

V.A MEDICAL CENTER  
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NORTHPORT, NY  
  
PO# 632-B30005

## Biograph mCT S 64

All items listed below are included for this system: *(See Detailed Technical Specifications at end of Proposal.)*

Qty	Item Description
1	<b>Biograph mCT-S(64)</b>
1	<b>Install Kit with PDU - mCT</b> Items necessary for install. Includes power distribution unit for connecting entire system to a single 3-phase power drop.
1	<b>PET Gantry UPS - mCT</b> Uninterruptible Power Supply (UPS) option providing 10 minutes of backup power enabling proper shutdown of the PET system in the event of power loss. Specifications: 8.0 KVA, 230 Volts, 50/60 Hz.
1	<b>Cooling System Water/Air - mCT</b> Water-to-air heat exchanger for the dissipation of heat loss generated in the gantry to the outside air. System operating temperature:20 - 26 degrees C, 15 - 75 % rel. humidity (not condensing). Ideal for installation far from the scan room. Cooling system contains to units, water/water exchanger close to the scan room and an additional remote water/air exchanger. Maximum distance between water/water unit and remote water/air exchanger up to 40 meters enabled by thin diameter of water transferring pipes.
1	<b>Cooling System US Install Kit - mCT</b> Kit for installation of the Cooling System Water/Air in US Includes: - Transformer for powering the Cooling System Water/Air - Service switch to shut off the outdoor cooling unit for maintenance or in case of emergency
1	<b>Biograph Ge-68 Sources</b> Calibration sources for the Biograph mCT. These sources are to be purchased with a new Biograph mCT scanner.
1	<b>Biogr. Uni. Phantom Shield-Fixed</b> Contains shield for the Biograph TrueV Uniform Phantom.
1	<b>Keyboard, English - mCT</b> Keyboard in the above-mentioned language.

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### **ultraHD•PET Option -mCT (AWP)**

Utilizing timing information (time-of-flight) between the two PET coincidence events, coupled with resolution recovery of HD•PET, ultraHD•PET option provides improved image signal-to-noise which can be used to either enhance image quality and/or reduce patient acquisition time. With a system timing resolution of 555 ps, the Biograph ultraHD•PET option takes PET imaging to the pinnacle of performance. HD•PET Package provides unprecedented PET image quality with clearer, more defined PET images from edge-to-edge of the field of view. The world's only clinical PET technology with near uniform resolution throughout the entire field of view, HD•PET is the first to deliver razor sharp, distortion-free image quality from edge to edge. Allowing you to precisely visualize lesions with exceptional contrast and clarity. HD•PET Package contains TrueX, an innovative image processing technique, as well as HI-REZ, and 3D iterative reconstruction. TrueX is an innovative image processing technology that is the final key to achieving HD•PET performance levels. Conventional PET technology ultimately causes loss of resolution and contrast in the final image, especially farther from the center of the field of view. TrueX technology utilizes millions of accurately measured point spread functions in the iterative reconstruction of the image, and produce High Definition PET images with improved uniformity, high resolution, and enhanced contrast. HI-REZ provides optimized image processing for maximum reconstructed image resolution for the most demanding clinical and research applications. Supported image matrices are 128x128, 200x200, 256x256, 400x400, and 512x512. 3D Iterative reconstruction (OSEM) provides improved image quality in the most demanding low statistics acquisitions.

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### **RTP Pallet**

RTP Flat pallet for Biograph mCT. The carbon fiber table top utilizes a quick release latch for easy on/off. Varian Exact(tm) compatible indexing for accessories.

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### **CT SAFIRE (AWP) - mCT**

The 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 to reduce dose. The part is currently not expected to be available for shipment until the third calendar quarter 2012.

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### **CARE Contrast (US) - mCT**

Integrated solution for a simplified bolus injector coupling. It synchronizes scan and contrast injection and transfers the injector protocol data in the patient protocol, in the e-logbook and to MPPS (if configured).

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### **BiographOn-site NEMA testing**

Class standard testing NU2-2007 tests are offered as follows for PET/CT.

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### **Installation (US/CAN)**

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### **English Manual - mCT**

Hardcopy of English Operator's Manual for Biograph mCT

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### **syngo.via Advanced User #1**

One Advanced User License of the syngo.via client server solution for multi-modality image reading. It provides 2D, 3D, 4D image reading capabilities at almost every workplace for various modalities (e.g. CT, MR, PET/CT, CR, XA image types). The syngo.via client runs on standard Windows computers in the network and integrates into radiologist's reading workplace (RIS; PACS) for efficient image reading based on a wide range of imaging applications (advanced visualization applications) for different clinical cases. Those applications are available as additional options for syngo.via. The syngo.via licensing model is flexible and tailored to the number of concurrent users (users working at the same time). The service support for syngo.via requires the provision of an administrator with dedicated tasks and a minimum broadband Internet connection bandwidth.

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### **syngo.via Advanced User #1+**

The additional syngo.via Advanced User license provides Advanced 2D, 3D, 4D image reading capabilities for an additional Advanced User

1	<b>syngo.mCT Oncology Engine</b> The syngo.mCT Oncology Engine facilitates lesion detection, staging, and treatment follow-up by enabling the registration visualization and quantitative analysis of PET.CT studies acquired across multiple time points on syngo.via.
1	<b>Local Client Oncology</b> This engine facilitates lesion detection, staging, and treatment follow-up by enabling the visualization, volumetric analysis, and registration/fusion of PET.CT studies acquired at three separate time points.
1	<b>syngo.mCT Oncology Engine #1+</b> syngo.mCT Oncology Engine for one additional user for syngo.via only. This engine includes only on syngo.via: - PET&CT Cross-Timepoint Evaluation - PET Segmentation It does not include any additional users for the MMWP.
1	<b>syngo.CT Segmentation #1</b> syngo.CT Segmentation provides automated segmentation and evaluation of lesions in lung, liver, lymph nodes and other organs.
1	<b>Server HW Config XL</b> syngo.via server hardware configuration XL
1	<b>Software License Ext. Server HW XL</b> Mandatory license extension for embedded applications on Hardware systems with more than one CPU. Second CPU license.
1	<b>HP Care Pack. 5y 13hx5d HW Support</b> HP Care Pack Services upgrade or extend the standard warranty with enhanced, customized on-site and remote support for hardware for 5 years.
1	<b>HP Rack 14 Units 19"</b> HP Rack Type Rittal for syngo(r).via server configurations. Physical Characteristics: Rack S10614
1	<b>UPS 100/110/120/127 V</b> Uninterruptible Power Supply for HP server with 3KVA capacity. The HP 3KVA UPS requires 2 units height in the rack.
1	<b>Monitor for Administration</b> HP LCD monitor 20"for syngo.via administration.
1	<b>syngo MMWP Client #1</b> This is a syngo MultiModality Workplace advanced post-processing workstation, comprising Windows XP PC with syngo(r) base user software, syngo 3D, syngo Expert-i and monitor. The syngo MMWP Client workplace is already prepared for advanced 3D post-processing regarding hardware performance and graphics card. The software functionality can be extended to suit specific user clinical needs by adding optional cross-modality and modality-specific application modules.
1	<b>Modality Integration MI</b> Modality integration of the syngo MMWP Client with primary use MI.
1	<b>syngo Keyboard USA English</b> English (US) syngo(r) keyboard
1	<b>19"Color Flat Screen</b> The DSC 1910 is a color LCD monitor with a resolution of 1280 x 1024 pixels.

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### **PACS-Driven Implementation Pkg.**

This PACS-Driven Implementation Package includes installation and integration services for syngo.via in a radiologic workflow mainly supported by the PACS functionality. This package includes professional services, such as: - Installation of the syngo.via server software on the server hardware - Installation of the syngo.via client software on one clinical workplace for one user - Connection to up to 5 DICOM nodes - Image call-up of syngo.via from the PACS' user interface - Integration of syngo.via into the IT infrastructure using Active Directory, if applicable - Configuration of basic syngo.via workflows and rules - Integration of one syngo.via client workplace with one syngo MultiModality Workplace.

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### **Upgrade PACS to RIS Implementation**

The syngo.via system has been previously installed with the PACS-Driven Implementation. It is now to be upgraded to the RIS-Driven Implementation Package. The RIS-Driven Implementation Package includes installation and integration services for syngo.via in a radiologic workflow mainly supported by the RIS functionality of a DICOM Modality Worklist for preprocessing of images in syngo.via. This upgrade package includes professional services, such as: - Image call-up of syngo.via from the PACS' or RIS' user interface, if image call-up has not been installed previously - Integration of syngo.via into the IT infrastructure using Active Directory, if it has not been configured in syngo.via previously - Configuration of DICOM Modality Worklist integration in syngo.via.

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### **Server HW Installation Service**

Basic installation service for the syngo.via server hardware with the operating system at the customer's site. Integration into the Local Area Network of the customer and to Siemens Remote Service over internet connection.

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### **MMWP Client HW Implementation Service**

Implementation services for one syngo MultiModality Workplace include the tasks for installation, configuration and integration of one syngo MMWP 2010A (VE40A).

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### **Apps Training and Basic Config 1day**

Apps Training and Basic Config 1day On-Site Application Training - targeted to give the user a solid base for understanding and applying syngo.via workflows and to operate the system within the clinical routine. The training is focused on three key users which have to be selected.

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### **Virtual syngo.via IT Admin Training**

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### **VIA Srvr Excel L XL Promo**

This promotion enables customers with purchase of a Siemens syngo.via system which includes Server hardware, syngo.via base license and corresponding user licenses a price reduction in the amount of \$20,000.00 for the syngo.via server Excel Edition, Server HW Config L, or Server HW Config XL. To qualify, Customer's binding purchase order must be received by Siemens on or before March 31, 2013 and syngo.via system delivery if not purchased with a Siemens scanner, must occur no later than September 30, 2013.

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### **VIA Advanced User Promo**

This promotion enables customers with purchase of a Siemens syngo.via system which includes Server hardware, syngo.via base license and corresponding user licenses a price reduction in the amount of \$10,000.00 for the syngo.via Advanced User license. To qualify, Customer's binding purchase order must be received by Siemens on or before December 30, 2012 and syngo.via system delivery if not purchased with a Siemens scanner, must occur no later than September 30, 2013.

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### **MI PET Project Management**

A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemens 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.

1	<p><b>Initial onsite training 32 hrs</b></p> <p>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.</p>
1	<p><b>Follow-up training 32 hrs</b></p> <p>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.</p>
1	<p><b>CT Cross Trainer</b></p> <p>CT Cross Trainer printed self study materials for (1) imaging professional. These materials will provide the user with basic CT knowledge by testing the participant periodically. Successful completion of the self study program will provide the participant with CE credits. CT Cross Trainer printed self study materials for (1) imaging professional. These materials will provide the user with basic CT knowledge by testing the participant periodically. Successful completion of the self study program will provide the participant with CE credits. 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>Additional onsite training 16 hours</b></p> <p>Up to (16) 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>
4	<p><b>e.class-Virtual Instructor Led Training</b></p> <p>One hour instructor led web-training for up to (4) imaging professionals to participate in. The one hour training will review advanced molecular imaging applications on the syngo multi-modality workstation. 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>
2	<p><b>Initial onsite training 12 hrs - PET Gat</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. 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>
3	<p><b>GOV'T ONLY - MI PET Training Class</b></p> <p>Tuition for (1) government attendee to attend a classroom course of choice at one of the Siemens training centers. 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>

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## OPTIONS:

Qty	Item Description
1	<b>HW HP Standard Client Workplace</b> HP minitower for syngo.via client workplaces.
1	<b>EIZO MX241W Display</b> The EIZO MX 241W is a color widescreen LCD monitor for clinical review with a resolution of 1920 x 1200 pixels.
1	<b>syngo.mCT Cardiology Engine 4DM #1</b> The syngo.mCT Cardiology Engine 4DM provides disease-oriented workflows on syngo.via allowing for speed in routine examinations while at the same time offering powerful functions and ease of use for complex cases. The Engine enables quantified perfusion assessment and functional analysis of PET studies and delivers excellent diagnostic risk assessment while automatically integrating multi-modality information into the workflow for differential diagnosis. Shortest time-to-report for highest efficiency: many time-consuming manual preparation steps are automatically performed. All the data is ready for immediate review when opening the case Software Modules: - syngo.PET Corridor4DM provides quantification and visualization of gated and non-gated PET myocardial perfusion and viability studies in a single integrated package. - syngo.CT Extension Corridor4DM performs review and reporting of CT studies, and the quantification of calcium burden in the coronary arteries. - syngo.CT CaScoring for quick risk assessment and coronary age calculation.
1	<b>syngo.mCT Cardiology Engine Pro #1</b> The syngo.mCT Cardiology Engine Pro provides disease-oriented workflows on syngo.via allowing for speed in routine examinations while at the same time offering powerful functions and ease of use for complex cases. The Engine Pro enables absolute quantification of myocardial blood flow and coronary flow reserve of <sup>13</sup> NH <sub>3</sub> -Ammonia or <sup>82</sup> Rb-Rubidium PET studies and delivers excellent diagnostic output from morphological to functional analysis while automatically integrating multi-modality information into the workflow for differential diagnosis. Shortest time-to-report for highest efficiency: many time-consuming manual preparation steps are automatically performed. All the data is ready for immediate review when opening the case. Additional Software Modules: - syngo.PET Myocardial Blood Flow provides quantitative assessment of myocardial tracer uptake to aid in the interpretation of dynamic myocardial perfusion PET <sup>13</sup> NH <sub>3</sub> -Ammonia and <sup>82</sup> Rb-Rubidium images. - syngo.CT Coronary Analysis for quantification of coronary stenoses / arteries. - syngo.CT Cardiac Function for left ventricular functional assessment.
1	<b>LAP Dorado Wall Mount Red</b> Includes one year warranty through LAP.
1	<b>Cardiac PET/CT Option - mCT</b> Provides both HeartView CT as well as PET cardiac gating acquisition/reconstruction.
1	<b>PET Dynamic Option # mCT (AWP)</b> Support for list mode acquisition, offline histogramming and reconstruction. Support for retrospective histogramming in any arbitrary frame durations of 3 second or greater, maximum of 100 frames defined by available disk space. Whole body (multi-bed) dynamic support of up to 25 passes.
1	<b>ECG monitoring module (UPMM) - mCT</b> Universal Physiological Monitoring Module (UPMM) provides patient cardiac ECG information for either CT or PET cardiac gating. Locates in the patient handling system for convenient patient connection. Includes patient cable.

1	<p><b>PET + CT Resp. Gating Option - mCT</b></p> <p>Provides both CT Respiratory and Triggering option as well as PET respiratory gated acquisition/reconstruction.</p>
1	<p><b>HD-Chest #AWP</b></p> <p>Adaptive respiratory gating for automated optimal, motion-freeze, providing improved image quality by reducing respiratory motion artifacts while providing optimized count statistics.</p>
1	<p><b>Respiratory Trigger System 3.0</b></p> <p>Respiratory trigger system for PET or CT Gating. The respiratory gating and triggering hardware is comprised of: chest/abdominal belt, pressure transducer, sensor port, Wave Deck, respiratory phantom, laptop PC with connecting cables. Power: 100-240 V, 50/60 Hz</p>
1	<p><b>Open Interface Resp. Gating - mCT</b></p> <p>Interface kit to connect to an external respiratory device. Important note: When using the open Interface and the cable to connect the CT scanner to an external respiratory device the customer accepts the responsibility of this connection. This is not valid when using the ANZAI respiratory sensor system provided by Siemens/ANZAI.</p>
1	<p><b>syngo 3D Bone Removal (AWP) - mCT</b></p> <p>Simple, automated bone removal functionality for the syngo 3D application. Preconfigured algorithms for angiography and hip/pelvis fracture scenarios are included to facilitate fast removal of bone structure for three dimensional presentation and analysis of CT data.</p>



# Detailed Technical Specifications

## Biograph mCT S 64

### Description

The Biograph mCT•S is a whole-body PET•CT tomograph designed for the purposes of oncological, neurological and cardiac imaging and diagnosis. With a single noninvasive procedure, the Biograph produces remarkable CT and PET•CT images that reveal highly-detailed anatomy and biological processes at the molecular level. The Biograph mCT provides:

- high performance spiral computed tomography (CT) imaging and applications.
- high-resolution, high-count rate, positron emission tomography (PET) imaging of metabolic and physiologic processes.
- highest quality anatomic and metabolic image registration for optimal lesion detection and identification within the body.
- highest quality attenuation correction and scatter correction for PET imaging.

Scope of Delivery:

Scanning Unit (Integrated PET•CT Gantry)

The fully integrated PET•CT gantry incorporates CT and PET detector assemblies and electronics in an efficient, compact design that reduces data transmission noise and increases system reliability. The large gantry opening, continuous patient port and short tunnel length provide ease of positioning for all patient types and help to minimize patient claustrophobia. Quad operator controls on gantry for positioning from either side of patient from either the front or rear. Dual gantry displays (front and rear) for system status.

## Description

### CT System

The CT imaging capability of the Biograph mCT consists of a 64-slice CT featuring a full range of SPIRAL CT clinical applications with highest performance.

#### Gantry:

Aperture: 78 cm; power supplied via low-voltage slipring.

Rotational speed of the gantry: 182 rpm with a rotation time of 330 ms.

#### Scanning system:

Adaptive Array Detector (AAD) system based on UFC™ (ultrafast ceramics) with up to 23,552 elements depending on configuration, and 1472 measuring channels per slice (the measuring system can contain replacement components).

#### STRATON tube high-performance X-ray system:

The STRATON tube provides direct oil cooling of the anode with the ball bearings located outside the vacuum. The direct anode cooling and the small and compact design of the anode eliminates the need for heat storage capacity (0 MHU) and enables an unprecedented cooling rate of 7.3 MHU/min. Therefore cooling delays between multiple long range scans are eliminated, even for large patients. Tube current range: 20-800 mA. Focal spot size according to IEC 60336: 0.7 x 0.7mm/7°, 0.9 x 1.1mm/7°. Computer controlled monitoring of anode temperature, multifan principle with flying focal spot.

#### Z-Sharp technology:

The unique STRATON X-ray tube utilizes an electron beam that is accurately and rapidly deflected, creating two precise focal spots alternating 4,608 times per second. This doubles the X-ray projections reaching each detector element. The two overlapping projections result in an oversampling in z-direction, known as Double z-Sampling. The resulting measurements interleave half a detector slice width, doubling the scan information without a corresponding increase in dose. Siemens' proprietary, high-speed Ultra Fast Ceramic (UFC) detector enables a virtually simultaneous readout of two projections for each detector element - 2 x 32 slices for every viewing angle - resulting in a full 64-slice acquisition.

#### 80 kW X-ray generator:

Microprocessor-controlled, low-noise high-frequency generator with integrated, automatic self-testing system for continuous monitoring of operation. Settings: High-voltage range 80,100, 120 and 140 kV; power max. 80 kW, adjustable in fine steps.

### PET System

The PET imaging capability of the Biograph mCT consists of the multi-LSO-detector ring system with 3D acquisition and reconstruction and 81 image planes with a 16.2 cm axial field of view.

OptisoHD detection system provides:

- High spatial slice resolution in trans-axial and axial dimensions.
- Slice spacing (2 mm) optimized for speed and resolution.
- Pico-3D ultra fast electronics for decreased deadtime and high signal-to-noise.
- ACS III acquisition computer system for high countrate capability.
- PRS reconstruction system for fast reconstruction of PET data.
- Three-dimensional display of organs with a large axial view.
- Excellent volume sensitivity.
- Fast acquisition and reconstruction of 128 x 128 and 200 x 200 matrices.
- Unique block detector technology provides excellent temporal and energy resolution response.
- Simultaneous data acquisition and image reconstruction for high patient throughput.
- Static and whole body acquisition capability.
- 842 mm detector ring diameter.
- 78 cm gantry aperture.
- 70 cm transverse field of view
- 16.2 cm axial field of view.
- Unique, accurate Patient Handling System.
- TrueC advanced scatter correction technique

### Patient Handling System

The Biograph mCT patient handling system (PHS) has a unique reinforced cantilever design that ensures reliable

## Description

patient support with the highest weight capacity and minimal pallet deflection. As one of the pillars of SMART (Siemens Molecular & Anatomical Registration Technologies), the PHS provides:

- Reinforced cantilever design for maximum patient support and absolute positioning between PET and CT scan.
- Integrated patient table design for easy patient positioning.
- Low attenuation carbon fiber pallet.
- 43 cm vertical motion range.
- Maximum 190 cm PETCT co-scan range.
- Low attenuation head holder, table extensions, head-arm support, knee-leg support.
- Maximum patient weight of 227 kg (500 lbs.).

Control and evaluation unit:

CT control box with intercom system with user-programmable patient instruction system. Dual monitors (19 inch (48 cm) LCD flat panel displays), keyboard and mouse for syngo Acquisition Workplace.

Computer system:

The computer system of the Biograph mCT consists of four components.

- syngo Acquisition Workplace console for the planning and execution of the CT examination, including evaluation and management of the CT images
- Reconstruction computer for the preprocessing and reconstruction of the CT data
- PET acquisition system (ACS III)
- PET data reconstruction system (PRS)

The syngo Acquisition Workplace console consists of a high-performance Celsius Windows XP based computer with Quad Xeon 2.53 Ghz processor, 8 GB RAM, 300 GB storage capacity for 480,000 images, DVD DICOM with 4.7 GB media for 8,000 images. External USB 2.0 devices for data storage are supported (recommended: Iomega 160 GB External Hard Drive Hi-Speed USB 2.0; Maxtor One Touch 160 GB External Hard Drive).

The CT reconstruction computer contains a cluster of 2 high-performance processors performing the preprocessing and reconstruction of the CT data at up to 40 images/sec (512x512). Raw data memory is 900 GB.

The PET acquisition system (ACS III) provides high performance acquisition and sorting of 3D coincidence events. Supports 3D static and 3D whole body acquisition modes. Contains dual Xeon 2.33 GHz processors with a total of 32 GB RAM. Disk storage of 1.0 TB for PET raw data is provided.

The PET reconstruction system (PRS) provides fast 3D image reconstruction of the PET raw data. Iterative and backprojection are supported. Contains dual Xeon 2.4 GHz QuadCore processors, Tesla C1060 GPU, 12 GB RAM. Disk storage of 1.0 TB for PET raw data.

syngo User Software:

syngo features an intuitive and thus easy-to-learn user interface. syngo visualizes the examination in individual process steps on so-called task cards, such as patient registration or examination card. A large number of functions and input parameters as well as the language used can be selected according to individual requirements. Frequently repeated processes can be automated and saved.

Patient registration - The system can accept patient data in different ways. These include entering the data via keyboard or transfer of a worklist via network. DICOM Worklist: Software module for accepting lists of patient data and exam requirements from a Radiology Information Systems (RIS) via DICOM Get Worklist functionality. The program enables very efficient working and ensures consistent patient data.

Examination card - The scanner is supplied with a large number of predefined CT and fully integrated PET•CT examination protocols, making examination planning a very fast and efficient procedure.

Viewing card - On the viewing card it is possible to move interactively with the mouse through the image volume of the ongoing examination. The images of different examinations can be displayed in parallel for comparison. A large number of functions are available for evaluation, documentation and archiving.

Filming card - A virtual film sheet shows a 1:1 display of the film sheets to be printed out, thus permitting an effective preview of the filming job and re-windowing the images, as well as providing a large number of evaluation functions. Layout changes are possible interactively with up to 64 images. The printout parameters for the ongoing auto-filming running parallel to acquisition or reconstruction are also defined with the filming card.

3D card - The 3D task card contains the User Interface for the operation of the MIP (Maximum Intensity Projection), SSD (Surface Shaded Display), MPR (Multi-planar Reconstruction) three-dimensional post-processing.

## Description

3D VRT - Advanced 3D functionality as an extension to the basic 3D viewer, containing volume rendering technique (VRT) and advanced editing functions. Advanced 3D application package for the optimal display and differentiation of different organs through independent control of color, opacity, and shading in up to 4 tissue classes.

CT Angio: Software for the reconstruction of angular projections from the images of a spiral data record for the display and diagnosis e.g. of aneurysms, plaques, stenoses, vascular anomalies or vascular origins. MIP: Maximum Intensity Projection, MinIP: Minimum Intensity Projection and Thin MIP available. Interfering or irrelevant parts of the image can be eliminated with the integrated volume editor. The angular projections are reconstructed around a definable axis, whereby the maximum CT values in this direction are selected for each angular projection. The resulting images can be viewed with the CINE function as a series of images with a 3D image effect.

Workstream – Planning and reconstruction of diagnostic CT coronal, sagittal, oblique and MIP images can take place directly after scanning.

DynEva card: Software for dynamic evaluation of the contrast enhancement in organs and types of tissues, enabling the reconstruction of

- Time-density curves (up to 5 ROIs)
- Peak-enhancement images
- Time-to-peak images.

Video Capture and Editing Tool: Software contains integrated solution for imaging and visualization of 4D information, allowing the generation and editing of video files for improved diagnoses, recording and teaching. A wide range of multimedia formats is supported, e.g. AVI, Flash (SWF), GIF, QuickTime (MOV), streaming video.

HD FoV - Extended Field of View - option which allows visualization of objects with a CT FOV up to 78 cm., and improved CT image quality beyond the traditional 50 cm CT FOV for improved PET attenuation correction.

TrueD Basic: Single-mode, single timepoint layout for displaying the PET and CT either fused or side-by-side comparison with viewer formats and color map tables. Support for 3D spherical regions-of-interest with units of Bq/ml or Standard Uptake Value (SUV). Allows re-registration of PET to CT data for correction of misregistration as a result of patient motion.

Media Viewer: Provides basic viewing capabilities in a portable Windows-based application that can be burned to media (CD, DVD) along with patient images. Not intended for diagnostic use.

- Review volume datasets from CT and PET
- Supports viewing single-modality or fused images
- View linked axial, coronal, and sagittal views
- Navigate in three dimensions
- View MIP images correlated to axial, coronal, and sagittal views
- Blend fused images
- Quantify Hounsfield units, SUV

CARE Solutions:

UFC Detector: Up to 30% dose reduction compared to conventional CT detectors. High efficiency for low mAs requirements enable best possible image quality with low patient dose.

CARE Filter: Specially designed X-ray exposure filter installed at the tube collimator. Up to 25% dose reduction with increased image quality.

With the introduction of Siemens' unique FAST CARE platform, the Biograph mCT is set to raise the standard of patient-centric productivity. Utilizing FAST – Fully Assisting Scanner Technologies -, typically time-consuming and complex procedures during the scan process are extremely simplified and automated, not only improving workflow efficiency, but optimizing the overall clinical outcome by creating reproducible results, making diagnosis more reliable and reducing patient burden through streamlined examinations.

FAST Scan Assistant: An intuitive user interface for solving conflicts by changing the scan time, resp. the pitch and/or the maximum tube current manually.

FAST Adjust: assists the user to handle system settings in a fast and easy way by automatically solving of conflicts within user defined limits by one single click on the FAST Adjust button. The limits for scan time and tube current

## Description

per scan are defined via the Scan Protocol Assistant. FAST Adjust offers an undo functionality to return to previously set values.

CARE kV: Automated, organ-sensitive voltage setting to optimize contrast-to-noise-ratio and reduce dose by up to 60%.

CARE Profile: Visualization of the dose distribution along the topogram prior to the scan.

CARE Dashboard: Visualization of activated dose reduction features and technologies for each scan range of an examination.

CARE Child - Pediatric Protocols: Special examination protocols with 70 or 80 kV and a large range of adjustable mAs values for optimum adaptation of the radiation exposure to the age and weight of the child to be examined.

CARE Topo: Real-time topogram, Manual interruption possible once desired anatomy has been imaged.

CARE Bolus: Operating mode for CM-enhancement triggered data acquisition. The objective is optimum utilization of the contrast medium bolus in its "plateau" phase in the target organ. This option has been especially adapted to the increased speed and timing requirements resulting from the multirow capability and faster rotation. The CM enhancement is observed via monitoring scans in a user-defined ROI with a trigger threshold. As soon as the enhancement reaches its predefined threshold, the spiral scan is triggered as quickly as possible. License for software use on one modality.

CARE Dose4D: This software feature provides automatic, real-time x-ray dose management for all scan modes. The minimal x-ray dose level needed to obtain optimal image quality is determined from extensive computer analysis of the Topogram image and also from the data collected during every slice scanned, on a real time basis. This automatic approach ensures optimal image quality at the lowest possible x-ray dose. CARE Dose4D uses at first a automated adjustment of the dose level depending on patient size based on the attenuation values obtained from the standard topogram along the patient axis. In addition CARE Dose4D uses a real-time adaptation of the tube current during the scan based on the actual attenuation of the X-ray beam measured around the patient. Up to 2,320 projections are evaluated per second to optimize the mA level instantaneously. In combination with the extreme adjustment speed of the tube current, CARE Dose4D ensures consistent high quality images in every anatomical position. And that's at anytime with the minimal possible X-ray dose.

Several clinical benefits are achieved with CARE Dose4D:

- 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.

CARE Dose Configurator: Enhancement of Siemens' renowned real-time dose modulation CARE Dose4D, introducing new reference curves for each body region and for each body habitus allowing to adjust the configuration even more precisely to the patient's anatomy.

Dose Notification: As requested by the new release of the standard IEC 60601 3rd edition, the Biograph mCT provides the ability to set dose reference values (CTDIvol, DLP) for each scan range. If these reference values are exceeded the Dose Notification window informs the user.

Dose Alert: As requested by the new release of the standard IEC 60601 3rd edition, the Biograph mCT automatically adds up CTDIvol and DLP depending on z-position (scan axis). The Dose Alert window appears, if either of these cumulative values exceeds a user-defined threshold.

Adaptive Dose Shield eliminates clinically irrelevant radiation in every spiral scan, adding to the lowest possible dose that CARE Solutions provide.

Examination and Evaluation Functions:

Topogram: Scanning perspectives: a.p., p.a., lat.; length of scan field: 128 - 1974mm, width of scan field: 512 mm, 1.5 - 20s. The topogram can be switched off manually when the desired examination length is reached.

Tomogram: Scan field size: 50 cm. Standard scan times: 0.33, 0.5 and 1 seconds. Slice thickness in sequence: 0.6, 0.75, 1, 1.2, 1.5, 2.0, 2.4, 3, 3.6\*\*, 4.0, 4.8, 5, 6, 7, 7.2, 8, 9, 10, 12, 14.4, 15, 20 mm  
Slice thickness in spiral: 0.4\*\*, 0.5\*\*, 0.6, 0.75, 1.0, 1.5, 2, 3, 4, 5, 6, 7, 8, 10 mm  
(\*\*optional with z-UHR)

## Description

Real-time image display. Immediate image reconstruction and display without time delay simultaneously to data acquisition in 512 x 512 matrix size.

Spiral: Scanning technique for continuous volume scans with continuous table feed in multirotation mode. Max. scan time 120 seconds with full low-contrast resolution. Volume length 1940 mm with full low-contrast resolution. Selection of the pitch factor between 0.3 and 1.5 depending on scan mode. Selection of up to 33 separately parameterizable examination ranges in a patient protocol. In addition individual anatomic sections can be successively combined and then scanned automatically. Storage of up to 10,000 examination protocols. Rotation times/cycle: 0.33 sec, 0.5 sec and 1 sec.

Dynamic: Program for functional dynamic examinations. Serial scanning technique in one slice position with variable scan cycle times.

Serio sequential examination without table feed: Up to 100 scans in uninterrupted, continuous sequence without table feed. Scan cycle time: 0.75 - 60 seconds.

Multiscan spiral examination without table feed: Continuous multirotational data acquisition in one slice position. Quantitative evaluation and graphical display of time-density curves.

WorkStream4D with Asynchronous Recon: 4D workflow with direct generation of axial, sagittal, coronal, or double-oblique images from standard scanning protocols. Elimination of manual reconstruction steps. 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 and storage: Image reconstruction in full resolution (512 x 512 matrix) takes place during the examination with up to 40 images per second, with full cone beam reconstruction, z-Sharp Technology and full image quality. Reconstruction fields of 5 cm to 50 cm through raw data zoom with the possibility of freely selecting the image center either prospectively before each scan or retrospectively. Reconstructions of different slice thicknesses from a single raw data record, e.g. lung soft tissue and lung high-contrast with CombiScan, with simultaneous suppression of partial volume artifacts. Up to 8 reconstructions per scan range can be predefined with the examination protocol. Patient-related storage of the image and raw data.

Image display: 1024 x 1024 display matrix; screen splitting configurable up to 64 image segments; CT value scale from -1024 to +3071 HU. For very dense objects, the CT value scale can be extended from -10240 to +30710 HU (extended CT scale) e.g. for suppressing metal artifacts.

Image evaluation: Complete software-controlled image evaluation program for all diagnostic requirements.

CINE Display: Dynamic display technique for the visualization of time or volume series. A series of up to 1024 images can be displayed at a frame rate of at least 30 f/s. Automatic or interactive mouse-operated control.

Multitasking functions: Simultaneous processing during operation of the scanner.

Real-time Display: Image reconstruction in pace with the examination in full image quality (512 x 512 matrix) with up to 40 images/second (with full cone beam reconstruction and z-Sharp Technology).

Metro Display: Simultaneous display, processing and evaluation of images from other patients while the current patient is being scanned.

Metro Documentation: Simultaneous documentation of images from any previously examined patient while the current patient is being scanned.

Metro Copy: Automatic transfer of image data to the syngo CT Workplace (optional) or a DICOM network node.

### Networking and Documentation

For the connection to a local Ethernet (10, 100 Mbit or 1-Gigabit) in order to communicate with networked printers, diagnostic and therapy workstations, RIS or HIS systems and teleradiology routers.

### Scope of functions:

- Configurable network stations.
- Unlimited selection of stations.

## Description

- DICOM Standard (Digital Imaging and Communications in Medicine) for the transfer of information between DICOM-compatible units from different manufacturers. The scope of functions is described in detail in the DICOM Conformance Statement, and the standard version comprises the functions Send/Receive, Query/Retrieve and BasicPrint, Worklist, Storage Commitment, MPPS (Modality Performed Procedure Step).

### System Documentation (1 set)

#### Siemens Remote Service:

Siemens Remote Service (SRS) offers a wide range of medical equipment-related remote services resulting in increased system availability and efficiency. SRS employs sophisticated authentication and authorization procedures, state-of-the-art encryption technologies and logging routines together with strictly enforced organizational measures that provide optimal patient data security and access protection. The following SRS services are included for all service agreement customers and during warranty period:

**Remote Diagnosis & Repair:** In case of an unforeseen system malfunction, Siemens competent experts may directly connect with the CT system in order to identify the problem quickly. Moreover the remote repair function enables Siemens to often correct software errors immediately. Should an engineer on site be required, Remote Diagnosis & Repair allows Siemens to identify defective parts efficiently and accelerate their delivery, thereby keeping repair times to a minimum.

**Event Monitoring:** Event Monitoring screens the performance of the system. If a parameter deviates from a predefined value, a status message is automatically sent to the Siemens UPTIME Service Center. Service Engineers may evaluate the status message at periodic intervals and may initiate appropriate action within the scope of the service agreement.

### Sources consist of the following:

2 LS-ART Set-up rod sources (Max. 46.25 MBq per rod source)  
1 CS-27 Low Activity Uniform Phantom (Max. 92.5 MBq)

Disposal of sources is not included in sale price.

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 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.

The part is currently not expected to be available for shipment until the third calendar quarter 2012.

CARE Contrast III supports a smart coupling of the CT system and the contrast medium injector to provide an easier, faster and safer contrast workflow in CT scanning. It facilitates contrast enhanced clinical workflow by synchronizing CT scan and contrast media injection using a single button control from either the scanner or the injector. It speeds up clinical workflow and allows efficient and confident monitoring of patients for extravasation during contrast media injection and scan delay countdown, even if only one technician is present.

CARE Contrast III is based on the international standard for the communication between CT and injector (CANopen Application profile for medical diagnostic add-on modules, Part 2: Injector). Due to its open interface technology it is ready for future applications.

In addition, the injection parameters are automatically transferred to the patient protocol, the e-logbook and to MPPS (if configured) thus completing the data for the examination therein. With this, no separate documentation is needed resulting in significant workflow improvements: e.g. the injector information is available from the PACS when reading the images or it is accessible from the HIS/RIS. The injection parameters are also displayed on the

## Description

contrast card.

CARE Contrast III also fulfils CANopen 425, class 4. This includes contrast protocol definition on the CT scanner (via Scan Protocol Assistant) and linking of contrast protocols with scan protocols. Next to the synchronized start of scan and injection from either the scanner's user interface or the injector's user interface, CARE Contrast III automatically transfers the injection parameters from the CT scanner to the injector.

Including 3D Spatial Resolution (NU 2-2007 Ch. 3); 3D scatter fraction, Count losses, and randoms measurement (NU 2-2007 Ch 4 ); 3D Sensitivity , according to (NU 2-2007 Ch 5). Modifications, changes or additions to these tests subject to factory approval and quotation.

All radioisotopes (e.g. Fluorine-18) to be provided by the site.

Loaner phantoms available from factory.

90 day lead time on scheduling. Estimated 1 week to complete measurements on site.

### Brief description

*syngo.via* provides one graphical user interface to prepare and read images from various modalities.

Supported images types are:

- Computed Tomography Images
- Magnetic Resonance Images
- PET Images
- Computed Radiography Images
- Digital X-Ray Images
- X-Ray Angiographic Images
- X-Ray Radio-Fluoroscopic Images
- Ultrasound 2D Images
- Secondary Capture Images
- Encapsulated PDFs

### Standard reading functions, such as:

- Browser functionality for fast patient and data access
- Case navigator for easy and fast case navigation
- Automatic image Processing,
- Automatic Loading and displaying of images in user-specific layouts, Multiple layouts for 2D, 3D diagnosis
- Ad Hoc workflow change for flexible Application handling
- Scrolling through images (e.g. movie mode, fast mouse scrolling, synchronized scrolling)
- Mirror, rotate, invert, windowing, pan/zoom, annotations, distance and angle measurement, pixel lens, ROI / VOI evaluation
- Findings navigator - create, collect ,navigate and present findings quickly
- Correlated cursor
- Series synchronization for pan/zoom, windowing, LUT, scrolling
- Locked navigation of different modality types (e.g. MR / CT)
- User-defined context menu
- Snapshot images as secondary capture

### Integrated 3D tools, such as:

- All reformats immediately available: VRT, MIP, MIP thin, MinIP, MPR thin / thick, interactive slice thickness change
- VRT Punch, VRT Gallery
- Clip plane and clip box
- Bone and Table removal for fast segmentation
- MPR/MPR Fusion and registration
- Parallel and radial range
- 2D & 3D reference lines, 3D Reference Point
- Movie export



## Description

### Applications for dedicated clinical areas

Beside standard 2D/3D capabilities, the following advanced functionalities for dedicated clinical areas are part of *syngo.via*.

These applications are medical products in their own rights and necessary country-specific approvals might not yet be available (e.g. 510k, CE Mark).

#### *syngo* CT Coronary

Review Marker, Heart Isolation, Movie (Beating Heart), • Plaque Visualization, Manual Coronary Tracking (> 2 click centerline), Cardiac Planes, Curved & Cross-Section MPR, Context-specific Reporting

#### CT Vascular

Review Marker, Manual Vessel Tracking (> 2 click centerline), Curved & Cross Sectional MPR, Integrated Reporting Plaque Visualization,  
- Context-specific Reporting

#### PET&CT Oncology

- Navigation between segments, Timepoint comparison (two timepoints),
- Image fusion and Registration, RECIST/WHO measurement, • PET and MR visualization, Basic PET evaluation, Image fusion, Registration, 3D overview image,
- Context-specific reporting

#### *syngo.CT* Dual Energy

The *syngo.CT* Dual Energy offers a viewer that displays a fused image for initial diagnosis. It includes Optimum Contrast to calculate automatically contrast-optimized images as well as the possibility to calculate monoenergetic images for a range of 40 - 190 keV. The additional, optional Dual Energy applications utilize *syngo* Dual Energy's two data sets even further: the material-specific difference in attenuation enables an easy classification of the elementary chemical composition of the scanned tissue. Works only with Dual Energy images from SOMATOM Definition and Definition Flash.

#### MR Reading

- MR Reading workflow
- Follow-up support: Follow-up layout for easy comparison between two timepoints.
- Rescan handling: Repeated scans are collected in one stack that provides an overview layout to select the best rescan for reading.
- Workflow customization and creation: MR Reading allows the user to generate new, customized workflows.
- Context-specific Reporting

### Workflow Automation

- Triggered by PACS or modality:  
Disease-specific workflow mapping can also be done based on image information (modality and/or study description)
- Triggered by RIS:  
*syngo.via* requests the DICOM Modality Worklist (DMWL) from the connected RIS to enable automatic disease-specific workflow mapping and prefetching of examinations from PACS for follow-up reading.

### Context-specific reporting:

- Context-specific reports can be derived from different clinical applications (structured reporting).
- Findings collected in the Findings Navigator can be transferred to context-specific reporting application and can then be stored as DICOM Structured Reports.
- The reports created with *syngo.via* are stored as encapsulated PDF DICOM objects. Additionally the report can be saved in the file system as a PDF file. The stored PDF report can be viewed and printed by the clinical user.
- With RIS integration package and an additional license, the report content can be transferred to the RIS via HL7.

### Further functionality, such as:

## Description

- "Direct Image Transfer" for Siemens modality integration
- *syngo* Expert-i support for *syngo* MMWP integration
- *syngo.plaza* Integration
- Query/retrieve from DICOM nodes
- Export images and Movie and creating patient media
- Filming (DICOM print) or postscript printing functionality

### Integrated elearning:

- *syngo.e-Learn* – integrated electronic learning for *syngo.via* workflows and clinical applications.
- Available languages: English

### Prerequisites for all service related issues:

- Availability of a customer administrator that performs dedicated administration and support tasks (e.g. 1st line support, data security, backup,...).
- Minimum broadband internet connection bandwidth for uncompromised service support are 2000 kBit/s downstream and 512 kBit/s upstream.  
Otherwise, certain support services may not be provided and the agreed remote response time cannot be guaranteed.

#### Specification of minimum broadband internet connection in detail:

- Downstream: 2000 kBit/s for Software update, IT- and Application support
- Upstream: 512 kBit/s for Application support
- Upstream: 256 kBit/s for Software update and IT support

### Scope of delivery:

- DVDs with *syngo.via* software  
(software license for one *syngo.via* client user)

### Brief description

In addition to the standard 2D/3D/4D reading capabilities, the following advanced functionalities for dedicated clinical areas are part of *syngo.via* Advanced User.  
These applications are medical products in their own rights and necessary country-specific approvals might not yet be available (e.g. 510k, CE Mark).

#### *syngo* CT Coronary

Review Marker, Heart Isolation, Movie (Beating Heart), • Plaque Visualization, Manual Coronary Tracking (> 2 click centerline), Cardiac Planes, Curved & Cross-Section MPR, Context-specific Reporting

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Review Marker, Manual Vessel Tracking (> 2 click centerline), Curved & Cross Sectional MPR, Integrated Reporting Plaque Visualization,  
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- Navigation between segments, Timepoint comparison (two timepoints),
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Description
<p>MR Reading</p> <ul style="list-style-type: none"> <li>- MR Reading workflow, Follow-up support: Follow-up layout for easy comparison between two timepoints.</li> <li>- Rescan handling: Repeated scans are collected in one stack that provides an overview layout to select the best rescan for reading.</li> <li>- Workflow customization and creation: MR Reading allows the user to generate new, customized workflows.</li> <li>- Context-specific Reporting</li> </ul> <p><b>Scope of delivery:</b></p> <ul style="list-style-type: none"> <li>- software license for <i>syngo.via</i> Advanced User</li> </ul>
<p>The <i>syngo.mCT</i> Oncology Engine enables physicians to efficiently compare patient scans from multiple time points (e.g. pre- and post-therapy) by automatically registering and displaying PET/CT images from studies. It assists physicians in making better-informed diagnostic, therapeutic, and follow-up decisions.</p> <p>Quantitative analysis of lesions in terms of volume, average and max SUV are performed in order to assess changes in activity and size, as part of evaluation of therapeutic response. Findings can be tracked using the findings navigator and are automatically stored and can be used in the final report.</p> <p>To assist NaF bone scan reading, the system additionally creates 4 projections: anterior, posterior, left and right lateral. These projections can be displayed in the MM Reading task.</p>
<p>Oncologic diagnosis demands a volumetric visualization technique that provides fused anatomical and functional volumes into orthogonal or arbitrary oriented planes using multiple layout views or full screen mode.</p> <p>This engine enables physicians to efficiently compare patient scans from three different time points (e.g., pre-therapy, post-therapy and follow-up) by automatically registering and displaying PET/CT images from studies acquired at different times. This engine assists physicians in making better-informed diagnostic, therapeutic, and follow-up decisions. The engine can display all studies at the same time in a comparison layout or use a single study layout. While single-study layouts are displayed, the other studies are available in the back-ground. Quantitative analysis of a lesion in terms of volume, HU level and average and peak SUV values are done simultaneously by linking the studies which are loaded, to assess changes in lesion number, activity and size, often for evaluation of therapeutic response. The application also incorporates a unique set of easy-to-use reporting tools.</p> <p>This engine is built upon the ability of volume rendering techniques for both PET and CT image data. It offers independent control of color, opacity and shading of up to 4 tissue classes, as well as predefined VRT settings which can be selected via an image gallery. It also offers the ability to interactively manipulate the levels of fusion ranging from CT only to PET only and various scaled combinations. As MPR, MIP, SSD or VRT are different visualization modes possible with the same dataset, the user can arbitrarily switch between these modes as well as switch the actual display segment to full-screen mode. All modes can be registered and linked so the image manipulations including interactive slice browsing and image rotation are viewed in synchronization.</p> <p>The integrated editing package allows segmentation of 3D datasets either with manual contour creation, thresholding or 3D freeform segmentations. 3D segmentations are visualized on the MIP providing an overview of the findings. Findings are book marked allowing for quick navigation through the study during collaborative reviews. As layouts are configurable with preferred visualization orientations and modes the user can set default viewing preferences for when a study is loaded. The current presentation state of a study can be saved to facilitate easy call up at a later time.</p> <p>Applications include: <i>syngo TrueD</i> with support for PERCIST (PET Response Criteria in Solid Tumors)</p>

## Description

The *syngo.mCT* Oncology Engine enables physicians to efficiently compare patient scans from multiple time points (e.g. pre- and post-therapy) by automatically registering and displaying PET/CT images from studies. It assists physicians in making better-informed diagnostic, therapeutic, and follow-up decisions. Quantitative analysis of lesions in terms of volume, average and max SUV are performed in order to assess changes in activity and size, as part of evaluation of therapeutic response. Findings can be tracked using the findings navigator and are automatically stored and can be used in the final report.

To assist NaF bone scan reading, the system additionally creates 4 projections: anterior, posterior, left and right lateral. These projections can be displayed in the MM Reading task.

*syngo.CT* Segmentation provides advanced features for easy and fast CT oncology reading. It supports the automated segmentation and evaluation of lesions in lung, liver, lymph nodes and other organs.

Key functionalities are

- Follow up of multiple time-points
- 3D evaluation of lesions measurements
- Single click auto-segmentation of lung and liver lesions lymph nodes and general lesion
- Easy adaptation of segmentations
- Auto-measurements and display of RECIST 1.0 or 1.1, WHO and volume data
- Prefetching of prior exams
- Two time-point comparison
- Calculation and display of Choi criteria
- PET visualization and basic evaluation CT, PET, and MR data. In case additional image data from MRI or PET are available images can be evaluated in the oncology reading environment. Images will be automatically registered and synchronized with the CT data sets.

All results are stored in *syngo.via*'s findings navigator.

### Brief description

Type: Hewlett Packard rack mount server.

Processor: 2 CPU

RAM: 72GB

System Disk: RAID Level 1

DB Data Disk: RAID Level 1

Data Disk: RAID Level 5,

1x Hot Spare for RAID 5

Image Storage: approximately 4.900 GB

Optical drive: CD/ DVD-RW

Graphical Processing Unit: 2x NVIDIA GPUs

Mouse: USB Optical Scroll Mouse

Keyboard: USB standard international

Rack mount kit for 19" HP rack included

Operating System: Windows Server 2008 R2, 64 Bit - Enterprise Edition

This server is configured with a redundant fan and a redundant power supply.

### Recommended Environment Requirements

Server for operation only in server rooms

A 100 Mbit/s (minimum) / 1 Gbit/s (recommended) network environment is needed for optimal performance.

For remote access a 10 Mbit/s (minimum) / 16 Mbit/s (recommended) broad-band connection is required.

### Service Package

Basic care pack for this server configuration is not included and has to be ordered separately!

Technical details are subject to change without notice!

#### Brief description

The HP Care Pack Option "13 x 5 x 4 hours on-site" consists of the following deliverables:

- **Remote problem diagnosis and support** – Siemens Remote Services uses HP remote support tools to isolate your problem and facilitate resolution in close cooperation with the next HP service hub in your area.
- **13 hours x 5 days, 4h reaction time, break & fix service onsite** – For issues that cannot be resolved remotely, an authorized HP Services representative arrives at your site within 4 hours after a defect has been confirmed. HP Services returns your system to operational condition, repairing or replacing components or entire units. If required, HP services restore at the same time system and network functionality to allow Siemens Remote Services to seamlessly continue with any further required service activity.
- **Defective Media Retention Service** – This option lets you protect sensitive data by keeping your defective disk, without having to return a defective media to the manufacturer.
- **Integrated service management** – Siemens and HP has bundled a set of proactive and reactive service elements with Siemens and HP Mission Critical Engineers working together from joint service centers in your region. This optimizes the coordination and execution of all required service activities without unnecessary delays.
- **Proactive monitoring** – Proactive monitoring of HW status and events to be able to correct HW problems before they affect system stability.
- **Enhanced HW support** – Provision of necessary Bios- and Firmware update packages to keep the HW system up to date. Required patches and updates are provided remotely to be installed conveniently during the next application maintenance or service window by the responsible IT system administrator.
- **Enhanced OS support** – Provision of necessary hotfixes or service packs to keep the server system working reliably. Required updates are provided to be installed conveniently during an application maintenance or service window by the responsible IT system administrator.

Uninterruptible Power Supply for HP server supporting only 100/110/120/127 voltage.  
UPS Management Module is included.  
2 units high in a 19" rack.

#### Brief description

The syngo Multi Modality Workplace client is configured as a DICOM-connected standalone system. The workstation is ideal for providing additional or specialist clinical workplaces, and is particularly suited to multi-modality installations. The base viewing system can be extended by adding a wide range of cross-modality and modality-specific application options.

#### Scope of delivery

- PC
- Enhanced Graphics Card
- 12 GB RAM
- Base User software
- syngo 3D
- syngo Expert-i
- syngo CT Basic Evaluation
- syngo CT Dual Monitor
- User documentation in selected language
- 19" Monitor

#### PC

High Performance Windows XP based Workstation with a Quad-Core processor and a RAM capacity of 12 GB and a minimum disk capacity of 147 GB for patient data. The workstation is equipped with an Enhanced Graphics Card to support 3D applications. To exchange medical images on DICOM-compatible DVD-R, CD-Rs the system is

equipped with a DVD-Recording unit.

PC can be connected to an existing network via 10/100 Mbit Ethernet and 1 Gbit Ethernet.

**Base User Software:**

Software features an intuitive and thus easy to learn user interface developed from prototypes tested in close cooperation with users.

Standard functions such as filming or image review, and optional clinical application software, are performed in individual processes on dedicated task cards. A number of functions and input parameters, as well as the language used, can be selected according to individual requirements.

**Package comprising the following software licenses:**

Base software with CD and dongle for the functions patient browser, filming, image review and system services.

syngo Patient Browser

Patient management

- DICOM 3 communication with Send, Receive, Query&Retrieve
- DICOM Print
- Reading of DVDs, CDs
- DVD-R module for writing DICOM-DVDs for data exchange. Writing is in background mode.

syngo Filming

A virtual film sheet shows a 1:1 display of the film sheets to be printed, thus permitting an effective preview of the filming job and re-windowing the images, as well as providing a large number of evaluation functions.

syngo SR Viewer

Reading and creation of DICOM structured reports.

syngo Viewing

Image Review supports interactive 2D review, evaluation and documentation functions. Multiple studies from the same patient can be displayed side-by-side for comparison.

**Image display**

1024 x 1024 screen matrix, configurable as up to 64 image segments.

**CINE Display**

Automatic or interactive dynamic presentation technique for the visualization of time and volume series. Synchronized viewing of multiple series.

**Measurement and annotation:**

Text annotation; Distance, angle, circle, ROI and pixel lens, depending on information available from the acquisition system.

**Video sequences stored on offline media:**

Any user-selectable file, such as cardiac, DSA or InSpace AVI video sequences, can be burned to DVD, CD to prepare quality presentations and demos of pathologies.

**System services:**

Microsoft Office 2000 (except FrontPage) is supported (not provided).

Software for burning user-selectable files to DVD-R, CD ROM.

**Network module:**

For connection to a local Ethernet (10 or 100 baseT) for communication with networked printers, diagnostic and therapy workstations, HIS/ RIS systems and teleradiology routers.

Scope of functions:

Network stations can be configured.

Unlimited selection of stations.

DICOM: industrial standard for the transmission of information between DICOM-compatible units from different manufacturers. The scope of functions is described in detail in the DICOM Conformance Statement and in its standard version includes the Transmission/ Reception, Query/ Retrieve and Basic Print functions.

**syngo 3D**

3D Basic

Basic 3D Viewer platform for display of 3D series with multi-planar reconstruction (MPR), shaded surface display (SSD), and maximum intensity projection (MIP).

### 3D VRT

Advanced 3D functionality as containing volume rendering technique (VRT) and advanced editing functions.

### Fly Through

High quality SSD/VRT virtual endoscopic viewing using high performance rendering modes.

### Image Fusion and FusedVision3D

Spatial alignment and visualization of image data of one patient where image data has been generated at different points in time or by different modalities. 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. Allows precise localization of lesions while using either the Clip plane view or the Slab Plane view displays. Displays correlated rotating Maximum Intensity Projection (MIP), and special 3 x 3 layout to display correlated CT, PET and fused images.

### 3D Dual Monitor

Viewing and manipulation of two different datasets on two monitors.

### **syngo Expert-i**

Enables the interaction with the syngo MMWP Client from virtually anywhere in your hospital.

### **syngo CT Basic Evaluation**

Supports the evaluation of CT images through volume calculation and dynamic evaluation.

### **syngo CT Dual Monitor**

Enables dual monitor operation for capable CT applications.

### **19" Monitor**

19 in high-resolution LCD flat panel color monitor (1280 x 1024 pixels) in landscape format for images and text.

syngo keyboard for the selected language. For easy operation of syngo browser, viewer and filming tasks. Special keys for windows, sheets, printing, marking and network communication.

### **Brief description**

Size: 19"  
Resolution: 1280 x 1024 pixels, 1.3MP  
Brightness: 280 cd/m<sup>2</sup>  
Contrast ratio: 450:1  
After sales services: 3 years on-site swap service

The PACS-Driven Implementation Package includes the following tasks:

- Activation of Siemens Remote Services connections
- Import of all syngo.via server license files
- Basic clinical configuration and integration of up to 5 DICOM nodes in syngo.via, such as one modality, one PACS, not more than two syngo MultiModality Workplaces, one printer, or one RIS/ DMWL-source including the request of a DICOM Modality Worklist sent to syngo.via for a networked Siemens scanner. All nodes need to be validated for connection with syngo.via.
- Installation of a software upgrade and a syngo.via client on one formerly installed syngo MMWP, already configured in syngo.via as a DICOM node;
- Configuration DICOM access to syngo.via in syngo MMWP;  
Integration of the basic syngo MMWP access into one syngo.via client workplace by installation and configuration of the software Expert-i on the syngo.via client.
- syngo MMWP versions 2009B (VE36A) onwards with service pack VX29A support syngo.via client integration and remote desktop access using syngo Expert-i. syngo MMWP version 2009B (VE36A) when used in dual monitor configuration needs to be upgraded to syngo MMWP versions 2012A (VE50A) or higher.
- Frontend integration of syngo.via with one PACS workplace (for image call-up directly out of the PACS application user interface)
- Integration of syngo.via into the IT infrastructure using an existing Active Directory, consultation of the customer's IT administrator for routing/ports.
- Configuration of basic workflow rules: autodelete, archiving, autorouting in syngo.via
- Acceptance Test in cooperation with the customer

Context of the implementation tasks:

- The DICOM conformance of the DICOM nodes is prerequisite for connection to *syngo.via*.
- The DICOM nodes to be connected to *syngo.via* must be configured and tested by the customer, for e.g. configuration of the remote DICOM node *syngo.via*, routing rules, procedures. If necessary, the customer orders these services from the DICOM node's vendor.
- The DMWL-source must be able to provide the DMWL to *syngo.via* identical to the DMWL provided to the modalities.
- The configuration of the customer's Local Area Network is performed by the customer.
- Provision of a minimum broadband Internet connection bandwidth with 2000 kBit/s downstream and 256 kBit/s upstream for Siemens Remote Services (SRS) by the customer. If the customer does not provide SRS connectivity, then additional professional services for implementation without SRS support are offered. For service support after implementation the following minimum specification has to be provided: Downstream 2000 kBit/s (for Software update, IT- and Application support); Upstream 512 kBit/s (for Application support); Upstream 256 kBit/s (for Software update and IT support).
- The customer provides information, such as: IP addresses of the server for its network integration and the DICOM nodes identifiers.
- The customer provides the required power supply and the installation location for the server hardware.
- Presence and support of the customer's administrators (clinical and IT administrator) is required during implementation. In preparation for implementation support the customer's administrators have completed the *syngo.via* web-based trainings, which are part of the scope of delivery.
- A list of applications and systems with validated connectivity to *syngo.via* can be requested from your Siemens Sales Representative.
- If a DICOM node or another system has not been validated yet for connection to *syngo.via* by Siemens, then the customer will give his acceptance though there could be a narrowed functionality of the connection.
- Installation of *syngo.via* client software on additional workplaces, or configuration of additional DICOM nodes, or the distribution of the frontend integration to additional PACS workplaces are performed by the customer's administrator or can be ordered from Siemens separately as an option.
- Implementation of a new *syngo* MMWP 2010B (Hardware and Software) or a *syngo* MMWP software upgrade to an on-site already installed sMMWP is performed as an additionally offered service.
- The image call-up implementation and configuration will be upgraded by the customer with future software versions of the calling application (RIS, PACS).
- Project coordination is performed by Siemens. Please see the *syngo.via* Data Sheet for system requirements and detailed description of implementation tasks.

The Upgrade to the RIS-Driven Implementation Package includes the following tasks:

- Activation of Siemens Remote Services connections, if provided new for the first time for *syngo.via* and has not been previously installed
- Import of all *syngo.via* software license files, which have been delivered for upgrade
- Frontend integration of *syngo.via* with one PACS or one RIS workplace for image call-up directly out of the PACS or the RIS application user interface, if not previously installed
- Integration of *syngo.via* into the customer's IT infrastructure using an existing Active Directory, consultation of the customer's IT administrator for routing/ports, if not previously installed
- Configuration in *syngo.via* for the requesting of a DICOM Modality Worklist from the RIS or another DMWL-source to *syngo.via*
- Acceptance Test in cooperation with the customer
- Update of the existing *syngo.via* IT documentation.

Context of the implementation tasks:

- The configuration of the customer's Local Area Network is performed by the customer.
- Provision of a minimum broadband Internet connection bandwidth with 2000 kBit/s downstream and 256 kBit/s upstream for Siemens Remote Services (SRS) by the customer. If the customer does not provide SRS connectivity, then additional professional services for implementation without SRS support are offered. For service support after implementation the following minimum specification has to be provided: Downstream 2000 kBit/s (for Software update, IT- and Application support); Upstream 512 kBit/s (for Application support); Upstream 256 kBit/s (for Software update and IT support).
- Presence and support of the customer's administrators (clinical and IT administrator) is required during upgrade of the implementation.
- A list of applications and systems with validated connectivity to *syngo.via* can be requested from your Siemens Sales Representative.



	<ul style="list-style-type: none"> <li>- If a DICOM node or another system has not been validated yet for connection to <i>syngo.via</i> by Siemens, then the customer will give his acceptance though there could be a narrowed functionality of the connection.</li> <li>- The previous set up of the <i>syngo.via</i> configuration will not be reengineered. Exchange of the server hardware is not supported. Installation and integration of the ordered options for upgrade of an already operational <i>syngo.via</i> system are supported.</li> <li>- The image call-up implementation and configuration will be upgraded by the customer with future software versions of the calling application (RIS, PACS).</li> <li>- Project coordination is performed by Siemens. Please see the <i>syngo.via</i> Data Sheet for system requirements and detailed description of implementation tasks.</li> </ul>
	<p>This hardware installation service includes the following tasks:</p> <ul style="list-style-type: none"> <li>- Unwrapping. Consolidation of all packaging material and notification to the customer that the materials are ready for removal.</li> <li>- Mechanical and electrical connections at site of operation</li> <li>- Mechanical installation in a common rack (e.g. HP, Fujitsu, IBM, Rittal) not older than three years and connection to a console.</li> <li>- Connection to the power supply, to Uninterruptable Power Supply (if applicable)</li> <li>- Startup of operating system; check status of patches, drivers, service packs and hot fixes, etc.</li> <li>- Connection and network configuration of the server and the remote service board to the LAN</li> <li>- Configuration of remote service board (network settings, users configuration)</li> <li>- Handover of the readily installed system to the customer.</li> </ul> <p>Context of the implementation tasks: The customer provides, as described in the <i>syngo.via</i> Data Sheet:</p> <ul style="list-style-type: none"> <li>- Access to the location and space for server operation</li> <li>- Electrical power</li> <li>- LAN access and LAN configuration</li> <li>- Configuration of the broadband internet access for Siemens Remote Services</li> <li>- IT Administrator's coordination and support for the mechanical and IT installation.</li> <li>- Server and monitor(s) are on-site of operation. The customer's monitors are accompanied by appropriate cables.</li> </ul>
	<p>The <i>syngo</i> MMWP implementation includes the following tasks:</p> <ul style="list-style-type: none"> <li>- Unwrapping of server and monitors (if applicable). Consolidation of all packaging material and notification to the Customer that the materials are ready for removal</li> <li>- Mechanical and electrical connections at site of operation, connection to the power supply</li> <li>- Startup of operating system, check status of patches, drivers, service packs and hot fixes etc., import of all license files for the <i>syngo</i> MMWP 2010A</li> <li>- Connection to LAN; network configuration</li> <li>- Activation of an additional Siemens Remote Services connection for <i>syngo</i> MMWP (if applicable)</li> <li>- Basic clinical configuration, autodelete, archiving, autorouting on <i>syngo</i> MMWP</li> <li>- Configuration on <i>syngo</i> MMWP for connection to one new modality (if sold in a bundle)</li> <li>- Integration with <i>syngo.via</i> and one validated PACS, i.e. installation of <i>syngo.via</i> client on the <i>syngo</i> MMWP</li> <li>- Basic integration of this <i>syngo</i> MMWP in one <i>syngo.via</i> client using Expert-i</li> <li>- Enhancement of the <i>syngo.via</i> workflow rules configuration on the <i>syngo.via</i> server: autorouting referring to <i>syngo</i> MMWP</li> <li>- Backup of the <i>syngo</i> MMWP configuration on DVD/ CD or on customer file server</li> <li>- Acceptance test of the installed <i>syngo</i> MMWP in cooperation with the customer, handover of the readily installed system to the customer.</li> </ul> <p>Context of the implementation tasks:</p> <ul style="list-style-type: none"> <li>- The connection of one or two monitors to a <i>syngo</i> MMWP client does not include monitor calibration. Depending on local legal regulations, this monitor installation may allow viewing only.</li> </ul> <p>The customer provides, as described in the <i>syngo.via</i> Data Sheet:</p> <ul style="list-style-type: none"> <li>- Access to the location and space for <i>syngo</i> MMWP client operation as well as for the monitors (if applicable)</li> <li>- <i>syngo</i> MMWP client hardware and monitor(s) are on site of operation. The customer's monitors are accompanied by appropriate cables.</li> </ul>

- Electrical power
- LAN access and LAN configuration
- Configuration of the broadband internet access for Siemens Remote Services
- The customer provides the information for the *syngo* MMWP network integration, such as: IP addresses.
- Integration of the *syngo* MMWP on additional *syngo.via* clients (Expert-i) is performed by the customer's administrator
- Configuration of additional DICOM nodes in the *syngo* MMWP is performed by the customer's administrator. Optionally, configuration of additional DICOM nodes can be ordered from Siemens.
- Please see the *syngo.via* Data Sheet for the overall system configuration of *syngo.via* with *syngo* MMWP and detailed description of implementation tasks.

*syngo.via* is the latest product from Siemens Healthcare for Advanced visualization of 2D/3D/4D data sets. This server client system is fully embedded in the customers IT infrastructure and allows access to information from anywhere to any modality and supports the user with appropriate, time saving reading workflow according to modality and disease. Having attended this course, the participant will understand the workflow and implementation concept of *syngo.via*. In practical exercises he learns to use the Service UI and is prepared to perform the administrative tasks. In addition basic first level support questions are covered.

#### Target Group

IT Administrators *syngo.via* responsible for local user management, regular maintenance tasks and first level service support

#### Learning Target

*syngo.via* is the latest product from Siemens Healthcare for Advanced visualization of 2D/3D/4D data sets. This server client system is fully embedded in the customers IT infrastructure and allows access to information from anywhere to any modality and supports the user with appropriate, time saving reading workflow according to modality and disease. Having attended this course, the participant will understand the workflow and implementation concept of *syngo.via*. In practical exercises he learns to use the Service UI and is prepared to perform the administrative tasks. In addition basic first level support questions are covered.

#### Prerequisite

Basic understanding of clinical workflow  
Basic IT know how  
Basic DICOM knowledge

#### Contents

Overview of the Enterprise Platform and *syngo.via*  
IHE, Infrastructure and Function View  
Client install  
Workflow configuration  
Service UI  
Trouble shooting Tools

#### Notice

Virtual training course for USA- No travel required

#### Duration

2.00 days

### **MEDRAD Stellant D Dual Head CT Injector with DualFlow technology.**

**MEDRAD's DualFlow technology gives the user the ability to inject both contrast and saline at the same time. The key is the simultaneous injection capability of the DualFlow option. DualFlow enables variable ratios of plunger motion from the contrast and saline syringes simultaneously.**

#### Pedestal / Floor Stand

Stellant D is the first dual head injector system on the market in the U.S. It offers saline flush capability that reduces artifacts from the venous system & maximizes contrast utilization. In addition, you can test vein accesses with saline that will allow more precise control of contrast delivery. Stellant D will better prepare your CT suite for the more sophisticated demands of present and future procedures.

Key features of the Stellant family (Sx and D) are:

Improved syringe design saves time and increases throughput capability  
Maximizing throughput with automatic loading  
Pressure monitor graph & Flow profile preview  
Up to 6 phases including pause & hold capabilities  
Programmable pressure limit  
Color touch screen  
Prime patient tubing with saline to save contrast and reduces mess

Package includes warranty, installation and applications by Medrad.

**This product has been tested and verified for compatibility with the following Siemens' products: SOMATOM Definition, Sensation, Emotion and Biograph TruePoint. Compatibility with other products cannot be guaranteed and used w/any other products may void service contracts and/or system warranties.**

The unique STRATON X-ray source utilizes an electron beam that is accurately and rapidly deflected, creating two precise focal spots alternating 4,608 times per second. This doubles the X-ray projections reaching each detector element. The two overlapping projections result in an oversampling in z-direction. The resulting measurements interleave half a detector slice width, doubling the scan information without a corresponding increase in dose. Siemens' proprietary UFC (Ultra Fast Ceramic) detectors and the corresponding 64-slice detector electronics enable a virtually simultaneous readout of two projections for each detector element - resulting in a full 64-slice acquisition. This sampling scheme is identical to that of a 64x 0.3 mm allowing for reconstruction of 192 slices using 0.1 mm reconstruction interval increment. z-Sharp Technology, utilizing the STRATON X-ray sources and the UFC detectors, provides scan speed independent visualization of 0.33 mm isotropic voxels and a corresponding elimination of spiral artifacts in the daily clinical routine at any position within the scan field.

#### **Brief description**

Type: Hewlett Packard workstation-based server  
Processor: 1 x CPU  
RAM: 8GB  
Hard disks: 1 x SATA 250 GB, SATA, 7.2k rpm  
Graphic card: 2 x NVIDIA GPUs  
Optical drive: CD/DVD-RW  
Network interface: 1 x 1Gbps  
Operation system: Windows 7, 64bit Edition, English version  
Mouse: USB Optical Scroll Mouse  
Keyboard: USB standard international

Technical details are subject to change without notice!

#### **Brief description**

Size: 24.1"  
Resolution: 1920 x 1200 pixels, 2.3 MP  
Brightness: 320 cd/m<sup>2</sup>  
Contrast ratio: 1000:1  
DICOM calibration: with bundled RadiCS LE quality control  
After-sales service: 3 years on-site swap service

The **syngo.mCT Cardiology Engine 4DM** permits access for one user for the following software modules:

#### **Software Modules**

**syngo.PET Corridor4DM** comprises a comprehensive set of quantification parameters for the evaluation of gated or non-gated PET myocardial perfusion images. Semiautomatic generation of parameters, including ejection fraction, wall thickening and perfusion defect estimation as well as quantification of 82Rb-Rubidium Stress/Rest studies, ensures complete cardiac processing functionality.

**syngo.PET Corridor4DM** provides quantification of non-gated PET images, parameters related to left ventricular function from gated PET images, assessment of myocardial viability from PET images and evaluation of the extent of mismatch between myocardial viability and perfusion. Dedicated tools for quality control assessment of PET data are provided along with ASNC and ICANL-compliant reporting capability.

**syngo.CT Extension Corridor4DM** complements syngo.PET Corridor4DM. It performs review and reporting of CT studies, and the quantification of calcium burden in the coronary arteries. It includes the following features:  
- CT Viewer

- Calcium Scoring

The Corridor4DM CT Viewer option provides an interactive work environment for the display and reporting of CT studies.

The Corridor4DM Calcium Scoring option provides an interactive work environment for the display, quantification, and reporting of Calcium Scoring studies.

**syngo.CT CaScoring** is a workflow step that quantifies coronary calcifications (mass, volume, Agatston equivalent) and calculates the patient's coronary age. During the evaluation, the patient's score is compared to the scores of a healthy reference group.

Implemented large reference databases are:

- MESA, McClelland, Circulation, 2006 (USA, 6,110 patients)  
Data support for different ethnic groups: Caucasian, Asian, Hispanic, etc.
- Hoff, Am J Cardiol, 2001 (USA, 35,246 patients)
- Rumberger, Mayo Clinic, Proc, 1999 (USA, 1,898 patients)
- HNR, Schmermund, Atheroscl., 2006 (Germany, 4,275 patients)
- Raggi, Circulation, 2000 (USA, 9,730 patients)

The Corridor4DM application is an OEM product developed by INVIA Medical Imaging Solutions.

The use of the syngo.PET Corridor4DM application on syngo.via is subject to Microsoft's Remote Desktop Services Per User Client Access License (RDS Per User CAL) agreement. Under this agreement, the use of the syngo.PET Corridor4DM application on syngo.via is limited to a certain number of "physical users".

The term "physical user" refers to all individual users that are using or have recently been using the syngo.PET Corridor4DM application on syngo.via (not necessarily concurrently), e.g. the individual users listed in the active directory. Each "physical user" is required to have his/her own personal RDS Per User CAL.

This syngo.mCT Cardiology Engine 4DM includes 5 of these licenses for 5 "physical" users.

The syngo.mCT Cardiology Engine Pro permits access for one user for the following additional software modules:

Additional Software Modules

syngo.PET Myocardial Blood Flow allows visualization, assessment and quantification of dynamic PET images acquired with either  $^{13}\text{NH}_3$ -Ammonia or  $^{82}\text{Rb}$ -Rubidium. Residual activity correction of  $^{13}\text{NH}_3$ -Ammonia scans reduces time between rest and stress studies thus enhancing clinical throughput. syngo.PET Myocardial Blood Flow provides manual and automatic tools to orient and segment the myocardium and automatic identification of the blood pool region. Tissue activity curves over time are displayed and polar plots of quantitative perfusion measurements are displayed – computed using a 1 tissue-compartment or a 2 tissue-compartment tracer kinetic model for  $^{82}\text{Rb}$ -Rubidium and  $^{13}\text{NH}_3$ -Ammonia respectively. Side by side comparison of rest and stress dynamic PET images is provided and the reserve between them is represented by the ratio of rest to stress values. Reference database comparison provides additional diagnostic information and the software allows to create and edit reference databases, i.e. adding and deleting patients. However, no factory reference databases are provided. A tabulated view of statistics for each dataset is provided. The software allows export of statistics and graph data as a comma-separated values file and export of screen captures as DICOM Secondary Capture for reporting.

syngo.CT Coronary Analysis provides a cardiac-specific set of automatic pre-processing steps and display functions for quick and reliable evaluation and quantification of angiography images of the coronary arteries. With these features, the case is ready for review when first opened, thus saving many manual workflow steps and bringing more efficiency into daily practice. The rule-out of coronary artery disease is possible in less than a minute.

- Automatic segmentation and labeling of the main coronary arteries (RCA, LM, CX), major coronary branches and saphenous vein grafts (SVG).
- The Single Click Stenosis function provides all relevant information for stenosis quantification and coronary stent planning: Stenosis diameter and area, curved length, minimum lumen identification, effective diameter etc.
- The robust and intuitive VesselSURF guarantees ultra fast, 3D vessel assessment in axial slices even without the existence of centerlines or in occluded vessels. As the vessel is being surfed, the cross section and best longitudinal view are displayed in real time.
- The Image Sharpening tool allows for a more thorough evaluation of calcified lesions or stents without the need for an additional reconstruction at the scanner thus saving up to 3 minutes.

syngo.CT Cardiac Function is a workflow step that allows reading and diagnosing CT angiography images of the heart for the evaluation of left ventricular function. Automatic pre-processing of the data includes left ventricular volumetry and myocardial wall segmentation of the left ventricle in all cardiac phases without any interaction. Full Cardiac assessment is now possible in less than four minutes.

- The local cardiac function is automatically displayed in AHA-conform 17-segment 2D polar plots.
- The display of the aortic valve plane with a single click facilitates the quantitative assessment of the aortic annulus for pre-procedural TAVI planning. Automatic calculation of the C-arm angulation (LAO/RAO, CRAN/CAUD) helps to save contrast agent in the interventional procedure.
- The workflow CT TAVI Planning allows to combine the assessment of the aortic annulus with the evaluation of the peripheral vessels (CT Vascular) providing streamlined TAVI planning.

The use of the syngo.PET Myocardial Blood Flow application on syngo.via is subject to Microsoft's Remote Desktop Services Per User Client Access License (RDS Per User CAL) agreement. Under this agreement, the use of the syngo.PET Myocardial Blood Flow application on syngo.via is limited to a certain number of "physical users".

The term "physical user" refers to all individual users that are using or have recently been using the syngo.PET Myocardial Blood Flow application on syngo.via (not necessarily concurrently), e.g. the individual users listed in the active directory. Each "physical user" is required to have his/her own personal RDS Per User CAL.

The option supports adaptive prospective ECG-triggered sequence scanning and adaptive retrospective ECG-gated spiral scanning to obtain CT images of the heart in defined phases of the cardiac cycle at a minimum rotation time of 0.33 s (0.30 s for mCT-X). With prospective ECG-triggered sequence scanning, quick scans are triggered by ECG signals. A temporal resolution of up to 165 ms (150 ms for mCT-X) can be achieved. Retrospective gating is based on a continuous spiral scan with simultaneous ECG recording. The cardio spiral reconstruction allows volume imaging in selectable phases of the cardiac cycle. With retrospective ECG-gated spiral scans the ECG signal can be edited for improved image quality in the case of severe arrhythmia. A dedicated "Preview" tool enables the planning of the volume reconstruction during an optimal cardiac phase on the basis of axial single slices. With ECG-pulsed control of the tube current a dose reduction of approx. 50% can be achieved with retrospective ECG-gated spiral scans. The special scan protocols "Cardio-Care" and "Cardio-Sharp" offer a special filter technique for cardiac examinations for improved sharpness and a lower dose. ECG-controlled imaging techniques are the basis for both the quantification of calcified plaques in the coronary arteries (calcium scoring) and 3D reconstructions of the heart and coronary arteries in contrast media studies (CT angiography of the heart). 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). Provides PET cardiac gated list mode acquisition, offline histogramming, and reconstruction for improved accuracy in quantitation as well as visualization of cardiac motion. Supports a maximum of 16 gate bins from the list mode PET acquisition. Requires the optional UPMM for ECG signal capture.

The CT Respiratory Gating and Triggering option is comprised of software components that allow for the capture and storage of a signal representing a patient's respiratory cycle during a spiral or sequence CT acquisition. With the Respiratory Gating feature, the respiratory data is synchronized with the CT acquisition data so that a user can freely select the point at which images are retrospectively reconstructed based on the corresponding respiration amplitude. With the Respiration Triggering feature, the user prospectively selects a point in the respiratory cycle at which sequence images will be acquired.

Through the selection and reconstruction processes, organ motion artifacts caused by respiration are minimized or eliminated and a better visualization and localization is possible resulting in more accurate assessment of tumor and organ motion, their position, size, and volume during respiration.

These applications generate 4D CT datasets that can be used to create more accurate treatment plans and also for the delivery of respiratory-triggered radiation therapy.

Provides PET respiratory gated list mode acquisition, offline histogramming, and reconstruction for improved accuracy in quantitation as well as visualization of organ motion. Supports adaptive respiratory gating for automated optimal, motion-freeze, providing improved image quality by reducing respiratory motion artifacts while providing optimized count statistics. Supports a maximum of 16 gate bins from the list mode PET acquisition.

Requires the optional Respiratory Trigger System.