

REQUESTING SERVICE: RADIOLOGY( 1 14R)  
DEL. TO: WAREHOUSE  
VA MEDICAL CENTER B70039  
V.A. Medical Center  
500 FOOTHILL BLVD  
BLDG 7, \AIAREHOUSE  
SALT LAKE CITY, UT 84148

660-B70039

Qty	Item Description
1	<p><b>Biograph mCT Flow Edge</b></p> <p>The Biograph mCT Flow Edge with FlowMotion Technology 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.</p> <p>The Biograph mCT Flow provides:</p> <ul style="list-style-type: none"><li>- high performance spiral computed tomography (CT) imaging and applications.</li><li>- high-resolution, high-count rate, PET imaging of metabolic and physiologic processes.</li><li>- high quality anatomic and metabolic image registration for optimal lesion detection and identification within the body.</li><li>- high quality attenuation correction and scatter correction for PET imaging.</li></ul>
1	<p><b>TrueV PET - mCT Flow</b></p> <p>The Biograph mCT Flow TrueV option provides improved PET productivity and performance by extending the axial PET coverage to 22.1 cm.</p>
1	<p><b>RT Pro Package</b></p> <p>The Biograph RT Pro edition offers comprehensive solution tailored for radiation treatment (RT) planning which includes:</p> <ul style="list-style-type: none"><li>- RT flat pallet</li><li>- HD FoV Pro</li><li>- PET/CT respiratory gating technology including Average CT, t-MIP and phased-matched gating</li><li>- iMAR</li><li>- Single-source dual energy CT</li><li>- Dual-energy monoenergetic at the acquisition workstation</li></ul>
1	<p><b>Cardiac PET/CT Option</b></p> <p>Provides both HeartView CT as well as PET cardiac gating acquisition/reconstruction. Allows for the ability to automatically match gate definition between CT and PET during reconstruction for phase match attenuation correction and visualization.</p>
1	<p><b>HD-Cardiac - mCT Flow (AWP)</b></p> <p>Provides automated, rigid registration of CT and PET during cardiac imaging. A proprietary algorithm identifies the heart and aligns the two images for optimal attenuation correction, improving the workflow and reducing variability between users. Allows user verification of</p>

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	CT/PET registration accuracy in either patient (transverse/sagittal/coronal) or cardiac (SA/VLA/HLA) orientation. Provides ability to automatically detect respiratory motion (triggerless respiratory gating) during F-18, Rb-82, and N-13 cardiac studies enabling dual-gated PET with cardiac gated list mode acquisition for optimal motion-static respiratory imaging, offline histogramming, and reconstruction.
1	<b>Cardio BestPhase Plus (AWP)</b> Cardio BestPhase, a software dedicated to automatically detect the optimal phase for motion-less coronary visualization. The phase is defined in either end-systole, end-diastole or both timepoints and automatically reconstructed.
1	<b>PET Dynamic Option (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. Dynamic Speed feature supports online processing capabilities for list mode imaging allowing reconstruction of dynamic frames from list mode data while acquisition is ongoing.
1	<b>ECG monitoring module (UPMM-2)</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	<b>HD-Chest #AWP</b> Adaptive respiratory gating for automated optimal, motion-freeze, providing improved image quality by reducing respiratory motion artifacts while providing optimized count statistics.
1	<b>Anzai Respiratory Interface</b> Configuration for connecting Anzai respiratory trigger system to the Biograph.
1	<b>ultraHD-PET Option (AWP)</b> 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. The Biograph ultraHD•PET option takes PET imaging to the pinnacle of performance.
1	<b>Multi-series CT AC (AWP)</b> Multi-series CT AC provides ability to merge multiple CT acquisitions/reconstructions into a single CT series for use during PET attenuation correction. Avoids the need to perform a separate PET attenuation correction CT exam when performing multiple CT acquisitions optimized for various regions in the body.
1	<b>PET Gantry UPS - mCT</b> Uninterruptible Power Supply (UPS) option providing 5 minutes of backup power enabling proper shutdown of the PET system in the event of power loss. Specifications: 5.0 KVA, 230 Volts, 50/60 Hz.
1	<b>Keyboard, English</b> Keyboard in the above-mentioned language.
1	<b>BiographOn-site NEMA testing</b> Class standard testing NU2-2012 tests are offered as follows for PET/CT.
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.

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1	<p><b>Install Kit with PDU</b></p> <p>Items necessary for install. Includes power distribution unit for connecting entire system to a single 3-phase power drop.</p>
1	<p><b>Installation US</b></p>
1	<p><b>Cooling System Water/Air</b></p> <p>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, 20 - 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.</p>
1	<p><b>Cooling System US Install Kit</b></p> <p>Kit for installation of the Cooling System Water/Air in US</p> <p>Includes:</p> <ul style="list-style-type: none"> <li>- Transformer for powering the Cooling System Water/Air</li> <li>- Service switch to shut off the outdoor cooling unit for maintenance or in case of emergency</li> </ul>
1	<p><b>syngo.via MI Scanner Bundle</b></p> <p>PET/CT system bundled with syngo.via</p>
1	<p><b>syngo.via XL-Software</b></p> <p>The syngo.via XL-Software offers 2D, 3D, 4D multi-modality routine reading capabilities and a variety of advanced applications tailored to the XL-Server HW grade. The combination of syngo.via XL-Software and XL-Server Hardware is ideal for 5 - 15 users. The availability of all applications and workflows included in syngo.via XL-SW is virtually unlimited, i.e. the number of opened cases is only constrained by server HW resources.</p> <p>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 clinical applications (advanced visualization applications) for different clinical cases. Those applications are available as additional options for syngo.via.</p> <p>The optional advanced visualization applications/Engines follow the flexible concurrent user model (users working at the same time).</p> <p>The service support for syngo.via requires the provision of an administrator with dedicated tasks and a minimum broadband Internet connection bandwidth.</p>
1	<p><b>syngo.MM Oncology Engine #1</b></p> <p>The syngo.MM Oncology Engine facilitates lesion detection, staging, and treatment follow-up by enabling the registration and quantitative analysis of PET and CT studies acquired across multiple time points. It offers the visualization of up to 4 time points simultaneously, the ability to visually trend lesion measurements over time, and the tools to standardize quantitative assessment of metabolic tumor response through EQ.PET, PERCIST, MTV (Molecular Tumor Volume) and TLG (Total Lesion Glycolysis).</p>
1	<p><b>syngo.MM Oncology Engine #1+</b></p> <p>syngo.MM Oncology Engine for one additional user for syngo.via only. This engine includes only on syngo.via:</p> <ul style="list-style-type: none"> <li>- PET&amp;CT Cross-Timepoint Evaluation</li> <li>- PET Segmentation</li> </ul>
1	<p><b>syngo.MM Oncology Engine Pro #1</b></p> <p>The syngo.MM Oncology Engine Pro further enables physicians to evaluate patient scans by comparing up to 8 time points (e.g. baseline, staging, pre- and post-therapy) and automatically registering and displaying PET and CT images simultaneously.</p>

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	<p>It assists physicians evaluating diagnostic, therapeutic, and follow-up cases with simple or complex patient histories, and initiates collaboration between imaging and therapy planning. It also provides options to visualize and quantify gated and dynamic PET acquisitions.</p> <p>The syngo.MM Oncology Engine Pro provides automated CT segmentation and evaluation of lesions in lung, liver, lymph nodes and other organs. In addition further quantifications are provided like Choi criteria and Advanced HU Statistics.</p>
1	<p><b>syngo.MM Oncology Engine Pro #1+</b></p> <p>syngo.MM Oncology Engine Pro for one additional user for syngo.via only. This engine includes only on syngo.via:</p> <ul style="list-style-type: none"> <li>- MM Multi-Timepoint</li> <li>- CT Segmentation</li> <li>- PET Dynamic Analysis</li> <li>- MM Therapy Interface</li> </ul>
1	<p><b>syngo.via Project Identifier</b></p> <p>System identifier for syngo.via project</p>
1	<p><b>Server HW Config XL</b></p> <p>syngo.via server hardware configuration XL.</p> <p>Hewlett Packard rack mount server.</p>
1	<p><b>HP Care Pack. 5y 24x7 HW Support</b></p> <p>Prime HW Support for 5 years (for HW config L, XL or XL_10 ? ML350 Gen9)</p>
1	<p><b>PACS-Driven Implementation Pkg.</b></p> <p>This PACS-Driven Implementation Package includes installation and integration services for syngo.via in a radiologic workflow mainly supported by the PACS functionality.</p> <p>This package includes professional services, such as:</p> <ul style="list-style-type: none"> <li>- Installation of the syngo.via server software on the server hardware</li> <li>- Installation of the syngo.via client software on one clinical workplace for one user</li> <li>- Connection to up to 5 DICOM nodes</li> <li>- Image call-up of syngo.via from the PACS' user interface</li> <li>- Assistance in setting up image call-up of syngo.via from the PACS' user interface. This may require the purchase of software and services from the PACS vendor.</li> <li>- Configuration of basic syngo.via workflows and rules</li> <li>- Integration of one syngo.via client workplace with one syngo MultiModality Workplace.</li> </ul> <ul style="list-style-type: none"> <li>- Installation of WebViewer integrated license (syngo.via SW version VA30 or higher, country restrictions might apply).</li> <li>- Installation of the syngo.via WebViewer client application on one Mobile Device or Web Client system if requested by the customer. Ensure that the customer's Web Clients / Mobile Devices fulfill the minimum requirements according to the syngo.via WebViewer Data Sheet. Verification of the syngo.via WebViewer basic functionality</li> <li>- If applicable: Integration into the Local Area Network of the customer and to Siemens Remote Service over the internet connection plus basic installation service for the syngo.via HW system at the customer's site.</li> </ul>
1	<p><b>syngo.via local Impl. (Identifier)</b></p> <p>Identifier for professional services completely provided by locally organized resources.</p>
1	<p><b>Server HW Installation Standard</b></p> <p>Basic installation of the syngo.via server hardware with the operating system at the customer's site by the hardware supplier. Integration into the Local Area Network of the customer and to Siemens Remote Service over internet connection. Please check that the following information is included in the customer quote: correct and complete delivery location, customer's contact</p>

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1	<p>person for implementation planning. See also the questions in the Sales Checklist, which supports you in evaluation of the customer's requirements.</p> <p><b>Virtual Initial Consultation, syngo.via</b></p> <p>This virtual initial consultation session, up to 4 hrs in duration, is designed to define the clinical customization of syngo.via specific to radiology workflow. Through direct communication with a clinical education specialist, this session will identify and configure site-specific workflow and imaging storage and retrieval parameters. This educational offering must be conducted no more than 4 weeks before the scheduled system turnover event. This consultation session will be scheduled during standard business hours, Monday through Friday. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>Add'l training 24hrs, syngo.via</b></p> <p>Up to (24) hours of on-site clinical applications training on syngo.via navigation and modality specific clinical workflows, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4)users. The training offering must be completed (12) months from the later of turnover date or offering purchase 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>Classroom ClinicAdmin Training 5 day</b></p> <p>The objective of this course is to give the participants the necessary theoretical knowledge and practical experience to routinely operate the syngo.via system, and to become acquainted with the settings and configuration of the system.</p> <p>Lectures and interactive practical exercises will familiarize the participants with the functionality of syngo.via and the clinical case specific applications.</p> <p>This class includes lunch, economy airfare, and lodging for (1) imaging professional. All arrangements must be arranged through Siemens designated travel agency This educational offering must be completed by the later of (12) months from purchase or install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>Initial onsite training 24 hrs syngo.via</b></p> <p>Up to (24) hours of on-site clinical applications training on syngo.via basic navigation and modality specific clinical workflows, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4)users. Training will focus on the use of syngo.via in clinical routine and customization of systems based on workflow needs. This educational offering must be completed (12) months from turnover 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 16 hrs, syngo.via</b></p> <p>Up to (16) hours of follow-up on-site clinical applications training on syngo.via navigation and modality specific clinical workflows, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4)users. Training will focus on the optimization of syngo.via in clinical routine and customization of systems based on clinical workflow needs. Advanced clinical applications will be covered for users previously attending initial applications training. This educational offering must be completed (12) months from turnover 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 System Manuals</b></p> <p>Additional user manual for the above selected MI system.</p>
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</p>

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	refund.
1	<p><b>CT Cross Trainer</b></p> <p>The CT CrossTrainer Program is a printed self-study course provided and administered by MIC and is intended for (1) imaging professional. StudyModules(tm) present CT in an easy to learn, interactive format with a comprehensive scope including physical principles, hardware and software, image parameters selection, image formation, safety, contrast administration, artifact prevention, patient handling, routine and advanced imaging techniques, and an abundance of images and illustrations.</p> <ul style="list-style-type: none"> <li>- Target audience: Any technologist seeking to learn CT imaging. Prior CT experience is not required.</li> <li>- Specs: 6 StudyModules, 15 hours of study time, 17 Cat A CE credits</li> <li>- Time limited: A 6 month term of enrollment provides an opportunity to earn the associated CE credits starting on the date the course materials are shipped. Upon expiration of enrollment, unearned credits are forfeited without refund.</li> </ul>
1	<p><b>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>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>
1	<p><b>MI PET Project Management</b></p> <p>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.</p>
1	<p><b>PET Gating Onsite Training 16 Hrs</b></p> <p>Up to (16) hours of on-site gating clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>Additional onsite training 24 hours</b></p> <p>Up to (24) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<b>Project Mgmt/Site Planning (US only)</b>
1	<b>MI PET Riedel Chiller Start-up by SBT</b>
1	<p><b>NEMA_XR-29 Standard</b></p> <p>This system is in compliance with NEMA XR-29 Standard Attributes on CT Equipment Related To Dose Optimization and Management, also know as Smart Dose</p>
1	<b>Low Contrast CT Phantom &amp; Holder</b>

Qty	Item Description
1	<p><b>Stellant D Dual Ceiling w/Certegra WS</b></p> <p>Stellant D Dual Ceiling mounted with Certegra Workstation NO Informatics. Short ceiling post - 580 mm.</p> <p>Other ceiling post lengths are available (different part numbers): 850 mm and 1000 mm.</p> <p>Includes Stellant D, Dual Head, ceiling mounted injector; Certegra workstation; installation and warranty through Medrad.</p>
1	<p><b>Biograph PET Gantry Trinity Complimentary Biomed Training</b></p> <p>This educational offering includes system training tuition for 1 clinical engineering professional on the PET Biograph mCT (Definition Based), and the syngo multimodality workstation as applicable. The training curriculum depends on and is limited to the system purchased and may include multiple courses including classroom training in USA or an international site, and/or virtual and web-based training. Additional modality basics training may be required as a prerequisite to these courses and must be purchased separately. This system training includes a 15% discount. Travel and lodging are not included. This educational offering must be completed by the later of (12) months from purchase or install end date; if training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund. This forfeiture does not apply to Federal government agencies.</p>
1	<b>GOV'T - ONLY - Projectmanagement Offset</b>
1	<b>GOV'T - ONLY - Installation mCT Offset</b>
1	<p><b>VIA Govt Trng in PACS Imp</b></p> <p>Per agreement, credit for initial training in Basic Implementation 14412663</p>
1	<p><b>VIA Govt Server HW Install</b></p> <p>Per agreement, credit for syngo.via hardware installation</p>

Offset Biograph PET Gantry Trinity Complimentary Biomed Training

Initial onsite training 32 hrsGov Offset

Offset Virtual Initial Consultation, syngo.via

Offset Initial onsite training 24 hrs syngo.via

Offset Part 14422287 Additional System Manuals

# Detailed Technical Specifications

## Description

Biograph mCT Flow Edge consists of the following:

### 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 up to 500 lb (227 kg) patients 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.

### CT System

The CT imaging capability of the Biograph mCT consists of a 128-slice CT based on the Definition Edge CT platform featuring a full range of spiral CT clinical applications with high performance.

#### Gantry:

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

Rotational speed of the gantry: 214 rpm with a rotation time of 280 ms.

#### Scanning system:

Adaptive Array Detector (AAD) system based on UFC™ (ultrafast ceramics) with up to 47104 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 (equivalent of 50 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 64 slices for every viewing angle - resulting in a full 128-slice acquisition.

#### 100 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 70, 80, 100, 120 and 140 kV; power max. 100 kW, adjustable in fine steps.

#### SAFIRE reconstruction:

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 by up to 60%.



## Description

In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software: Noise, CT numbers, homogeneity, low-contrast resolution and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.

### 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 (optional 109) image planes with a 164 (optional 221) mm axial field of view.

FlowMotion Technology provides:

Improved planning workflow, acquisition and reconstruction with continuous table movement PET acquisition, a simple CT-like planning workflow and high resolution optimized image processing. Precise CT-like planning for PET provides flexibility for scan area allowing reduced radiation dose. Simple customization of protocols provides the ability to incorporate features for motion management, varied speed for focused image quality and improved throughput, and maximum reconstructed image resolution for the most demanding clinical and research applications. Additional benefits include:

- PET acquisition without the limitation of bed positions
- Ability to customize scan protocols to the specific physician preference for each patient
- Enables easy setup for up to 4 scan regions for optimized scan parameters in each body area
- Maximum reconstructed image resolution for the most demanding clinical and research applications with 81 (optional 109) image planes across 164 (optional 221) mm axial field-of-view at 2.0 mm slice spacing with 128 x 128, 200 x 200, 256 x 256, 400 x 400, and 512 x 512 reconstruction matrices.
- Designed for improved axial uniformity, end-plane sensitivity and increased reproducibility
- Up to 32% CT dose reduction for ALARA dose
- One-click CT-like range planning to scan the precise area needed
- Improved patient satisfaction due to a sense of progress being made with constant bed motion during acquisition

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.
- Acquisition computer system for high countrate capability.
- 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 at any available matrix size.
- 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
- 164 (optional 221) mm axial field of view.
- Dedicated Patient Handling System.
- TrueC advanced scatter correction technique

Supported image sizes

## Description

### Patient Handling System

The Biograph mCT patient handling system (PHS) has a unique reinforced cantilever design that ensures reliable patient support with the high 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 203 cm PETCT co-scan range (198 cm with TrueV option).
- 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
- PET data reconstruction system with supported image reconstruction of 128 x 128, 200 x 200, 256 x 256, 400 x 400 and 512 x 512.

The syngo Acquisition Workplace console consists of a high-performance Celsius Windows 7 based computer with Quad Xeon 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 2.0/3.0 devices for data storage are supported.

The CT reconstruction computer contains a cluster of high-performance processors performing the preprocessing and reconstruction of the CT data at up to 40 images/sec (512x512). Raw data memory is 1.5 TB.

The PET acquisition system provides high performance acquisition and sorting of 3D coincidence events. Supports 3D static and 3D whole body acquisition modes. Disk storage of 1.0 TB for PET raw data is provided.

The PET reconstruction system provides fast 3D image reconstruction of the PET raw data. Iterative and backprojection are supported.

### 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.

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## Description

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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. The 3D card also features an intuitive and fast bone removal function for CTA post processing and presentation.

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 Pro - 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. HD FoV Pro can show reconstructed CT attenuation values outside the conventional FoV with an accuracy of +/- 50 HU within a 65 cm FoV.

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

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## Description

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 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

## Description

configuration even more precisely to the patient's anatomy.

Dose Notification: 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: 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 - 2200mm, 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: 0.28, 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, 4.0, 4.8, 5, 6, 7, 7.2, 8, 10, 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)

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 80 seconds and up to 2M scan length with full low-contrast resolution. Selection of the pitch factor between 0.35 and 1.7 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: 0.28, 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: 0.5-60 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 128 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.

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## Description

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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.
- 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.

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The Biograph TrueV option provides additional PET axial coverage (22.1 cm/109 image planes) providing improved system sensitivity and count rate performance for enhanced patient throughput, reduced radiation dose and/or improved image quality. The extended axial field-of-view reduces the number of bed positions needed for whole body imaging relative to the standard coverage mCT systems, while providing greater coverage for single bed static and listmode (gated or dynamic) acquisitions.

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The Biograph RT Pro edition, a comprehensive solution tailored for radiation treatment planning, is designed to take full advantage of the premium PET and CT technologies of the Biograph family of large-bore scanners enabling clinicians to devise treatment strategies with confidence. It offers the following functionality:

#### RT Positioning:

RTP flat pallet supports reproducible patient positioning between the Biograph family's TG-66 compliant patient handling system and the linear accelerator couchtop. The 2-pin Lok-Bar supports a wide variety of RT patient immobilization devices that when used in tandem with the RTP flat pallet, offer a centered, fixed and reproducible patient set-up.

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## Description

### Extended CT Field of View:

HD FoV Pro is an advanced algorithm using intelligent contour and attenuation estimation outside the diagnostic CT field of view (sFoV) of 50 cm. This enables a more reliable visualization of the skin line located outside of the sFoV for precise RT planning of patients positioned outside the isocenter.

### Flexible PET/CT Motion Management:

Biograph family CT respiratory gating technology allows for the capture and storage of a signal representing a patient's respiratory cycle during a spiral or sequence CT acquisition. With the CT respiratory gating feature, the respiratory data is synchronized with the CT acquisition data enabling the user to freely select the point at which images are retrospectively reconstructed based on the corresponding respiration amplitude. With the triggering feature, the user prospectively selects a point in the respiratory cycle which sequence images will be acquired. Through the selection and reconstruction processes, organ motion artifacts caused by respiration are minimized or eliminated to enhance visualization and localization resulting in potentially more accurate assessment of tumor and organ motion, their position, size and volume during respiration. For RT planning purposes, the Biograph family CT respiratory gating technology supports AverageCT which captures the entire motion-path in a single image "tumor cloud" dataset. AverageCT is an ideal match with cone-beam CT and serves as a good foundation for RT dose calculation. It also supports t-MIP which the CT dataset is built such as the voxel value for a certain position is the maximum and minimum from the selected breathing phases for that position enabling visualization of the area of tumor movement. t-MIP provides sharp images to facilitate contouring tasks.

Biograph family PET respiratory gating technology provides PET respiratory-gated list mode acquisition, offline histogramming and reconstruction for improved accuracy in quantification as well as visualization of organ motion. It supports a maximum of 24 gate bins from the list mode PET acquisition.

To maximize the utility of both PET and CT gating technologies the Biograph family offers one-click phase-matched gating which enables automatic, accurate registration of the PET and CT images, allowing synchronized and fused visualization of PET and CT data, improving reproducibility over manual phase registration.

To facilitate the implementation and enhance the workflow of PET/CT respiratory gating, the Biograph family offers an easy to use PET/CT respiratory gating user interface that supports same gating modes and bi-directional matching. The CT gate positions are aligned with the center of the PET gates which can be used for attenuation correction of the corresponding PET gate.

Biograph family PET/CT gating technology combined generate 4D PET and CT datasets that can assist the physician in creating more accurate treatment plans and support the delivery of respiratory-triggered radiation therapy.

### Comprehensive Metal Artifact Solution:

Offers iterative metal artifact reduction (iMAR) software that is a valuable tool to significantly improve images obscured by metal artifacts.

Offers user-defined, dose-optimized, single-source, dual-energy CT scan mode and dual energy monoenergetic at the acquisition workstation for flexible and easy-to-use metal artifact reduction.

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 phased of the cardiac cycle at a minimum rotation time of 0.33 s (0.28 s for Edge, 0.30 s optional for 64). With prospective ECG-triggered sequence scanning, quick scans are triggered by ECG signals. A temporal resolution of up to 165 ms (142 ms for Edge) 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 24 gate bins from the list mode

## Description

PET acquisition.

Requires the optional UPMM for ECG signal capture.

HD•PET Package provides improved PET image quality compared to conventionally reconstructed images. HD•PET Package contains TrueX, an innovative image processing technique and 3D iterative reconstruction.

TrueX is an innovative image processing technology that is the key to achieving HD•PET performance levels. Conventional PET does not take into account the detector geometry and incorrect positioning of the LORs. HD•PET incorporates measured point spread functions (PSF) into the iterative reconstruction algorithm. Through modeling of the PSF, HD•PET more precisely accounts for the positioning of the LOR yielding visually sharper clinical images, visual improvements in contrast and in resolution.

3D Iterative reconstruction (OSEM) provides improved image quality in the most demanding low statistics acquisitions.

Including 3D Spatial Resolution (NU 2-2012 Ch. 3); 3D scatter fraction, Count losses, and randoms measurement (NU 2-2012 Ch 4 ); 3D Sensitivity , according to (NU 2-2012 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.

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.

### 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

### General reading functions, such as:

- Browser functionality for patient and data access
- Loading and displaying images
- 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 and navigate findings
- Correlated cursor
- Series synchronization for pan/zoom, windowing, LUT, scrolling
- Locked navigation of different modality types (e.g. MR / CT)



## Description

- User-defined context menu
- Multiple layouts for 2D, 3D, 4D diagnosis
- Snapshot images as secondary capture

### Integrated 3D tools, such as:

- All reformats immediately available: VRT, MIP thin/thick, MPR thin / thick, interactive slice thickness change
- VRT Punch
- VRT Gallery
- Clip plane and clip box
- Bone removal for fast segmentation and removal of bony structures
- Fusion and registration
- Parallel, curved & radial ranges
- 2D & 3D reference lines, 3D reference point
- Region growing and quantification for interactive segmentation of anatomical structures

### Anatomic intelligence:

- Automatic spine labeling
- Automatic rib labeling for CT thorax scans
- Automatic landmark registration for accurate anatomical alignment of multiple timepoint cases

### Applications for dedicated clinical areas

Beside general 2D/3D/4D capabilities, the following advanced functionalities for dedicated clinical areas are part of *syngo.via*.

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

#### CT Cardiac

Review Marker, Heart Isolation, Movie (Beating Heart), Manual Coronary Tracking, Cardiac Planes, Curved & Cross-Section MPR, Integrated Reporting

#### CT Vascular

Bone Removal, Table Removal, Review Marker, MPR, Thin MIP Ranges, Curved & Cross Sectional MPR, Integrated Reporting

#### PET&CT Oncology

10 CT image series per time point, RECIST/WHO measurement, Basic PET evaluation, Image fusion, Registration, Time point comparison (two time points) 3D overview image, Local registration, Export CSV

#### *syngo*.CT Dual Energy

*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, the possibility to calculate monoenergetic images for a range of 40 - 190 keV as well as *syngo*.CT DE Rho/Z to display electron density and effective atomic number maps. 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.

The Rapid Results Technology offers the ability to select the required Dual Energy results in the scan-protocol. After auto-transfer of the image data to the connected *syngo.via* system, all predefined results are calculated automatically. On top of that, an immediate distribution of the results to the connected reading environment can be triggered.

*syngo*.CT Dual Energy works with Dual Energy images from SOMATOM Definition, Definition Flash, SOMATOM Drive & SOMATOM Force and with single source Dual Energy images from SOMATOM Definition Edge, SOMATOM Definition AS family, SOMATOM Perspective and SOMATOM Scope (Power configuration).

#### MR Reading

- Automatic data loading:  
All data of the current study is automatically loaded in a 2\*2 stack layout - including 3D and 4D data.
- Follow-up support:  
Follow-up layout for comparison between two timepoints.

## Description

- 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.  
MR Reading report template included.

### 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.

### Disease-specific reporting:

- Disease-specific reports can be derived from different clinical applications (structured reporting).
- Findings collected in the Findings Navigator can be transferred to disease-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.

### Further functionality, such as:

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

### 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 permanent 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 (Siemens Remote Service – SRS)
- Upstream: 512 kBit/s for Application support (SRS)
- Upstream: 256 kBit/s for Software update and IT support (SRS)

### Scope of delivery:

- DVDs with *syngo.via* software – VB20  
(software license for *syngo.via* XL-Software)

The *syngo.MM* Oncology Engine enables physicians to compare patient scans from multiple time points (e.g. pre- and post-therapy) by automatically registering and displaying PET and CT images, visualizing up to 4 time points simultaneously, and visually trending lesion measurements over time.

Quantitative analysis tools such as max SUV, peak, MTV (Molecular Tumor Volume) and TLG (Total Lesion Glycolysis) which can assist physicians in making diagnostic, therapeutic, and follow-up decisions.

*syngo.MM* Oncology Engine provides the ability to harmonize quantitative PET values to a reference by applying a

## Description

user-specified smoothing filter to each measurement, helping account for differences in scanner characteristics and reconstruction protocols without compromising displayed image quality through EQ.PET.

PET segmentation provides methods for creating PET VOIs. Standardized quantitative assessment of metabolic tumor response, such as that recommended by the PERCIST standard, is possible through:

- automated PERCIST reference region placement in liver or descending aorta
- summary of reference region variability between timepoints
- calculation of PERCIST threshold for selecting reportable lesions
- peak quantification, with reduced susceptibility to noise and inter-observer variability, for all measured lesions
- dedicated PERCIST report template

Efficiency of reporting and treatment response assessment is determined through quantification of functional tumor burden with the automatic calculation of total MTV and TLG.

Findings can be tracked using the findings navigator, 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.

Provides 1 concurrent seat for the syngo.MM Oncology Engine.

The syngo.MM Oncology Engine Pro further enables physicians to evaluate patient scans by comparing up to 8 time points and automatically registering and displaying multi modality (CT, PET, SPECT or MR) images simultaneously which aids in monitoring complicated patient histories involving initial diagnosis, staging, pre- and post-therapy, re-staging and disease reoccurrence.

It can assist physicians in making diagnostic, therapeutic, and follow-up decisions, and can initiate collaboration between imaging and therapy planning. It also provides options to visualize and quantify gated CT, PET and SPECT acquisitions

The syngo.MM Oncology Engine Pro provides advanced features for CT oncology reading. Supporting the automated segmentation and evaluation of lesions in lung, liver, lymph nodes and other organs. Additional quantifications like Choi criteria and Advanced HU Statistics provide enhanced clinical insights in assessment of potential cancerous lesions.

The syngo.MM Oncology Engine Pro enables physicians to evaluate volumetric regions of interest with sphere and iso-contour on dynamic PET acquisitions. A time activity curve (TAC) for metrics such as volume, max, peak, mean, and standard deviation SUV can be reviewed to assist in the quantitative analysis of radiopharmaceutical uptake over time.

Therapy Interface encourages collaboration between radiology, nuclear medicine and radiation oncology departments by providing the following key functionality:

- visualize and quantify gated PET and CT acquisitions that may allow for visual interpretation of tumor motion and displacement
- convert diagnostic regions of interest such as PET iso-contour and automatic PET and CT segmentations into Gross Tumor Volume (GTV) contours
- visualize GTV contours over planning CT and other relevant volumes via fused segments
- freehand editing of GTV contours using familiar nudge tools
- publish IHE-RO contourer profile conformant DICOM RT Structure Sets for use in radiotherapy treatment planning
- evaluate treatment response in post-therapy acquisitions by viewing GTV over pre-registered volumes

## Description

Provides 1 concurrent seat for the syngo.MM Oncology Engine Pro

### Brief description

Type: Hewlett Packard rack mount server.  
Processor: 2 CPU  
RAM: 128GB  
System Disk: RAID Level 5  
DB Data Disk: RAID Level 5  
Data Disk: RAID Level 5  
1x Hot Spare for RAID 5  
Gross Image Storage: approximately 5500GB  
Optical drive: CD/ DVD-RW  
Graphical Processing Unit: 1x NVIDIA GPUs  
Mouse: USB Optical Scroll Mouse  
Keyboard: USB standard international  
Rack mount kit for 19" HP rack included

Operating System: Windows Server 2012 R2

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

Prime HW Support with a service window depending on your IT Care Plan and on the SIEMENS Customer Care Center (CCC) office hours.  
The delivery of the on-site Break&Fix support is performed by HP.

- Content of the Prime HW Support: **Remote problem diagnosis and support** – Siemens Service remotely uses HP support tools to isolate your problem and facilitate resolution in close cooperation with the next HP service hub in your area.
- **Break & fix service with on-site support.** – For issues that cannot be resolved remotely, an authorized HP Services representative will be sent on-site and 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 Service to seamlessly continue with any further required remote service activity.
- **Defective Media Retention Service** – This option lets you protect sensitive data by keeping your defective disk, without the need to return defective media.
- **Integrated service management:** - Seamless cooperation and processes between SIEMENS and HP to ensure optimized end-to-end issue handling.
- **Enhanced HW support** – Provision of necessary BIOS-, Firmware and Driver update packages to keep the HW system up to date. Required patches and updates are provided remotely to be installed conveniently

## Description

during the next application maintenance or service window by the responsible IT system administrator.

The PACS-Driven Implementation Package includes the following tasks:

- Basic hardware installation and network integration
- 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.
- Assistance in setting up frontend integration of *syngo.via* with one PACS workplace (for image call-up directly out of the PACS application user interface). This may require the purchase of software and services from the PACS vendor.
- 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*
- Installation of the WebViewer integrated license (applicable only for *syngo.via* SW version VA30 or higher and only in countries where released)
- 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.

## Description

- 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.

If applicable, the hardware installation service includes the following tasks:

- Unwrapping. Consolidation of all packaging material and notification to the customer that the materials are ready for removal.
- Mechanical and electrical connections at site of operation
- Mechanical installation in a common rack (e.g. HP, Fujitsu, IBM, Rittal) not older than three years and connection to a console.
- Connection to the power supply, to Uninterruptable Power Supply (if applicable)
- Startup of operating system; check status of patches, drivers, service packs and hot fixes, etc.
- Connection and network configuration of the server and the remote service board to the LAN
- Configuration of remote service board (network settings, users configuration) if supported by server
- Test monitor setup and Handover of the readily installed system to the customer.

For the installation the customer provides, as described in the product Data Sheet:

- Access to the location and space for server operation
- Electrical power
- LAN access and LAN configuration
- Configuration of the broadband internet access for Siemens Remote Services
- IT Administrator's coordination and support for the mechanical and IT installation.
- Server and monitor(s) are at the site of operation. The customer's monitors are accompanied by appropriate cables.
- The connection of one or two monitors to the Workstation HW (including the Workstation HW Extended) does not include monitor calibration.
- For Workstation HW (including the Workstation HW Extended), depending on the local regulations, the monitor installation described here may allow viewing only.

If applicable, the import of a predefined container is to be done by the customer administrator for the setup of a virtualized system.

### Note:

Certain constraints apply regarding the supported OS versions for the *syngo.via* clients and the supported versions of MMWPs. For details please check the datasheet of the respective *syngo.via* version.

This hardware installation service includes the following tasks:

- Unwrapping of server and monitors (if applicable). Consolidation of all packaging material and notification to the Customer that the materials are ready for removal
- Mechanical and electrical connections at site of operation
- Mechanical connections to console and to diagnostic monitors (if applicable)
- Connection to the power supply, to Uninterruptable Power Supply (if applicable)
- Startup of operating system, check status of patches, drivers, service packs and hot fixes etc.
- Connection of the server and the remote service board (e.g. the HP dash board) to LAN; network configuration of the server and the remote service board
- Configuration of the operating system for two monitors (if delivered by Siemens)
- Test monitors setup (if applicable)
- Handover of the readily installed system to the customer.

Context of the implementation tasks:

The customer provides, as described in the *syngo.via* Data Sheet:

- Access to the location and space for server operation as well as for the monitors (if applicable)
- Server and monitor(s) are on-site of operation. The customer's monitors are accompanied by appropriate

## Description

- cables.
- Electrical power
- LAN access and LAN configuration
- Configuration of the broadband internet access for Siemens Remote Services
- IT Administrator's coordination and support for the mechanical and IT installation.
- The connection of one or two monitors to a workstation-based server does not include monitor calibration.
- Depending on local legal regulations, the monitor installation described here may allow viewing only.

### Brief description

#### Target Group

This course is mainly designed for clinical administrators, technologists and physicians who act as departmental key user for the *syngo.via* system.

#### Prerequisites

It is assumed that attendees have an understanding of the clinical workflow.

#### Content:

System introduction  
Data handling  
Reading 2D /3D  
Configuration and settings  
Clinical applications  
Workflow consulting and adaptation  
Overview on modality applications and workflows

This system is in compliance with NEMA XR-29 Standard Attributes on CT Equipment Related To Dose Optimization and Management, also know as Smart Dose

This educational offering must be completed by the later of (12) months from purchase of training or if applicable, completion of installation. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.