

V.A. Medical Center
REC. WHSE. BLDG 500
1201 BROAD ROCK BLVD.
RICHMOND, VA 23249

652-B50056

Qty	Item Description
1	SOMATOM Definition Edge The SOMATOM Definition Edge is based on the revolutionary Stellar Detector, the first fully-integrated detector. Designed to minimize electronic noise using Siemens' innovative TrueSignal Technology, it significantly improves the signal-to-noise-ratio (SNR). This enables the unique Edge Technology. It allows the generation of ultra-thin slices of 0.5 mm facilitating a spatial resolution of 0.30 mm. This new level of spatial resolution in clinical routine that can visualize previously unseen details without an increase in dose, for example to allow more accurate stenosis and stent analysis. Additionally, the Stellar Detector with TrueSignal Technology is the perfect match for Siemens' comprehensive ultra-low-dose imaging portfolio. With its improved SNR, the Stellar Detector can handle low signals much more efficiently, thus delivering more diagnostic quality with less patient radiation. With the Stellar Detector, the SOMATOM Definition Edge Dual Energy finally becomes truly suitable for Single Source CT. The novel design of the Stellar Detector with TrueSignal Technology provides HiDynamics, an extended dynamic range that improves the image detail level especially at low kV datasets. With this and the first dose-optimized Single Source Dual Energy scan mode, the SOMATOM Definition Edge allows adding tissue characterization to morphology. With these unrivaled features, the SOMATOM Definition Edge enters new frontiers in medical imaging, making it the Reference in Single Source CT.
1	High-speed 0.28 s rotation Fast rotation time of 0.28 seconds for unprecedented image quality and highest scan speed. Fast gantry rotation times are the prerequisite for highest temporal resolution and are therefore essential for brilliant, motion free cardiovascular imaging.
1	100 kW Power The 100 kW power allows the X-ray generator the use of maximum power of 100kW in fine adjustable steps.
1	FAST CARE Platform Siemens' unique FAST CARE platform 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 clinical outcome by creating reproducible results, making diagnosis more reliable and reducing patient burden through streamlined examinations. Siemens' desire for as little radiation exposure as possible lies at the heart of the CARE - Combined Applications to Reduce Exposure - research and development philosophy offering a unique portfolio of dose saving features, many of them being introduced as industry's first.
1	CARE Child Dedicated pediatric CT imaging, including 70 kV scan modes and specific CARE Dose4D curves and protocols

Qty	Item Description
1	<p>FAST Planning #AWP</p> <p>Direct, organ-based setting of scan and recon ranges for a faster and more standardized workflow</p>
1	<p>DoseMAP</p> <p>DoseMAP - Siemens CT Dose Management Program - creates transparency in dose values and makes it possible to assess the dose situation</p> <p>DoseMAP provides functionalities like CARE Analytics to report, document and analyze dose. It lets the user access dose values per case, per examination type, or per patient.</p> <p>DoseMAP may also help to protect our patients from over radiation - thanks to its alert function that warns the operator in case set dose thresholds are exceeded.</p> <p>Additionally, to protect the set dose levels, access to scan protocols can be restricted to prevent unauthorized changes to the scan parameters</p>
1	<p>WorkStream 4D #AWP</p> <p>WorkStream 4D further enhances the already superb workflow of the SOMATOM Definition AS CT system by offering direct generation of sagittal, coronal, oblique or double-oblique reconstructed images directly from CT raw data as part of the CT protocol.</p>
1	<p>FAST Spine #AWP</p> <p>Accurate and anatomically aligned preparation of spine recons with just a single click.</p>
1	<p>FAST 3D Align #AWP</p> <p>FAST 3D Align enables automated alignment of FOV, adjustments and reconstructions of standard views.</p>
1	<p>X-CARE</p> <p>Partial scanning to reduce direct X-ray exposure for the most dose-sensitive body regions, e.g. the breasts, thyroid gland or eye lens</p>
1	<p>FAST IRS</p> <p>Reconstruction computer for the preprocessing and reconstruction of the CT raw data. The reconstruction computer contains of a cluster of high-performance GPU boards performing the preprocessing and reconstruction of the CT data. The peak reconstruction performance is up to 60 frames/sec.</p>
1	<p>ADMIRE #AWP</p> <p>ADMIRE (Advanced Modeled Iterative REconstruction) is the next generation of Iterative Reconstruction. ADMIRE offers on the fly powerful dose reduction, excellent image quality and everyday suitability. Other unique qualities of ADMIRE are: Superb details, delineation and sharpness of organ borders. Positive impact on the image quality. Thick slice reconstruction allows for PACS-ready workflow. Reader-ready reconstructions deliver the desired image impression on the fly. Due to the computer power of the new Image Reconstruction System (IRS), ADMIRE has a potential to lower radiation, improve organ delineation and to offer a routine-ready performance.</p>
1	<p>iMAR #AWP</p> <p>The iMAR metal artifact reduction algorithm combines three successful approaches (beam hardening correction, normalized sinogram inpainting and frequency split). This allows to reduce metal artifacts caused by metal implants such as coils, metal screws and plates, dental fillings or implants.</p> <p>iMAR is compatible with extended FoV, the extended CT scale as well as the newest dose reduction feature.</p> <p>Along with the new algorithm comes the simple user interface of iMAR enabling easy reconstruction of clinical images with reduced metal artifacts.</p>
1	<p>Extended Field of View</p> <p>Software program with special reconstruction algorithms that allow for visualization of objects using a FoV up to 78 cm (non-diagnostic image quality). License to use software on a single</p>

Qty	Item Description
	unit.
1	z-UHR incl. UHR z-UHR/UHR functionality provides significantly improved spatial resolution.
1	CT Replacement Definition Edge SOMATOM Definition Edge base configuration.
1	Rear cover incl. gantry panels Rear Cover including gantry control panels with control functionality from the backside.
1	Keyboard English Keyboard in the above-mentioned language.
1	Cooling System Air SOMATOM Definition Edge air cooling for the dissipation of heat generated in the gantry.
1	Cable loom 25 m Cable loom used to connect the power distribution system (PDS) with the gantry.
1	Patient Table Def. Edge 2000mm Patient table to support up to 200cm scan range. Motor-driven table height adjustment from min. 48 cm to max. 92 cm, longitudinal movement of the tabletop 200 cm in increments of 0.5 mm, positioning accuracy +/- 0.25 mm from any direction. Horizontal scan range 200 cm. Table height can be controlled alternatively by means of foot switch (2 each on both sides of the patient table). In the case of emergency stop or power failure, the tabletop can also be moved manually in horizontal direction. Max. table load: 227 kg/500 lbs, Table feed speed: 2-200 mm/s, Distance between gantry front and table base 40 cm. Positioning aids: Positioning mattress, mattress protector, head-arm support (inclusive cushion), and non-tiltable head holders with positioning cushion set, patient restraining system for head fixation, restraining-strap set with body fixation strap that can be directly connected to the patient table top, headrest, table extension with positioning mattress, knee-leg support.
1	Physiological Monitoring Module The Physiological Monitoring Module allows to connect a 3 Channel ECG cable for ECG controlled cardiac acquisition.
1	ECG Cable IEC2 #D ECG cable, IEC2 (AHA/US color coding).
1	Tiltable Head Holder Tiltable Head Holder for the fixation of the patient's head. Tilt range between +30 till - 15 degree.
1	Computer Desk, height adjust 110V The height adjustable table (710 mm to 1100 mm) supports optimal ergonomic working positions at the CT consoles. It allows users to switch between the dynamism of a standing desk and the comfort of a traditional desk.
1	Computer Cabinet New cabinet to accommodate the computer system and UPS. Matched to the design of the control console table. Width: 800 mm, Depth: 800 mm, Height: 720 mm
1	HeartView CT Scanning technique and program for ECG controlled data acquisition and image reconstruction with SOMATOM Definition Edge. The package comprises: HeartView CT option on the syngo Acquisition Workplace console for the ECG-controlled acquisition and reconstruction of artifactfree images of the heart.

Qty	Item Description
	<p>The ECG signal is supplied by an ECG device integrated in the gantry.</p> <p>The use of the software of this option is restricted to a single system unit.</p>
1	<p>Additional User Manual</p> <p>Additional user manual for the above selected CT system.</p>
1	<p>CT Project Management</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>CT Standard Rigging and Installation</p> <p>This quotation includes standard rigging and installation of your CT new system.</p> <p>Standard rigging into a room with reasonable access, as determined by Siemens Project Management, during standard working hours (Mon. - Fri./ 8 a.m. to 5 p.m.)</p> <p>It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents.</p> <p>Any special rigging requirements (Crane, stairs, etc.) and/or special site requirements (e.g. removal of existing systems, etc.) is an incremental cost and the responsibility of the Customer.</p> <p>All other "out of scope" charges (not covered by the standard rigging and installation) will be identified during the site assessment and remain the responsibility of the Customer.</p>
1	<p>Edge Comp Conversion Bonus</p>
1	<p>Initial onsite training 32 hrs</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>Initial onsite training 32 hrs GovOffset</p>
1	<p>Additional onsite training 32 hours</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 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>Additional onsite training 32 hours</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 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>Govt. Training Class (T&L not included)</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>

Qty	Item Description
1	<p>Stellant D Dual Ceiling w/Certegra WS</p> <p>New 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>Medrad Informatics Starter Pkg</p> <p>Includes installation and Certegra integrations services through Medrad.</p>
1	<p>Medrad PACS Outbound Interface</p> <p>PACS connectivity - requires Informatics Starter Package, INS included when purchased with Stellant CWS configuration</p>
1	<p>Nuance PowerScribe 360 Interface</p> <p>Nuance PowerScribe 360 Outbound Interface</p> <p>Software upgrade to interconnect with Nuance PS360 - requires Manage.Report(tm) Premium Application or Connect.PACS(tm) Application or Informatics Starter Package. INS included when purchased with Stellant CWS configuration.</p>
1	<p>UPGRADE, Connectivity with M*MODAL VR</p>
1	<p>HL7 Outbound Int, RIS Systems Int</p> <p>HL7 Outbound Interface, RIS Systems Interface</p> <p>Software upgrade to interconnect with M*MODAL VR - requires Manage.Report Premium Application or Connect.PACS(tm) Application or Informatics Starter Package. INS included when purchased with Stellant CWS configuration.</p>
1	<p>Low Contrast CT Phantom & Holder</p>
1	<p>CT Slicker</p> <p>Thermoseal seams and flaps deflect fluids, reducing contaminant penetration into the cushion and table. Contaminants are retained on the tabletop or shunted to the floor. Cleanup is faster, more thorough, and contaminant build-up is reduced.</p> <p>Built using heavy, clear, micro matte vinyl, and top grade hook and loop fastening strips (Velcro) to better fit the specified table. Custom vinyl resists tears and minimizes radiologic interference. Latex free. Set includes CT Skirts.</p> <p>Shipped with main cover, a catheter bag holder, and 3 restraining belts unless otherwise noted.</p> <p>Includes warranty from RADSCAN Medical.</p>
1	<p>EATON Powerware 9390-160kVA UPS</p> <p>Powerware 9390 160kVA UPS.</p> <p>160kVA/144kW. 480 volts input / 480 volts output. Double Conversion Topology, Unit efficiency up to 94%, Unit output rating @ 0.9 Power Factor, Input current distortion < 4.5%, Patented ABM Technology, Patented HotSync parallel firmware control, Scalable Architecture, Parallel Redundancy and Capacity capable.</p> <p>Included Services: Start-up (5x8): PLUS One year on-site parts & labor coverage (7x24), PLUS: One year remote monitoring. If requested, for remote monitoring, a ConnectUPS Web/SNMP Card will be installed during start-up at no charge.</p>

C

One complimentary biomedical tuition is included with the purchase of this system. This training must be completed before the end of the warranty period.

Offset Part CT_ADD_32 One Additional Onsite Training 32 hours)

Offset Part 14428168 Additional User Manual

CT2DEFFAM - Definition Family including Definition AS/AS+, Definition Flash, Edge Systems - 13 days at

Lodging for Complimentary Biomed training for one engineer for 22 nights at

Lodging for Additional Biomed Training Class for one engineer for 17 nights at

Lodging for Govt Only Training for four Techs for 5 nights at

Detailed Technical Specifications

Description

The SOMATOM Definition Edge is founded on Siemens' revolutionary Stellar Detector and the unique STRATON X-ray tube with Siemens' z-Sharp Technology. In combination with FAST (Siemens' Fully Assisting Scanner Technologies and Combined Applications to Reduce Exposure) and CARE (Combined Applications to Reduce Exposure) solutions as well as Siemens exclusive CT Clinical Engines options, the SOMATOM Definition Edge offers unprecedented image quality and detail at significantly reduced patient exposure, as well as substantially increased diagnostic speed and confidence.

The STRATON source provides direct oil cooling of the anode, eliminating the need for heat storage capacity (equivalent of 50 MHU). The resulting small and compact design enables an unprecedented cooling rate of 7.3 MHU/min as well as reliable performance even when operating at a very high rotation time of up to 0.28 sec (optional). In combination with the HeartView CT option temporal resolution of 142 ms (optional) of the SOMATOM Definition Edge allows to reliably scan even high heart rates, e.g. in acute chest pain evaluation, in coronary visualization, and in functional analysis of the heart.

The 0.5 mm slices from the innovative Edge Technology of the SOMATOM Definition Edge together with the unique z-Sharp Technology deliver a spatial resolution of up to 0.30 mm without an increase in dose allowing the visualization of previously unseen details in clinical routine, whether the to allow highly accurate analysis of stenosis and stents or crucial small fractures in acute care. In addition, the z-UHR functionality enables industry's highest isotropic and scan field position independent spatial resolution of up to 0.24 mm voxel size, visualizing the smallest anatomical structures with exceptional quality, for example complex inner-ear bones Neuro head image quality is significantly improved with Neuro BestContrast, by optimizing grey/white matter differentiation without increase in radiation dose.

The Ultra Fast Ceramics (UFC) of the Stellar Detector in the SOMATOM Definition Edge acquire 128 slices of measured image data per rotation. Using the Edge Technology, the SOMATOM Definition Edge can facilitate 256 slices with 0.5 mm thickness per rotation for high-resolution imaging or generate up to 384 slices, per rotation depending on the chosen examination mode.

In combination with its 78 cm large bore, up to 200 cm scan range, and the 80 kW (100 kW optional) generator power, it adapts to virtually any patient independent of size or condition, helping to save precious time from scan to diagnosis to treatment. When doing interventional CT for example, the easy patient access enables fast positioning of interventional instruments and thus provides a larger and more comfortable sterile environment. Or for emergency room examinations, the large bore of the SOMATOM Definition Edge virtually eliminates the necessity to reposition and adjust life support equipment. Additionally, positioning and scanning of bariatric patients is significantly simplified while improving patients comfort.

With all this, the SOMATOM Definition Edge offers the unique combination of industry's highest image detail and industry's highest sub-millimeter volume coverage of up to 23 cm/sec enabling whole body examinations within a few seconds - adapting to challenging patients such as poly-trauma and unconscious or uncooperative patients, leading to an improvement in image quality and patient comfort.

Siemens has developed many significant products and protocols that follow the "As Low as Reasonably Achievable" (ALARA) principle to reduce radiation dose to the lowest possible level. This desire for as little radiation exposure as possible lies at the heart of our CARE – Combined Applications to Reduce Exposure - research and development philosophy. The SOMATOM Definition Edge consequently offers a unique portfolio of dose saving features; many of them being industry's first like the Adaptive Dose Shield, CARE kV or 70kV scan modes. Using Siemens' CARE solutions radiation dose can be significantly reduced compared to conventional CT systems.

With the introduction of Siemens' unique FAST CARE Technology, the SOMATOM Definition Edge raises 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.

With its unique Adaptive 4D Spiral scan mode (optional) the SOMATOM Edge overcomes the coverage limitations

Description

in dynamic CT imaging when using a static detector and allows for up to 48 cm coverage in dynamic CT imaging.

In addition the SOMATOM Definition Edge optionally offers the 3D minimal invasive suite, enabling 3D guided interventions with full control of the radiologist due to wireless in-room control. Already included with the standard configuration of the scanner is 2D Basic Intervention, which enables sequential scans (i-Sequence) e.g. for CT-guided biopsy. Also included is HandCARE™, which reduces on-line radiation exposure to the user and the patient by switching the radiation off in the upper segment of the 360° tube-rotation. It switches off the x-ray exposure for a 100° angle between three user selectable positions (10:00, 12:00 and 2:00 o'clock).

Furthermore, the system also enables the user to acquire Dual Energy data and benefit from Dual Energy post processing. Also the SOMATOM Definition Edge offers the widest range of clinical applications options, which allow performing everything from fast and confident diagnoses to comprehensive reporting in only a matter of minutes, reviewing results before the patient is off the table.

1. Gantry:

Aperture: 78 cm; power supplied via low-voltage slip ring. Scanning system: Stellar Detector with Siemens' proprietary Ultra Fast Ceramics (UFC) with 47,104 elements, 128 detector electronic channels (DAS) utilized for up to 128 slices/rotation acquisition, and 1,472 measuring channels per slice (The measuring system can contain replacement components).

In cases of very low signal at the detector (e.g. when scanning bariatric patients), the TrueSignal Technology minimizes electronic noise of detector thus increasing the signal-to-noise-ratio (SNR) and allowing to make much more efficient use of low signals.

Three laser light markers: Horizontal, sagittal, and vertical laser light that shows the isocenter position of the scan plane.

2. Tube Assembly:

Source: STRATON high performance X-ray source. Tube current range: Single source 20- up to 800 mA; Tube anode heat storage capacity equivalent of 50 MHU. Cooling rate 7.3 MHU/min (5,400 kJ/min). Focal spot size according to IEC 60336: 0.7 x 0.7 mm/7°, 0.9 x 1.1 mm/7°. Computer controlled monitoring of anode temperature, Multifan principle with flying focal spot.

3. High Power 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. 80 kW (100 kW optional), adjustable in fine steps.

4. z-Sharp Technology:

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) of the Stellar Detector and the corresponding 128-slice detector electronics enable a virtually simultaneous readout of two projections for each detector element – resulting in a full 128-slice acquisition. z-Sharp Technology, utilizing the STRATON X-ray sources together with the Edge Technology of the Stellar Detector provide scan speed independent visualization of up to 0.30 mm spatial resolution and a corresponding elimination of spiral artifacts in the daily clinical routine at any position within the scan field.

5. Control and Evaluation Unit:

Control box: CT control with patient intercom, user-recordable patient instruction system, 30 automatic patient instruction (API) text pairs are available in nine languages.

syngo Acquisition Workplace: The *syngo* Acquisition Workplace provides an intelligent and reliable workflow for data acquisition, image reconstruction and routine post-processing at the CT scanner. Built on the unique *syngo* platform, the *syngo* Acquisition Workplace is intuitive and user friendly. Computer system: High-performance computer with one Xeon Quad Core HT, 2.53GHz, NVIDIA Quadro 2000 DVI graphics card for fast 3D post-processing. High resolution, flicker free, 19-inch (48 cm) color flat panel display for medical diagnostic applications combining the demanding requirements of medical imaging with the advantages of liquid crystal displays. This display provides a resolution of 1,280 x 1024 and has a wide viewing angle, features high contrast even under high ambient light conditions. Display light output stability is enabled by controlled backlight throughout the whole lifetime. Keyboard and mouse, 8 GB RAM, 2 x 136 GB image storage for 520,000 uncompressed images, CD-R 700 MB for 1,100 images. DVD DICOM with 4.7 GB media for 8,400 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

Description

160 GB External Hard Drive).

6. Cooling System:

SOMATOM Definition Edge can be equipped with either air or water cooling adapting to your room requirements. This optimizes system availability independently of the ambient conditions and reduces expensive reconstruction costs. System operating temperature: 18-28°C, 18 - 75 % rel. humidity (not condensing).

7. syngo User Software:

syngo features an intuitive and thus easy-to-learn user interface developed from prototypes in close cooperation with users. *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 enables consistent patient data. In emergency cases, fast registration is possible. Here the system automatically assigns an emergency number which can later be replaced by the actual patient number. The input profile can be designed individually.

Examination card:

The SOMATOM Definition Edge is delivered with a large number of predefined examination protocols (e.g. for pediatric applications), making examination planning a very fast and efficient procedure. Example: A three-phase examination of the liver available as independent protocol only needs to be adapted to the patient's individual situation. Each examination is represented pictorially as a so-called "chronicle", which views the individual phases of the examination separately. This has the advantage that the individual phases of the examination can be accessed quickly and selectively and changes to the protocol can be made easily in graphical mode via drag-and-drop using the mouse. With a so-called routine window, it is possible to adapt individual examination parameters, representing a submenu of the essential parameters and giving information at a glance about the parameterization of the examination.

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 simultaneously 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 enabling an effective preview of filming jobs and rewinding of 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 autofilming process running in parallel to acquisition or reconstruction are also defined with the filming card. Freely selectable positioning of images onto film sheet, configurable image text.

3D card:

Secondary reconstruction calculation: Real-time MPR for real-time reformatting of secondary reconstructions. Slice orientation: coronal, sagittal, oblique and double-oblique. Secondary reconstructions can be determined from the topogram, other MPR views or from a 3D surface reconstruction. Reconstruction with selectable slice thickness.

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.

3D Display: Software for the three-dimensional display of surfaces of a body region from a series of continuous slices, for display and analysis of complex anatomies, e.g. the visceral cranium, pelvis, hips, for the purpose of planning surgical interventions. The 3D objects can be tilted and rotated interactively on the monitor and can also be displayed in relation to multiplanar reconstruction (MPR).

Volume card: Volume scans of tissues and organs, based on a "region-growing" algorithm and interactive ROI definition.

Description

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.

Additional task cards available as an option.

8. Examination and Evaluation Functions:

Topogram: Scanning perspectives: a.p., p.a., lat.; length of scan field: 128 – up to 1,970mm (depending on table configuration), width of scan field: 512 mm, 1.5 – 16 s (optional 20 s). 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 (optional), 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 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 of up to 100 seconds with full low-contrast resolution. Depending on table configuration volume length 1.970 mm with full low-contrast resolution (max. 200 cm scan range possible using multiple automatic ranges). Selection of the pitch factor between 0.3 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 sec (optional), 0.33 sec, 0.5 sec and 1 sec.

Iterative reconstruction: SAFIRE* (standard) enables dose savings potential up to 60%.

*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.

Adaptive 4D Spiral (optional): Continuous multirotational data acquisition with continuous smooth bi-directional table movement. Quantitative evaluation and graphical display of time-density curves over entire organs.

Dual Energy: Dual Spiral Dual Energy Scan mode (standard) enables to acquire Dual Energy data and benefit from Dual Energy post processing with several applications.

The intelligent algorithm Neuro BestContrast improves native head image quality especially grey/white matter differentiation. Images are decomposed into high and medium/low spatial frequencies. While relevant tissue information is contained in medium and low frequencies noise is dominated by high frequencies. Separate processing of medium and low frequency information improves the tissue contrast without amplifying image noise resulting in a better signal to noise ratio.

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

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

WorkStream4D (optional) 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.

Description

Asynchronous Recon allows for multiple image reconstructions and reformats, parallel to scanning. With this feature, up to eight reconstructions 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 60 fps (depending on image reconstruction system), 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 60 fps (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.

9. Network Module:

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).

10. Integrated CARE Solutions:

Stellar Detector: Due to TrueSignal Technology electronic noise can be minimized resulting in dose reduction in low signal imaging (e.g. bariatrics.).

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

Adaptive Dose Shield: world's first dynamic tube collimation that protects the patient from clinically irrelevant radiation in every spiral scan.

CARE Filter: Specially designed X-ray exposure filter installed at the tube collimator. Dose reduction with increased image quality.

Pediatric Protocols: Special examination protocols with 70 and 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.

Description

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.

11. 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.

SOMATOM LifeNet: An information and service portal directly at the CT Scanner consoles, featuring up to date information on CT products, application guides, accessories and training schedules as well as download of the latest scan protocols and 90 day free trial licenses on available software applications.

Notes on software use: Use of the entire integrated software, including optional software programs, is restricted exclusively to the application with this system.

Note: This product is in compliance with IEC60601-1-2 and fulfills CISPR 11 Class A. Note: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Welcome Package

The Welcome Package contains a welcome letter, three current versions of the customer magazine SOMATOM Sessions, three Siemens Mouse Pads plus an e-Learning CD.

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.

Siemens has always been at the forefront to deliver highest image quality and reduce radiation dose to the lowest possible level at the same time. But today, an additional barrier has to be mastered to maximize clinical outcome: overcome the growing restrictions and limitation of resources. With FAST CARE, Siemens opens a new chapter in CT, explicitly focusing on the optimization of patient-centric productivity in modern healthcare delivery. With FAST CARE, time-consuming and complex procedures such as scan or recon preparations are extremely simplified – ideally reduced to a single click. The scanning process gets more intuitive and the results become more reproducible.

The FAST CARE platform consists the following features:

Description
<p>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.</p> <p>CARE kV: First automated, organ-sensitive voltage setting to improve image quality and contrast-to-noise-ratio while optimizing dose and potentially reducing it by up to 60%.</p> <p>CARE Child: Dedicated pediatric CT imaging, including 70 kV scan modes and specific CARE Dose4D curves and protocols</p> <p>CARE Profile: Visualization of the dose distribution along the topogram prior to the scan</p> <p>CARE Dashboard: Visualization of activated dose reduction features and technologies for each scan range of an examination to analyze and manage the dose to be applied in the scan</p> <p>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.</p> <p>Dose Notification: As requested by the new release of the standard IEC 60601 3rd editions, the SOMATOM Definition Flash 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.</p> <p>Dose Alert: As requested by the new release of the standard IEC 60601 3rd editions, the SOMATOM Definition Flash 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.</p>
<p>With Siemens' unique STRATON tubes, the tube voltage can now be reduced to 70kV which helps to reduce radiation exposure to patients. With prior tube technology, the minimum tube voltage setting was 80 kV. The new tube voltage setting of 70 kV helps to further reduce the radiation dose to small pediatric or neonate patients.</p> <p>CARE Child consists of:</p> <ul style="list-style-type: none"> - dedicated 70 kV scan modes - new CARE Dose4D curves for children - respective Children Protocol utilizing these features
<p>FAST Planning assists the scan and reconstruction planning, based on a topogram, to provide an easier, faster and standardized workflow in CT scanning. FAST Planning features the selection of the anatomical region of interest from a list prospectively defined scan and reconstruction ranges, automatic detection of the scan region(s) of interest and proposal of corresponding scan range(s) in the topogram (in a narrow or wide lateral FoV), optimized FoV and automatic iso-center adaptation for Head scans.</p>
<p>DoseMAP is exists of the three parts. These three parts in combination with each other deliver a complete and comprehensive dose management.</p> <p>Report Dose: Create transparency and document dose values.</p> <ul style="list-style-type: none"> - <u>DICOM SR Dose Reports:</u> DICOM structured file allows for the extraction of dose values (CTDIvol, DLP) - <u>DoseLogs:</u> Whenever a limit exceeds of the set up reference dose levels (Dose Notification and Dose Alert) automatically a report is created on the system. The report can for example be used for audit purposes. <p>Analyze Dose: Assess the dose situation.</p> <ul style="list-style-type: none"> - <u>CARE Analytics:</u> makes it possible to set a query and retrieve DICOM SR Dose Reports. With CARE Analytics it is possible assess DICOM SR Dose Reports from different DICOM nodes and document dose data to get an insight in radiation dose per case or examination type, cumulative dose per patient or to start in-house dose reporting. Exported and structured dose information makes it possible to monitor the dose over time and gives an insight in the radiation values per examination type. Based on that outcome, measures can eventually be defined to reduce

Description
<p>dose.</p> <ul style="list-style-type: none"> - <u>CARE Dashboard</u>: Pre-examination dose check-up by showing an overview of all the used dose reduction features per scan. - <u>CARE Profile</u>: Pre-examination dose check-up by displaying the dose distribution prior to the scan at every z-position. <p>Protect Dose: Manage access to protocols and potentially protect patients from over-radiation</p> <ul style="list-style-type: none"> - <u>Access protection</u>: by setting a password it is only possible to change and access the scan protocols in the Scan Protocol Assistant by authorized staff members only. - <u>Dose Notification and Dose Alert</u>: Both functionalities may help to protect from over-radiation and warn the operator in case set dose thresholds are exceeded. Dose Notification checks the dose values per chronicle entry. Dose Alerts checks the accumulated dose per z-position.
<p>Unlike other automated MPR offerings, WorkStream 4D does not require thin slice data to be reconstructed prior to the production of reformatted images. This enhancement saves time when compared to alternative MPR techniques.</p> <p>In Addition, WorkStream 4D allows the user to produce oblique and double oblique reformats as either MPR or MIP images which substantially improves workflow both for routine and CTA examination when compared with alternative techniques.</p> <p>Further advantages are the elimination of manual reconstruction steps and the reduction of data volume up to a factor of 10, since virtually all diagnostic information is captured in 3D slices.</p>
<p>FAST Spine provides various modes that automatically create anatomically orientated spine reconstructions based on a 3D volume. It provides an easier, faster and standardized workflow in CT scanning. FAST Spine features automatic segmentation of the spinal canal, automatic labeling of the vertebrae, anatomically oriented slices – (orthogonal to the spinal canal), coronal and sagittal reconstructions which refer to the curvature of the spinal column and more. All modes offer the possibility to adapt the results manually.</p> <p>FAST Spine requires Workstream 4D.</p>
<p>FAST 3D Align automatically corrects misalignment of anatomic structures, organs of the patient. It aligns those to fit it to the selected reconstruction plane for a highly automated reconstruction workflow. Additionally it minimizes the black area in the image through automatically adjusts recon field of view selection.</p> <p>FAST 3D Align requires Workstream 4D.</p>
<p>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.</p> <p>Iterative reconstruction approaches allow decoupling of spatial resolution and image noise.</p> <p>With the next generation of iterative reconstruction, ADMIRE (Advanced Modeled Iterative REconstruction) correction loops are introduced into the image generation process next to a more precise modeling of geometry and hardware components.</p> <p><u>Superb details, delineation and sharpness of organ borders and positive impact on image quality.</u></p> <p>These iteration loops utilize raw-data information to significantly improve image quality.</p> <p>A statistical weighting of all projections and measuring points in the raw data domain improve the quality</p> <p>Additionally, intelligent model based noise cancellation iteration will take place in the image domain. This iteration distinguishes anatomical structures from noise and results in a natural image* impression and excellent IQ.</p> <p><u>Thick slice reconstruction allows for PACS-ready workflow.</u></p> <p>This new iterative reconstruction technique results in an excellent image quality with reduced noise and increased</p>

Description

image sharpness that can be translated to dose savings for a wide range of clinical applications. ADMIRE shows a benefit in image quality in image thicker than 3mm in comparison to SAFIRE and therefore the impact of ADMIRE is visible on the PACS-station.

Reader-ready reconstructions deliver the desired image impression on the fly

The new IRS will support the reconstruction performance so that ADMIRE is suitable for the daily routine and it creates Reader-Ready Reconstructions with a reconstruction speed of up to 20 images/second. Different ADMIRE kernels and five reconstruction strengths can be chosen to tailor the results of ADMIRE to the personal requirements.

*in terms of the outliers in the pixel noise structure

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

The correction process is then iteratively refined by repeating the normalized sinogram inpainting and the mixing steps thanks to the Adaptive Sinogram Mixing.

Along with the new algorithm comes the simple user interface of iMAR. Besides the typical reconstruction parameters it only requires to select the desired protocol from a drop down menu which contains the following type of implants: dental fillings, neuro coil, thoracic coil, hip implants, extremity implants, pacemakers, spine implants and shoulder implants.

In today's clinical environment, there are cases for which it is important to visualize areas outside of the normal 50 cm CT scan field. For this reason, special reconstruction algorithms have been created to allow for visualization of objects using a FoV up to 78 cm. This extra versatility was primarily created to assist with radiation treatment planning applications. The image quality for the area outside the standard 50 cm scan field does not meet the image quality specifications shown in the technical data sheet (non-diagnostic image quality). Image artifacts may be common in the area outside the normal 50 cm scan field, depending on the anatomy scanned.

Siemens proprietary z-UHR (z-Ultra High Resolution) option enables previously unachievable image detail with an isotropic resolution of 30 lp/cm (0.17mm) at 0% MTF (+/- 10%). In addition, z-UHR Catphan® measurements demonstrate the industry's highest visible high-contrast resolution of 0.24 mm x 0.24 mm x 0.24 mm. The combination of z-Sharp Technology and z-UHR offers, in daily clinical routine, an isotropic detail in the range of research Csl-aSi flat-panel and Micro CT technology. z-UHR is intended for ultra-high resolution bone-imaging, in particular for small structures such as inner ear, joints or fractures of the bone. The option includes the z-UHR software as well as a dedicated tantalum detector comb.

The options support 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 0.28s. With prospective ECG-triggered sequence scanning, quick scans are triggered by ECG signals. A temporal resolution of up to 142 ms can be achieved. Retrospective gating is based on a continuous spiral scan with simultaneous ECG recording. The cardiac 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. These 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 reconstruction 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). The ECG signal is supplied by an ECG device integrated in the gantry.