to 20% dose savings in spiral mode.

### Workstream4D

4D workflow with direct generation of axial, sagittal, coronal, or double-oblique images from standard scanning protocols. Elimination of manual reconstruction steps. Reduction of data volume up to a factor of 10, since virtually all diagnostic information is captured in 3D slices. Fast image reconstruction of up to 16 images/s in 512 matrix is provided.

### Asynchronous Recon:

Asynchronous Recon allows for multiple image reconstructions and reformats, parallel to scanning. With this feature, up to eight reconstruction job requests can be loaded into a scan protocol. Immediately upon completion of the scan acquisition, these reconstruction jobs are automatically executed in the background without delaying the start of next patient examination.

### Image reconstruction:

Reconstruction using raw data zoom with the possibility of freely selecting the image center either before scanning (prospectively) or retrospectively.

### Image display:

CT value scale for window setting -1024 to +3071 HU. For very dense objects the CT value scale can be extended from -10240 to +30710 HU.

### Multiplanar Reconstruction (MPR)

Real-time MPR for real-time reconstruction of secondary slices. Slice orientation: coronal, sagittal, irregular as well as multiplanar with SIR and Oblique. Cutlines can be determined using the reference tomogram or in sagittal reformatted images (SRI). 512 x 512 reconstruction matrix.

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Symbia utilizes energy independent low profile digital Foresight detectors.

### Detector assembly technical specifications:

- True rectangular FOV of 38.7 x 53.3 cm (15.25 x 21 in.)
- 59 photomultiplier tubes – 53, 7.6 cm (3 in.) and 6, 5.1 cm (2 in.) diameter tubes
- .95 x 59.1 x 44.5 cm (3/8 x 23 x 17.4 in.) NaI (TI) crystal material

## Description

The Low Profile Digital Foresight Detector features:

- Balanced performance between energy resolution and spatial resolution
- One, 10-bit high-speed flash ADC per PMT
- Variable PMT selection ensures high resolution for all multi-energy and multi-peak applications
- Optimized dynamic digital integration time to improve high count rate capability
- Individual PMT pile-up correction for improved performance at high count rates
- Energy independence maintains clinical performance at all energies including multi-peak and dual isotope studies
- Location independence maintains consistent spatial resolution across the field of view
- Crystal variation correction for optimal uniformity and linearity across all energies

Single source (Co-57 or Tc-99m) tunes the detector for all energies

The low energy high resolution collimator has the following technical specifications:

- 148,000 hexagonal holes
- Sensitivity: 202 cpm/microCurie
- Resolution: 7.5mm at 10 cm
- Weight: 22 kg (49 lbs)

The medium energy collimator has the following technical specifications:

- 14,000 hexagonal holes
- Sensitivity: 275 cpm/microCurie
- Resolution: 12.5 mm at 10 cm
- Weight: 64 kg (140 lbs)

The pinhole collimator with 4 mm aperture has the following technical specifications:

- 1 round hole
- Sensitivity: 123 cpm/microCurie for 99m Tc
- Resolution: 6.6 mm at 10 cm
- Weight: 80 kg (177 lbs)

SPECT imaging with a pinhole collimator is not allowed.

The pinhole collimator occupies the upper 2 locations on a collimator cart; Therefore, only an additional 2 collimators (1 pair) can be stored on the same cart.

The 6 mm aperture has the following technical specifications:

- Sensitivity: 271 cpm/microCurie for 99m Tc
- Resolution 9.5 mm at 10 cm

The 8 mm aperture has the following technical specifications:

- Sensitivity: 478 cpm/microCurie for 99m Tc
- Resolution: 12.5 mm at 10 cm

The productivity package includes the following features:

- Integrated Collimator Changer
- Automatic Collimator Exchange
- Automatic Quality Control

### Integrated Collimator Changer

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## Description

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Innovative collimator exchange system that is mounted beneath the patient bed. Saves time and effort when collimators. Holds two sets of low or medium energy collimators including SMARTZOOM collimators.

### Automatic Collimator Changer

Fully automated changing of collimators within the integrated collimator changer. Collimator removal or exchange is initiated from the patient positioning monitor.

### Automatic Quality Control

Automatic quality control is performed via self-shielding Gd-153 line and Co-57 point sources. The sources are housed in the patient bed and are extended automatically as part of the camera's quality control procedures. The daily, weekly, and monthly procedures are customer scheduled and performed automatically without manual intervention.

Included is a seismic kit that includes a bar which attaches to the front of the Integrated Collimator Changer to retain the collimators in their respective drawers in the event of an earthquake.

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The collimator cart is automatically clamped to the patient bed once positioned by the user. The clamping mechanism allows precise collimator exchange to occur.

The collimator cart is designed to hold 2 sets of collimators, or 1 set in combination with a pinhole collimator.

Due to the weight of the high energy collimators, it is recommended that an individual collimator cart contains only 1 set of high energy collimators.

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The useful life of the 370 MBq (10 mCi) Gd-153 line, used for daily extrinsic floods and monthly multi-head registration procedures, is 2 years. The useful life of the 1.85 MBq (50  $\mu$ Ci) Co-57 point, used for intrinsic floods, is 1 year.

Sources that have been replaced are returned to the source vendor for disposal. Return shipment costs are not included in the purchase price.

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The xSPECT advanced reconstruction technique enables absolute quantification of uptake that is both accurate and reproducible for Tc99m, I123, In111, Lu177. With xSPECT Quant, quantitative values are derived automatically during the reconstruction in units of Bq/ml or SUV's. These values can be confidently compared across patients, systems and time.

Broad Quantification provides a streamlined clinical workflow for performing quantitative SPECT studies using a dose calibrator to calibrate the system. Radiopharmaceuticals supported includes: Co57, Ga67, I123, I131, In111, Lu177, Se75, Tc99m, Tl201, P32, Ra223, Re186, Sm153, Sr89, Xe133, Y90, Am241, Ba133, Gd153, I125, Kr81, Kr85, Rb81, Xe127, Yb169, C11, Cu62, F18, Ge68, N13, O15, and Rb82.

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xSPECT Bone is the most advanced SPECT bone imaging reconstruction software available. It uses the CT as the frame-of-reference for image reconstruction enabling CT-like anatomical clarity and resolution. xSPECT Bone defines five tissue classes: air, adipose, soft tissue, soft bone and cortical bone. Based on attenuation coefficients each image voxel in the  $\mu$ -map is indexed into one of these classes. The result is a patient-specific linear zone map, which can improve image resolution. For the first time, physicians can potentially detect and distinguish between cancerous lesions and degenerative disorders and may better visualize small or low-uptake lesions thanks to a level of clarity and image detail never before experienced in nuclear medicine.

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This package provides the following features:

- Heartview CT
- Calcium Scoring

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## **Description**

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### **Heartview CT**

Scanning technique and program for ECG-controlled data acquisition and image reconstruction for the Symbia Intevo 6, Intevo 16, T6 and T16 systems.

This option supports prospective ECG-triggered sequence scanning and retrospective ECG-gated spiral scanning to obtain CT images of the heart in defined phases of the cardiac cycle.

ECG-controlled imaging techniques are the basis for both the quantification of coronary calcifications (calcium scoring) and 3D reconstructions of cardiovascular anatomy. Retrospective ECG gating also allows functional imaging of the heart. Moreover, these techniques suppress pulsation or motion artifacts in the lung and in vessels close to the heart (e.g. ascending aorta).

### **Calcium Scoring**

The calcium scoring application supports volumetric processing of the data and treats individual calcified lesions as 3D objects. For effective visualization, axial images are displayed together with fast, interactive MIPs. Processing is as simple as marking calcified regions visualized in the coronary arteries. The application offers the following features:

- Agatston scoring, volumetric scoring and calcium mass quantification.
- Overlapping slice compensation.
- User configurable threshold for identifying coronary calcifications
- Semiautomatic selection of coronary calcifications by "3D picking" functionality
- User-defined assignment of lesions to one of the four arteries (LM, LAD, CX, RCA) or to other lesions or structures
- 3D editing of lesions
- Generation of a configurable report

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The Symbia Intevo and T series scanners come standard with a single hand controller that can be plugged into either side of the gantry. This option adds an additional hand controller for added efficiency in accessing the motorized motions for the patient bed, gantry, and detectors.

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Specifications:

1.4 KVA

Input configuration: 120 VAC, 5-15P

Output configuration: 120 VAC, (6) 5-15R

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The extended pivot increases the range from 33 degrees to 45 degrees to allow better handling of wide hospital beds.

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The dual monitor software option enables the Hybrid Acquisition Console to utilize 2 LCD or DICOM monitors thereby expanding your clinical flexibility and efficiency when running multiple workflows. This option allows you to optimally compare an old and a new study on the same patient, or to simply process more than one patient at the same time.

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Additional features include:

- 19" TFT panel
  - minimum of 170 degree horizontal and vertical viewing angle
-

## Description

- Optimal picture resolution of 1280 x 1024
- Contrast ratio 450:1
- Maximum luminance 280 cd/m<sup>2</sup>
- Anti-glare panel surface

Hospital promotional videos, patient procedure information, relaxation videos, and music CDs are just a few examples of the material that can be experienced with e.media.

Organ processing provides generic tools for the manipulation of NM images. In addition, it provides dedicated processing protocols for the many different types of exams performed in nuclear medicine departments. Features provided are:

- Cardiac: Planar Gated Blood Pool, First Pass, Shunt
- Lung: Perfusion, Ventilation, V/Q
- Thyroid
- Renal: GFR, ERPF, MAG3, Transplant, TER, Ace Inhibitor
- Gastric
- Hepatobiliary
- Brain: Patlok, Lassen, IMP, IMP-ARG, NIMS
- GSA Liver
- Parathyroid: Scaled subtraction
- Image manipulation tools: Series Filter, Series Arithmetic,
- Series Reformat, and Series ROI and Curve
- Manual Fusion

The Planar ½ Time Imaging package is based upon a statistical, adaptive de-noising and de-blurring process for planar imaging. It can be used to:

- Shorten the acquisition time of planar imaging, and/or
- Reduce the dose administered to the patient, and/or
- Enhance the image quality of statistically poor imaging results

This package supports images from NM, PET, CT, MR and AX and features the following:

### 3D Package

Basic 3D package used to navigate through volume data and to create surface shaded and maximum intensity projection images. This package supports the following features:

- Surface Shaded Display
- Maximum Intensity Projection (MIP)
- MPR user defined Thickness
- Interactive 3D volume rotation
- Interactive 3 slice display
- Oblique cuts at any angle within the volume
- Storage of fused results as DICOM secondary capture images
- Region of interest punch tool
- Curved cuts along any user defined pathway
- Storage of 3D results

### Image Fusion Package

Image Fusion Package for spatial alignment, superimposition, and visualization of image data of one patient where image data has been generated by different modalities. Supports optimal diagnosis by fusing the morphological with the functional information.

- Easy-to-use visual alignment with 6 degrees of freedom (3X translation, 3X rotation)

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## Description

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- Landmark based registration with convenient landmark editor for point-based registration using anatomical landmarks
- Storage of transformation matrix after registration for later retrieval
- Side by side visualization with correlated pointer and simultaneous scrolling
- 2D alpha blending in monochrome or pseudo-color with adjustable balance between the two superimposed data sets.

### Automatic Image Fusion

Enhances the existing Image Fusion Package with techniques for automatic image registration. Surface Matching and Mutual Information algorithms allow for mix of image registration between anatomic modalities and functional modalities.

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### Direct Volume Rendering Technique (VRT) for viewing 3D-volumes

Projection of volume information on to an arbitrarily orientation plane. For each projection ray the density, opacity, and refraction of the penetrated volume is evaluated and the resulting intensity/color is recorded. Independent control of color, opacity and shading of up to 4 tissue classes. Predefined VRT settings can be selected via an image gallery. 3D VRT can be supported by the optional Volume Pro graphics accelerator, providing image quality and performance enhancements.

As MPR, MIP, SSD or VRT are different visualisation filters of the same dataset, the user can arbitrarily switch between these modes as well as switch the actual display segment to full-screen mode. Reconstructed images or ranges can be stored or sent to the filming task card.

### Editing Functions to create and modify segmented objects

The integrated editing package allows segmentation of 3D datasets either with manual contour creation, by thresholding, or by volume growing operations. Dataset confinement is possible either using the ClipBox or a variable editing slab. Image quality can be improved with morphological operators such as Erosion and Dilatation.

The FusedVision3D features:

Single VRT

Fused PET/CT VRT display with MIP 3-D displays

VRT gallery

Full 3-D Object editor

Clip or Slab plane views

3 x 3 displays layout with correlated rotating MIP displays CT, PET and Fused datasets in a single page.

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The Cardiology Engine provides the Corridor4DM Cardiac Suite, a comprehensive set of quantitation programs for the evaluation of SPECT Myocardial Perfusion Imaging

The Corridor4DM application includes comprehensive interactive processing and display, generation of 2D, 3D, and polar maps images, calculation of ventricular volumes, myocardial mass and ejection fraction for gated SPECT studies and utilizes gated bloodpool data to calculate left ventricular Ejection Fraction. Compare perfusion and functional polar maps to gender matched normal files, which includes additional support for attenuation correction. Also included are a normal database generator and the ability to create reports within the Corridor4DM application. The Corridor4DM application is an OEM product developed and supported by INVIA.

Outputs include DICOM secondary capture files, result files, reports as well as the ability to generate an AVI or TIFF file.

Supported software for Profile Reconstruction cardiac data

Applications include: Corridor4DM Cardiac Suite

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The Cardiology Engine provides the Cedars Cardiac SPECT Suite, a comprehensive set of quantitation programs for the evaluation of SPECT Myocardial Perfusion Imaging

The engine calculates a comprehensive set of cardiac parameters including ejection fractions, volumes, wall motion including right ventricular free wall motion in QBS, wall thickening, perfusion (%). QPS allows for the

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## Description

quantitation of prone SPECT data and of serial perfusion changes. Both 20 and AHA-17 segment scoring models are available. In addition to calculating an Eccentricity Index, QGS also calculates a more regional measure of LV shape known as the Shape Index. Displays include gated slices with contours, a motion frozen display which results in better resolution and contrast by eliminating motion of the cardiac cycle, interactive 3D images, and polar maps. Manual over-ride of contours and DICOM compatible output are additional features. Outputs include DICOM secondary capture files, result files as well as the ability to generate an AVI file format. The Cedars application is an OEM product developed and supported by Cedars Sinai.

Applications include: Cedars SPECT Suite

Enhanced user management, including:

- User authentication to prohibit unauthorized access
- Privileges to define user/role based functionality
- Permissions to control data access
- Audit trails to log system and data access.

The useful life of the Co57 point sources is 2 years. Sources that have been replaced are returned to the source vendor for disposal. Return shipment costs are not included in the purchase price.

The useful life of both Se75 point sources is 1 year. Sources that have been replaced are returned to the source vendor for disposal. Return shipment costs are not included in the purchase price.

A broadband connection is required for full remote service functionality and optimal system uptime. The Smart Remote Service option allows for remote access to your networked workstations. Hardware may need to be purchased.

Features include:

- Image Transfer
- Remote updates including Virus Protection
- Error log retrieval
- Remote Workflow revisions
- Remote configuration
- License management
- Remote workstation control via netmeeting

Installation includes:

- Complete system assembly
- Alignment
- System startup
- Calibrations
- Performance verification to factory specifications

This option is required for all US Installations

teampay BASIC applications provide a locally installed teampay Receiver software with web-based data analytics capabilities in the area of Dose, Usage and Image data management.

teampay Dose BASIC application and teampay Usage BASIC application are restricted to datasets produced by Siemens modalities.

Its easy onboarding allows you to register on teampay's digital platform and download the needed software to set it up in your institution: Click > Try for free at [www.siemens.com/teampay](http://www.siemens.com/teampay)

### **teampay Receiver software**

teampay Receiver software is a DICOM gateway that is installed on the local institution network to manage communication of data between hospital systems and teampay servers and manage conformity with local data

## Description

privacy regulations.

Functionalities of the teamplay Receiver software:

- DICOM fetch and receive (Query/Retrieve and C-STORE)
- Choice of three data privacy levels
- Automatic software updates

The teamplay Receiver software can be installed on hardware or virtual machines provided by the customer meeting the minimum requirements listed below.

- Windows 64-bit server or client operating system  
(at least Windows server 2012 R2 or Windows server 2016 is recommended for a production environment although Windows 10 may be used):  
min. dual core CPU system  
min. 4 GB memory  
at least 200 GB free disk space (< 500 GB recommended)
- Recommendation for small sites (up to 50.000 procedures per year):  
at least 4 core system  
at least 8 GB memory
- Recommendation for medium sites (between 50.000 and 250.000 procedures per year):  
at least 6 core system  
at least 8 GB memory
- Recommendation for large sites (more than 250.000 procedures per year):  
at least 8 core system  
at least 16 GB memory
- At least 6 Mbit/s upload bandwidth to the Internet

*The minimum hardware requirements are applicable when fetching data for teamplay Dose and Usage using DICOM Q/R. For scenarios where data will be actively sent to teamplay using DICOM C-Store the hardware requirements depend on the actual load and needs to be adjusted accordingly. Please contact the Siemens teamplay support for help*

### **teamplay Dose:**

teamplay Dose provides easy access to dose data to support the quality assurance process for monitoring imaging radiation doses across the fleet of scanners in the institution.

### **teamplay Usage:**

teamplay Usage provides an intuitive way to display an overview of the fleet utilization of all institutional diagnostic imaging scanners.

### **teamplay Images Research:**

teamplay Images Research provides the functionality to receive imaging data from other teamplay members for research and education.

Caution: teamplay Images Research is not intended for clinical use.

### **teamplay Images:**

teamplay Images provides the functionality to receive imaging data from other teamplay members.

xSPECT Edition includes xSPECT Reconstruction, expanding your clinical capabilities. xSPECT technology utilizes an ordered-subset conjugate-gradient reconstruction (OSCGM) algorithm to register the SPECT information into the CT frame of reference providing the foundation for higher SPECT image resolution with xSPECT Bone (purchasable option) and accurate and reproducible quantitative results with xSPECT Quant and Broad Quantification (purchasable options).

Additionally, xSPECT Edition includes a Dedicated Reconstruction System (DRS). This high performance workstation is a state-of-the-art 64-bit computer architecture capable of handling high resolution data without impeding workflow. This workstation is seamlessly connected to the acquisition console by allowing the user to perform advanced reconstructions from the acquisition console.

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## Description

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SAFIRE: Dose reduction with CT has been limited by the currently used filtered back projection (FBP) reconstruction algorithm. When using this conventional reconstruction of acquired raw data into image data, a trade-off between spatial resolution and image noise has to be considered. Higher spatial resolution increases the ability to see the smallest detail; however, it is directly correlated with increased image noise in standard filtered back projection reconstructions as they are used in CT scanners today. Iterative reconstruction approaches allow decoupling of spatial resolution and image noise. With the Sinogram Affirmed Iterative Reconstruction (SAFIRE), correction loops are introduced into the image generation process. These iteration loops utilize raw-data information to significantly improve image quality. Additionally, image noise is removed in the iterative corrections the without degrading image sharpness. The noise texture of the images is comparable to standard well-established convolution kernels. The new technique results in a significantly superior image quality with reduced noise and increased image sharpness that can be translated to dose savings for a wide range of clinical applications. In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.

iMAR: The iMAR correction process is iteratively refined by repeating the normalized sinogram inpainting and the mixing steps thanks to the Adaptive Sinogram Mixing. Along with the new algorithm comes the simple user interface of iMAR. Besides the typical reconstruction parameters it only requires to select the desired protocol from a drop down menu which contains the following type of implants: dental fillings, neuro coil, thoracic coil, hip implants, extremity implants, pacemakers, spine implants and shoulder implants.

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The DoD Level Security option ensures that the system conforms to the Defense Information Systems Agency's Standard Technical Implementation Guides (DISA STIGs). This level of security provides for the following:

- Secure configuration and hardening
  - Whitelisting anti-malware protection
  - Quarterly security updates
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