



# The Most Popular CT in the World\*

**SOMATOM Emotion**  
16-slice configuration

Datasheet for the Excel Edition  
*syngo* CT 2009E

Answers for life.

**SIEMENS**

\*Based on the number of systems sold worldwide

# SOMATOM



# SOMATOM Emotion

## Excel Edition

### Over 7,000 Emotion systems sold worldwide: The most Popular CT in the World

Innovation is not only about bringing cutting-edge technology to the high-end CT market, but also about finding ways to bring these patient-focused technologies to more people through innovative approaches to reduce the cost of this leading technology. With the introduction of the SOMATOM Emotion Excel Edition, Siemens continues to lead the world of innovation by bringing superb imaging technology to our customers at lower cost. With the SOMATOM Emotion Excel Edition the world's most popular CT system\* is available in a 16-slice configuration to a greater variety of institutions, and ultimately, patients.

Sales for the SOMATOM® Emotion CT system have now exceeded 7,000 worldwide making it the world's most popular CT system\*. The SOMATOM Emotion has achieved this outstanding success through a combination of an extremely efficient system, leading-edge clinical application, superb workflow, and Siemens' continued focus on system uptime. This combination offers our customers enhanced clinical capabilities that translate into better clinical outcomes and greater financial success. The success of this philosophy is easily recognized with over 7,000 satisfied and knowledgeable customers worldwide.

We are now continuing this unparalleled success story in an increasingly competitive and rapidly changing healthcare market. While patients continue to expect higher diagnostic accuracy, healthcare institutions and physicians are being forced to reduce time to diagnosis and unnecessary hospitalization. To meet these and tomorrow's demands for higher quality and cost-efficient healthcare, we have developed the new SOMATOM Emotion Excel Edition which brings the capabilities of 16-slice scanning to a new range of customers.

With the SOMATOM Emotion Excel Edition you can expect, and will receive, high-end imaging performance from an unbelievably compact and efficient scanner that can continuously protect your investment and maximize your returns. If you are a radiologist, technologist, or financial administrator, you will enjoy knowing that you own the world's most popular CT scanner\*.

# Emotion

\*Based on the number of systems sold worldwide

# SOMATOM Emotion Excel Edition – Standard Configuration

System hardware	CARE applications
0.6 s rotation time	CARE Filter
Multislice UFC™ (Ultra Fast Ceramic) Detector	CARE Topo
5.0 MHU liquid bearing X-ray tube	CARE Dose4D™
50 kW generator	CARE Bolus CT
CT patient table (200 kg/440 lbs table load)	
Workplaces	System software
<i>syngo</i> ® Acquisition Workplace	<i>syngo</i> Examination
19" (48 cm) flat screen monitor	<i>syngo</i> Viewing
DVD Storage	<i>syngo</i> Filming
CD Storage	<i>syngo</i> Archiving & Network
	<i>syngo</i> Service Solutions
	Image Filter
	SureView™
	SOMATOM LifeNet
	Video Capture and Editing Tool
	Scan Protocol Assistant
	Applications
	Real-time MPR
	<i>syngo</i> 3D SSD (Surface Shaded Display)
	<i>syngo</i> Volume Calculation
	CT-Angiography
	<i>syngo</i> Dynamic Evaluation

• Standard feature

# SOMATOM Emotion Excel Edition – System Options

System hardware		syngo applications for syngo CT Workplace	
Additional 19" (48 cm) flat screen monitor	◦	syngo VRT	◦
Dual 19" (48 cm) flat screen monitor	◦	syngo InSpace4D™	◦
Radiation Treatment Planning Enhancement	◦	syngo InSpace4D AVA (Advanced Vessel Analysis)	◦
Workplaces		syngo Fly Through	◦
syngo.via	◦	syngo Dental CT	◦
syngo CT Workplace	◦	syngo Osteo CT	◦
syngo MultiModality Workplace	◦	syngo Pulmo CT	◦
Additional 19" (48 cm) flat screen monitor	◦	syngo Volume Perfusion CT Neuro	◦
Dual 19" (48 cm) flat screen monitor	◦	syngo Neuro DSA CT (Digital Subtraction Angiography)	◦
2 GB Enhanced Graphics Card**	◦	syngo Neuro PWM CT (Perfusion Weighted Map)	◦
4 GB Enhanced Graphics Card**	◦	syngo Volume Perfusion CT Body	◦
CARE applications		syngo Colonography CT	◦
CARE Contrast CT	◦	syngo Colonography CT PEV (Polyp Enhanced Viewing)	◦
CARE Vision CT with HandCARE™	◦	syngo LungCARE CT	◦
System software and applications on syngo Acquisition Workplace		syngo LungCAD (Computer Assisted Detection)	◦
Extended FOV (Field of View)	◦	WorkStream4D (3D-Recon and Recon card CT Workplace) for syngo CT Workplace	◦
syngo Security Package	◦	syngo Image Fusion CT	◦
Siemens Virus Protection	◦	syngo Expert-i	◦
e-Logbook	◦	syngo CT Oncology	◦
syngo Fly Through	◦	syngo Security Package	◦
syngo Dental CT	◦	e-Logbook	◦
syngo Osteo CT	◦	syngo applications for syngo.via	
syngo Pulmo CT	◦	syngo.via	◦
syngo Volume Perfusion CT Neuro	◦	Multi-modality 2D and 3D Reading	◦
syngo Volume Perfusion CT Body	◦	Multi-modality compare	◦
syngo Image Fusion CT	◦	WebReport	◦
syngo VRT (Volume Rendering Technique)	◦	syngo.PET&CT Oncology*	◦
Automated Bone Removal	◦	syngo.CT Segmentation	◦
Advanced Interventions	◦	syngo.PET&CT Cross-Timepoint Evaluation	◦
WorkStream4D™ (3D-Recon)	◦	syngo.CT Colonography	◦
syngo Expert-i	◦	syngo.CT Colonography – Advanced	◦
Virtual Simulation	◦	syngo.CT Colonography – PEV	◦
		syngo.CT Vascular*	◦
		syngo.CT Vascular Analysis*	◦
		syngo.CT Vascular Analysis – Autotracer*	◦
		syngo.CT Neuro DSA	◦

◦ Optional feature

\* 510k pending

\*\* available only on CTWP and MMWP

# System Hardware

Gantry	
Aperture	70 cm
Gantry depth	68.4 cm (27")
Distance scan plane to gantry cover	26.4 cm (10.4")
Scan field	50 cm (70 cm reconstructed FOV available*)
Tilt	± 30°
Rotation time	0.6, 1.0, 1.5 s
Continuously rotating tube-detector unit with optimized geometry for high-resolution data acquisition across the entire scan field	
CT storage box in gantry allows easy access to standard CT accessories	
Data acquisition system	
Max. number of slices/rotation	16
Number of physical detector rows	24
Number of physical detector channels/slice	736
Number of detector elements	17,664
Total channels per slice	1,472
Number of projections	up to 1,250 (1/360°)
Sequence acquisition modes	4 x 0.6 mm, 12 x 0.6 mm, 16 x 0.6 mm, 2 x 5 mm, 12 x 1.2 mm, 2 x 8 mm, 16 x 1.2 mm
Spiral acquisition modes	4 x 0.6 mm, 16 x 0.6 mm, 16 x 1.2 mm
Speed and efficiency based on UFC (Ultra Fast Ceramic) detector with ultra short afterglow	
Designed to effectively suppress scattered radiation	

\* Optional

\*\* Requires syngo HeartView CT option

# System Hardware

Tube assembly	
Tube	DURA 422MV High performance CT X-ray tube
Tube current range	20–345 mA
Tube voltage	80, 110, 130 kV
Tube anode heat storage capacity	5.0 MHU
Focal Spot size according to IEC 60 336	0.8 x 0.5 mm/7° 0.8 x 0.7 mm/7°
Computer controlled monitoring of anode temperature	
Multifan principle with Flying Focal Spot	
Three laser light markers	
Coronal, sagittal, and axial laser light, that show the isocentric position of the scan plane. With RTP (Radiation Treatment Planning) Enhancement, the laser lights can be easily adjusted.*	

CARE Filter	
Al equivalent	tube: 5.5 mm Al
Beam limiting device	collimator: 0.5 mm Al
Generator	
Max. power	50 kW
Patient table	
Max. table load	200 kg/440 lbs
Table feed speed	1–100 mm/s
Vertical table travel range	45–83 cm (at table top) (17.7–32.7")
Vertical travel speed	≤ 22.4 mm/s
Scannable range	153 cm (60")
Distance between gantry front and table base	37 cm (14.5")
Patient breath-hold time indicator	
Patient-friendly display at the back of the gantry for indication of the remaining breath-hold time	
Automatic patient positioning	
Two user-configurable buttons on the gantry panel One touch, quick patient positioning for pre-selected clinical protocols – e.g. head, thorax	

\* Optional for RTP

# syngo Workplaces

## syngo Acquisition Workplace

The *syngo* Acquisition Workplace provides an intelligent and reliable workflow for data acquisition, image reconstruction, and routine postprocessing at the CT scanner. Built on the unique *syngo* platform, the *syngo* Acquisition Workplace is intuitive and user friendly.

## High-performance computer

XEON Core2 Quad Q9400 2.66 GHz

## Graphics accelerator

NVIDIA FX1700 for fast 3D postprocessing

## Standard monitor

19" (48 cm) flat screen monitor  
1,280 x 1,024 resolution  
1,024 x 1,024 image display matrix  
0.29 mm pixel size

## Additional monitor\*

19" (48 cm) flat screen monitor  
Replication of primary monitor at remote location  
Distance from host up to 30 m

## Dual monitor\*

19" (48 cm) flat screen monitor  
Dual monitor enables the simultaneous display of two scans on two monitors within the 3D task card, ideally used for comparison of follow-up studies or native and contrast-enhanced scans

## RAM storage

4 GB

## Image storage

146 GB; 260,000 uncompressed images

## Additional storage

DVD DICOM drive	4.7 GB DVD media 8,000 images Write-RW/+RW/-DL/Read
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CD-R	700 MB 1,100 images
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External USB 2.0 disks for quick and easy raw data storage are supported. External USB memory devices for image data.

## DICOM viewer

Included on each CD/DVD; automatically started on the viewer's PC

\* Optional



# syngo Workplaces

## syngo CT Workplace\*

The *syngo* CT Workplace is a dedicated CT processing workplace that provides instant access to image and scan data via a shared database with the *syngo* Acquisition Workplace. With access to our comprehensive portfolio of CT clinical applications, the *syngo* CT Workplace can be customized to further enhance clinical performance.

## High-performance computer

2 x Xeon 3.0 GHz processor

## Graphics accelerator

NVIDIA Quadro FX 3500 for fast 3D postprocessing  
Enhanced graphics card\* additionally accelerates applications

## Standard monitor

19" (48 cm) flat screen monitor  
1,280 x 1,024 resolution  
1,024 x 1,024 image display matrix  
0.29 mm pixel size

## Dual monitor\*

19" (48 cm) flat screen monitor  
Dual monitor enables the simultaneous display of two scans on two monitors within the 3D task card, ideally used for comparison of follow-up studies or native and contrast-enhanced scans

## RAM storage

8 GB

## Image storage

Shared database with *syngo* Acquisition Workplace

## Additional storage

DVD DICOM drive	4.7 GB DVD media 8,000 images Write-RW/+RW/-DL/Read
CD-R	700 MB 1,100 images

External USB 2.0 disks for quick and easy raw data storage are supported. External USB memory devices for image data.

## DICOM viewer

Included on each CD/DVD; automatically started on the viewer's PC

\* Optional

# syngo CT.3D

# CT Engines

<b>syngo CT.3D</b> (on syngo CT Workplace)	◦
syngo CT Workplace	
19" (48 cm) flat screen monitor	
2 GB Enhanced Graphics Card	◦
syngo 3D Basic	
syngo VRT	◦
syngo Fly Through	
syngo InSpace4D	◦
syngo Volume Calculation	
syngo Dynamic Evaluation	
syngo Expert-i	◦
WorkStream4D (3D-Recon and Recon Card CT Workplace)	

<b>CT Neuro Engine*</b>	◦
syngo.CT Neuro DSA	
<b>CT Neuro Engine Pro*</b>	◦
syngo Volume Perfusion CT Neuro (on syngo MMWP Client)	
<b>CT Oncology Engine*</b>	◦
syngo.CT Segmentation	
syngo.PET&CT Cross-Timepoint Evaluation	
syngo.CT Colonography	
<b>CT Oncology Engine Pro*</b>	◦
syngo.Lung CAD	
syngo.PET Segmentation	
syngo.CT Colonography – Advanced	
syngo.CT Colonography – PEV	

◦ Optional feature

\* syngo software features available on syngo.via unless otherwise stipulated

# syngo.via

## syngo.via\*\*

syngo.via is the new imaging software, creating an exciting experience in efficiency and ease of use – anywhere<sup>1</sup>.

syngo.via is intended to be used for viewing, manipulating, communicating, and storing medical images. It can be used as a stand-alone device or together with a variety of cleared<sup>2</sup> and unmodified syngo.via based software options. syngo.via supports interpretation and evaluation of examinations within healthcare institutions, for example in Radiology, Nuclear Medicine, and Cardiology environments.

## Client-Server Architecture

syngo.via is based on a client-server architecture:

- The server processes and renders the data from the connected modalities
- The client provides the user interface

Since the majority of the data processing is performed by the server, the client can be installed on standard off-the-shelf computers<sup>3</sup>. This means that syngo.via can be accessed from virtually anywhere within the network infrastructure.

## syngo.via Server

syngo.via runs on specific configurations of standard hardware components. The configurations are tailored to the special requirements regarding memory, with storage capacity of 0.3, 0.9 and 3.3 TB image memory, graphical processing power, and serviceability.

## License Model

The syngo.via license model is flexible and tailored to the number of concurrent users at the syngo.via solution. The maximum number of slices for concurrent rendering (in VRT and MIP representation) is virtually unlimited<sup>4</sup>.

## Multi-modality support

syngo.via supports the following:

- CT, MR, and PET images
- Computed radiography images
- Digital X-ray, X-ray angiographic, and X-ray radio-fluoroscopic images
- Ultrasound images
- Secondary capture images
- Encapsulated PDFs
- Dual Energy images from SOMATOM Dual Source CT scanners

## Connectivity and Data Exchange

Efficiency depends on how workplaces are networked. syngo.via integrates imaging modalities and IT, making it possible to access and share information with clinical partners. The following interfaces and standards are supported:

- DICOM
- HL7
- Front-end integration for image call-up from PACS/RIS
- Import image data from CD/DVD, network drives
- IT infrastructure (Active Directory, DNS, Global Session Management, e-mail Server)
- Communication based on IHE Profiles
- HIPAA (Health Insurance Portability and Accountability Act)
- RöV (Deutsche Röntgenverordnung)

## syngo.via Clients\*

Minimum requirements:

- Processor: Pentium IV, 2.4 GHz or higher
- RAM: 1 GB
- Hard Drive (free space): 500 MB
- Graphic Card: OpenGL 1.1 (min. 1024x768)
- Server connection: 100 Mbit/s
- Network connection: 100 Mbit/s
- Client remote connection: 6 Gbit/s

<sup>1</sup> Prerequisites include: Internet connection to clinical network, DICOM compliance, meeting of minimum hardware requirements, and adherence to local data security regulations.

<sup>2</sup> The software options are medical devices on their own rights.

<sup>3</sup> Minimum technical requirements have to be met

<sup>4</sup> Includes swap mechanism.

\*\* syngo.via can be used as a standalone device or together with a variety of syngo.via based software options, which are medical devices in their own rights.

\* Optional

# CARE Applications

## UFC Detector

Up to 30% dose reduction compared to conventional CT detectors.

High efficiency for low mAs requirements enable best possible image quality with low patient dose Ultra short afterglow. Specially developed for sub-second and multislice applications.

## SureView – Multislice Spiral Image Reconstruction

Brilliant image quality and dose savings up to 20% in spiral mode

## CARE Filter

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

## Pediatric protocols

Special clinical protocols with 80 or 110 kV selection and a wide range of mAs settings. The X-ray exposure is adapted to the child's (and small adult's) weight and age, substantially reducing the effective patient dose.

## CARE Topo

Real-time topogram

Manual interruption possible once desired anatomy has been imaged

## CARE Dose4D – minimizing dose, maximizing quality – patient by patient

Automated real-time tube current adjustment for best diagnostic image quality at lowest possible dose, independent of patient size and anatomy Fully automated dose management for adults and children with up to 68% dose reduction\*\*

## CARE Bolus CT

Scan mode for contrast bolus triggered data acquisition

Significant improvement of the planning procedure and diagnosis by enabling an optimum spiral scan start after contrast injection

The procedure is based on repetitive low dose monitoring scans at one slice level and analysis of the time density curve in a ROI (Region of Interest)

## CARE Vision CT\* with HandCARE

Perform interventions with real-time image guidance, including CT fluoroscopic mode. Single slice or simultaneous display of 3 slices for optimal navigation with two alternate display methods:

A) 256 x 256, 1024 x 1024, 256 x 256

B) 512 x 512, 512 x 512, 512 x 512

Head and feet label for easy orientation adaptable to physician's position

Auto-move table to displayed image position

User configurable dose and windowing display

Switch between continuous and incremental table movement with user configurable increment

Automatic table positioning via buttons or joystick with auto-stop function

**Includes Real-time image guidance:**

Image rate up to 10 frames per second

Image matrix 512 x 512

Configurable saving of images

**Foot switch.** Radiation release directly at the gantry.

**Additional flat screen monitor.** For parallel image display in the examination room.

Flat screen 19" (48 cm) monitor

Distance from host max. 30 m

**HandCARE.** Real-time dose modulation during the CT-guided intervention. The tube current is automatically switched off to avoid direct X-ray exposure to the physician's hands. HandCARE yields dose savings of up to 70% for the physician and up to 30% for the patient.

## Basic Intervention\*

For non-fluoroscopic CT intervention

Biopsy mode with user configurable dose and windowing display

Switch between continuous and incremental table movement with user configurable increment

Automatic table positioning via buttons or joystick with auto-stop function

3 image display

Zoom and pan functionality

Head and feet label for easy orientation adaptable to physician's position

Auto-move table to displayed image position

## Advanced Intervention\*

For real-time fluoroscopic CT intervention

Basic intervention with CARE Vision and HandCARE

\* Optional

\*\* Results may vary. Data on file

# System Software

## Patient registration

Direct input of patient information on *syngo* Acquisition Workplace immediately prior to scan

Pre-registration of patients at any time prior to scan

Special emergency patient registration (allows examination without entering patient data before scanning)

Patient information from HIS/RIS via DICOM Get Worklist

Transfer of examination information from scanner into HIS/RIS via MPPS (Modality Performed Procedure Step)

## Protocols

Up to 10,000 protocols can be edited, modified and stored

Scan Protocol Assistant for fast and easy protocol adjustment

## Patient communication

Integrated patient intercom

Automatic Patient Instruction (API)

- Freely recordable
- 30 API text pairs
- Presets in twelve languages available

## Integrated display panel

Gantry front display showing current scan parameters such as kV, mA, scan time, table position, and gantry tilt

## Gantry front control panels

For convenient patient positioning (e.g. in case of trauma or interventional exams)

Gantry tilt control from the operator's console

## Synchronized scanning and contrast injection\*

CARE Contrast facilitates enhanced CT examinations through the hardware and software integration of CT scanner and injector

## Topogram

Length	128–1,500 mm (5–59")
Scan times	1.5–15.8 s
Views	a.p., p.a., lateral
Real-time topogram	
Manual interruption possible once desired anatomy has been imaged	

## Sequence Acquisition

Reconstructed slice widths	0.6, 1.2, 2.4, 3.6, 4.8, 5.0, 8.0, 9.6, 10.0, 16.0, 19.2 mm
Scan times full scan (360°)	0.6, 1.0, 1.5 s (± 5%)
Partial scan times (240°)	0.4 s (± 5%)
No. of uninterrupted scans per range	99
No. of ranges in autorange	8
Standard scan cycle time	1.8 s (± 10%) at 0.6 s scan time
Acquisition with or without table feed	
Automatic clustering of scans	

## Dynamic Multiscan

Multiple (continuous) sequence scanning without table movement for fast dynamic contrast studies

Dynamic scan cycle time	0.9 s (± 10%) at 0.6 s scan time
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\* Optional

\*\* Requires *syngo* HeartView CT option

# System Software

## Multislice Spiral Acquisition

Reconstructed slice widths	0.6, 0.75, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0 mm
Scan times full scan (360°)	0.6, 1.0, 1.5 s
Reconstruction increment	0.1–10 mm
Pitch factor	0.4–1.5 (with cone beam correction) 0.4–2.0 (without cone beam correction)
Volume pitch	6.4–32.0
Spiral scan time max.	100 s
Scan length	max. 150 cm (59")

## Extended Field of View\*

Special image reconstruction algorithms that provide visualization of objects using a FOV up to 70 cm\*\*

## Scan protocol assistant

Easy and intuitive way to change and manage scan protocols

## Auto Field of View Adaptation

When positioning the scan range, the width of the range is automatically adapted to cover the whole body of the patient

## SureView: Siemens' patented solution for Multislice CT reconstruction

### Excellent for clinical workflow:

Forget about compromises in your clinical workflow. Just specify the slice thickness in your protocols according to your clinical needs. SureView automatically takes care of providing excellent volume image quality – with exceptional performance.

### Multiply your clinical performance with SureView:

High-quality imaging at any scanning speed. SureView allows the CT scanner to automatically select the necessary pitch value to achieve the coverage and scan time defined by you, while keeping selected slice thickness.

## Image reconstruction

Real-time display	Real-time image display (512 x 512) during spiral acquisition
Slice thickness	0.6–19.2 mm
Scan field	50 cm (70 cm*)
Recon field	5–50 cm, 5–70 cm with extended FOV*
Recon time	up to 8 images/s
Recon matrix	512 x 512
HU scale	–1,024 to +3,071
Extended HU scale	–10,240 to +30,710
Wide range of selectable slice thickness for prospective selection and/or retrospective reconstruction for spiral scans	
Real-time image display in 512 x 512 matrix parallel to spiral acquisition (e.g. for trauma)	

## CINE display

Display of image sequences	
Automatic or interactive with mouse control	
Max. image rate	30 frames/s

## Windowing

Window width and center freely selectable	
Single window	
Double window (e.g. bone/soft tissue)	
Multiple window settings for multi-image display	
Organ-specific window settings, e.g. for soft tissue and bones	

\* Optional

\*\* 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 and image artifacts may appear, depending on the anatomy scanned

\* Optional, reconstruction area outside the standard 50 cm FOV is for visualization purposes only and is not of diagnostic image quality

# System Software

## Filming

Digital film documentation; connection to suitable digital camera

Connection via DICOM Basic print

Automatic filming

Interactive virtual film sheet

Customizable film formats with up to 64 images

Filming parallel to other activities

Independent scanning and documentation

Freely selectable positioning of images onto film sheet

Configurable image text

## Printing

Documentation on postscript printer supported

## Image transfer/Networking

Interface for transfer of medical images and information using the DICOM standard. Facilitates communication with devices from different manufacturers.

DICOM Storage (Send/Receive)

DICOM Query/Retrieve

DICOM Basic print

DICOM Get Worklist (HIS/RIS)

DICOM MPPS

DICOM Storage Commitment

DICOM Viewer on CD/DVD

## Raw data

Drive size 365 GB

Capacity 5,300 scan-seconds

External USB 2.0 disks for quick and easy raw data storage are supported

## Evaluation tools

Parallel evaluation of more than 10 Regions of Interest

- Circle
- Irregular
- Polygonal

Statistical evaluation

- Area/Volume
- Standard deviation
- Mean value
- Min./max. values
- Histogram

Profile cuts

- Horizontal
- Vertical
- Oblique

Distance measurement

Angle measurement

Online measurement of a 5 x 5 pixel size ROI

Freely selectable positioning of coordinate system

Crosshair

Image annotation and labeling

## syngo Dynamic Evaluation

Evaluation of contrast enhancement in organs and tissues

Calculation of

- Time-density curves (up to 5 ROI's)
- Peak-enhancement images
- Time-to-peak images

## Video Capture and Editing Tool

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 are supported, e.g. AVI, Flash (SWF), GIF, QuickTime (MOV), streaming video.

# System Software

# Image Quality

## 2D postprocessing

Image zoom and pan

Image manipulations

- Averaging, subtraction
- Reversal of gray-scale values
- Mirroring

Advanced image algorithms

- Posterior Fossa Optimization for reduction of beam hardening artifacts in head images
- Low Contrast Enhancement for improving low contrast detectability
- High Contrast Enhancement for increased sharpness of high contrast structures
- Advanced Smoothing Algorithm edge preserving and smoothing filter, dedicated to cardiac exams

## WorkStream4D\*

4D workflow with direct generation of axial, sagittal, coronal, or double-oblique images from standard scanning protocols

Elimination of manual reconstruction steps

Reduction of data volume up to a factor of 10, since virtually all diagnostic information is captured in 3D slices

## syngo Security Package\*

Provides functionality for user management and flexible access control for patient data

## Siemens Virus Protection\*

Offers top-level defense in safeguarding CT systems against viruses

## syngo Expert-i\*

Enables the physician to interact with the syngo CT Acquisition Workplace from virtually anywhere in your hospital

## Low-contrast resolution

Low-contrast resolution is the ability to see

- a small object (mm)
- with a certain contrast difference (HU)
- on a particular phantom (Ø)
- at a certain mAs value (mAs)
- with a particular patient dose (mGy)

Phantom	CATPHAN (16 cm)
Object size	3 mm
Contrast difference	3 HU
Dose at the surface	21.5 mGy* at 102 mAs
Technique	0.6 s, 10 mm, 130 kV

Phantom	CATPHAN (20 cm)
Object size	5 mm
Contrast difference	3 HU
Dose at the surface	16 mGy* at 92 mAs
Technique	0.6 s, 10 mm, 130 kV

## High-contrast resolution

0% MTF ( $\pm 10\%$ )	17.5 lp/cm, 0.29 mm
2% MTF ( $\pm 10\%$ )	15.6 lp/cm, 0.32 mm
Technique	Tungsten wire in air 160 mAs, 130 kV, 1 s, 2.4 mm

## Homogeneity

Cross-field uniformity in a 20 cm water phantom	max. $\pm 4$ HU typ. $\pm 2$ HU
Phantom positioned near center of rotation	

## Dose, CTDI<sub>100</sub> values mGy/100 mAs

Phantom Ø	110 kV		130 kV	
	A	B	A	B
16 cm	14.1	15.2	21.3	22.6
32 cm	4.1	8.2	6.6	13.5
A: at center	B: 1 cm below surface			
Technique	PMMA-Phantom Absorbed dose for reference material air Max. deviation $\pm 30\%$ Expected deviation $\pm 20\%$ Slice 2 x 5 mm			

\* Optional

\* Air KERMA, measured on the surface of the phantom with max. deviation  $\pm 30\%$



# Applications

## Real-time MPR\*

Real-time multiplanar reformatting of secondary views

Variable slice thickness (MPR thick, MPR thin) and distance with configurable default values

Viewing perspectives

- Sagittal
- Coronal
- Oblique
- Double oblique
- Freehand (curvilinear)

## syngo 3D SSD (Surface Shaded Display)

Three-dimensional display of surfaces with different density values

- Soft tissue
- Bone
- Contrast-enhanced vessels

## syngo Volume Calculation

Measurements of various tissues and organs with HU-based region growth algorithms and interactive ROI definition

## syngo VRT (Volume Rendering Technique)\*

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-Angiography

MIP: Maximum Intensity Projection

MinIP: Minimum Intensity Projection

Thin MIP function for projection within a small slab to focus on particular vascular structure

Evaluation of spiral images and display of vessels, vascular anomalies, aneurysms, plaques, and stenoses

## Automated Bone Removal\*

Simplified workflow

Fast accurate presentation of subtracted CTA data sets

## syngo CT Oncology\*

Fast-track routine diagnostic oncology, staging, and follow-up. It provides a range of fully automated tools specifically designed to support physicians in the detection, segmentation, and evaluation of suspicious lesions including dedicated tools for lung, liver, and lymph node assessment. It also offers a fully automated follow-up protocol and features LungCAD (Computer Assisted Detection). *syngo* CT Oncology also facilitates functional imaging offering fusion of PET with CT data.

## syngo Fly Through\*

Virtual Endoscopy software enabling visualization of vessels, airways, and the intestines

## syngo Dental CT\*

Reformatting of panoramic slices and paraxial sections through the lower and upper jaw for analysis in connection with implantation surgery

## syngo Osteo CT\*

Non-invasive measurement of the bone mineral density of the lumbar spine to help early diagnosis of osteopenia and osteoporosis, and to assess the effectiveness of treatment

Osteo CT measurements are standardized to the ESP Phantom (ESP: European Spine Phantom)

Includes table mat and reference Phantom for Osteo CT studies

# Applications

## *syngo* Pulmo CT\*

Quantitatively evaluates lung density and structure to help early diagnosis and treatment of lung disease and surgical intervention planning

## *syngo* Volume Perfusion CT Neuro\*

Evaluates dynamic CT data of the brain. Used for the early differential diagnosis of acute ischemic stroke. Additionally, it allows imaging of blood brain barrier disruptions in brain tumors.

## *syngo* Neuro DSA CT (Digital Subtraction Angiography)\*

The fully automated bone removal, facilitates optimal visualization and evaluation of complex intracranial vascular structures and helps to delineate aneurysms and other vascular diseases

## *syngo* Neuro PWM (Perfusion Weighted Map)\*

3D calculation of colored perfusion weighted maps from standard CTA images of the brain. Enhances 3D visualization of severely ischemic areas in acute stroke.

## *syngo* Colonography CT\*

For non-invasive visualization and quantitative evaluation of colon polyps  
Enables real-time virtual 3D endoluminal viewing

## *syngo* Colonography CT PEV (Polyp Enhanced Viewing)\*

Computer-assisted identification of polyps with virtual second reader support

## *syngo* LungCARE CT\*

Software for fast 3D-based visualization and quantitative evaluation of lung nodules, with lowest possible radiation dose. Includes fully automated follow-up.

## *syngo* LungCAD (Computer Assisted Detection)\*

Provides computer supported identification of lung nodules. Functions as a second reader opinion.

## *syngo* Volume Perfusion CT Body\*

For functional analysis of organs and tumors. Useful for interventional procedures and radiation therapy monitoring and planning.

## *syngo* Image Fusion CT\*

Registration and composite display of CT, MR, NM, and PET images. Provides for optimal physician's diagnosis by fusion of morphological data with functional information.

## RTP Enhancement\*

Hardware and software components to optimize the RTP process

## Respiratory Gating and Triggering CT\*

Hardware and software components that allow for the capture and storage of a patient's respiratory signal data during a spiral (for gated reconstruction) or triggered sequence acquisition  
Respiratory data is synchronized with the CT acquisition data

The user can select the image reconstruction points (based on respiratory cycle amplitude)

Preselection of up to 8 phases for respiratorily gated reconstruction

Organ motion artifacts caused by respiration are minimized or eliminated and better accuracy is obtained regarding organ position, size, and volume

Selection of image reconstruction points based on respiratory cycle amplitude and respiratory phase respectively

## e-Logbook for AWP and CTWP\*

Tool to collect patient information for statistics, documentation, and research

- View
- Archive
- Print
- Export

## *syngo* Expert-i\*

Enables the physician to interact with the *syngo* CT Workplace or *syngo* MultiModality Workplace from virtually anywhere in your hospital

\* Optional

# Installation

Dimensions	Height (mm/inch)	Width (mm/inch)	Length (mm/inch)	Weight (kg/lbs)
<b>Components</b>				
Gantry	≤ 1,820 / 71.7	≤ 690 / 27.2	≤ 2,300 / 90.6	≤ 1,200 / 2,640
Patient table	≤ 940 / 37.0	≤ 680 / 26.7	≤ 2,230 / 87.8	≤ 400 / 880
Operator's console*	≤ 730 / 28.7	≤ 800 / 31.5	≤ 1,200 / 47.2	≤ 60 / 132
UPS	≤ 440 / 17.3	≤ 135 / 5.3	≤ 490 / 19.3	≤ 40 / 88
Line Connection Box (LCB)	≤ 820 / 32.3	≤ 350 / 13.7	≤ 750 / 29.5	≤ 110 / 242
Image reconstruction system	≤ 450 / 17.7	≤ 220 / 8.7	≤ 620 / 24.4	≤ 30 / 66
<b>syngo Workplaces</b>				
syngo Acquisition Workplace	≤ 500 / 19.7	≤ 250 / 9.8	≤ 650 / 25.6	≤ 30 / 66
syngo CT Workplace*	≤ 500 / 19.7	≤ 250 / 9.8	≤ 650 / 25.6	≤ 30 / 66
<b>syngo.via*</b>				
syngo.via	≤ 508 / 20.0	≤ 282 / 11.1	≤ 732 / 28.8	≤ 70 / 154

Power supply	
Nominal voltage ± 10 %	380–480 V
Nominal line frequency ± 10 %	50; 60 Hz
Max. power consumption	≤ 70 kVA
Power consumption	≤ 3.7 kW standby
Mean power consumption	≤ 7.0 kW scanning

Protection against input power instability	
X-ray	10 ms
Controllers	300 ms
syngo Acquisition Workplace and syngo CT Workplace	3 min
Frequency stability	± 5 % 50; 60 Hz

Electromagnetic compatibility	
This product is in compliance with IEC 60601-1-2 and fulfills CISPR 11 Class A	

Examination room environment	
Temperature range	18–30 °C
Relative air humidity without condensation	20–85 %
Heat dissipation (Gantry)	≤ 6.8 kW scanning
Heat dissipation (Computer)	≤ 2.5 kW standby ≤ 1.3 kW

Surface area for installation	
Minimum installation space for the complete system**	18 m <sup>2</sup> / 194 ft <sup>2</sup>

\* Optional

\*\* Full performance in terms of gantry tilt and scannable range, depending on the adjustable scan range and safety distances according to country-specific requirements

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