Caution: US federal law restricts the herein described devices to sale by or on the order of a physician.

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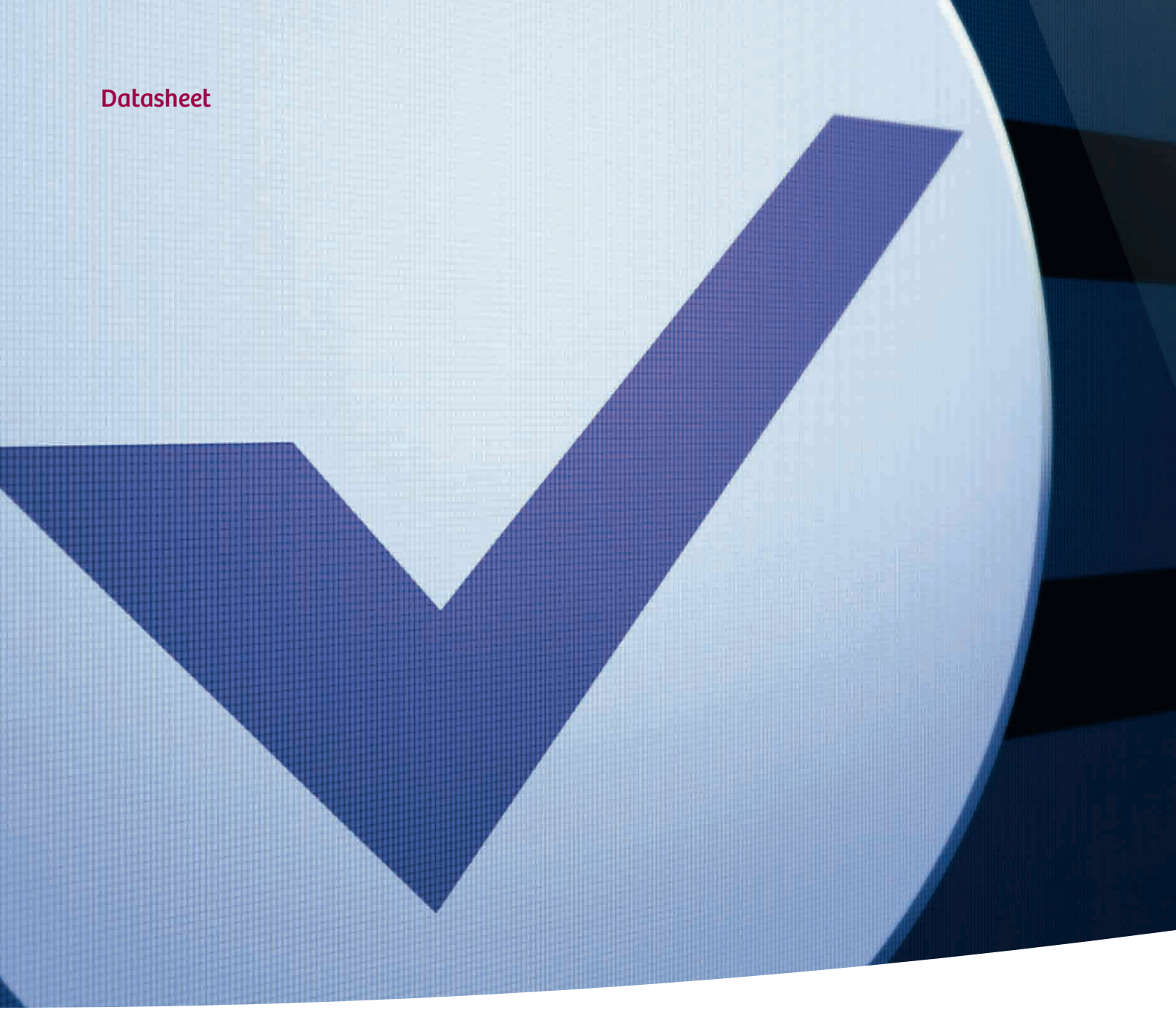
Datasheet



syngo.via

Software Version VB20A

siemens.com/healthineers

SIEMENS Healthineers

Contents

Introduction

syngo.via[1] is the intelligent imaging software for multi-modality reading that helps you master growing amounts of imaging data in less time.

In short: *syngo*.via is reading as it should be.

Get the most out of your images

Whether you look at CT, MI or MRI images, read mammography or prepare for radiation therapy, with *syngo*.via, you read your cases regardless of modality in one place. There is no need to switch workstations. *syngo*.via is the intelligent software that brings together the imaging information you need to make a clear decision.

See what's relevant

When you open a case in *syngo*.via, you immediately see the information relevant to you. *syngo*.via works with intelligent anatomy recognition, images are mapped and aligned based on anatomical landmarks, so you can start reading straight away.

Deliver to the point

syngo.via reports are clearly arranged and enriched by images such as photorealistic Cinematic VRTs[2], trendings, and actionable data. This supports your colleagues' medical decision-making. *syngo*.via can easily be integrated into existing information systems – simplifying the distribution of results inside and outside of your department.

[1] *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 right. *syngo*.via and the *syngo*.via-based software options are not commercially available in all countries. Due to regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens organization for further details.

[2] Cinematic VRT is recommended for communication, education, and publication purposes and not intended for diagnostic reading.

System overview

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.

syngo.via meets the demands of 3D Routine and advanced visualization in radiology, cardiology workflow, and nuclear medicine and enables fast and efficient diagnostics.

syngo.via client can access multiple servers.[1]

Unique User Interface

The graphical user interface of *syngo*.via has the following features:

- Workflow guidance and context-sensitive tool sets
- One-click access to a patient.
- Up to 4 patient cases can be loaded simultaneously.[2]
- Corner menus in each segment allow for fast access to tools while eyes remain focused on images
- Automatic tracking of findings and measurements through the unique Findings Navigator

ALPHA Technology

ALPHA stands for Automatic Landmark Parsing of Human Anatomy. With this technology, *syngo*.via automatically recognizes anatomical landmarks in the acquired images available on the server. This information is used in various features to accelerate the reading workflow.

Workflow Approach

syngo.via provides workflows that can be adapted to several medical indications based on clinical needs, integrating disease-specific applications. Each application provides case preparation (data pre-processing, auto-layouts), structured case navigation, features for quantitative reading and disease orientation.

Findings Reporting

Findings and measurements are tracked and listed by the Findings Navigator.

Context-Specific Reports

Context-specific report information can be created in *syngo*.via. These context-specific reports are stored either as encapsulated PDF DICOM[3] or as DICOM Secondary Capture Image objects and can be archived in the PACS.

In addition, they can be saved in the file system as a PDF file. The stored PDF or DOCX reports can be viewed and printed by the clinical user. The report can be sent as HL7 message, as a CDA Level 3 document or as a PDF document to other information systems. And the report can be integrated into Nuance Powerscribe 360.

Multi Server Access

Allows for easy access from one client to up to six *syngo*.via servers. *syngo*.via also supports automatic loading of studies from different customer sites with different Medical Record Numbers but same EMPI (Electronic Master Patient Index).[4]

[1] The version and hotfix level of server and *syngo*.via client must match.
[2] For 32 Bit clients it is recommended not to open more than 2 cases simultaneously.
[3] PACS must be able to support storing and retrieving DICOM encapsulated PDF objects.
[4] Please contact your local sales representative for further information on availability in your region, technical requirements, and limitations.

Every *syngo*.via comes with the following multi-modality reading functionality and applications, suitable for many needs in the clinical routine.

Multi-modality 2D/3D/4D Reading

Allows for easy side-by-side comparison of images from different modalities and time points.

Supported modalities

CT Reading
Enables reading of 2D, 3D, and 4D CT data

MR Reading
Enables reading of 2D, 3D, and 4D MR data

SPECT and SPECT/CT Reading
Enables reading of SPECT-only and hybrid SPECT/CT 2D, 3D and 4D data

PET/CT Reading
Enables reading of hybrid PET and CT data for 2D[1], 3D and 4D

CR Reading
Enables reading of CR and digital X-ray images

RF & XA Reading
Enables reading of fluoroscopy and angiography images, including *syngo* DynaCT images

Ultrasound Reading
Enables reading of 2D Ultrasound images (including movies)

syngo.via includes:

- Image manipulation:
  Zoom, pan, window
- Image evaluation:
  Distance, Angle, Marker
  Region of interest
  Volume of interest
  Arrow
  Pixel lens
  Plane annotation text
  Synchronized Scrolling based on Anatomical Registration
  Correlated Cursors
- Image presentation:
  2D
  MPR, MPR thick
  MPR/MPR fusion
  MIP
  MIP thin
  MinIP
  VRT
  VRT thin
- Image processing:
  Clip plane slab
  Clip box
  Punching
  Bone removal
  Table removal
  Parallel & radial ranges
  Curved Ranges
  2D & 3D reference lines
  3D reference point
  Movie (incl. export)
  Interactive Segmentation ("Region Growing")
  Volume measurement on RG objects
  Automatic Spine Labeling for CT and MR
  Automatic Rib Labeling for CT Thorax

syngo.via common features

- Patient Browser
- Case Navigator
- Findings Navigator
- Auto-Sorting
- Auto-Processing
- Auto-Layouts
- Anatomical registration
- Offline Filmsheet Editor
- Image Text Editor
- Flexible application change
- Summary Series
- Online Help

[1] No 2D PET.

syngo.via Workstation/L/XL Software

Applications for Special Use Cases[1]

syngo.CT Coronary Analysis

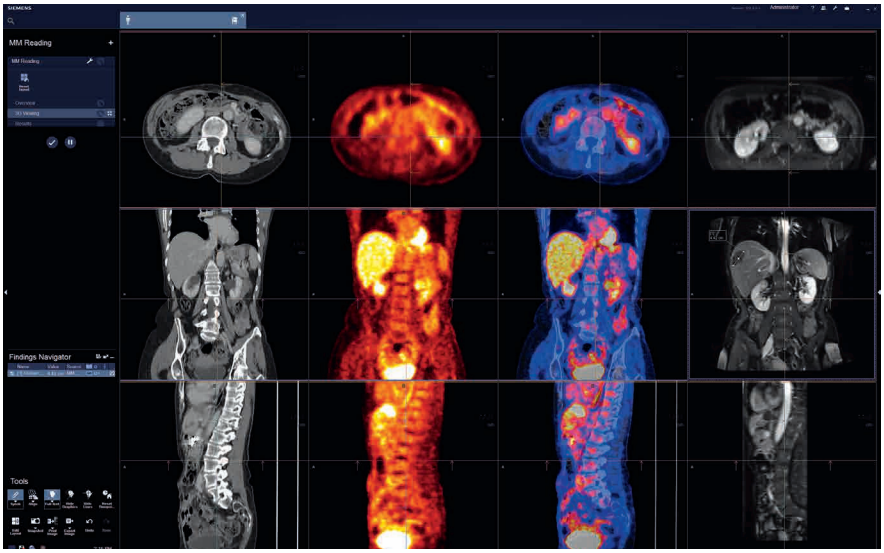
Includes:

- Review Marker
- Plaque visualization
- Heart Isolation
- Movie (beating heart)
- Manual coronary tracking
- Cardiac planes
- Curved & cross-section MPR
- Integrated and context-specific reporting
- Thin MIP Images

syngo.CT Vascular Analysis

Includes:

- Manual vessel tracking
- Integrated and context-specific reporting
- Plaque visualization
- Single Energy Calcification Removal
- Combined workflow Oncology & Vascular (MM Onco + CT Vascular)



MM Reading

syngo.MM Oncology

Includes:

- Navigation synchronized across segments
- RECIST/WHO measurement (manual)
- Registration + Image fusion
- 3D overview through MIP or VRT
- Two time point display
- CT, MR, PET, and SPECT visualization
- Basic PET and SPECT quantification
- Combined workflow Oncology & Vascular (MM Onco + CT Vascular)

syngo.CT Dual Energy[2]

Includes:

- Preparing and viewing of Dual Energy data
- Mixed Image calculation
- Monoenergetic
- Optimum Contrast[3]
- Rho/Z (electron density/effective atomic number)

syngo.MR Reading

Includes:

- Basic workflow
- Workflow customization
- Follow-up support
- Rescan handling
- Context-specific reporting

[1] Already included in the basic package are advanced applications which provide dedicated features for specialized use cases.
[2] Works with Dual Energy images from the whole SOMATOM Family (Single Source and Dual Source Dual Energy).
[3] Optimum Contrast is only available for Dual Source and Twin Beam Dual Energy. This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

Mobile Image Access with *syngo.via* WebViewer[1]

syngo.via WebViewer is a client server product that provides access to rendered medical image data through web browsers and mobile devices. Image data includes 2D images as well as volumetric data.

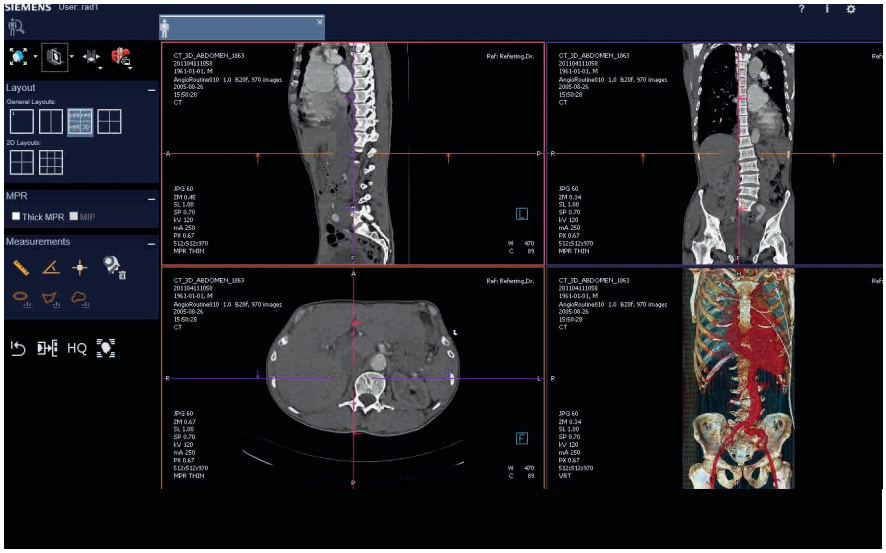
syngo.via WebViewer is available in two deployments: integrated or dedicated.

Each *syngo.via* Workstation, L- and XL-grade server is delivered with an integrated permanent *syngo.via* WebViewer concurrent license (side-by side installation with *syngo.via*). The server grades L and XL can be upgraded to max 3 concurrent users.

syngo.via WebViewer Dedicated servers support 4 to 19 concurrent users and can operate as Webserver, please compare to *syngo.via* WebViewer datasheet.

It features:

- Fast and easy image access in time critical situation or on-call, e.g. Stroke and Trauma.
- High quality image access for physicians outside the radiology, e.g. Surgeons
- Illustrate and discuss results directly with patients, e.g. Oncology



***syngo.via* WebViewer**

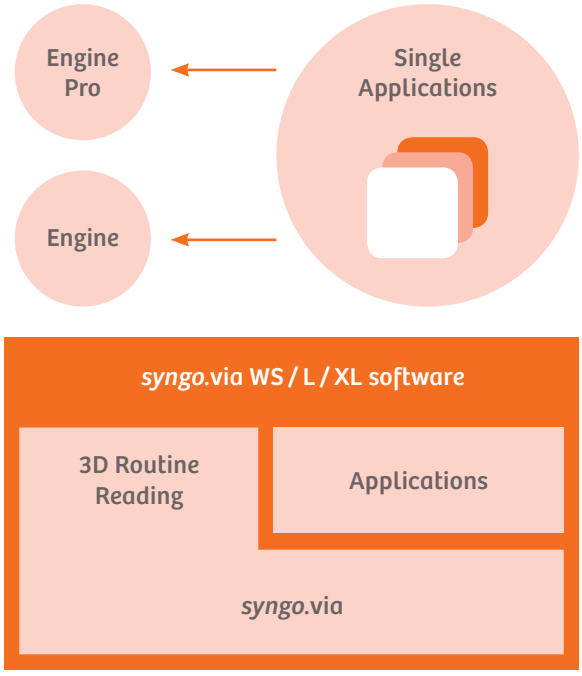
syngo.via WebViewer supports the following image and file formats:

- Computed Tomography (CT)
- Magnetic Resonance (MR)
- Positron Emission Tomography (PET and PET/CT)
- Computed Radiography/Digital Radiography (CR/DR)
- Secondary Capture Images (SC)
- Encapsulated PDF Configuration

[1] The application *syngo.via* WebViewer is not for diagnostic viewing/reading on mobile devices in the US. Please refer to your sales representative whether the product is available for your country. Diagnostic reading of images with a web browser requires a medical grade monitor. For iPhone and iPad country specific laws may apply. Please refer to these laws before using for diagnostic reading/viewing. For Japan: Applications on iPhone / iPad / iPod are not a medical device in Japan. Use at your own risk. They are not intended to be used for diagnosis.

syngo.via Engines and Applications

The following engines and applications are organized by modalities and specialties, including a detailed description of the applications and their key features.



syngo.via WS/L/XL Software

syngo.via can be ordered in different software grades: *syngo*.via Workstation, L-Server, or XL-Server.

- The workstation is the solution for 1–2 users.
- The L server is ideal for 2–7 users working concurrently.
- The XL server is recommended for 5–15 users.

The licensing for multi-modality, multi-user routine reading follows the simple *syngo*.via L/XL software package. Applications/Workflows included in these packages – such as the MM Reading workflow – are not limited by means of software licensing or software constraints. Concurrent usage (instances loaded or concurrent users) is only a result of available hardware resources (e.g. RAM).

Optional Engines and Applications for concurrent users (such as *syngo*.CT Onco Engine) are being offered as counted license.

All grades offer you a wide range of multi-modality 3D reading capabilities to support the basic needs of image processing and reading.

However, there are a broad variety of clinical applications[1] available for *syngo*.via to extend it for specific clinical needs.

These applications are commercially available either as single applications or as groups, referred to as Engines.

There are two Engine levels:

"Engine" and "Engine Pro".

- The "Engine" level addresses the needs of users who regularly work in a specific clinical field.
- The "Engine Pro" level, which can be ordered on top of the "Engine" level, provides advanced imaging functionality and automatic features for state-of-the-art reading.[2] The result is a processing and evaluation solution tailored to your workflow requirements, installed modalities, and clinical focus.

[1] Medical Devices in their own right.
[2] If system is configured appropriately by the user – the user has the full control over the automated functions as they are completely configurable.

Multimodality Engines

syngo.via General Engine

ALPHA Technology

Speeds up the workflow by automating and standardizing reconstructions

- Improves consistency in image presentation
- Anatomical Range Presets (Ranges and projections are automatically initialized with respect to the underlying anatomy)
- AutoViews positions and orients the MPR segments automatically in a clinically meaningful way (available for various body regions)
- Rapid Results Technology for standardized and automated anatomical ranges creation and archiving, triggered from the CT scanner[1]

Advanced Reporting

Efficient and structured communication of *syngo*.via results

- Into a diagnostic report as Text, HTML and RTF
- Into file system as DOCX and PDF
- Into PACS as DICOM SC and as DICOM embedded PDF
- Easily edit picklists and numeric fields for structured data entry and create picklists
- Cross workflow reporting. Combine results in one document
- Flexible selection of print layout
- Easily edit and create sections and picklists. Possibility to create new report sections or modify existing sections to adapt the report content to the clinical needs
- Easily insert snapshots into the report

syngo.via General Engine

Engines	Contained Applications / Functionality
syngo.via General Engine	Highly efficient reading and reporting through: • ALPHA Technology with Automatic Range Tool and AutoViews • Advanced Reporting
syngo.via RT Image Suite	3D/4D CT, PET, PET•CT, MRI and Linac Cone Beam CT (CBCT) image viewing and contouring for Radiotherapy
	Applications /Options
Additionally available (not bundled in any engine)	Cinematic VRT

[1] Only available for CT data, for the whole SOMATOM Family.

Multimodality Engines

syngo.via RT Image Suite

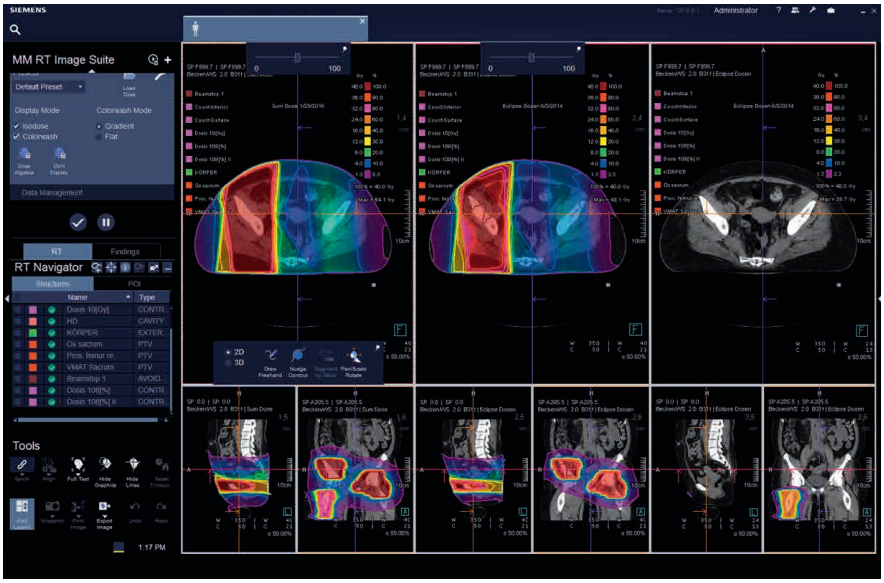
syngo.via RT Image Suite was developed for Radiation Oncology professionals. Designed as a user-friendly work aid to make simulation, image assessment, and contouring easier and better integrated, it eases what you do daily while also offering capabilities that go beyond the current standard.

Multi-modality support

- 3D CT, PET, PET/CT, MRI and Linac CBCT
- 4D CT, PET/CT, MRI
- Time resolved CT and MR images
- Calculate SUV for PET images
- Concurrent display of up to a total of 8 image series (4 single or 4 fused series) over 4 image panels[1]

Direct4D features

- 4D data management with phase splitting, tMinIP, tMIP, AverageCT generation, cine-loop visualization of 4D CT dataset and contours, semiautomatic contour propagation over 4D CT breathing phases[1] and ITV generation
- Quantitative assessment of 3D tumor trajectory and amplitude and semi automatic calculation of the mid-ventilation phase



syngo.via RT Image Suite

[1] Optional

Contouring features

- AutoContouring for organs-at-risk (brain, heart, left lung, right lung, liver, left kidney, right kidney, left femoral head, right femoral head)
- User configurable Organ Templates
- "CT-free" contouring: native PET or MR contouring
- Parallel contouring: contouring performed on any image is reflected on all other images
- Contour copy and warping[1] between image series

Image Registration features

- Rigid and Deformable[1] Registration with region-of-interest based registration and multiple registrations per image pair
- Save registrations and save aligned or deformed images as a new image series
- Registration Quality Check[1] with spyglass, deformation vector map, deformation magnitude color map

RT Dose[1] features

- Display dose volumes overlaid on any supported image type and side-by-side
- Display related dose volume histograms
- Use deformable registration between current and prior dose volumes and images

Simulation features[1]

- Reference point / isocenter management
- Direct Laser Steering for LAP lasers[2]
- DICOM data exchange with LAP lasers, text file based data exchange with other laser manufacturers
- Virtual Laser View for display of laser lines on 3D patient model (VRT)

[1] Optional
[2] Requires compatible laser systems.

Computed Tomography

The CT Clinical Engines

Better understand diseases and make the right treatment decisions – with disease-specific software applications complementary to your CT. Continuously enhance your clinical capabilities by providing better diagnostic confidence. Improve process efficiency by saving working steps and make your entire patient pathway even faster.

Get further with your CT.

Engines	Contained Applications / Functionality
syngo.CT Neuro Engine	*syngo*.CT Neuro DSA *syngo*.CT Neuro Perfusion[1]
syngo.CT Neuro Engine Pro	*syngo*.CT Dynamic Angio
syngo.CT Cardio-Vascular Engine	*syngo*.CT Vascular Analysis *syngo*.CT Coronary Analysis *syngo*.CT Cardiac Function *syngo*.CT CaScoring
syngo.CT Cardio-Vascular Engine Pro	*syngo*.CT Vascular Analysis – Autotracer *syngo*.CT Cardiac Function – Enhancement *syngo*.CT Cardiac Function – Right Ventricle Rapid Stent Planning
syngo.CT Acute Care Engine	*syngo*.CT CaScoring *syngo*.CT Cardiac Function *syngo*.CT Coronary Analysis *syngo*.CT Vascular Analysis *syngo*.CT Neuro DSA *syngo*.CT Neuro Perfusion[1]

[1] This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

Engines	Contained Applications / Functionality
syngo.CT Acute Care Engine Pro	*syngo*.CT Cardiac Function – Enhancement *syngo*.CT Cardiac Function – Right Ventricle *syngo*.CT Vascular Analysis – Autotracer *syngo*.CT Dynamic Angio Rapid Stent Planning
syngo.CT Oncology Engine	*syngo*.CT Segmentation *syngo*.MM Cross-Timepoint Eval *syngo*.CT Colonography
syngo.CT Oncology Engine Pro	*syngo*.CT Lung CAD *syngo*.CT Colonography – PEV *syngo*.CT Colonography – Advanced *syngo*.MM Multi-Timepoint Eval
syngo.CT DE Advanced Package	*syngo*.CT DE Direct Angio *syngo*.CT DE Lung Analysis *syngo*.CT DE Calculi Characterization *syngo*.CT DE Brain Hemorrhage *syngo*.CT DE Heart PBV *syngo*.CT DE Virtual Unenhanced *syngo*.CT DE Gout *syngo*.CT DE Monoenergetic Plus *syngo*.CT DE Bone Marrow *syngo*.CT DE Hardplaque Display
Engines	**Applications / Options**
Additionally available (not bundled in any engine)	*syngo*.CT PE CAD[1] *syngo*.CT Pulmo 3D *syngo*.CT Cardiac Planning – Valve Pilot[2] *syngo*.CT Liver Analysis *syngo*.CT Body Perfusion *syngo*.CT Bone Reading *syngo*.CT Myocardial Perfusion *syngo*.CT Dental *syngo*.CT Onco Function – Hepatic AEF

[1] This feature is not commercially available in the U.S.
[2] This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

Computed Tomography

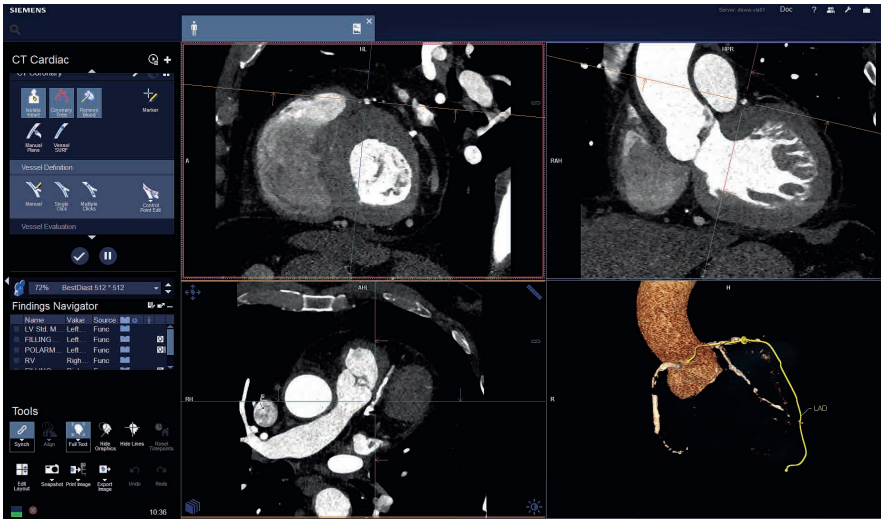
syngo.CT Neuro Engine

syngo.CT Neuro DSA

- Bone Removal
- Follow-up Workflow
- Findings Navigator & Reporting
- Workflow CT Neurovascular

syngo.CT Neuro Perfusion[1]

- Tissue-at-risk model with user-defined perfusion parameters (e.g. CBF, CBV, TTD, TTS. TTP, MTT)
- Calculation of perfusion parameters based on two different perfusion models
- Rapid Results Technology for standardized and automated perfusion results creation and archiving
- Multiparameter View
- Allows time point and volume navigation
- Dedicated Motion Correction
- 4D Noise Reduction
- Bone Removal
- Statistical ROI analysis
- Data Export
- Reporting and Findings Handling
- Motion correction
- 4 step workflow available both as guided or automated – Auto Stroke



syngo.CT Cardiac Function

syngo.CT Neuro Engine Pro

The *syngo*.CT Neuro Engine Pro requires the *syngo*.CT Neuro Engine.

syngo.CT Dynamic Angio

- Time resolved CT images reconstructed from dynamic CT data
- Visualization of the vessel enhancement over time
- Visual inspection of time attenuation curves

syngo.CT Cardio-Vascular Engine

syngo.CT Vascular Analysis

- Curved & cross-sectional ranges
- VesselSURF
- Vessel tracking (2-click centerline)
- Stenosis measurement
- Single Energy Calcification Removal
- DE Direct Angio for Bone and Calcification Removal[2]
- Bone & vessel isolation mode for selective highlighting of high contrast structures
- Rapid Results Technology for standardized and automated image creation
- Export segmentation meshes as DICOM objects for third-party usage
- Cinematic VRT[3]: Cinematic Rendering for high resolution photorealistic 3D views of the vessels

[1] This feature is pending 510(k) clearance, and is not yet commercially available in the United States.
[2] Requires at least one user license of *syngo*.CT DE Direct Angio.
[3] Cinematic VRT is recommended for communication, education, and publication purposes and not intended for diagnostic reading.

syngo.CT Coronary Analysis

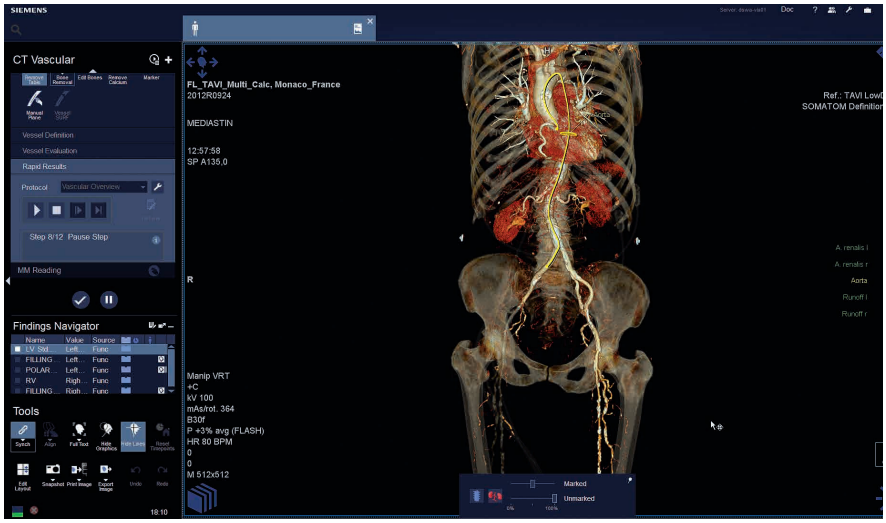
- AngioView
- VesselSURF for navigation along coronaries
- Automatic coronary tracking and labeling (RCA, LM, CX, major coronary branches, and saphenous vein grafts)
- Single-click stenosis measurement
- Single-click coronary vessel tracing
- Image Sharpening for stent/calcified lesion evaluation
- Rapid Results Technology for standardized and automated image creation
- Export segmentation meshes as DICOM objects for third-party usage
- Cinematic VRT (CRT) Cinematic Rendering for high resolution photorealistic 3D views of the heart

syngo.CT Cardiac Function

- Left Ventricular Analysis (LVA)
- Automated left ventricular segmentation
- MinDose capability
- Left ventricular volumetry
- Left ventricular wall analysis
- 17 segment 2D polar maps
- Single-click navigation to aortic and mitral valve plane
- Cinematic VRT (CRT) Cinematic Rendering for high resolution photorealistic 3D views of the heart

syngo.CT CaScoring

- Total & standard Calcium Scoring and Coronary Age calculation based for example on MESA Trial data and more



syngo.CT Vascular Analysis

syngo.CT Cardio-Vascular Engine Pro

The *syngo*.CT Cardio-Vascular Engine Pro requires the *syngo*.CT Cardio-Vascular Engine.

syngo.CT Vascular Analysis – Autotracer

- Automatic tracking and labeling of main vessels (zero-click)

syngo.CT Cardiac Function – Enhancement

- Visualization of first pass, Dual Energy, and dynamic myocardial perfusion data
- AHA-conform 17-segment polar maps for visualization of all types of myocardial perfusion data

syngo.CT Cardiac Function – Right Ventricle

- RVA – Right Ventricular Volumetry

syngo.CT Rapid Stent Planning

- Automatic completion of manufacturer-specific graft order forms

The *syngo*.CT Acute Care Engine

contains all features included in the *syngo*.CT Neuro and *syngo*.CT CardioVascular Engines.

The *syngo*.CT Acute Care Engine Pro

contains all features included in the *syngo*.CT Neuro and *syngo*.CT Cardio-Vascular Engines Pro.

Computed Tomography

syngo.CT Oncology Engine

syngo.CT Segmentation

- Volume rendering of segmentation
- Automated RECIST 1.0 or 1.1 calculation
- Automatic segmentation of lung, liver, lymph nodes and general lesions
- Choi criteria in report
- Dual Energy support of *syngo*.CT DE Virtual Unenhanced[1]
- Advanced HU Statistics with color coding of hypodense areas of lesions (potential indicator for necrosis)

syngo.MM Cross-Timepoint Eval

- Quantify tumor growth rates between time points
- Dual-time point comparison
- 4-time point visualization
- Trending workflow step for fast assessment of response to therapy

syngo.CT Colonography

- Parallel flight prone/supine visualization
- 3D Reading (Fly-through)
- Global View (solid/semi-transparent)
- Registered navigation (prone/supine)
- Delete small intestine
- Distance to rectum
- Stool tagging
- Panoramic View
- Polyp measurements in 3D endo-luminal view

syngo.CT Oncology Engine Pro

The *syngo*.CT Oncology Engine Pro requires the *syngo*.CT Oncology Engine.

syngo.CT Lung CAD

- Adjunct second reader tool
- Solid Nodule detection
- Partial solid and Ground-GlassNodule (GGN) detection[2]
- Auto-processing
- Mini-Toolbar
- Rapid Results Technology for standardized and automated Lung CAD results creation and archiving

syngo.CT Colonography – PEV

- Polyp Enhanced Viewing (PEV)
- PEV marker
- Auto-processing

syngo.CT Colonography Advanced

- Polyp Lens
- Stool Removal
- Virtual Dissection for an unrolled, sliced open and flattened display of the colonic surface

syngo.MM Multi-Timepoint Eval

- 8-time point visualization and synchronized navigation

[1] Requires at least one user license of *syngo*.CT DE Virtual Unenhanced.
[2] This feature is not commercially available in the U.S. or China.

CT Single Applications

syngo.CT Dual Energy[1]

- Preparing and viewing of Dual Energy data
- Mixed image calculation
- Monoenergetic
- Optimum Contrast[1]
- Rapid Results Technology for standardized and automated Dual Energy image creation and archiving
- Rho/Z (electron density/effective atomic number)

syngo.CT DE Gout

- Color-coded visualization of deposited uric acid crystals in peripheral extremities

syngo.CT DE Calculi Characterization

- Visualization of the chemical composition of kidney stones
- Seamless navigation through the visualized stones

syngo.CT DE Brain Hemorrhage

- Iodine uptake quantification
- Differentiate hemorrhage from contrast agent

syngo.CT DE Heart PBV

- Heart isolation
- Iodine uptake quantification
- Virtual non contrast display

syngo.CT DE Direct Angio

- Highlighting of bone structures
- Subtract bones by a single click

syngo.CT DE Hardplaque Display

- Differentation of calcified plaque and iodine contrast media with color-coding

syngo.CT DE Lung Analysis

- Combination of *syngo* Lung PBV and *syngo* Lung Vessels
- Lung isolation
- Color-coding of affected vessels
- Iodine uptake quantification

	Dual Spiral DE	TwinBeam DE[2]	Dual Source DE
syngo.CT Dual Energy[1]	x	x	x
syngo.CT DE Gout	x	x	x
syngo.CT DE Calculi Characterization	x	x	x
syngo.CT DE Brain Hemorrhage	x		x
syngo.CT DE Heart PBV			x
syngo.CT DE Direct Angio		x	x
syngo.CT DE Hardplaque Display		x	x
syngo.CT DE Lung Analysis		x	x
syngo.CT DE Bone Marrow	x		x
syngo.CT DE Virtual Unenhanced	x Liver VNC only	x	x
syngo.CT DE Monoenergetic Plus	x	x	x

[1] Works with Dual Energy images from, the whole SOMATOM Family (Single Source and Dual Source Dual Energy).
- Dual Source Dual Energy scanners support all Dual Energy applications.
- Dual Spiral Dual Energy scanners support only the following Dual Energy applications:
  syngo.CT Dual Energy (incl. Monoenergetic), *syngo*.CT DE Gout, *syngo*.CT DE Calculi Characterization, *syngo*.CT DE Virtual Unenhanced (only Liver VNC and only available for SOMATOM Definition AS+ and SOMATOM Definition Edge), *syngo*.CT DE Bone Marrow, *syngo*.CT DE Brain Hemorrhage (only available for SOMATOM Definition AS+ and SOMATOM Definition Edge).
- Optimum contrast is only available for Dual Source Dual Energy and Twin Beam Dual Energy.
- TwinBeam Dual Energy[2] supports the following applications:
  syngo.CT DE Gout, *syngo*.CT DE Calculi Characterization, *syngo*.CT DE Direct Angio, *syngo*.CT DE Lung Analysis, *syngo*.CT DE Virtual Unenhanced, *syngo*.CT DE Monoenergetic Plus, *syngo*.CT DE Hardplaque Display.

[2] This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

Computed Tomography

syngo.CT DE Bone Marrow

- Color-coding of bone marrow
- Evaluation of diffuse tumor infiltrations

syngo.CT DE Virtual Unenhanced

- Iodine uptake quantification
- Calculation of virtual unenhanced image
- Calculation of fat map in the liver

syngo.CT DE Monoenergetic Plus

- Improved algorithm for enhanced image quality and iodine contrast
- Evaluation of multiple ROI

syngo.CT Cardiac Planning – Valve Pilot[1]

- Zero-click display of the aortic annulus plane based on aortic valve hinge points
- All measurements for quantitative annulus assessment (annulus area, annulus perimiter min. and max. diameters, effective diameters based on annulus area or perimeter) are ready for review as the case is opened
- Automated transfer of the C-arm angulations to the cath lab
- Cinematic VRT (CRT) Cinematic Rendering for high resolution photorealistic 3D views of the heart

syngo.PET Segmentation

- PET segmentation
- PET quantification including SUV and Peak
- Volume rendering of segmentation
- Projection Image creation and display for NaF Whole Body Exams
- Automated segmentation of hypermetabolic lesions
- Automated reference regions in the liver and blood pool
- EQPET normalizes changes for tumor growth rates across timepoints and across scanners

syngo.CT Pulmo 3D

- Segmentation of lungs
- Evaluation: lung volume, mean lung density, and standard deviation
- Calculation of evaluation index, subranges, percentiles, and clusters
- Result presentation in tables and histograms
- Measurements of airways
- Context-specific reporting
- Segmentation of lunglobes and evaluation of airways (trachea and bronchi) with color-coded display

syngo.CT PE CAD[2]

- Automatic detection of filling defects
- Overview layout
- Automatic lesion zoom view

syngo.CT Body Perfusion

- Fast simultaneous multislice calculation of blood flow, blood volume, permeability images
- Automated motion correction for improved anatomical alignment
- Guided workflow, for example pre-defined evaluation templates for tumor and liver
- User-defined individual evaluation templates
- VOI measurement tools for perfusion characteristics
- Composite images – merged anatomical and color parameter display
- Dedicated liver perfusion analysis

syngo.CT Myocardial Perfusion

- Intuitive visualization of time-variant multislice or volumetric data
- Advanced motion correction for improved anatomical alignment
- Fast simultaneous calculation of various volumetric perfusion parameter images
- Input of target volumes of interest (VOI) and volumetric segmentation of myocardium
- Composite images allowing a merged display of an anatomical image with a color parameter display in the target VOI
- VOI and ROI (region of interest) measurement tools for a detailed analysis of perfusion characteristics
- Optimized color display of perfusion parameter
- Assessment and quantification of the perfusion of the myocardium

syngo.CT Dental

- Prepare dental images with CT imaging for implant planning
- Create panoramic and paraxial images based on a defined reference plane and centerline in real-time
- Print images in TrueSize (1:1)
- Outline and visualize the mandibular channel

syngo.CT Liver Analysis

- Pre-processing for complete liver segmentation
- Semi-automated segmentation of liver lesions
- Semi-automated segmentation of arterial, portal venous, and venous vascular and bile ducts tree
- 3D semi-automated mapping of vascular supply areas onto liver tissue
- Virtual dissection planes and sub-sequent volumetric calculation of resected and residual liver
- Review of results on available MRI datasets

[1] *syngo* CT Cardiac Planning is currently 510(k)-pending.
[2] This feature is not commercially available in the U.S.

syngo.CT Bone Reading

- Rib unfolding – bone reading adopted visualization of all ribs in one plane
- Spine reading optimized reading functionality
- Computer Aided Detection (CAD) for spine lesions[1]
- Automated rib and spine labeling and numbering
- Rapid Results Technology for standardized and automated Bone Reading results creation and archiving

CT Onco Function – Hepatic AEF

- Dedicated color-coded visualization of arterial enhancement fraction (AEF) values calculated from routine abdominal multiphase CT
- Enables assessment of hepatic arterial perfusion ratio compared to the total perfusion

syngo.via Frontier[2]

- Gateway to an open research environment
- Access to state-of-the-art research prototypes from multiple imaging modalities that are seamlessly integrated with your routine *syngo*.via system
- Design and implement new prototypes to leverage your research endeavors (required optional *syngo*.via Frontier Development Kit)
- Share your experiences with fellow researchers in an internationa online community

CT View&GO[3]

For additional flexibility, the same interpretation and evaluation tools from the SOMATOM go. platform are also available in the CT View&GO Workplace's reading environment, providing the ideal performance boost for the SOMATOM go. scanners. This convenient and flexible reading solution optimizes the scanning workflow by unleashing the image evaluation and reading tasks from the scanner interface if needed, and thus optimizing patient throughput

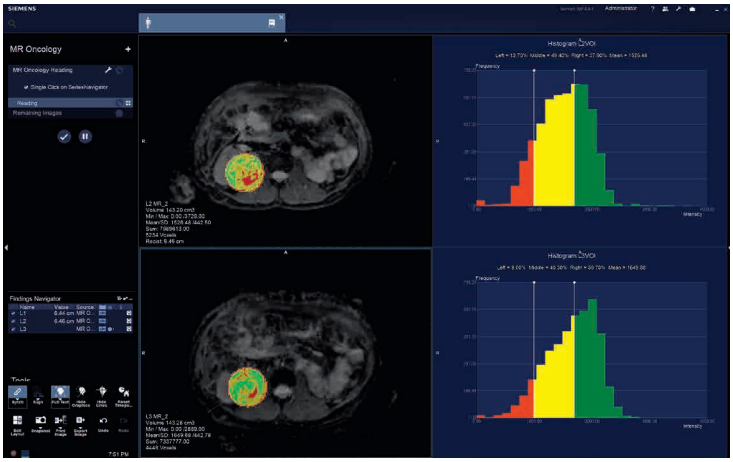
As an all-in-one, cross-specialty viewing solution, CT View&GO provides a large variety of clinical applications and tools for smooth reading in just one workflow:

- Customizable user interface, through a Favorite Toolbox
- Automatic distribution and filming of images and results
- Table and Bone Removal: Fast accurate presentation of subtracted CT Angiographic data sets
- Vessel Extension: Set of tools and layouts for guided creation of CPR (Curved Planar Reconstructions) for enhanced vascular assessment – for aneurysms or peripheral artery disease, for instance
- Endoscopic View: Virtual Endoscopy software enabling visualization of airways and intestines
- Diameter/WHO area Longitudinal lesion measurements and WHO for enhanced clinical decisions in oncology
- ROI HU Threshold: Evaluation and display of tissue densities within a certain HU range. This can help to quantify fat or assess lesions for hypodense areas as a possible indicator of therapy response.
- Spine Ranges guided reconstruction of anatomically aligned spine
- Curved Planar Reconstructions (CPR) and automatic detection and labeling of vertebrae.
- CT Osteo[4]: 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
- Neuro DSA[4]: single-click, bone-free visualization of the supraaortic vessels for quick and easy evaluation of neurovascular disease and interventional treatment planning.
- Lung CAD[4]: fully automated, computer assisted second reader tool, designed to assist radiologists in the detection of pulmonary nodules during review of CT examinations of the chest.

[1] This feature is not commercially available in the U.S.
[2] *syngo*.via Frontier is not a medical device. The images created with the *syngo*.via Frontier application are not for clinical use and must not be used for diagnosis.
[3] This feature is pending 510(k) clearance, and is not yet commercially available in the United States.
[4] Optional

Magnetic Resonance

The MR applications and engines make it easier to add advanced applications to clinical routine thanks to *syngo*.via's capability to take out the complexity of advanced post-processing. Standardization of the results is improved through robust algorithms and user-defined automation of the processing steps. Finally, communicating the results to the referring physician in a meaningful way is made possible by structured reports following clinical recommendations.



***syngo*.MR OncoCare**

Engines	Contained Applications /Functionality
syngo.MR General Engine	Several MR Radiology workflows and MR Evaluation features. *syngo*.MR General Engine is the precondition for all other, advanced MR *syngo*.via applications and Engines. MR General Routine MR Cardiac Reader
syngo.MR Onco Engine	*syngo*.MR Onco *syngo*.MR 3D Lesion Segmentation
syngo.MR Onco Engine Pro	*syngo*.MR OncoCare
syngo.MR Neuro Perfusion Engine	*syngo*.MR Neuro Perfusion *syngo*.MR Neuro Perfusion Mismatch
syngo.MR Neuro 3D Engine	*syngo*.MR Neuro fMRI *syngo*.MR Tractography
syngo.MR Spectro Engine	*syngo*.MR Spectro SVS *syngo*.MR Spectro CSI *syngo*.MR Spectro Extension
syngo.MR Cardio Engine	*syngo*.MR Cardiac 4D Ventricular Function *syngo*.MR Cardiac Flow
syngo.MR Prostate Engine	*syngo*.MR Tissue 4D *syngo*.MR Spectro CSI
Engines	**Applications /Options**
Additionally available (not bundled in any engine)	*syngo*.mMR General *syngo*.MR Composing *syngo*.MR BreVis *syngo*.MR Vascular Analysis *syngo*.MR Spectro Research *syngo*.MR Cardiac Perfusion

syngo.MR General Engine

- MR Basic workflow with Easy Reading Mode for intuitive reading of examinations from different body regions: Fast interactions to select, fuse, and compare series in suitable layouts
- MR Neurology workflow for efficient reading of neuro examinations with customizable layouts. With the respective licenses, the tools for advanced DSC perfusion analysis (Perfusion Maps[1], specific Mean Curve[1], Mismatch[2]) and semi-automated lesion segmentation[3] are centrally accessible within the workflow.
- Includes MR Breast Reading workflow for synchronized reading of 2D, 3D and 4D images with on-the-fly mean curve analysis and BIRADS reporting
- Includes MR Prostate Reading workflow for simultaneous reading of anatomical, diffusion, and T1 weighted dynamic images with PI-RADS™ v2 prostate reporting
- MR Cardio-Vascular Reading Workflows:
  Cardiac Reader (incl. Tissue Volume Quantification tool), Angio Single Station, Angio Multi Station, Angio TimCT and Angio TWIST
- MR Evaluation: Mean Curve analysis, Image Filter, 2D/3D Distortion Correction, Elastic Motion Correction, Addition, Subtraction, Multiplication, Division.
- Diffusion tools: generation of ADC maps and computed b-value images with interactive preview
- MR Workflow manager

syngo.MR Onco Engine

syngo.MR Onco

syngo.MR Onco provides an intuitive way to deal with the high amount of data generated in oncological studies.

- RECIST evaluation tool
- Additional specific oncology layouts
- Dedicated follow up layout
- Structured report for communication of the results

syngo.MR 3D Lesion Segmentation

- Semi-automated volumetric evaluation of lesions
- 2 possible modes: Box-based and brush-based initialization of segmentation
- Longest lesion diameter provided
- Correction tools

syngo.MR Onco Engine Pro

syngo.MR OncoCare

syngo.MR OncoCare is an extension package to *syngo*.MR Onco Engine providing rich feature sets for histogram analysis and trending over multiple time points.

- VOI and ROI-based histogram analysis
- Intuitive color definition for three histogram domains
- Presets for histogram analysis can be saved
- Back-mapping of histogram colors on the image of reference
- Export of histogram values in .CSV format of pixel intensity values
- Extended trending possibilities (including RECIST, Volume, Mean intensity and histogram domain areas)
- Trending plot

[1] Requires *syngo*.MR Neuro Perfusion.
[2] Requires *syngo*.MR Neuro Perfusion Mismatch.
[3] Requires *syngo*.MR 3D Lesion Segmentation.

Magnetic Resonance

syngo.MR Neuro Perfusion Engine

syngo.MR Neuro Perfusion

syngo.MR Neuro Perfusion enables processing of brain perfusion data-sets within the MR Neurology workflow

- Rigid Motion Correction and spatial filter
- Computation of relative Mean Transit Time (relMTT), relative Cerebral Blood Volume (relCBV), relative Cerebral Blood Flow (relCBF), Time to Peak (TTP) and Percentage of Baseline at Peak (PBP)
- Global AIF, Global AIF with delay correction, local AIF, and local AIF with T1 correction for perfusion maps generation.
- Preprocessing functionality for map generation using local AIF methods
- Dedicated stripes layout for perfusion map reading
- Mean Curve Evaluation with up to 10 ROIs
- One-click mirror ROIs on the contralateral side with ratio computation
- Summary table displaying results with .CSV export functionality

syngo.MR Neuro Perfusion Mismatch

- Mismatch evaluation between any series with same frame of reference
- Evaluation based on ROIs or combination of ROIs
- Summary table displaying results with .CSV export functionality

syngo.MR Neuro 3D Engine

syngo.MR Neuro fMRI

- Multi contrast evaluation of up to 4 fMRI contrasts with simultaneous overlay in 2D and 3D
- Automatic selection and registration of BOLD datasets across multiple sessions
- 3D Visualization: color t-value maps on anatomical datasets
- LUT, thresholding, clustering, and interpolation settings can be customized and saved for automatic later reuse
- Volume navigation and display possibilities: Zoom, pan, rotate, cut planes, split planes, head mask, brain mask
- Analysis of Signal Time Curves: Time course layout (3D Fused MPR and dynamic BOLD data), interactive analysis with up to 10 VOIs, shrink to activation functionality, side by side display of signal time and motion curves
- Offline calculation of statistical maps from BOLD data (t-value maps with t-test or with GLM)
- Export of processing results as DICOM or RGB data. Additionally, all color fused images and results can be stored or printed
- If the respective option is available, results from *syngo*.MR Tractography can be displayed and exported together with fMRI results and anatomy

syngo.MR Tractography

- Automatic selection and registration of DTI datasets
- Tracts from different tensor acquisitions can be combined
- Offline calculation of tensor from DTI raw data for tractography post-processing. The following diffusion maps can additionally be generated: ADC, b0, Trace-Weighted, FA (Fractional Anisotropy), AD (Axial Diffusivity), RD (Radial Diffusivity)
- Automatic whole brain tractography with user-customizable settings
- Easy definition of DTI seed regions with VOIs, planes, and logical combination of both
- On-the-fly tracts exploration by moving the VOI over the dataset
- Flexible parameters adjustment to generate tracts
- DTI seed generation using fMRI activated voxels (requires *syngo*.MR Neuro fMRI)
- Simultaneous display of diffusion maps (ADC, FA,RD, AD,trace-weighted) and tractography results with anatomical images
- DTI Evaluation step: Side by side display of multiple diffusion maps for simultaneous evaluation. The evaluation can be performed using ROI, freehand ROI, VOI, VOI restricted to fMRI activated voxels (requires *syngo*.MR Neuro fMRI), or voxels of interest. Measurements can be exported as DICOM or .CSV.
- Volume navigation and display possibilities: Zoom, pan, rotate, cut planes, split planes, had mask, brain mask
- Export of processing results as DICOM or RGB data. Additionally all color fused images and results can be stored or printed
- If the respective option is available, results from *syngo*.MR Neuro fMRI can be displayed and exported together with DTI results and anatomy

syngo.MR Spectro Engine

syngo.MR Spectro SVS

- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)
- Improved algorithm based on extended prior knowledge modeling
- Ad hoc possibility

syngo.MR Spectro CSI

- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)
- Improved algorithm based on extended prior knowledge modeling
- Automatic display of color-coded metabolite images (preset or user-defined) with possibility of 3D coloring interpolation
- Automatic display of the fit on the spectral map
- Automatic MPR creation for reference images (Inline MPR creation to match slice positioning of CSI slice(s))
- Real-time display of CSI spectra
- Integration in the prostate workflow: the pre-processed results are automatically displayed in the main reading step
- Ad hoc possibility

syngo.MR Spectro Extension

- Quality check criteria can be defined by the user
- More display possibilities (e.g. real / imaginary parts)
- Creation of new metabolite templates

syngo.MR Cardio Engine

syngo.MR Cardiac 4D Ventricular Function

- Fully automatic left ventricle and semi-automatic right ventricle segmentation.
- Volume-time curves
- 4D visualization
- Easy user guidance with graphical selection of ED, ES, basal and apical slices
- Volumetric and regional wall motion analysis
- Export of result images containing relevant contours

syngo.MR Cardiac Flow

- One-click vessel segmentation
- Color-coded display of velocity values
- Calculation of flow and velocity parameters (e.g. peak velocity, average velocity, flow, integral flow), regurgitant fraction
- Inversion of polarity of flow-encoding direction (mirror flow curves)
- Export of result images containing relevant contours

Magnetic Resonance

syngo.MR Prostate Engine

syngo.MR Tissue 4D

syngo.MR Tissue 4D provides advanced tools for T1 perfusion evaluation.

- Elastic motion correction
- Registration of dynamic data on anatomical data
- Manual or automated selection of the processing volume (spheroid or cuboid)
- Qualitative model: wash-in, washout, iAUC, TTP, AT, PEI
- Quantitative model (Tofts model): Ktrans, Kep, Ve. Three predefined arterial input functions are available
- Overlay of parametric maps on selectable MR images
- On-the-fly, ROI-based, and VOI-based curve analysis
- Tissue 4D is configurable to automatically perform the motion correction, registration, and initial computation of the pharmaco-kinetics analysis readily in the pre-processing phase
- Integration in the prostate workflow: the pre-processed results are automatically displayed in the main reading step
- Export of precessing results as DICOM or .CSV format

syngo.MR Spectro CSI

- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)
- Improved algorithm based on extended prior knowledge modeling
- Automatic display of color-coded metabolite images (preset or user-defined) with possibility of 3D coloring interpolation
- Automatic display of the fit on the spectral map
- Automatic MPR creation for reference images (Inline MPR creation to match slice positioning of CSI slice(s))
- Real-time display of CSI spectra
- Integration in the prostate workflow: the pre-processed results are automatically displayed in the main reading step

Single Applications

syngo.mMR General

syngo.mMR General is an extension package to *syngo*.MR Onco Engine providing dedicated features for analysis of MR-PET images.

- Dedicated MR-PET layouts
- Dedicated layout for MR-PET and PET-CT comparison
- SUV units supported : SUV_bw, SUV_lbm, SUV_bsa
- SUV parameter GUI
- VOI isocontour: PET-segmentation tool
- Copy-Paste of ROIs and VOIs between MR and PET
- MR-PET dedicated reporting

syngo.MR Composing

- Composing of images from different table positions
- Automatic and manual composing of sagittal and coronal images
- Dedicated algorithms for spine, angiography
- Dedicated algorithm to combine multiple axial series (e.g. DWI examinations)
- Integration of the composing step in the Angio Multi Station and Whole Spine workflows

syngo.MR Cardiac Perfusion

- Fully automated motion correction of perfusion series
- Specific synchronization of rest and stress series
- Generation of parametric maps: TTP, AUC, Slope
- Interactive pixel-based time course analysis
- Evaluation of Time-to-Peak, Peak Value, Uptake Slope, Area under the Curve
- Graphical display of results in parametric bull's-eye plot

syngo.MR BreVis

syngo.MR BreVis provides advanced tools for contrast-enhanced MR mammography and enables efficient breast reading and reporting.

- Elastic motion correction
- Automatic subtraction
- Automatic synchronization of 2D, 3D, and 4D datasets
- Parametric analysis of dynamics: wash-in, wash-out, curve type, enhancement rate, PEI
- Set of pre-defined layouts suitable for breast reading on one or two monitors
- Automated calculation of intuitive color-coded maps as overlay on anatomy
- On-the-fly, ROI-based, and VOI-based curve analysis
- Computation of enhancing volume
- Graphical volume statistics of lesion enhancement
- Reporting according to BI-RADS standard

syngo.MR Vascular Analysis

- Viewing with VRT, MPR, or MIP mode
- Special CPR reformating along the vessel centerline
- Semi-automatic detection of vessel segments
- Quantitative assessment of vascular lesions (e.g. stenosis degree)
- Integration in the Angio workflows

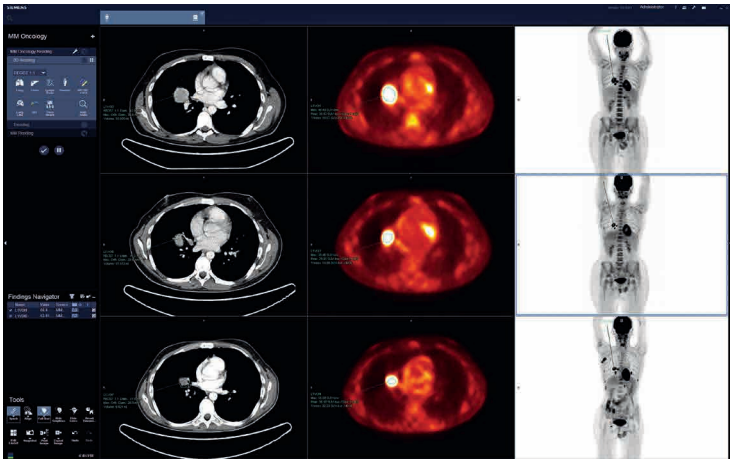
syngo.MR Spectro Research

- Support of multi-nuclear option
- Manual phase correction
- Additional fitting line for single metabolites
- Advanced export functionalities: raw data, model signal files, and curve result value data (gda format)

Molecular Imaging

The MI Clinical Engines visualize, measure and report disease at a functional level, with disease specific software applications – complementary to your PET/CT, SPECT or SPECT/CT.

Clinical capabilities may be enhanced by performing organ-specific reading while multiple time-point cases are all registered with each other using ALPHA technology. Measure therapy response with quantitative tools and EQ•PET for normalized and comparable results.



syngo.MM Oncology

Engines	Contained Applications /Functionality
syngo.MM Oncology Engine	*syngo*.MI Segmentation *syngo*.MM Cross-Timepoint Eval
syngo.MM Oncology Engine Pro	*syngo*.PET Dynamic Analysis *syngo*.MM Multi-Timepoint Eval *syngo*.MM Therapy Interface *syngo*.CT Segmentation
syngo.PET Cardiology Engine 4DM	*syngo*.PET Corridor4DM *syngo*.CT Extension Corridor4DM *syngo*.CT CaScoring
syngo.PET Cardiology Engine 4DM Pro	*syngo*.PET Myocardial Blood Flow *syngo*.CT Coronary Analysis *syngo*.CT Cardiac Function *syngo*.MI Cardiac Reorientation *syngo*.MI Hybrid Coronary View
syngo.SPECT Cardio Engine 4DM	*syngo*.SPECT Corridor4DM

Engines	Contained Applications /Functionality
syngo.SPECT Cardio Engine 4DM Pro	*syngo*.CT Extension Corridor4DM *syngo*.MI Cardiac Reorientation *syngo*.CT CaScoring
syngo.MI Cardio Engine 4DM	*syngo*.PET Corridor4DM *syngo*.SPECT Corridor4DM *syngo*.CT Extension Corridor4DM *syngo*.CT CaScoring
syngo.MI Cardio Engine Pro	*syngo*.PET Myocardial Blood Flow *syngo*.CT Coronary Analysis *syngo*.CT Cardiac Function *syngo*.MI Hybrid Coronary View *syngo*.MI Cardiac Reorientation
syngo.PET Neurology Engine	*syngo*.PET Neuro DB Comparison *syngo*.MI Neuro Hybrid 3D
syngo.PET Neurology Engine Pro	*syngo*.CT Neuro DSA *syngo*.MI Neuro Reorientation *syngo*.MI Neuro DB Creation
syngo.SPECT Neurology Engine	*syngo*.SPECT Neuro DB Comparison *syngo*.MI Neuro Hybrid 3D
syngo.SPECT Neurology Engine Pro	*syngo*.MI Neuro Subtraction *syngo*.SPECT Striatal Analysis *syngo*.MI Neuro Reorientation
syngo.SPECT Processing Engine	MI Reading SPECT Organ Processing
Engines	**Applications /Options**
Additionally available (not bundled in any engine)	*syngo*.PET Amyloid Plaque *syngo*.MI Offline OncoBoard *syngo*.PET Cedars Suite *syngo*.SPECT Cedars Suite *syngo*.CT Extension Cedars *syngo*.PET Extension Corridor4DM CFR

Molecular Imaging

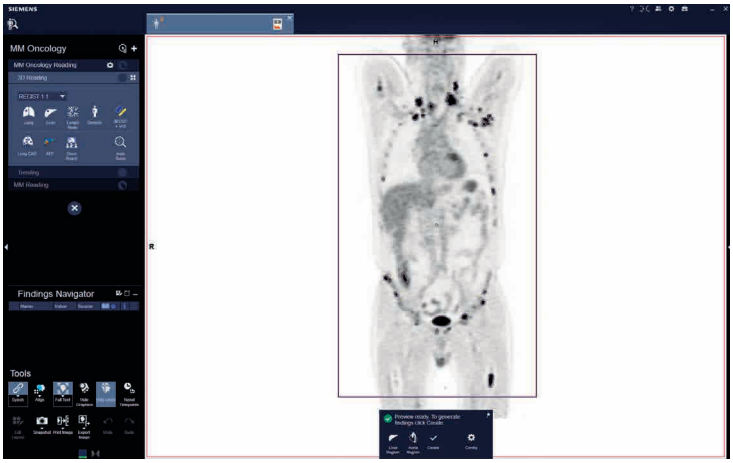
syngo.MM Oncology Engine

syngo.MI Segmentation

- Functional quantification including SUV, Peak, MTV and TLG
- Immediate and continual quantification of Max SUV at your mouse pointer
- Reporting and quantifiable treatment response assessment through automated segmentation of single or multiple foci and calculation of whole body or region specific functional tumor burden (MTV and TLG)[1]
- Projection image creation and display for NaF Whole Body Exams
- Automated reference regions in the liver and blood pool
- Calculate PERCIST threshold for selecting reportable lesions
- Hybrid tools to create measurements on functional & anatomical with ease
- EQ.PET harmonizes SUVs across scanners and reconstructions

syngo.MM Cross-Timepoint Eval

- Dual-time point comparison
- 4-time point visualization
- Quantify tumor growth rates between time points
- Trending workflow step for fast assessment of response to therapy
- Color-coded summary of RECIST response



syngo.MM Oncology

syngo.MM Oncology Engine Pro

syngo.PET Dynamic Analysis

- Evaluate volumetric regions of interest on dynamic acquisitions
- Generate time activity curves (TAC) for standard PET metrics

syngo.MM Multi-Timepoint Eval

- 8-time point visualization and synchronized navigation

syngo.CT Segmentation

- Volume rendering of segmentation
- Automated RECIST 1.0 or 1.1 calculation
- Automated segmentation of lung, liver, lymph node and general lesions
- General segmentation
- Choi criteria in report
- Dual Energy support of *syngo*.CT DE Virtual Unenhanced [2/3/4]
- Advanced HU Statistics with color-coding of hypodense areas of lesions (potential indicator for necrosis)

syngo.MM Therapy Interface

- Copy diagnostic segmentations onto a planning CT as a Target Volume and create an RTSS
- Freehand editing of Target Volumes with nudge tool
- Synchronized temporal navigation and side-by-side or fused visualization of phase-matched PET/CT respiratory gated data.

[1] The product is still under development and not yet commercially available. Its future availability cannot be ensured.
[2] Configuration of CT Clinical Engines can vary depending on CT scanner type.
[3] Works with Dual Energy images from the whole SOMATOM Definition Family (Single Source and Dual Source Dual Energy). *syngo*.CT DE Virtual Unenhanced for Single Source Dual Energy.
[4] Requires at least one user license of *syngo*.CT DE Virtual Unenhanced.

syngo.MI Offline OncoBoard

Present MI cases at tumor board, multi-disciplinary team meeting or conference with evidence from *syngo*.via even when not connected to the *syngo*.via system or clinical network

syngo.PET Cardiology Engine 4DM

syngo.PET Corridor4DM

- Corridor4DM for PET MPI and LV function

syngo.CT Extension Corridor4DM

- Extends Corridor4DM with CT fusion display

syngo.CT CaScoring

- Total & standard Calcium Scoring and Coronary Age calculation based for example on MESA Trial data and more

syngo.PET Cardiology Engine 4DM Pro

syngo.PET Myocardial Blood Flow

- Quantification of MBF and CFR for Rb82 and NH3-Ammonia
- Normal database comparison
- Motion compensation
- NH3 residual activity correction

syngo.CT Coronary Analysis
syngo.CT Cardiac Function
syngo.MI Hybrid Coronary View

- Fused 3D display combining CT Coronary Angiography with PET and SPECT MPI as well as PET MBF and CFR

syngo.MI Cardiac Reorientation

- Enables automatic re-orientation to the cardiac planes

syngo.SPECT Cardio Engine 4DM

syngo.SPECT Corridor4DM

- Corridor4DM for SPECT MPI and LV function

syngo.SPECT Cardio Engine 4DM Pro

syngo.CT Extension Corridor4DM

- Extends Corridor4DM with CT fusion display

syngo.CT CaScoring

- Total & standard Calcium Scoring and Coronary Age calculation based for example on MESA Trial data and more

syngo.MI Cardiac Reorientation

- Enables automatic re-orientation to the cardiac planes

syngo.MI Cardiology Engine 4DM

syngo.PET Corridor4DM

- Corridor4DM for PET MPI and LV function

syngo.SPECT Corridor4DM

- Corridor4DM for SPECT MPI and LV Function

syngo.CT Extension Corridor4DM

- Extends Corridor4DM with CT fusion display

syngo.CT CaScoring

- Total & standard Calcium Scoring and Coronary Age calculation based for example on MESA Trial data and more

syngo.MI Cardiology Engine Pro

syngo.PET Myocardial Blood Flow

- Quantification of MBF and CFR for Rb82 and NH3-Ammonia
- Normal database comparison
- Motion compensation
- NH3 residual activity correction

syngo.CT Coronary Analysis
syngo.CT Cardiac Function
syngo.MI Hybrid Coronary View

- Fused 3D display combining CT Coronary Angiography with PET and SPECT MPI as well as PET MBF and CFR

syngo.MI Cardiac Reorientation

- Enables automatic re-orientation to the cardiac planes

Molecular Imaging

syngo.PET Neurology Engine

syngo.PET Neuro DB Comparison

- FDG Normal Databases
- Display and quantification of PET brain scans

syngo.MI Neuro Hybrid 3D

- Enables state of the art 3D brain images for publications and presentations.

syngo.PET Neurology Engine Pro

syngo.CT Neuro DSA
syngo.MI Neuro DB Creation

- Creation of custom databases for different tracers for use in Neuro DB Comparison

syngo.MI Neuro Reorientation

- Enables automatic brain re-orientation to AC-PC line

syngo.SPECT Neurology Engine

syngo.SPECT Neuro DB Comparison

- Display and quantification of SPECT brain scans
- HMPAO and ECD Normal databases

syngo.MI Neuro Hybrid 3D

- Enable state of the art 3D brain images for publications and presentations.

syngo.SPECT Neurology Engine Pro

syngo.CT Neuro DSA
syngo.MI Neuro DB Creation

- Creation of custom databases for different tracers for use in Neuro DB Comparison

syngo.SPECT Striatal Analysis

- Reproducible visual assessment of ioflupane brain scans
- Quantification of e.g. left/right ratios and striatum to background ratios

syngo.MI Neuro Subtraction

- Assesses epileptic seizure patients with SISCOM subtraction
- Measures the difference in cerebral blood flow between seizures
- Display and quantification of subtraction

syngo.MI Neuro Reorientation

- Enables automatic brain re-orientation to AC-PC line

PET and SPECT Cardiology Applications

syngo.PET Corridor4DM

- Corridor4DM for PET MPI and LV function

syngo.PET Extension Corridor4DM CFR

- Extends *syngo*.PET Corridor4DM with quantification of MBF and CFR for Rb82-Rubidium and NH3-Ammonia

syngo.SPECT Corridor4DM

- Corridor4DM for SPECT MPI and LV function

syngo.CT Extension Corridor4DM

- Extends Corridor4DM with CT fusion display

syngo.PET Cedars Suite

- Cedars Cardiac Suite for PET MPI and LV function as well as quantification of MBF and CFR for Rb82-Rubidium and NH3-Ammonia

syngo.SPECT Cedars Suite

- Cedars Cardiac Suite for SPECT MPI and LV function

syngo.CT Extension Cedars Suite

- Extends Cedars Cardiac Suite with CT fusion display

syngo.PET Myocardial Blood Flow

- Quantification of MBF and CFR for Rb82 and NH3-Ammonia
- Normal database comparison
- Motion compensation
- NH3 residual activity correction

syngo.MI Hybrid Coronary View

- Fused 3D display combining CT Coronary Angiography with PET and SPECT MPI as well as PET MBF and CFR

PET and SPECT Neurology Applications

syngo.PET Neuro DB Comparison

- FDG NormalS Databases
- Display and quantification of PET brain scans

syngo.PET Amyloid Plaque

- SUV quantification of Amyloid plaque scans
- Florbetapir, Flutemetamol and Florbetaben quantification
- Florbetapir and Florbetaben normals databases

syngo.SPECT Neuro DB Comparison

- Display and quantification of SPECT brain scans
- HMPAO and ECD Normal databases

syngo.SPECT Neuro Subtraction

- Assesses epileptic seizure patients with SISCOM subtraction
- Measures the difference in cerebral blood flow between seizures
- Display and quantification of subtraction

syngo.SPECT Striatal Analysis

- Reproducible visual assessment of ioflupane brain scans
- Quantification of e.g. left/right ratios and striatum to background ratios

syngo.MI Neuro DB Creation

- Creation of custom databases for different tracers for use in Neuro DB Comparison
- Enables automatic brain reorientation to AC-PC line

syngo.SPECT Processing Engine

- Enables reading, measurement and reporting of SPECT and SPECT/CT by visualizing and quantifying physiology characteristics
- Provides quality control and organ based processing activities

Quality Control

- Motion and quality evaluation through use of cinematic images and a reference line that corresponds to a sinogram, lingoram and summed image
- Automatic and manual motion correction
- Review of gated histograms

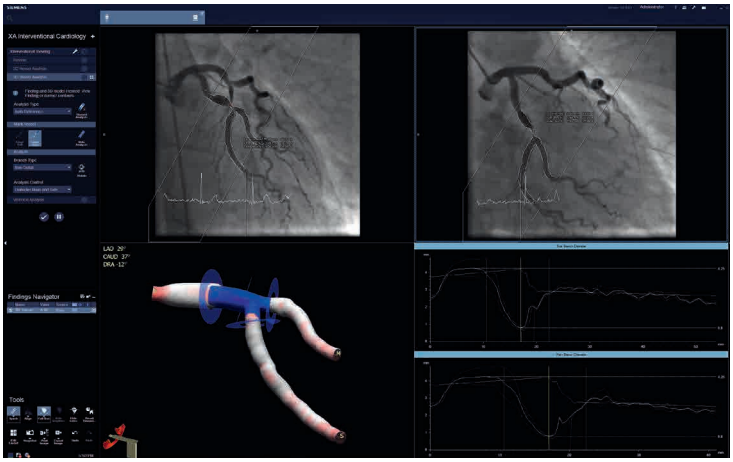
Organ Based Processing

Enables the user to further evaluate specific organ systems with automatic or manual region of interest determinations.

- Cardiac Planar Gated Blood Pool
  - Provides left and right ventricular analysis
  - Outputs result tables, functional images and curves for further filling and emptying analysis
- Planar Lung Quantification
  - Presents left and right lung perfusion quantification through geometric mean calculation
  - Allows total or segmented quantification
  - Produces functional V/Q image results, ratios and statistical tables
- Thyroid Analysis
  - Enables 6 and 24 hour uptake from scanner using dose calibrator or syringe methods
  - Presents count-rate, area and volume calculations
  - Allows for single lobe processing
- Renal Analysis
  - Utilizes patient and dose specific information to evaluate many different renal exams including:
    · MAG3
    · Lasix
    · Transplant
    · Itoh ERPF
    · Gates GFR
    · Oberhausen
    · Oriuchi
    · Bubeck
    · Captopril Comparison
  - Available dose calibrator or syringe methods
  - Yields detailed curve analysis and results summary
- Gastric Emptying Analysis
  - Delivers gastric emptying results for liquid/solid single or dual isotope protocols
  - Automatically applies geometric mean, decay and background corrections
  - Provides T½ and emptying % with optional extrapolation using curve fitting routines
- Hepatobiliary
  - Cholecystic Ejection Fraction results for hepatobiliary protocols with CCK
  - Calculates gallbladder curve and results table
- Image Manipulation
  - Manipulate and perform arithmetic on NM images such as curve interrogations, filtering, masking, adjusting matrices, addition, subtraction, scaled subtraction, multiplication, division, geometric mean and static merge.

Angiography

The engines for angiography include applications dedicated to the clinical specialties radiology and cardiology. The content and functionality is described below.



syngo.Interventional Cardiology

Engines	Contained Applications /Functionality
syngo.Interventional Radiology Engine	*syngo*.Interventional Viewer *syngo*.Interventional QVA
syngo.Interventional Cardiology Engine	*syngo*.Interventional Viewer *syngo*.Interventional LVA *syngo*.Interventional QCA
syngo.Interventional Cardiology Engine Pro	*syngo*.Interventional QCA Bifurcation *syngo*.Interventional IZ3D

syngo.Interventional Radiology Engine

syngo.Interventional Viewer

- 30f/s Biplane (DSA) Review[1]
- Native/Subtracted View
- Auto/Manual/Flexible Pixel Shift
- Move Mask
- Vessel Opacification
- Calibrated measurements

syngo.Interventional QVA

Quantitative Vascular Analysis (QVA)

- Analysis of body and head vessel lesions
- 0.5 mm to 50 mm diameter
- Native and subtraction support
- No bifurcations

syngo.Interventional Cardiology Engine

syngo.Interventional Viewer

- 30f/s Biplane (DSA) Review[1]
- Native/Subtracted View
- Auto/Manual/Flexible Pixel Shift
- Move Mask
- Vessel Opacification
- Calibrated measurements

syngo.Interventional LVA

- Left Ventricular Analysis (LVA)
- Quantitative Ventricular Volumetry
- Left Ventricular Wall analysis

syngo.Interventional QCA

Quantitative Coronary Analysis (QCA)

- Scientific analysis of coronary lesions
- 0.5 mm to 7 mm diameter
- No bifurcations

syngo.Interventional Cardiology Engine Pro

syngo.Interventional QCA Bifurcation

- QCA Add-on
- Scientific analysis of bifurcated coronaries

syngo.Interventional IZ3D

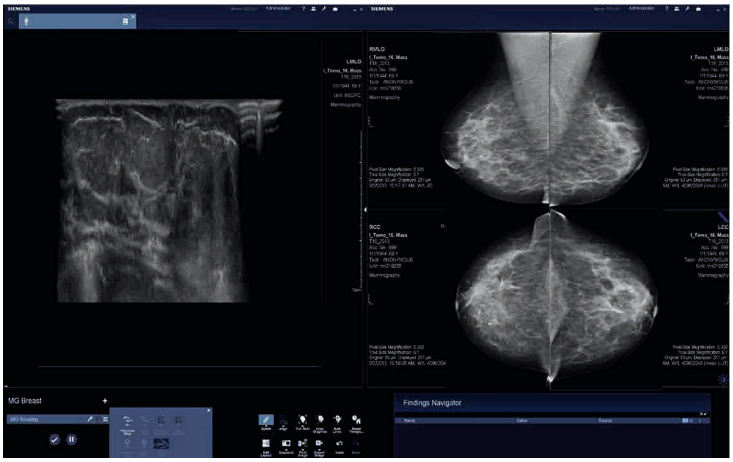
Quantitative 3D Coronary Analysis (IZ3D)

- 3D Analysis of coronary lesions
- 0.5 mm to 7 mm diameter
- Bifurcations supported

[1] Only with recommended client hardware requirements fulfilled, requires 20 GB of free hard disk space.

Mammography Applications

syngo.Breast Care is the intelligent reading solution for state-of-the art mammography and advanced breast tomosynthesis reading. Marked by outstanding flexibility, it offers comprehensive tools, customizable layouts and individually configurable workflow for confident diagnosis and decision-making in 2D and 3D.



syngo.Breast Care Reading

Engines	Contained Applications / Functionality
Single Applications (not bundled in any engine)	*syngo*.Breast Care Reading *syngo*.Breast Care Tomo *syngo*.Breast Care CAD Display *syngo*.Breast Care Link-it

syngo.Breast Care Reading

- Dedicated layouts for mammograms (DICOM MG) including current-prior comparison layouts
- Dedicated multi-modality layouts for comparing mammograms and ultrasound studies of the same patient
- Sizing modes: one-click for all segments
- User-configurable workflow (ReportFlow ®)
- Configurable time point grouping
- Magnifying glass, quadrant zooming
- Fast toggling through VOI LUTs
- Supports user-configurable key-pad
- Multi-vendor compatible
- Integration of 3D ultrasound reading (sUSBA Smart Open)
- Integration of Volpara Breast Density values
- Thumbnail views for easy image selection
- Remaining images concept to ensure complete reporting

syngo.Breast Care Tomo

- Tomo slabbing with presets and shortsuts
- Dedicated layouts for Digital Breast Tomosynthesis (DBT) exams (DICOM CT, DICOM DBT) including comparison with (current/prior) mammograms
- All sizing modes and magnifying functions available for tomosynthesis
- User configurable workflow (ReportFlow®) including tomosynthesis exams
- Marking and annotation tools including 3D
- Various scrolling tools by mouse, keypad or automatic cine mode
- Synchronized scrolling through two datasets
- Pictogram for real time orientation in tomosynthesis volumes
- Support of Insight 2D (synthetic mammogram) and Insight 3D (rotating MIP)[1]
- Multi-vendor support for Generated 2D (synthetic mammogram), images including DICOM MG and generated 2D images in DICOM BTO format

syngo.Breast Care CAD Display

- Displays CAD markers indicating calcifications and masses
- Adds quantitative lesion information
- Based on DICOM SR objects generated by various CAD systems

syngo.Breast Care Link-it

- Interactive correlation for anatomical areas within the breast between different views
- Works for current and prior DICOM MG images of various vendors
- Applies for tomosynthesis images together with *syngo*.Breast Care Tomo

In combination with the software option *syngo*.Breast Care, the display of mammography images for diagnosis on *syngo*.via is possible, as *syngo*.Breast Care is FDA-cleared for this purpose

Following systems are validated for the use with *syngo*.Breast Care:

syngo MammoCAD, iCAD SecondLook Digital, iCAD Power Look with SecondLook Premier, VuComp M-Vu, R2 CAD

The following displays are approved for diagnostic use for mammography: Eizo: 5 MP monitors: GX540. They can be operated with the *syngo*.Breast Care medical device in configuration of up to 2x5 mega pixels, plus up to 2 additional 10 or 12 MP monitors of up to 1536 x 2048 mega pixels

Operating other monitors approved for mammography reading is possible and lies within the customer's responsibility. Further details are described in the *syngo*.via Breast Care Workplace Datasheet

[1] Availability with MAMMOMAT Inspiration VB60 starting June 2016.

syngo.via Server

Licensing

*syngo.*via multi-modality routine reading functionality comes with every *syngo.*via system and is available to all users (i.e. is not licensed per user or seat). All other optional *syngo.*via applications and engines are licensed per concurrent user.

In a Multi Engines/Apps set up the advanced application counter over multiple Engines/Apps does not fully apply.

The limit over multiple Engines/Apps is set by the available HW resources. For those scenarios we recommend to go for the highest HW grade (XL Server).

When choosing the server hardware configuration for *syngo.*via, the following should be taken into account:

- Number of concurrent *syngo.*via users
- Number of months that images are stored

Data volume server sizing and server load are also depending on the footprint of particular applications in use. In addition the annual growth of numbers of examinations and resulting data volume should be considered for mid- and long-term planning. Please consult with your Siemens Sales Representative for detailed configuration.

There are special license requirements for the following applications:

*syngo.*PET Corridor4DM[1]
*syngo.*SPECT Corridor4DM[1]
*syngo.*PET Cedars Suite[1]
*syngo.*SPECT Cedars Suite[1]
*syngo.*PET Myocardial Blood Flow[1]
*syngo.*PET Neuro DB Comparison[1]
*syngo.*PET Amyloid Plaque[1]
*syngo.*SPECT Neuro DB Comparison[1]
*syngo.*SPECT Processing
*syngo.*SPECT Striatal Analysis[1]
*syngo.*MI Neuro DB Creation[1]
*syngo.*SPECT Neuro Subtraction[1]

[1] The use of certain integrated applications is subject to Microsoft's Remote Desktop Services Per User Client Access License (RDS Per User CAL) agreement. Under this agreement, the use of the application on *syngo.*via is limited to a certain number of "physical users". The term "physical user" refers to all individual users that are using or have recently been using the application on *syngo.*via (not necessarily concurrently), for example, the individual users listed in the active directory. Each "physical user" is required to have his/her own personal RDS Per User CAL. Engines that contain these applications include the appropriate number of RDS Per User CAL licenses for normal conditions and additional licenses can be purchased if required.

Configuration

*syngo.*via runs on optimized configuration of high performance HP hardware to meet customer requirements for scalability. The configuration is tailored to the particular requirements regarding memory, storage capacity, and graphical processing power.

The following scalability recommendations for new *syngo.*via VB20 SW and HW apply:

- Server-based workstation
- Server HW Configuration L
- Server HW Configuration XL
- Server HW Configuration XL-10TB

VB20A requires dedicated server hardware to provide high performance and reliable image rendering functions. The supported server hardware is subject of the VB20A release information.

For the CT View&GO Workplace a special hardware is available.

Server Virtualization

*syngo.*via VB20A server can be deployed and operated in existing VMware virtualization infrastructures. This option allows enterprises to utilize the advantages of their own hardware infrastructure[5].

	Server-based workstation[6]	L Server	XL Server	XL Server 10TB
Recommended number of concurrent users[1]	1–2	2–7	5–15	5–15
Max. number of slices for concurrent rendering[2/3]	16,000	24,000	46,000	46,000
Max. number of slices for Short-Term Storage without compression[4]	540.000	1,200.000	4,500.000	9,100.000

- Transmission between server and client can be compressed depending on configuration profiles.
- The default setting for displaying images is lossless compression for the final displayed images on the monitor. During image interaction, the images might be shown with a reduced resolution.
- The user is constantly informed about the current image quality.

[1] Actual numbers depend on case mix and applications in use.
[2] Typical loading performance for image data based on 512 x 12 bit matrix on latest server hardware. Results may vary.
[3] CT Dual energy applications load two image sets (images for low kV plus images for high kV) the max. number of slices is reduced accordingly.
[4] Max. number of slices for Short-Term Storage without compression (approx.).
[5] Please contact your local sales representative for further information on availability in your region, technical requirements, and limitations.
[6] For special workflow support and extended workstation is required.

syngo.via Clients

Hardware and Software[1]

The client software can be downloaded from the *syngo*.via server and needs to be installed on each client computer. The installation of the client software is the responsibility of the IT administrator.

The installation of the client software requires administrative rights on the client computer.

The client software can be installed and updated using the standard Microsoft Windows installer.

The tools check for updated software versions on the *syngo*.via server and can download and install updates.

Component	Minimum	Recommended
Processor	Minimum Intel dual core CPU with 2.4 GHz or higher	Intel Quad-Core 2.8 Ghz or equivalent
RAM	4 GB	≥ 8 GB
Hard drive (free space for client software)	≥ 1.5 GB	≥ 3 GB
Graphic card	Supports OpenGL 1.1 (min. 1024x768)	Supports OpenGL 2.0 or higher (for example NVIDIA Quadro K600)
Pixel depth graphic cards	16–32 bits	16–32 bits

Note: If other software is running on the client, performance may be affected.

Software Requirements[2]

- Microsoft Windows 7 SP1 (32bit & 64bit /Home Premium, Professional, Ultimate, Enterprise), Microsoft Windows 8.1 (64bit / Pro, Enterprise), Microsoft Windows 10 (64bit/Home, Pro, Education, Enterprise)
- Microsoft VC8, VC10 and VC12 Runtime
- Microsoft .NET framework 4.5.2 or higher
- Windows Media Player 9 or higher
- Internet Explorer 11
- Siemens Healthcare TeamViewer Connector Repack
- Siemens Healthcare VNC Repack
- Siemens Healthcare TeamViewer Repack
- Apple OS X (Emulating Microsoft Windows Operating Systems as listed above – using software like Parallels Desktop for Mac)

The VC Runtime, the Siemens Healthcare Repacks for Teamviewer, VNC and the .NET framework are installed automatically if they are not available on a client. The Media Player has to be installed manually by the user if screen captures and videos need to be replayed on the client. Administrative rights are required for all these installations.

Note: The IT administrator should ensure that all *syngo*.via client hardware drivers, especially the GPU driver, are up to date.

The following security settings must be enabled in Internet Explorer:

- File download
- Active scripting
- Submit non-encrypted form data
- ActiveX controls and plug-ins

The required hardware for *syngo*.via clients and servers may vary based on specific needs and performance expectations.[3]

The minimum recommended hardware for *syngo*.MI Offline OncoBoard client:

- IBM/PC compatible running Windows 7 or later, 64 bit
- Intel or equivalent processor with a minimum of 2 cores and 2.4 Ghz clock
- Minimum of 4GB of RAM
- Minimum of 1GB of free disk space
- Minimum screen resolution of 1366x768
- If using USB drives, minimum of USB 3.0

[1] The used hardware must follow IEC 60950-1/EN 60950-1.
[2] For MI Cardiology and MI Neurology on server HW configuration only: 64-bit operating systems are recommended. Windows 7 32-bit operating system is not recommended.
[3] For clients with 12 Megapixel Monitor 64bit operating system is recommended.

Monitors

The quality of displayed images is highly dependent on the quality and settings of the monitors, graphics cards, and graphics drivers that are used.

In the United States, monitors (displays) should not be used for diagnosis, unless the monitor (display) has specifically received 510(k) clearance for this purpose.

It is the customer's responsibility to ensure that client monitors are compatible with graphic cards and graphic drivers.

It is also his/her responsibility to use suitable monitors for diagnostic purposes[1].

We recommend a single monitor of at least 2 MP[2,4] or two monitors of at least 2 MP.

Supported are

- Landscape, portrait and widescreen monitors, color or grayscale[3] up to 6 MP monitors for diagnostic reading
- 8 MP, 10 MP, and 12 MP[5] monitors which are treated as 2x4/2x5/2x6 MP monitors
- Two office size landscape monitors for demonstrating images via projectors
- Two 5 MP portrait grayscale monitors in addition to 1 or 2 office size color monitors for reading of MG images (5 MP, grayscale) and MR and US images (office size color monitors) for multimodal breast reading Layouts of at least 8x8 segments per monitor are supported.
- Barco UNITI 12 MP monitor with Barco controller for client/server system[6]

Other Hardware

Printers and cameras used for diagnostic purposes must also fulfill minimum requirements. Siemens provides optional validation of the suitability of specific printers and cameras to be used for the diagnosis of radiological images.

In the United States, paper printouts should not be used for diagnosis, unless the Post Script printer has specifically received 510(k) clearance for this purpose.

Client Access Licenses

The *syngo*.via server is delivered with one instance of Microsoft Windows Server 2012 Standard Edition. With each installation of the *syngo*.via client software the client computer or user has access to services of the Windows Server 2012 Standard Edition running on the *syngo*.via server.

To legally access this Windows Server 2012 Standard Edition software, a Client Access License (CAL) is required. A CAL is not a software product; rather, it is a license that gives a user the right to access the services of the server.

It is the customer's responsibility to ensure that each client computer or user that accesses the *syngo*.via server through the *syngo*.via client software is equipped with an appropriate Windows Server 2012 device or user CAL. For more information about Microsoft CAL please refer to http://www.microsoft.com/licensing/about-licensing/client-access-license.aspx#tab=1<http://www.microsoft.com/licensing/about-licensing/client-access-license.aspx>

Hint: The syngo.via server factory delivery consists of 5 Microsoft Windows Server 2012 device CALs

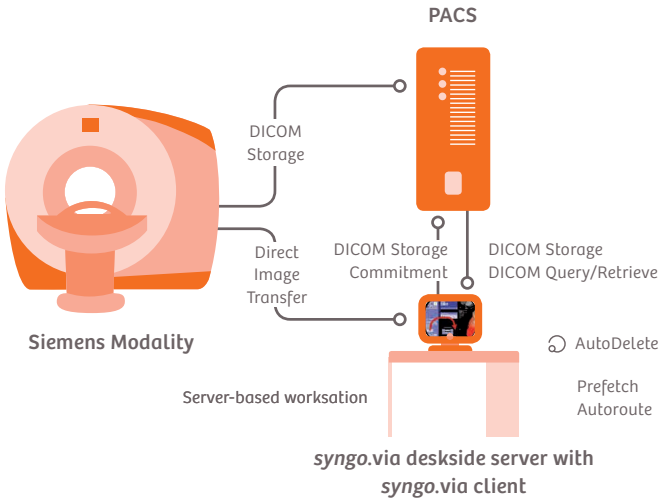
[1] Country-specific regulations/laws may apply.
[2] For MI Cardiology and MI Neurology on server-based workstation only: Minimum monitor resolution is 1600 x 1200.
[3] Not released for CT CaScoring. Not released for CT Colon. For Cardiac Function: Polarmaps shall be used only on color monitors.
[4] For *syngo*.SPECT Processing: minimum monitor resolution is 1920 x 1080.
[5] Restrictions for Mammo Tomosynthesis apply. Please contact your local sales representative for more information.
[6] Appropriate graphic card needed, contact our local Siemens organization for further details.

Implementation Packages

Siemens offers two implementation packages that differ according to how *syngo*.via is integrated into the clinical workflow.

Basic Implementation

This implementation package includes connection to a validated Siemens DICOM modality with images archived to the PACS and is the entry solution.

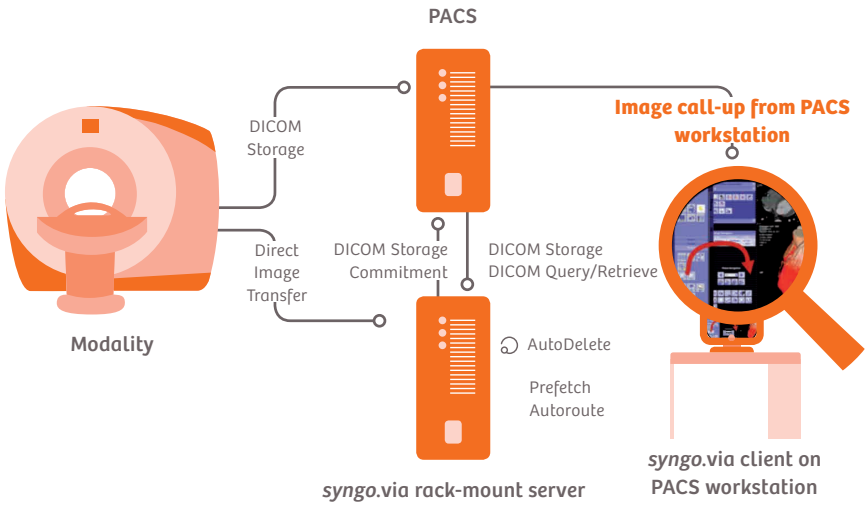


PACS Driven Implementation

The PACS-driven implementation package includes connection to DICOM modalities with images archived to the PACS, and image call-up directly out of the PACS[1].

syngo.via clients can be installed both outside and within the same department as the *syngo*.via server. RIS integration is available as an option.

syngo.via supports automatic loading of studies from different customer sites with different Medical Record Numbers but same EMPI (Enterprise Master Patient Index).[2]

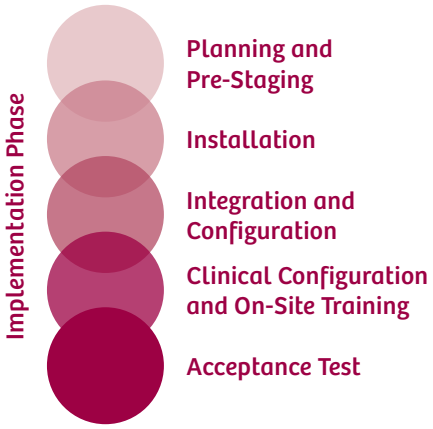


[1] As long as this is supported by the existing PACS.
[2] Please contact your local sales representative for further information on availability in your region, technical requirements, and limitations.

Implementation Phases

Siemens Professional Services supports institutions during the implementation phase of *syngo*.via. The professional services required depend on the ordered implementation package.

Implementation is divided into the following phases:



Planning

- Installation and configuration of Siemens Remote Service router if not available on-site
- Shipment of hardware to customer site
- Clarification of customer's workflow and on-site requirements for *syngo*.via implementation
- Project-specific request validation for DICOM or HL7 communication (optional)

Installation

Integration of server hardware into customer's IT infrastructure

- Connection of *syngo*.via server to customer's IT network and power supply or uninterruptible power supply (optional)
- Activation of Siemens Remote Service connection (optional)
- Installation of *syngo*.via server application
- Import of *syngo*.via server license file
- Installation of client on server and basic tests
- Installation of clients on customer workstations (optional)

Integration and Configuration

- Connection and integration into clinical environment:
  - Siemens modality[1] or other modalities[2/3]
  - PACS/customer's existing archive infrastructure
  - IT enterprise environment integration (Active Directory)[2/3] etc.
  - DICOM printer network nodes
  - Up to two *syngo* MMWP/ Leonardo Workstations
- Configuration of *syngo*.via servers and connected DICOM nodes in case of multiple server scenario
- Request DMWL from RIS[1/2/3]
- Support of *syngo*.via client call-up from PACS[2], RIS[3], or other applications.
- Basic configuration of workflow assignment rules
- Server configuration and basic clinical customization (for deletion, archiving and routing)

Clinical Configuration and On-site Training

- Optional support for definition of advanced rules for:
  - Auto-deletion
  - Archiving
  - Auto-routing
  - Pre-fetching of priors
- Support for advanced assignment of RIS planned procedures using DMWL and/or DICOM studies sent from modalities to workflows in *syngo*.via (in addition to the basic workflow mapping configuration) (optional)
- Configuration of layouts and monitor settings (optional)
- Application training for radiologists, technologists, and administrators

Acceptance Test

- Acceptance tests with the customer (IT administrator and responsible radiologist)
- Implementation handover to customer for operation

A list of applications and systems that are approved for connection to *syngo*.via is regularly updated. Please contact your Siemens Sales Representative for detailed information.

This list of service is just an overview. Please check for the details of the Professional Services the individual quotation of your project.

[1] Included in Basic Implementation Package.
[2] PACS Driven Implementation Package only.
[3] Further implementation options.

Roles and Responsibilities

syngo.via is based on a client-server architecture. Therefore, the integration into an existing IT architecture requires IT administration. It is also necessary for the IT administrator to assist the implementation and maintenance of *syngo*.via. Additionally, a customer clinical administrator (key user) is strongly recommended. The customer IT administrator as well as the customer clinical administrator are appointed by the customer and have to be trained by Siemens.

IT Administrator

Administration tasks (recurring)	occurence
Check *syngo*.via server systems for working properly (via Status Monitoring and e-mail notifications)	daily
Backup management (perform a secondary backup[1])	weekly
Archiving of audit trail logs using optical media or network shares (HIPAA Audit Controls, USA only)	weekly
Check the *syngo*.via server for available updates from the Software Catalog.	every three month
Installation of client software and prerequisites per client machine	once and on demand
Data security and data protection (install, configure and update firewalls, virus protection software, and Microsoft operating system Hot fixes on clients and servers)	once and on demand
Network Management (allow remote access for Siemens Customer Care Center, configure to send important messages to the IT Administrator by e-mail or SMS)	once
Support tasks (on demand)	
Update of *syngo*.via client prerequisites and application	
Update of *syngo*.via server with Microsoft hot fixes and service packs	
Update of *syngo*.via server with Siemens hot fixes and service packs from the Software Catalog	
Update of *syngo*.via client BIOS, firmware and drivers based on HW vendor instructions	
Configuration of DICOM nodes (e.g. printers, PACS, modalities)	
License Management (import, check availability of *syngo*.via application licenses, assign to dedicated users or clients)	
User Account and Role Management (manage domain and local user accounts using Active Directory and/or windows Authorization Manager, assign roles to users and user groups using Windows Authorization Manager)	
Provide help to clinical users regarding IT topics (use troubleshooting tools, escalate issues to the Siemens Customer Care Center, if required)	
Assist the Siemens Customer Care Center in trouble-shooting software issues (provide access and configuration data)	
Assist the hardware vendor during trouble-shooting of hardware issues (provide access to server hardware and diagnostic tool results)	
Solve *syngo*.via server issues (*syngo*.via application server, operating system and network)	
Solve *syngo*.via client issues (user management, network, hardware, and operating system issues)	

[1] A secondary backup is a copy of the primary backup.

Clinical Administrator

Administration tasks (recurring)	occurence
Configuration of application settings (for example, configuration of Display Layouts, Report Templates)	once
Configuration of data-related settings (auto data deletion, auto routing, exclude from archiving rules)	once
Configuration of workflow-related settings (workflow assignment rules, auto pre-fetching rules)	on demand
Customize client software options (for example, Advanced Search)	on demand
Support tasks (recurring)	**occurence**
Provide help to clinical users regarding application topics (use trouble-shooting tools, escalate issues to the Siemens Customer Care Center)	if required
Train clinical users in handling the *syngo*.via client (knowledge transfer on *syngo*.via applications to clinical users)	on demand
Assist Siemens application specialists during trouble-shooting of software issues (for example, provide anonymous patient examination for reproducing a software issue)	on demand
Solve *syngo*.via application-related issues (for example, delete or restore examination data, layouts, or worklists)	on demand

Connectivity and Standards Compliance

Connectivity

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:

- Front-end integration: *syngo*.via provides a standard interface for image call-up from third-party RIS/ PACS or HIS applications. This interface can be used to configure a third-party application to launch *syngo*.via with selected images
- Data exchange: *syngo*.via uses industry standards (DICOM and HL7) meaning it can connect to HIS/RIS, PACS, printers/ cameras, and modalities, regardless of the vendor
- Siemens integration solutions: further synergies can be achieved by using RIS/PACS and modalities from Siemens

Hospital IT Infrastructure

syngo.via can be connected to the hospital's IT infrastructure, such as the hospital's Active Directory, DNS, and mail server.

IHE Profiles

syngo.via is designed for back-end and front-end integration with Siemens *syngo* applications, and with systems from different vendors. Communication is based on the internationally recognized workflow- oriented profiles defined by the IHE Framework (Integrating the Healthcare Enterprise).

For the IHE profiles, see: http://www.siemens.com/IHE

Import and Export of DICOM Data

syngo.via provides functionality for importing/exporting DICOM data from/ to CD/DVD, from/to local and network drives, and from/to configured DICOM nodes.

Image Archiving

syngo.via stores images and changes in a short-term storage (STS). *syngo*.via can be configured to send images to the archive immediately or based on specific rules. In *syngo*.via, archiving means sending DICOM objects to a DICOM node which has been configured for archiving. DICOM objects comprise received DICOM objects and internally created DICOM objects. *syngo*.via itself does not provide equipment for archiving.

To fit the capabilities of the existing archiving environment *syngo*.via can be configured to wrap its DICOM result objects into basic objects. Furthermore, *syngo*.via supports multiple archives such as thin- and thick-slice archives and (new with VA30A) allows it to send results to different archives based on DICOM attributes such as Referring Physician.

DICOM Standard

DICOM is used for exchanging image data between *syngo*.via and modalities (Siemens and third-party), DICOM nodes, and the PACS.

For the DICOM conformance statements, see: http://www.siemens.com/DICOM

Data Exchange

syngo.via conforms with the major image and medical exchange formats, DICOM and HL7.

HL7 Messages

HL7 messages are used to communicate between *syngo*.via, the RIS, and/or HIS (in case of no RIS) to correct patient data and achieve a synchronized patient data set in these systems.

syngo.via supports the following incoming HL7 messages:

- ADT A08 (patient record update) ADT A40 (patient record merge)
- ADT A34 (patient record merge – Patient ID only)

All other not supported HL7 messages are silently discarded by *syngo*.via.

ORU R01 messages are used to export structured results to a connected information system. *syngo*.via supports three formats: ASCII Text, CDA Level 3 and PDF.

For the HL7 conformance statement, see http://www.siemens.com/HL7.

Nuance Powerscribe 360

The *syngo*.via report can be integrated into Nuance Powerscribe 360 using the web service provided by Powerscribe 360

File Drop Integration

The *syngo*.via report can be exported to a fileshare for the exchange with information systems

System Security and Data Protection

Offering a secure solution is one of our major goals. That is why we continue to improve the security for *syngo*.via in every version. To prevent data theft and keep up with changing security guidelines of the authorities, we have increased the system protection measures with VB20A.

Data Protection

Legal Requirements

All other not supported HL7 messages are silently discarded by *syngo*.via.

ORU R01 messages are used to export structured results to a connected information system. *syngo*.via supports three formats: ASCII Text, CDA Level 3 and PDF.

For the HL7 conformance statement, see http://www.siemens.com/HL7.

- Authorization required to access functions and data
- Audit trails to record user and system activities
- Automatic termination of user sessions after specific time-out
- Archiving of images using interface to existing PACS
- Secure data storage using RAID short-term storage for images
- Protection against malicious software attacks
- Encryption of Client-Server communication

Virus Protection

Virus protection software from the following manufacturers is approved for *syngo*.via:

- Trend Micro OfficeScan
- McAfee VirusScan Enterprise
- Symantec Endpoint Protection
- Sophos Endpoint Security and Control

Siemens provides information on recommended virus protection software, and general instructions on configuration.

The customer is responsible for regularly updating virus patterns/ definitions.

System Hardening

The medical industry is nowadays one of the most attacked industries worldwide. System hardening is one of the security measures to minimize the vulnerabilities of the system.

The hardening is based on the Secure Technical Implementation Guide (STIG) which is developed and maintained by Defense Information System Agency of the US.

Following STIGs are considered for the *syngo*.via server:

- Windows Server 2012 and Server 2012 R2 MS STIG
- Windows 10 STIG
- Windows Server 2008 and Server 2008 R2 STIG
- Windows 7 STIG
- Microsoft .NET Framework 4 STIG
- Internet Explorer 11 STIG

We offer hardware encryption to protect against the most common attacks, such as cold boot attacks, malicious code, brute force attack. Hardware encryption uses dedicated physical processors located in the RAID controller device to encrypt and decrypt the data in real time.

Backup/Restore

syngo.via backup policy uses an incremental backup scheme (daily). The backup includes system, application (including *syngo*.via configuration), and database (patient and workflow) data. *syngo*.via acts as short-term storage, therefore, it does not backup the image data itself. Restore operations can be performed by the IT administrator, for example recovery of corrupted files, recovery of a corrupted operating system, or recovery of applications. Restore operations after database failures must be performed by Siemens Service

Siemens IT Care Plan

Siemens IT Care Plan

Investment in IT services' development and staff's knowledge is key to long-lasting business success.

The trend towards evidence-based medicine also requires the decision-support features healthcare providers demand from their healthcare IT systems. Whatever your applications, workflow, or IT requirements are: The Siemens IT Care Plan is at hand.

The comprehensive service contract, customized for Healthcare IT systems, is offered to institutions who choose *syngo*.via, the leading Healthcare 3D post-processing suite.

The contracts are tailored to the level of service that is appropriate to your specific system and organization. The four main parts of the contract are Technical Support, Application Support, Software Updates, Software Upgrades and Care Plus.

Points of Contact

- Siemens is the single point of contact for the customer. Siemens provides support for the software as committed in the IT Care Plan. Hardware-related service requests will be routed to the responsible hardware service provider
- The customer administrator is the first contact person for internal users and the single point of contact to Siemens

Therefore, the administrator is an essential part of the service process. For more details regarding administrator tasks please refer to the current version of the respective Administrator Manual.

Siemens IT Care Plan

Technical Support
Service Desk for technical service requests

Application Support
Service desk for remote troubleshooting of application related requests

Software Updates
Updates for software applications

Software Upgrades
Version upgrades or software/applications

Care Plus
Extra IT support via knowledge bases, expert advice and remote support

Option:
Admin Plus
The remote administration service for your Siemens Healthcare IT systems

Option:
Evolve
HW or HW&SW Evolve *syngo*.via

Option:
Delta FIT
Keep your experts up to date and ensure optimized use of your system

The products/features and/or service offerings (here mentioned) are not commercially available in all countries and/or for all modalities. If the services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed. Please contact your local Siemens organization for further details.

IT Care Plan

System IT availability with fast and professional service provision:

- Ensure a high quality of reports, readings, and results when they are needed by keeping the system up-to-date, high performing, and available.
- Rely on our team of specialists who provide fast and comprehensive remote support up to 24/7 using the SRS infrastructure and features.
- Protect your budget and system investment: keep your software up-to-date and operational over the entire product lifecycle.
- Get the most out of your assets with optimized system usage.

Care Plus

Extra IT support via in-depth knowledge bases, expert advice and remote support

- Leverage your in-house workforce, and ensure you get the most out of your investment – without additional costs
- Rely on proactive event monitoring of your system availability: Siemens solves software issues remotely and coordinates hardware vendors for you
- Solve issues much quicker: rely on in-house knowledge, and if needed on expert support from Siemens experts
- Provide dedicated sources for best possible first response by your fast & efficient in-house experts

Evolve

Keeps your installed hardware and software up to date and ensure hardware and software compatibility:

- Extended duration of service contracts: Supports service contracts to run for up to 10 years and avoid the risk of increasing incompatibilities over time.
- Cost transparency: Predictable lifecycle costs through one fixed hardware exchange – included in this Evolve option of the Siemens IT Care Plan
- Future-proofed systems: An “evergreen” software system with one hardware/software upgrade

Admin Plus

The remote administration service for your Siemens Healthcare IT systems

- Outsourcing to a reliable partner for IT expertise, because without the 1st level support on-site clinical personnel could be frustrated and cannot work to their best ability.
- Rely on high level expertise of the Siemens contacts who can offer best support when integrating a new system into your IT landscape.

Siemens IT Care Plan

Training

The basic turnover training is mandatory and will be delivered together with the product installation.

Delta FIT option

Siemens offers upgrade delta application training as an optional part of the IT Care Plan called "Delta FIT".

Delta FIT keeps your key users up-to-date by providing a personalized training according to the changes and new features made available after every software upgrade:

- Optimized use of *syngo*.via with a smooth transition to the new version capabilites and enhancements
- State-of-the-art training methods, from e-Learnings to remote training sessions and webinars, to onsite training or even *syngo* Academy[1] training, the format follows the content and trainee needs
- Secure your investment by including delta training in your annual budget provision

[1] *syngo* Academies: In certain countries Siemens Healthcare offers special rooms on location, equipped to deliver classroom training for all *syngo* products.

Remote Service Software

All types of Siemens IT Care Plans require a Siemens Remote Service (SRS) via VPN connection.

Pre-Condition

- A minimum broadband internet connection bandwidth for uncompromised service support with 2000 kBit/s downstream and 512 kBit/s upstream. Otherwise, certain support services may not be provided and the agreed remote response time cannot be guaranteed.
- Specification of minimum broadband internet connection in detail:
  - Downstream: 2000 kBit/s for Software update, IT- and Application support
  - Upstream: 512 kBit/s for Application support
  - Upstream: 256 kBit/s for Software update and IT support

In case a normal SRS connection is not an option for a particular customer:

- Service will be based on Time & Material when SRS is not installed. Time & Material can be calculated by your local Service Organization or your regional sales support team.

Siemens provides a router for SRS connection between the customer's internal network and the Siemens Remote infrastructure. The customer provides internet access and the internal network for the direct access with controlled rights: data transfer from the customer to Siemens (e.g. system monitoring events) and from Siemens to the customer (e.g. software distribution).

Administration Workplace

The Administration Portal is part of the *syngo*.via server software and enables the following administrative functions:

- Status control of server and components
- Access to detailed status checks, down to sub-processes and sub-components
- Color-coded overall system status
- Statistical reports for continuous monitoring of key performance parameters
- Overview of active users
- Evaluation of centrally-stored system messages
- Configuration of system, workplaces, and DICOM nodes
- License management
- Detailed information about installed hardware and software
- Access control for Siemens Remote Service and remote administration
- In case of errors, suggestions for further analyses and corrective actions

The Administration Portal can be accessed by IT Administrators from workplaces inside a local network and by Siemens Service Engineers using a Service Key for special access authorization.

Siemens Integration Solutions

syngo MultiModality Workplace (MMWP) Integration

syngo MMWP versions VE60A, VE61A,VE61B, VE40D, VE40E and VE40F support *syngo*.via client integration and remote desktop access using *syngo* Expert-i.

The *syngo*.via client can be integrated on the *syngo* MMWP allowing user access both to *syngo*.via and *syngo* MMWP applications at one workplace.

syngo.via client workplaces can include the *syngo* MMWP Expert-i remote desktop application to allow single-monitor access to one or more *syngo* MMWP workplaces from any location in the hospital.[1]

Direct Image Transfer

Using direct image transfer (available for current Siemens CT scanners):

- The image transfer rate can be increased considerably compared to the standard DICOM protocol

Desktop Sharing

syngo.via enables collaboration between two *syngo*.via clients via desktop sharing. This mode can be used between physicians (asking for a second opinion) and between users and service technicians (for troubleshooting).

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

Network Requirements

The server requires two static IP addresses, which must be provided by the customer.
The following ports must be available for the *syngo*.via client (RTC):

syngo.via Client – *syngo*.via Client

The ports connect two *syngo*.via clients. Inbound ports are opened on the client that publishes its screen to the other client.

Service /Function	Direction	Protocol	Port number
syngo.via Client <–> *syngo*.via Client (VNC, Expert-i collaboration)	Inbound Outbound	TCP	5800, 5900, 5901, 5902, 5903

syngo.via Client – *syngo*.via Server

Inbound ports have to be opened on *syngo*.via server.

Service /Function	Direction	Protocol	Port number
syngo.via server <– *syngo*.via client (Online Help, Knowledge Gateway)	Inbound	http	8090
Remote Desktop connection: Microsoft Terminal Services *syngo*.via server <– *syngo*.via Client remote applications for MI usage	Inbound	TCP, UDP	3389
syngo.via server <– *syngo*.via Client (Login Dialog)	Inbound	https, http	443, 80
syngo.via server <–> *syngo*.via client (VNC, Expert-I collaboration)	Inbound Outbound	TCP	5800, 5900, 5901, 5902, 5903
syngo.via server <– *syngo*.via client (Online Help)	Inbound	TCP, http	80
syngo.via server <–> *syngo*.via client (Basic Communication outbound in multiserver environment, with client on server, if client connects to the other server)	Inbound Outbound	TCP	32912, 32914
Reporting Server <– Reporting Client Application	Inbound	https, http	80, 443
syngo.via server <– *syngo*.via client (Remote Assistance)	Inbound	TCPwSSL TCP	11080, 11081

Network Requirements

syngo.via Server – SRS

Inbound ports have to be opened for *syngo.via* server.

Service / Function	Direction	Protocol	Port number
syngo.via server <–> SRS (Admin Portal)	Inbound Inbound	HTTP HTTPS	80 443
syngo.via server <– SRS (MNP)	Inbound Outbound	TCP	in: 8226, 13001 out: 8227, 8228, 12061
syngo.via server –> SRS (MS Terminal Services)	Inbound	TCP, UDP	3389
syngo.via server <– SRS (active or passive FTP)	Outbound Inbound	TCP	20, 21 high port
syngo.via server <–> SRS (mail notification)	Outbound	SMTP	25
syngo.via server <–> SRS (VNC)[1]	Inbound	TCP	5800, 5900, 5901, 5902, 5903
syngo.via server <–> SRS (LifeNet, *syngo* Information Center)	Outbound	TCP	8080
syngo.via server <– SRS (Remote Assistance)	Inbound Outbound	TCP TCP	11080 8080

syngo.via Server (Remote Service Board) – SRS

The ports connect SRS to ILO Board with inbound ports opened for *syngo.via* server.

Service / Function	Direction	Protocol	Port number
syngo.via server <– SRS (HTTP) *syngo.via* server <– SRS (HTTPS)	Inbound	http	80, 443
syngo.via Remote Service Board <– SRS (SSH) *syngo.via* Remote Service Board <– SRS (Telnet)	Inbound	VirtMedia:22, TelNet:23	22, 23

syngo.via Server – Hospital Internal Network

Inbound and outbound ports have to be opened on *syngo.via* server.

Service / Function	Direction	Protocol	Port number
syngo.via (Openlink) <–> HIS/RIS (HL7 on 9973, Multi-Server solutions also need 9971, http:8080 is internal)	Inbound Outbound	HL7, http	9973, 8080, 9971-multi-server
syngo.via server <– DICOM nodes	Inbound	DICOM	104
syngo.via server <– HL7 messages (internally used only)	Inbound	HL7	9974, 9975
syngo.via server <–> *syngo.via* server (Configuration data, for multi-server solutions)	Inbound Outbound	LDAP	50000, 50001
syngo.via server <–> *syngo.via* server (License information, for multi-server solutions)	Inbound Outbound	TCP (Flexera-internal)	27000, 27010
syngo.via server (Reporting) <-> SQL server	Inbound Outbound	TCP	1433
syngo.via server <– CT (Direct Image Transfer)	Inbound	TCP	5445
syngo.via server <– MR (Report Access)	Inbound	SOAP	8888
syngo.via server –> RIS (default port on RIS for HL7 messages)	Outbound	HL7	9977

[1] Optional

Service / Function	Direction	Protocol	Port number
syngo.via server <–> scanning workplace (open only port 5559 for Status Monitoring Application, 5570 is for internal communication)	Inbound Outbound	5555, 5559, 5560, 5570 8889:http, 9000, 9995:TCP	5555, 5559, 5560, 5570, 8889, 9000, 9995
syngo.via server –> Domain Controller (*syngo*.via sync with domain controller)	Outbound	LDAP, TCP/ UDP:389, LDAPS:636	389, 636
syngo.via server –> Nuance Powerscribe 360 Server	Outbound	SOAP (http)	80, 443
syngo.via server –> Reporting Adapter (internally used and for internal multi server communication)	Inbound Outbound	HL7	9977
syngo.via server or Acquisition Workplace (CT RTEngine) Optional: –> external LAP-System)	Inbound Outbound	TCP	6661, 6662, 6663, 6664, 6665, 6666, 6667, 6668, 6669, 6670

As a faultless communication between *syngo*.via server and *syngo*.via client is crucial to the operability of the system, a reliable and performant network is a precondition for a successful integration

	Minimum	Recommended
Hospital internal Network Connection	100 Mbit/s	1Gbit/s
Remote Client Connection	Download: 6 Mbit/s[1] Upload: 1 Mbit/s, Latency: 20ms–25ms (sporadic use for viewing data remotely)	Download: 16 Mbit/s Upload: 2 Mbit/s Latency: 10 ms (routine use in clinical routine)

Transmission between server and client can be compressed depending on configuration profiles.

- The default setting for displaying images is lossless compression for the final displayed images on the monitor. During image interaction, the images might be shown with a reduced resolution.
- The user is constantly informed about the current image quality.

Connection to *syngo*.via WebViewer

The following ports are required for *syngo*.via WebViewer services

Service / Function	Direction	Protocol	Port number
syngo.via WebViewer: *syngo*.via server <– Web Access, CIFS for WebViewer, Index Manager	Inbound	TCP	445, 4510
syngo.via WebViewer: *syngo*.via server <– Web Access, CIFS for WebViewer, Authentication	Inbound	TCP	445, 4510
syngo.via WebViewer: *syngo*.via server <– Web Access, CIFS for WebViewer, Licensing	Inbound	TCP	445, 4510
syngo.via WebViewers: *syngo*.via server <– WebViewer (view medical images on mobile devices)	Inbound	https,4443/ TCP, SSL, 4475	4443, 4475

[1] For *syngo*.CT Dynamic Angio 16 Mbit/s as min. bandwidth should be available.

Mapping Table Medical Devices to Applications

SY Medical Devices[1]	Clinical Application
syngo.via	*syngo*.via *syngo*.via Workstation/L/XL Software
syngo.via WebViewer	*syngo*.via WebViewer
CT Medical Devices[1]	**Clinical Application**
syngo.CT Neuro DSA	*syngo*.CT Neuro DSA
syngo.CT Neuro Perfusion[2]	*syngo*.CT Neuro Perfusion[2]
syngo.CT Dynamic Angio	*syngo*.CT Dynamic Angio
syngo.CT Vascular Analysis	*syngo*.CT Vascular Analysis *syngo*.CT Vascular Analysis – Autotracer Rapid Results Technology Rapid Stent Planning
syngo.CT Coronary Analysis	*syngo*.CT Coronary Analysis Rapid Results Technology Rapid Stent Planning
syngo.CT Cardiac Function	*syngo*.CT Cardiac Function *syngo*.CT Cardiac Function – RVA *syngo*.CT Cardiac Function – Enhancement Rapid Results Technology Rapid Stent Planning
syngo.CT CaScoring	*syngo*.CT CaScoring
syngo.CT Colonography	*syngo*.CT Colonography *syngo*.CT Colonography Advanced *syngo*.CT Colonography – PEV
syngo.CT Dual Source Dual Energy	*syngo*.CT Dual Energy *syngo*.CT DE Gout *syngo*.CT DE Calculi Characterization *syngo*.CT DE Brain Hemorrhage *syngo*.CT DE Heart PBV *syngo*.CT DE Direct Angio *syngo*.CT DE Lung Analysis *syngo*.CT DE Bone Marrow *syngo*.CT DE Virtual Unenhanced *syngo*.CT DE Monoenergetic Plus
syngo.CT Single Source Dual Energy	*syngo*.CT Dual Energy *syngo*.CT DE Gout *syngo*.CT DE Calculi Characterization *syngo*.CT DE Brain Hemorrhage *syngo*.CT DE Bone Marrow *syngo*.CT DE Virtual Unenhanced *syngo*.CT DE Monoenergetic Plus

[1] See Legal manufacturer address on p.59.
[2] This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

CT Medical Devices[1]	Clinical Application
syngo.CT TwinBeam Dual Energy[2]	*syngo*.CT Dual Energy *syngo*.CT DE Gout *syngo*.CT DE Calculi Characterization *syngo*.CT DE Virtual Unenhanced *syngo*.CT DE Monoenergetic Plus *syngo*.CT DE Direct Angio *syngo*.CT DE Lung Analysis *syngo*.CT DE Hardplaque Display
syngo.CT PE CAD	*syngo*.CT PE CAD[2]
syngo.CT Liver Analysis	*syngo*.CT Liver Analysis
syngo.CT Bone Reading	*syngo*.CT Bone Reading
syngo.CT Myocardial Perfusion	*syngo*.CT Myocardial Perfusion
syngo.CT Pulmo 3D	*syngo*.CT Pulmo 3D
syngo.CT Body Perfusion	*syngo*.CT Body Perfusion
syngo.CT Dental	*syngo*.CT Dental
syngo.CT Cardiac Planning – Valve Pilot[2]	*syngo*.CT Cardiac Planning – Valve Pilot[2]
syngo.via RT Image Suite	*syngo*.via RT Image Suite
syngo.CT View&GO[2]	CT View&GO Endoscopic View @ CT View&GO
syngo.CT Extended Functionality[2]	Vessel Extension @ CT View&GO Diameter/WHO area @ CT View&GO ROI HU Threshold @ CT View&GO CT Osteo @ CT View&GO Neuro DSA @ CT View&GO Lung CAD @ CT View&GO
MR Medical Devices[1]	**Clinical Application**
syngo.MR General	*syngo*.MR General Engine *syngo*.MR Composing
syngo.MR Neurology	*syngo*.MR Neuro Perfusion *syngo*.MR Neuro Perfusion Mismatch *syngo*.MR Neuro fMRI *syngo*.MR Tractography
syngo.MR Cardiology	*syngo*.MR Cardiac 4D Ventricular Function *syngo*.MR Cardiac Flow *syngo*.MR Cardiac Perfusion
syngo.MR Vascular	*syngo*.MR Vascular Analysis

[1] See Legal manufacturer address on p.59.
[2] This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

Mapping Table Medical Devices to Applications

MR Medical Devices[1]	Clinical Application
syngo.MR Oncology	*syngo*.MR Onco *syngo*.MR OncoCare *syngo*.MR 3D Lesion Segmentation *syngo*.MR Tissue4D
syngo.MR Spectroscopy	*syngo*.MR Spectro SVS *syngo*.MR Spectro CSI *syngo*.MR Spectro Extension *syngo*.MR Spectro Research
syngo.mMR General	*syngo*.mMR General
syngo.MR BreVis	*syngo*.MR BreVis
MI Medical Devices	**Clinical Application**
syngo.PET&CT Oncology	*syngo*.MM Cross-Timepoint Eval *syngo*.MM Multi-Timepoint Eval *syngo*.MI Segmentation *syngo*.CT Segmentation *syngo*.PET Dynamic Analysis *syngo*.MM Therapy Interface *syngo*.CT Onco Function – Hepatic AEF *syngo*.MI Offline OncoBoard
syngo.CT Lung CAD – an accessory of *syngo*.MM Oncology	*syngo*.CT Lung CAD
syngo.MI Cardiology[2]	*syngo*.MI Cardiology *syngo*.MI Hybrid Coronary View
Corridor4DM – a component of *syngo*.MI Cardiology[3]	*syngo*.SPECT Corridor4DM *syngo*.PET Corridor4DM *syngo*.CT Extension Corridor4DM *syngo*.PET Exten. Corridor4DM CFR
Cedars Cardiac Suite – a component of *syngo*.MI Cardiology[4]	*syngo*.PET Cedars Suite *syngo*.SPECT Cedars Suite *syngo*.CT Extension Cedars Suite
syngo MBF – a component of *syngo*.MI Cardiology	*syngo*.PET Myocardial Blood Flow
syngo.MI Neurology[2]	*syngo*.MI Neurology *syngo*.MI Neuro Hybrid 3D

[1,2,3,4] See Legal manufacturer address on p.59.

MI Medical Devices	Clinical Application
Scenium – a component of *syngo*.MI Neurology[2]	*syngo*.PET Neuro DB Comparison *syngo*.SPECT Neuro DB Comparison *syngo*.PET Amyloid Plaque *syngo*.MI Neuro DB Creation *syngo*.SPECT Striatal Analysis *syngo*.MI Neuro Subtraction
syngo.SPECT Processing	MI Reading SPECT Organ Processing
XP Medical Devices[1]	**Clinical Application**
syngo.Breast Care	*syngo*.Breast Care Reading *syngo*.Breast Care Tomo *syngo*.Breast Care CAD Display *syngo*.Breast Care Link-it
AT Medical Devices[1]	**Clinical Application**
syngo.Interventional	*syngo*.Interventional Viewer *syngo*.Interventional QCA *syngo*.Interventional QCA Bifurcation *syngo*.Interventional IZ3D *syngo*.Interventional LVA *syngo*.Interventional QVA

[1]Legal Manufacturer	[2]Legal Manufacturer	[3]Legal Manufacturer	[4]Legal Manufacturer
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Notes