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The background of the top half of the page features a large, stylized blue checkmark on a light blue circular background. The Siemens logo is positioned in the top left corner.

SIEMENS

Data Sheet

syngo.via

Software Version VA30A

Answers for life.

A photograph of two male doctors in white lab coats standing in a modern hospital corridor. The doctor on the left is looking towards the right, while the doctor on the right is looking towards the camera with a slight smile. The background shows a bright, multi-level hospital interior with glass railings and modern lighting.

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Intended use

syngo.via is a software solution intended to be used for viewing, manipulation, communication, and storage of medical images.

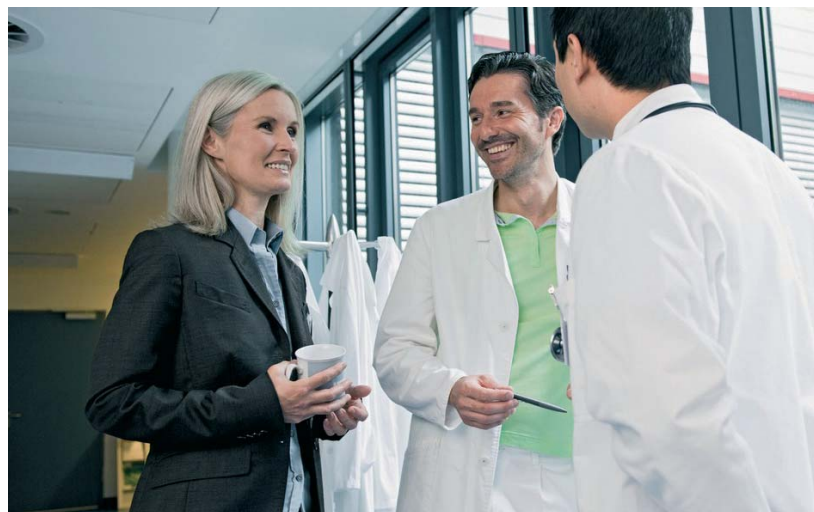
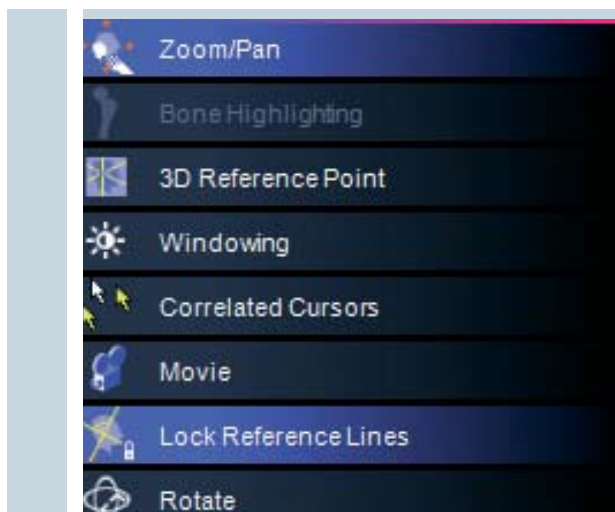
It can be used as a stand-alone device or together with a variety of cleared and unmodified *syngo* based software options.

syngo.via supports interpretation and evaluation of examinations within healthcare institutions, for example in Radiology, Nuclear Medicine, and Cardiology environments.

The system is not intended for the displaying of digital mammography images for diagnosis in the U.S.¹⁾

1) Application features are parts of medical products in their own rights and fully compatible with *syngo.via*

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 software in radiology, cardiology workflow, and nuclear medicine and enables fast and efficient diagnostics. *syngo.via* client can access multiple servers.¹⁾

Multi server access

Allows easy access from one client to up to four *syngo.via* servers.

Findings reporting

- Findings and measurements are tracked and listed by the Findings Navigator
- *syngo.via* creates a context-specific basic report based on DICOM Meta data, picklists, free text and snapshots
- *syngo.via* provides application-specific result sections. Customers can create new report sections or modify existing sections to adapt the report content to their clinical needs.

Context-specific reports

- Context-specific report information can be created in *syngo.via*. These context-specific reports are stored either as encapsulated PDF DICOM²⁾ or as DICOM Secondary Capture Image objects and can be transferred to and archived in the PACS. In addition, they can be saved in the file system as a PDF file. The stored PDF reports can be viewed and printed by the clinical user

- If *syngo.via* is integrated with the RIS, context-specific report information can be transferred to an information system using HL7 messages, as text message, as CDA object and as PDF object.
- If *syngo.via* is not integrated with PACS/RIS, context-specific reports created with *syngo.via* can be saved to the file system and printed out
- On an integrated workplace (*syngo.via* client and clients of other information systems are installed on the same workplace), the context-specific report can also be copied to other editors, for example to an RIS-based report editor, where the content is available in different paste formats (for example TEXT, HTML, RTF).

¹⁾ The version of server and *syngo.via* client must match.

²⁾ PACS must be able to support storing and retrieving DICOM encapsulated PDF objects

Applications and Engines

User interaction concept

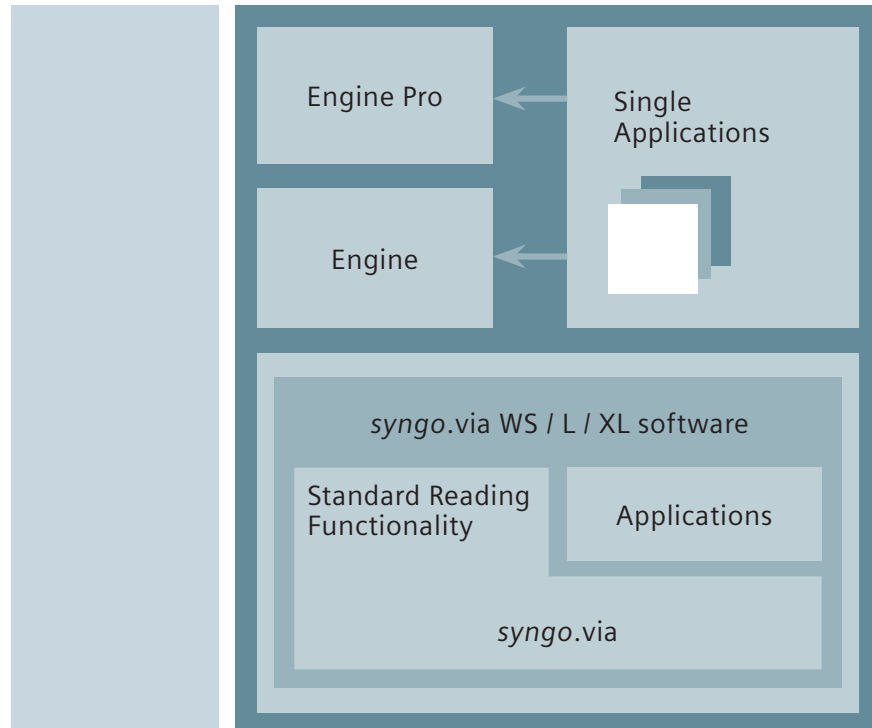
Workflow approach

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.

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
- Quick Worklists allow fast access to patient data
- Corner menus in each segment allow fast access to tools while eyes remain focused on images
- Automatic tracking of findings and measurements through the unique Findings Navigator



A broad variety of clinical applications¹⁾ are available for *syngo.via*.

These applications are commercially available as either single applications or as groups, referred to as Engines. There are two levels of Engine: "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

The result is a processing and evaluation solution tailored to your workflow requirements, installed modalities, and clinical focus.

¹⁾ Application features are parts of medical products in their own rights and fully compatible with *syngo.via*

syngo.via multi-modality routine reading functionality and applications

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

Multi-modality reading standard functionality

Multi-modality 2D/3D/4D reading
Designed for reading 2D, 3D and 4D multi-modality images.

Supported modalities

CT Reading

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

MR Reading

Enables reading of 2D and 3D MR data

PET/CT Reading

Enables reading of hybrid PET and CT data for 2D, 3D and 4D PET data

NM Reading

Enables reading of SPECT & SPECT/CT

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)

MultiModality Reading

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

MultiModality Reading



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
 - Anatomical Registration
 - Synchronized Scrolling
 - 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

- Case Navigator
- Findings Navigator
- AutoSorting
- AutoProcessing
- AutoLayouts
- Anatomical registration
- Offline Filmsheet Editor
- Image Text Editor
- Flexible application change
- Summary Series

Advanced applications

syngo.CT Cardiac¹⁾

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 Vascular¹⁾

Includes:

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

syngo.PET&CT Oncology¹⁾

Includes:

- Navigation between segments
- Reporting
- RECIST/WHO measurement (manual)
- Image fusion
- Registration
- 3D overview image
- Time point display (two time points)
- CT, MR, PET, and SPECT visualization
- Basic PET evaluation
- PET and SPECT visualization
- Combined workflow Oncology & Vascular (MM Onco + CT Vascular)
- Study comparability

syngo.CT Dual Energy^{1) 2)}

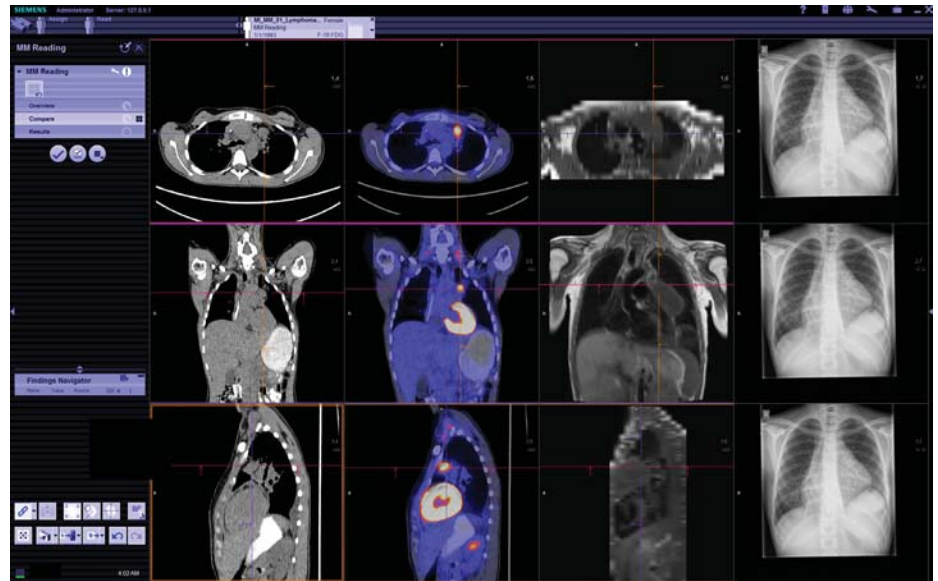
Includes:

- Preparing and viewing of Dual Energy data
- Mixed Image calculation
- Monoenergetic
- Optimum Contrast³⁾

syngo.MR Reading¹⁾

Includes:

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



¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

²⁾ Works with Dual Energy images from the whole SOMATOM Definition Family (Single Source and Dual Source Dual Energy).

³⁾ Optimum Contrast is only available for Dual Source Energy

syngo.via applications and Engines^{1) 2)}

syngo.via offers a broad variety of applications and engines, tailored to your clinical needs, that can be purchased individually

syngo.via General Engine

Highly efficient reading and reporting

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)

syngo.via Advanced Reporting

Efficient and structured communication of syngo.via results.

- Into a diagnostic report as RTF
- Into PACS as DICOM SC
- Easily edit and create sections and picklists
- Quickly create your own report templates
- Cross workflow reporting - Combine results in one document
- Flexible selection of print layout



syngo®.via WebViewer³⁾

syngo.via WebViewer is the solution for fast mobile reading of images.

It comes in two versions: Dedicated or Integrated server (XL-grade)^{4) 5)}.

It features:

- High speed image reading for time critical cases away from a workstation.
- Diagnostic reading of images on both iPad and with a web browser displayed on diagnostic grade monitor.⁶⁾
- Seamless collaboration with fellow physicians and allows to illustrate and discuss results directly with patients.

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

Computed Tomography (CT)
Magnetic Resonance (MR)

- Positron Emission Tomography (PET and PET/CT)⁴⁾
- Computed Radiography/Digital Radiography (CR/DR)⁴⁾
- Secondary Capture Images (SC)
- Encapsulated PDF

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

²⁾ Configuration of CT Clinical Engines can vary depending on CT scanner type.

³⁾ Deny load scenarios on WebViewer side might occur earlier in case of heavy concurrent usage of WebViewer and 3rd party workflows

⁴⁾ The product is not commercially available in the U.S.

⁵⁾ Each syngo.via XL Server with one permanent WebViewer license

⁶⁾ This feature is pending 510(k) review and is not yet commercially available in the US..

CT applications

syngo.CT Dual Energy⁶⁾

- Preparing and viewing of Dual Energy data
- Mixed Image calculation
- Monoenergetic
- Optimum Contrast⁶⁾

syngo.CT DE Gout⁶⁾

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

syngo.CT DE Calculi Characterization⁵⁾

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

syngo.CT DE Brain Hemorrhage⁶⁾

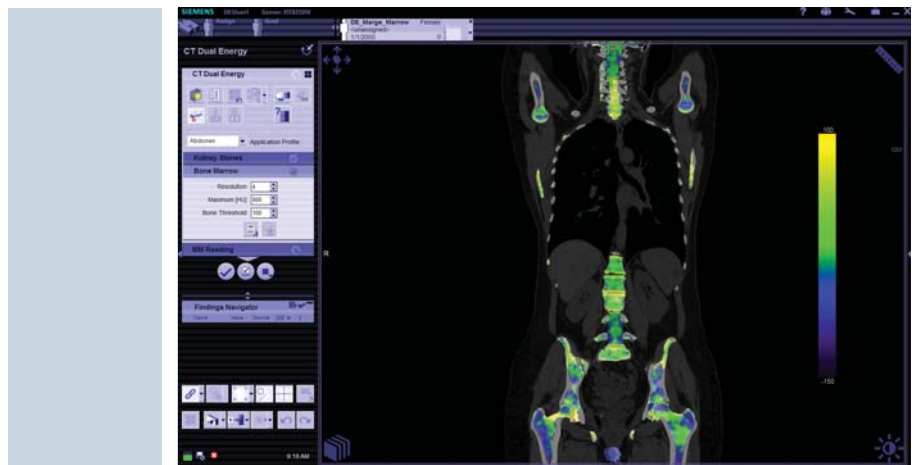
- Iodine uptake quantification
- Differentiate hemorrhage from contrast agent

syngo.CT DE Heart PBV⁶⁾

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

syngo.CT DE Direct Angio⁶⁾

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



syngo.CT DE Lung Analysis⁶⁾

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

syngo.CT PE CAD⁴⁾

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

syngo.CT DE Bone Marrow⁶⁾

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

syngo.CT DE Virtual Unenhanced

- Iodine uptake quantification
- Calculation of virtual unenhanced image

syngo.CT DE Monoenergetic Plus⁶⁾

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

⁶⁾ Works with Dual Energy images from the whole SOMATOM Definition Family (Single Source and Dual Source Dual Energy).

- Dual Source Dual Energy scanners support all Dual Energy applications.

- Single Source 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 (not available in the US), *syngo*.CT DE Virtual Unenhanced (only Liver VNC and only available for SOMATOM Definition AS+ and SOMATOM Definition Edge, not available in the US), *syngo*.CT DE Bone Marrow (not available in the US), *syngo*.CT DE Brain Hemorrhage (only available for SOMATOM Definition AS+ and SOMATOM Definition Edge, not available in the US)

Optimum contrast is only available for Dual Source Dual Energy

For Single Source DE only *syngo*.CT Dual Energy and *syngo*.CT DE Gout are commercially available in the US.

syngo.via applications and Engines^{1) 2)}

syngo.CT Cardiac Function - Valve Pilot

- Zero-click display of the aortic annulus plane based on aortic valve hinge points
- All measurements for quantitative annulus assessment (annulus area, 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 lab³⁾

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 hyper-metabolic lesions
- Automated reference regions in the liver and blood pool
- EQPET normalizes changes for tumor growth rates across time-points and across scanners

syngo.CT Pulmo 3D

- Segmentation of lungs
- Evaluation: lung volume, mean lung density, and standard deviation
- Calculation of emphysema 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

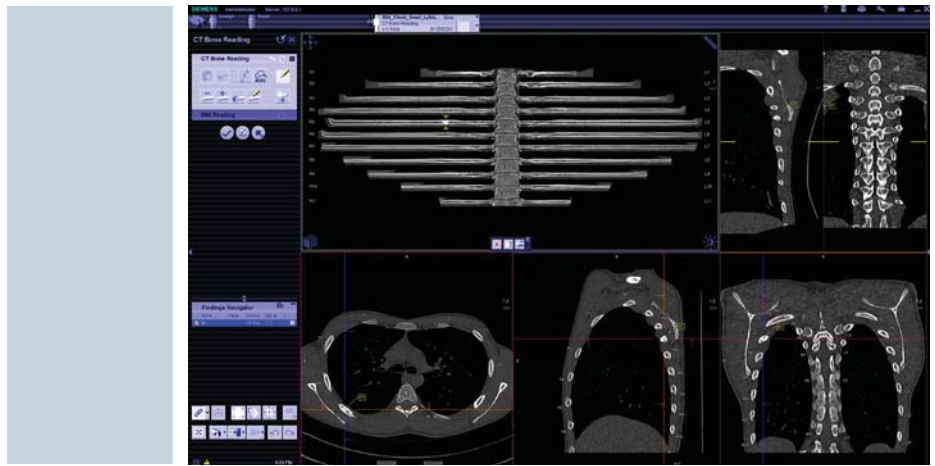
syngo.CT Body Perfusion

- 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

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

²⁾ Configuration of CT Clinical Engines can vary depending on CT scanner type.

³⁾ Requires syngo X Workplace VB21



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 subsequent volumetric calculation of resected and residual liver
- Review of results on available MRI datasets

syngo.CT Bone Reading⁴⁾

- Rib unfolding - bone reading adopted visualization of all ribs in one plane
- Spine reading optimized reading functionality
- Computer Aided Detection (CAD) for spine lesions⁴⁾
- Automated rib and spine labeling and numbering

syngo.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.

⁴⁾ The product is not commercially available in the U.S.

syngo.via applications and Engines^{1) 2)}

syngo.CT Neuro Engine

syngo.CT Neuro DSA

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

syngo.CT Neuro Perfusion

- 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
- Normalization
- 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
- 5 step guided workflow

CT Neuro Engine Pro

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 Removal³⁾
- Bone & vessel isolation mode for selective highlighting of high contrast structures
- Rapid Results Technology for standardized and automated image creation

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

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

²⁾ Configuration of CT Clinical Engines can vary depending on CT scanner type.

³⁾ Requires at least one user license of syngo.CT DE Direct Angio

syngo.CT Cardio-Vascular Engine Pro

The CT Cardio-Vascular Engine Pro requires the 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 ⁵⁾
- 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 CT Acute Care Engine contains all features included in the CT Neuro and CT Cardio-Vascular Engines.

The CT Acute Care Engine Pro contains all features included in the CT Neuro and CT Cardio-Vascular Engines Pro.

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
- General segmentation
- Choi criteria in report
- Dual Energy support of syngo.CT DE Virtual Unenhanced ^{6) 7) 8)}
- Advanced HU Statistics with color coding of hypodense areas of lesions (potential indicator for necrosis)

syngo.PET&CT Cross-Timepoint Evaluation

- Quantify tumor growth rates between time points
- Dual-time point comparison
- 4-time point visualization
- Trending graph 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 endoluminal view



syngo CT Oncology Engine Pro

syngo.CT Lung CAD

- Adjunct second reader tool
- Lung CAD
- Solid Nodule detection
- Partial solid and Ground-Glass Nodule (GGN) detection⁸⁾
- Autoprocessing

syngo.CT Colonography – PEV

- Polyp Enhanced Viewing (PEV)
- PEV marker
- Autoprocessing
- Mini-Toolbar⁸⁾

syngo.CT Colonography Advanced

- Polyp Lens
- Stool Removal
- Virtual Dissection

syngo.PET&CT Onco Multi-Time-point

- 8-time point visualization and synchronized navigation

⁵⁾ Requires syngo.CT DE Heart PBV and/or syngo VPCT Body - Myocardium

⁶⁾ 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

⁷⁾ Requires at least one user license of syngo.CT DE Virtual Unenhanced

⁸⁾ This feature is not commercially available in the U.S

syngo.via applications and Engines¹⁾

MR applications and Engines

syngo.MR General

syngo.MR General Engine

- MR Radiology workflows
- MR Cardio-Vascular workflows
- MR Basic Evaluation
 - Subtraction
 - Mean Curve
 - Image Filter
 - Distortion Correction
- syngo.MR Composing
 - Composing

syngo.MR Neurology

syngo.MR Neuro Perfusion Engine

- Perfusion
- Local AIF
- Perfusion Mismatch Evaluation

syngo.MR Neuro Perfusion

- Perfusion
- Local AIF

syngo.MR Neuro Perfusion Mismatch

- Perfusion Mismatch Evaluation

syngo.MR Neuro 3D Engine

- Neuro functional evaluation
- DTI (Diffusion Tensor Imaging)

syngo.MR Neuro fMRI

- Neuro functional evaluation

syngo.MR Tractography

- DTI (Diffusion Tensor Imaging) Tractography

syngo.MR Neuro Perfusion Engine Pro

- Tumor reading specific steps and layouts
- Follow-up reading support
- Generation of perfusion maps
- Integrated mean curve evaluation

syngo.MR Spectroscopy

syngo.MR Spectro Engine

- Single Voxel Spectroscopy
- Chemical Shift Imaging
- Extension for comprehensive Spectroscopy evaluation

syngo.MR Spectro SVS

- Single Voxel Spectroscopy

syngo.MR Spectro CSI

- Chemical Shift Imaging

syngo.MR Spectro Extension

- Extension for comprehensive Spectroscopy evaluation

syngo.MR Spectro Research

- Multinuclear Spectroscopy

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via

syngo.MR Oncology

syngo.MR Onco Engine

- MR Onco Workflows
- MR Onco Report
- 3D Lesion Segmentation

syngo.MR Onco

- MR Onco Workflows
- MR Onco Report

syngo.MR 3D Lesion Segmentation

- 3D Lesion Segmentation

syngo.MR Tissue4D

- MR Tissue4D

syngo.MR BreVis

syngo.MR BreVis

- Breast Evaluation

syngo.MR Cardiology

syngo.MR Cardio Engine

- 4D Ventricular Function evaluation
- Cardiac Flow evaluation

syngo.MR Cardiac 4D Ventricular Function

- 4D Ventricular Function evaluation

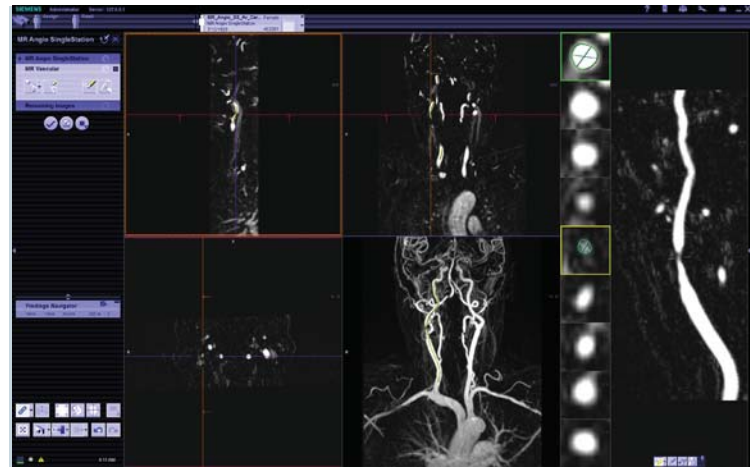
syngo.MR Cardiac Flow

- Cardiac Flow evaluation

syngo.MR Cardiac Perfusion

- Fully automated motion correction
- Specific synchronization of rest and stress series
- Interactive pixel map for dynamic analysis

syngo MR Onco Engine



syngo.MR Vascular

syngo.MR Vascular Analysis

- Vessel Segmentation

syngo.mMR General

syngo.mMR General

- Simultaneous MR and PET evaluation with standardized reporting
- Data preparation reduced with automated layouts
- Markings correlated and propagated between MR and PET
- Findings linked exactly in the Findings Navigator

syngo.via Applications and Engines^{1) 2)}

MI applications and Engines

syngo.mCT Oncology Engine

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 hyper-metabolic lesions
- Automated reference regions in the liver and blood pool
- Calculate PERCIST threshold for selecting reportable lesions
- Hybrid tools to create measurements on PET & CT simultaneously
- EQPET normalizes changes for tumor growth rates across time-points and across scanners

syngo.PET&CT Cross-Timepoint Evaluation

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



syngo.mCT 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.PET&CT Onco Multi-Time-point

- 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) 5)}
- Advanced HU Statistics with color coding of hypodense areas of lesions (potential indicator for necrosis)

syngo.PET&CT Therapy Interface

- Copy diagnostic segmentations onto a planning CT as a Target Volume and create an RTSS

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

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.

⁵⁾ This feature is not commercially available in the U.S

syngo.mCT 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

syngo.mCT 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.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

MI Applications

syngo.mCT Neurology Engine

syngo.PET Neuro DB Comparison

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

syngo.mCT Neurology Engine Pro

syngo.CT Neuro DSA

syngo.MI Neuro Database Creation

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

syngo.SPECT Neurology Engine

syngo.SPECT Neuro DB Comparison

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

syngo.SPECT Neurology Engine Pro

syngo.CT Neuro DSA

syngo.MI Neuro Database Creation

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

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

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

syngo.via Applications and Engines^{1) 2)}

PET and SPECT Neurology Applications

syngo.PET Neuro DB Comparison

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

syngo.PET Amyloid Plaque

- SUV quantification of Amyloid plaque scans
- Florbetapir normal database

syngo.SPECT Neuro DB Comparison

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

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 Neuro DB Creation

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

syngo.SPECT Reading

- Enables reading of Nuclear Medicine planar and tomo images
- Automatic layout selection for SPECT, PET and CT data

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

PET CT Applications

syngo.CT Colonography

- Multi-Monitor Layouts
- 2D Reading
- 3D Reading (Fly-through)
- Global view (solid/semi-transparent)
- Registered navigation (prone/supine)
- Hide small intestine
- Distance to rectum
- Unseen Areas³⁾
- Panoramic view

syngo.CT Colonography – PEV

- Autoprocessing
- Polyp Enhanced Viewing (PEV)
- Flat lesions detection
- Detection in tagged environment

syngo.CT Colonography Advanced

- Polyp Lens
- Stool Removal
- Virtual Dissection³⁾

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 Removal⁴⁾

syngo.CT Coronary Analysis

- Curved & cross-sectional ranges
- AngioView
- VesselSURF for vessel navigation
- Automatic coronary tracking and labeling including SVG bypass tracking and labeling
- Single-click stenosis measurement
- Single-click vessel tracking with multiphase propagation
- Image sharpening for stent/calcified lesion evaluation

syngo.CT Cardiac Function³⁾

Left Ventricular Analysis (LVA)

- Automated left ventricular function analysis incl. myocardial wall
- MinDose capability
- Left ventricular volumetry
- Left ventricular wall analysis
- 17 segment 2D polar maps
- Integration of syngo.CT DE Heart PBV⁵⁾
- Single-click navigation to aortic valve plane
- Workflow CT TAVI Planning

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

²⁾ Configuration of CT Clinical Engines can vary depending on CT scanner type.

³⁾ Requires upgrade to future software version by syngo.via service agreement.

⁴⁾ Requires at least one user license of syngo.CT DE Direct Angio

⁵⁾ Requires at least one user license of syngo.CT DE Heart PBV



syngo.CT CaScoring

- Total & standard Calcium Scoring with Coronary Age calculation based on e.g. MESA Trial data and more

syngo.CT Neuro DSA

- Bone Removal
- Recalculation Mode
- Follow-up Workflow
- Reporting
- Fast Toggling
- Best Plane
- Table Removal

syngo.CT Segmentation

- Volume rendering of segmentation
- Automated RECIST 1.0 or 1.1 calculation
- Automated segmentation of liver lesions
- Automated segmentation of lung nodules
- Automated segmentation of lymph nodes
- General segmentation
- Choi criteria in report
- Dual Energy support of syngo.CT DE Virtual Unenhanced^{2) 6) 7)}

syngo.CT Lung CAD

- Adjunct second reader tool
- Lung CAD
- Lung CAD (findings sorted by size)
- Solid Nodule detection
- Partial solid and Ground-Glass Nodule (GGN) detection
- Autoprocessing

⁶⁾ Requires at least one user license of syngo.CT DE Virtual Unenhanced

⁷⁾ Works only with Dual Energy images from SOMATOM Definition, Definition Flash, Definition As+ and Definition Edge.

syngo.via applications and Engines¹⁾

AX applications

syngo.Interventional Viewer

- 30f/s Biplane (DSA) Review²⁾
- 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 QCA Bifurcation

- QCA Add-on
- Scientific analysis of bifurcated coronaries

syngo.Interventional IZ3D

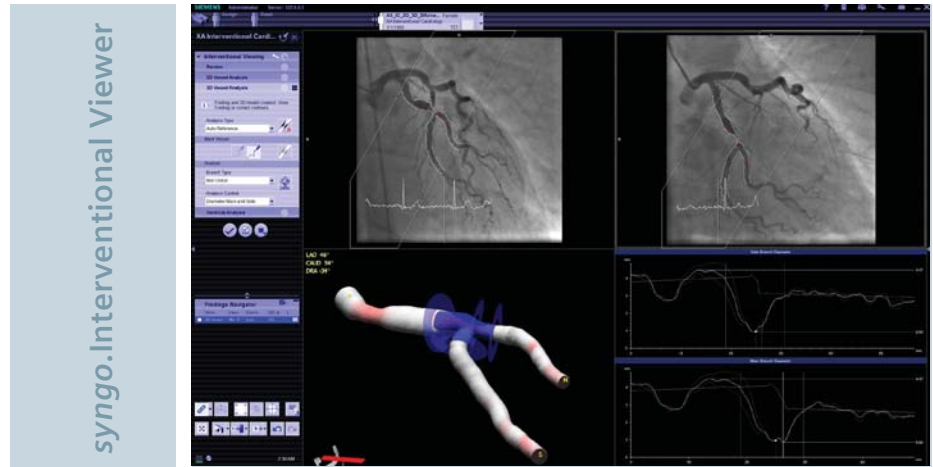
Quantitative 3D Coronary Analysis (IZ3D)

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

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 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 Viewer
- syngo.Interventional LVA
- syngo.Interventional QCA
- syngo.Interventional QCA Bifurcation
- syngo.Interventional IZ3D

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

²⁾ Only with recommended client hardware requirements fulfilled, requires 20 GB of free hard disk space.

syngo.via applications and Engines¹⁾

XP applications

syngo.Breast Care Reading

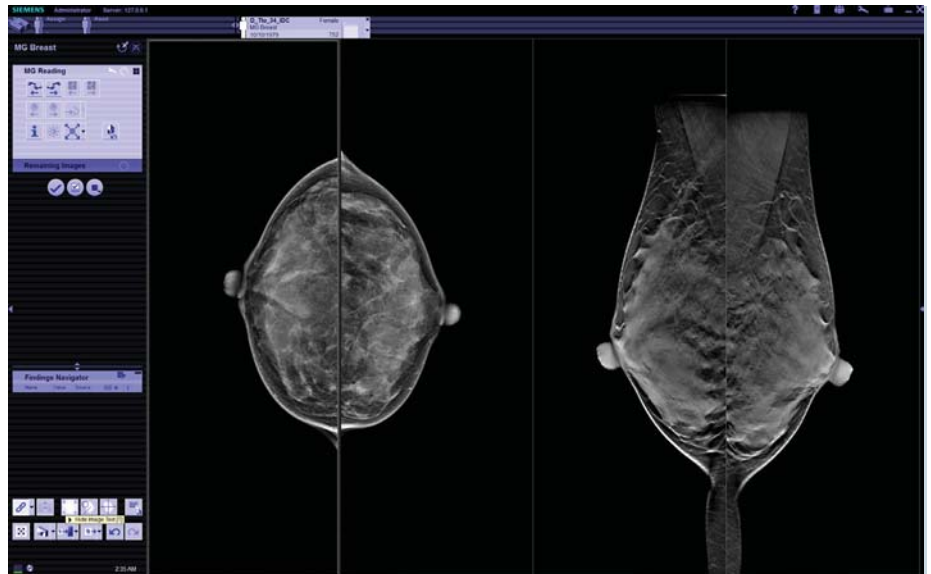
- Dedicated lay-outs for mammograms (DICOM MG) including current-prior comparison lay-outs
- Sizing modes: one-click for all segments
- User configurable workflow (ReportFlow[®])
- Magnifying glass, quadrant zooming
- Fast toggling through VOI LUTs
- Supports user configurable key-pad
- Multi-vendor compatible

syngo.Breast Care Tomo

- Dedicated lay-outs for tomosynthesis exams (DICOM CT, DICOM Tomo) including comparison with (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, keyboard or automatic cine mode
- Synchronized scrolling through two datasets

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

- Correlates 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

syngo.Breast Care requires only the syngo.via Standard User License ²⁾

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.

The following displays are approved for diagnostic use for mammography. They can be operated with the syngo.Breast Care medical device in configurations of up to 2x5 or 1x10 mega pixels, plus up to 2 additional monitors of up to 1536 x 2048 mega pixels

- Barco: 5 MP monitors: Coronis MFGD 5621HD, Coronis MDMG-5121, NIO MDNG-5121 BB, NIO MDNG-6121, Tomo MDMG-5221; 10 MP monitor: MDGC-10130
- Eizo: 5 MP monitors: GS521, GX540, GX530, SMD 21510 D; 10 MP monitor: GX1030
- NDS: 5 MP monitor: Dome E5

¹⁾ Application features are parts of medical products in their own rights and fully compatible with syngo.via.

syngo.via Server

Configurations

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

The following scalability recommendations for new syngo.via VA30 SW and HW apply:

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

	Server-based workstation	L Server	XL Server	XL Server 10TB
Recommended number of concurrent users ¹⁾	1	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

1) Actual numbers depend on case mix and application in use.

2) Typical loading performance for image data based on 512 x 12 bit matrix. 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.).

- 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.

syngo.via Server



Licensing

syngo.via multi-modality routine reading functionality and applications as described on pages 6 and 7 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.

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 configurations.

There are special license requirements for the following applications.

*syngo.PET Corridor4DM*¹⁾
*syngo.SPECT Corridor4DM*¹⁾
*syngo.PET Myocardial Blood Flow*¹⁾
*syngo.PET Neuro DB Comparison*¹⁾
*syngo.SPECT Neuro DB Comparison*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.

syngo.via clients

Hardware and software

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	Pentium IV, 2.4 GHz or higher	Intel Core 2 Duo, 3.6 GHz or higher
RAM	1,5 GB	≥ 3 GB
Hard drive (free space)	500 MB	3 GB
Graphic card	Supports OpenGL 1.1 (min. 1024x768)	NVIDIA Quadro 600
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

- Microsoft Windows XP32 SP3, XP64 SP2¹⁾, Microsoft Windows 7 32/64 SP1, Windows 8 (Professional) 64 Bit, Windows 8.1 or Windows Vista 32/64 SP1
- Microsoft Expression Encoder 4 SP1
- Microsoft VC8, VC9, VC10 Runtime
- Microsoft Silverlight 5.1
- Microsoft .NET framework 4.0
- MSTSC V6
- Windows Media Player 9 or higher
- Microsoft Image Mastering API v2.0 (IMAPIv2.0) - KB932716
- Internet Explorer 8 or higher shall be used

The VC9 Runtime, Silverlight and the .NET framework are installed automatically if they are not available on a client. The Expression Encoder and the Media Player have to be installed manually by the user. 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.

1) Microsoft has announced to discontinue Windows XP OS support. It cannot be guaranteed that a *syngo.via* client runs properly (for example the burning CD/DVD media feature) We recommend to switch to another supported Microsoft OS version (for example Windows 7 or 8). Link to corresponding Microsoft page: <http://www.microsoft.com/en-us/windows/endsupport.aspx>

syngo.via clients

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 purposes¹⁾.

Component	Minimum	Recommended
Monitor	Black/white ²⁾	Color
Monitor resolution and color depth ³⁾	1024 x 768 (24 bit) (b/w monitors 8 bits, color monitors 24 bits) ⁴⁾	≥1280 x 1024 (32 bit) (5 MP highest supported resolution)
Monitor orientation	landscape, portrait, and widescreen monitors supported	

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.

¹⁾ Country-specific regulations/laws may apply.

²⁾ Not released for CT CaScoring. Not released for CT Colon.

For Cardiac Function: Polarmaps shall be used only on color monitors.

³⁾ Monitors with different resolutions, such as 0.8, 1.3, 2, 3, 4, or 5 MPx are supported

⁴⁾ For MI Cardiology and MI Neurology on server-based workstation only: Minimum monitor resolution is 1600 x 1200

Implementation packages

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

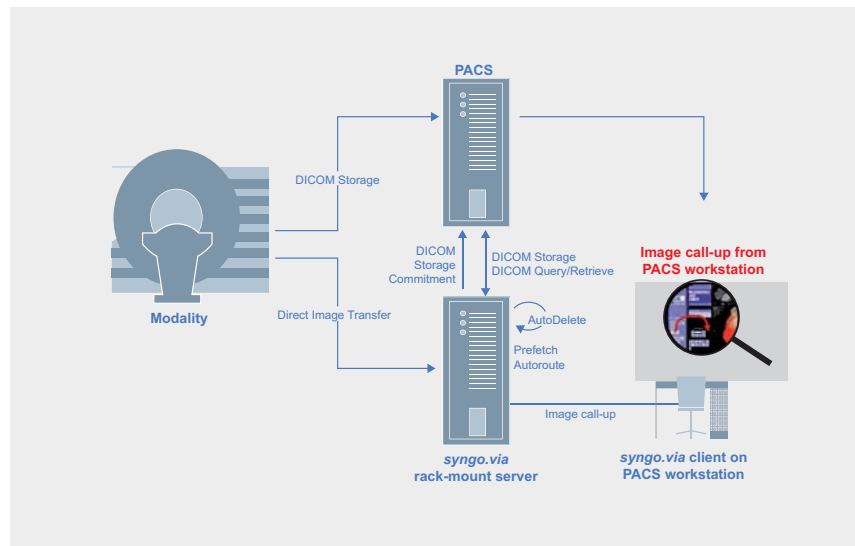
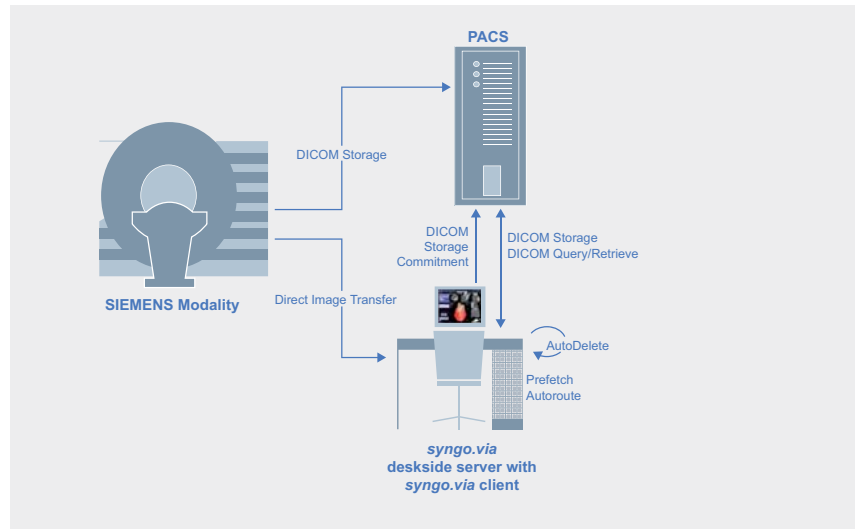
Basic implementation

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 PACS¹⁾.

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.

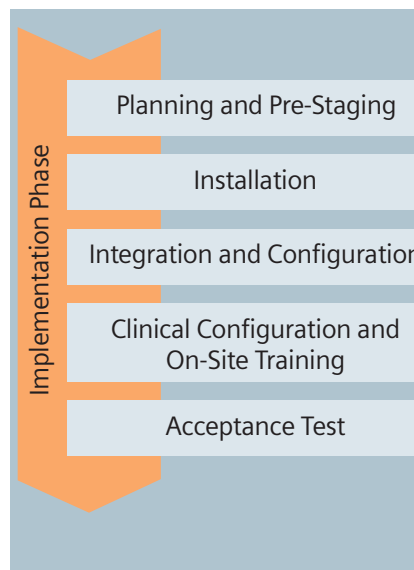


¹⁾ As long as this is supported by the existing PACS.

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 and pre-staging

- Preparation of server hardware
- Configuration of Integrated Lights Out/Remote Service Board
- Installation of operating system
- RAID configuration and partitioning of *syngo.via* server disks
- Siemens Remote Service router
- Installation and configuration (if not available on-site)
- Shipment of hardware to customer site
- Clarification of customer's workflow and on-site requirements for *syngo.via* implementation

Installation

Integration of server hardware into customer's IT infrastructure

- Connection of *syngo.via* server to customer's 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
- Basic Clinical Customization and On-Site Training (for deletion, archiving, routing, prefetching) and automatic assignment of images
- Installation of client on server and basic tests
- Installation of clients on customer workstations (optional)
- Project-specific request validation for DICOM or HL7 communication (optional)

Integration and configuration

- Basic configuration of workflow assignment rules
- Connection and integration into clinical environment:
 - Siemens modality¹⁾ 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* MM WP / 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 PACS²⁾, RIS³⁾, or other applications

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 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.

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.

Administration tasks Customer IT administrator

Installation of client software and prerequisites per client machine – once
Updates later on – automatically
Update of <i>syngo.via</i> server with Siemens hotfixes and Service Packs from the Software Catalog – on demand
Update of <i>syngo.via</i> server with Microsoft hotfixes and Service Packs – on demand
Update of <i>syngo.via</i> client BIOS, firmware and drivers – on demand
Backup Management (configure backup) – once and on demand
Archiving of Audit Trail logs using optical media or network shares (HIPAA Audit Controls, USA only) – weekly or on demand
Configuration of DICOM nodes (for example, printers, PACS, modalities) – on demand

License Management (import, check availability of *syngo.via* application licenses, assign to dedicated users or clients) – on demand.

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) – on demand

Network Management (allow remote access for the SRS, configuration to send important messages to the IT Administrator by e-mail or SMS) – once

Data security and data protection (install, configure and update firewalls, virus scanners) and Microsoft operating system hotfixes – regularly and on demand

Roles and responsibilities

Support tasks Customer IT administrator	Administration tasks Clinical administrator	Support tasks Clinical administrator
Provide help to clinical users regarding IT topics (use trouble-shooting tools, escalate issues) to the Siemens Customer Care Center, if required – on demand	Configuration of application settings (for example, configuration of Display Layouts, Report Templates) – once	Provide help to clinical users regarding application topics (use trouble-shooting tools, escalate issues to the Siemens Customer Care Center) – if required
Assist the Siemens Healthcare Customer Care Center during trouble-shooting of software issues (provide access and configuration data) – on demand	Configuration of data-related settings (auto data deletion, auto routing, exclude from archiving rules) – once	Train clinical users in handling the <i>syngo.via</i> client (knowledge transfer on <i>syngo.via</i> applications to clinical users) – on demand.
Assist the hardware vendor during trouble-shooting of hardware issues (provide access to server hardware and diagnostic tool results) – on demand	Configuration of workflow-related settings (workflow assignment rules, auto pre-fetching rules) – 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.
Check the system for available updates (Software Catalog) – on demand	Customize client software options (for example, Advanced Search) - on demand	Solve <i>syngo.via</i> application related issues (for example, delete or restore examination data, layouts, or worklists) - on demand
Check <i>syngo.via</i> server systems for working properly (use Status Monitoring and e-mail notifications) – daily		
Solve <i>syngo.via</i> server issues (<i>syngo.via</i> application server, operating system, network, and firmware) – on demand		
Solve <i>syngo.via</i> client issues (user management, network, hardware, and operating system issues) – on demand		

Connectivity and standards compliance

Connectivity

Efficiency depends on how work-places 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

Import and export of DICOM data
syngo.via provides functionality for importing/exporting DICOM data from/to CD/DVD¹⁾, 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 to send results to different archives based on DICOM attributes such as Referring Physician.

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.

Data exchange

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

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>

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)

For all other HL7 messages a “not acknowledged” message is sent back to the HL7 message sender by *syngo.via*.

ORU R01 messages are used to export structured results to a connected information system systems. *syngo.via* supports three formats: ASCII Text, CDA2 and PDF.

Reason to remove the sentence about adaptation: *syngo.via* supports a standardized HL7 message which shall not be customized. Any parsing of this message is supposed to happen at the receiving system.

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

¹⁾ The burning function requires additional software under Windows XP

Connectivity and standards compliance

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>

Data protection

Legal requirements

syngo.via provides the following mechanisms to support customers' compliance with legal requirements, such as HIPAA (Health Insurance Portability and Accountability Act) or RÖV (Deutsche Röntgenverordnung):

- 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

Anti-virus programs from the following manufacturers are approved for *syngo.via*:

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

Siemens provides information on released versions, and instructions on configuring

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

Backup/Restore

syngo.via backup policy uses an incremental backup scheme (daily). The backup includes system, application (including *syngo.via* configurations), 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

Whatever the application, workflow, or IT requirements are – with Siemens IT Care Plan, the Siemens IT Service Agreement, customers receive service and support that mirrors their needs and workflows to help them tap the full potential of their *syngo.via*.

We work hand in hand with them – to save their time and money. Their patients expect round the clock care – no problem. We are right by their side whenever they need us with our optional Service Levels and support with our know-how and commitment for their business.

Customers depend on fast diagnosis and every minute counts? Our optional offer of an extremely fast response time in case of an incident might be right for them.

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 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.

Software support

The inclusion of a Siemens IT Care Plan is always recommended. Customers will benefit for example from the following Siemens services (depending on the contract variant):

- Software Updates: Supply and electronic distribution of software corrections (functional and performance issues)
- Software Upgrades: Supply and electronic distribution of new version of software core functionality (basic license).
- Standard remote distribution of updates and upgrades via SRS

Examples what a standard IT Care Plan Service does not include:

- Installation of software updates and upgrades (responsible: IT administrator)
- Customer-specific implementation and integration effort for software updates and upgrades (remote or on-site)
- Provision of updates/upgrades for purchased software licenses, older than two previous versions (or 3 years)
- Installation and updates of virus protection software protected by a license
- Hardware updates and upgrades

We offer a wide range of additional services. For more details please contact your Siemens sales representative.

Siemens IT Care Plan



Hardware support

To benefit from the hardware call management as a part of the Siemens IT Care Plan deliverables, the following prerequisites have to be fulfilled:

- Hardware was purchased via Siemens
- An active service contract (Care Package) for the hardware exists.

The hardware call management will be performed by Siemens as the single point of contact for the customer and includes the forwarding and tracking of problems regarding service hardware on which Siemens software is installed.

The hardware support will be provided by the respective hardware manufacturer.

Siemens IT Care Plan



Service level

The service level is defined within the Siemens IT Care Plan.

The agreed service level applies for category 1 (severity level 1, for example system down) requests for service.

It describes:

- Principal coverage period with IT Care Plan:
 - Days on call (engineer on call to perform remote incident support)
 - Standard/extended working hours (from 8 hours to 24 hours per day)
- Principal coverage period without IT Care Plan:
 - Without any claim to a certain reaction time, service is based on best effort
- Remote Response Time with IT Care Plan:
 - Standard 4 hours
 - Extended: Within 2 hours / 1 hour after notification of incident, first remote action will be taken by Siemens

Remote Response Time without IT Care Plan: service is based on best effort

Training

To keep the IT and clinical administrators up-to-date, trainings and refresher courses are included in the Siemens IT Care Plan. The basic training is mandatory and will be delivered with the product.

Siemens offers targeted trainings and knowledge-driven tools to support key users.

Siemens IT Care Plan

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

Direct image transfer

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

- The image transfer rate can be increased considerably compared to the standard DICOM protocol
- The images can be viewed throughout the entire institution immediately after they were acquired at the MR scanner

Direct protocol transfer

syngo.via redefines MR protocol management – providing remote protocol planning and convenient protocol distribution.

- The radiologist can plan protocols from anywhere in the hospital network.¹⁾
- Automatic transfer of the patient data and planned protocols from *syngo.via* to the scanner
- Remote and easy protocol distribution
- Works with all Tim systems²⁾

syngo MultiModality Workplace (MM WP) integration

syngo MM WP versions 2009B (VE36A) onwards with service pack VX29A support *syngo.via* client integration and remote desktop access using *syngo* Expert-i.³⁾

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

syngo.via client workplaces can include the *syngo* MM WP Expert-i remote desktop application to allow single-monitor access to one or more *syngo* MM WP workplaces from any location in the hospital.^{1) 4)}

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.

²⁾ The product is not commercially available in the U.S.

³⁾ *syngo* MM WP version 2009B (VE36A) when used in dual monitor configuration needs to be upgraded to *syngo* MM WP versions 2012A (VE50A) or higher.

⁴⁾ Rich thin client.

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):

Port	Direction	Service
5800, 5900	Inbound	<i>syngo.via</i> client collaboration mode (request collaboration)
5900, 5901	Outbound	<i>syngo.via</i> client collaboration mode (provide collaboration)

The following ports¹⁾ must be available for the *syngo.via* server (APS):

Port	Direction	Service
20, 21	Outbound	Remote service (FTP)
22	Inbound	<i>syngo.via</i> Remote Service Board - ILO (SSH)
25	Outbound	Autoreport mail notification to Siemens (SMTP)
23, 2012	Outbound	<i>syngo.via</i> Remote Service Board - ILO (telnet)
80	Inbound	SOAP
104	Inbound	Receiving DICOM images
389	Inbound	LDAP
443	Both	HTTPS
1433	Both	Report Client communication with SQL Server (TCP)
3280	Inbound	MR FastTransfer (TCP)
3389	Inbound	Remote service (Microsoft Terminal Server)
5445	Inbound	Receiving data from Siemens modalities providing Direct Image Transfer (TCP)
5800, 5900-5903	Inbound	Remote service (VNC)
8080	Outbound/ Inbound	Sending of HL7 messages (in case of multiserver environment)
8888	Inbound	SOAP
8226, 13001	Both	SRS (MNP) SRS
8227, 8228, 12061	Both	SRS (MNP)
9971	Inbound	Sending HL7 messages (on dedicated OPENLink server in case of multiserver environment)
9973, 9975	Inbound	Receiving HL7 messages
9977	Outbound	Sending of HL7 message
9990	Inbound	Protocol Manager Service (TCP)
32912, 32914	Inbound	Client-server communication
520 ²⁾	Inbound	Rip Listener (UDP) (Required only if RIP listener is installed)
445 ²⁾	Outbound	CIFS for WebViewer (TCP) (Only for WebOptions)
4443, 4475	Inbound	TCP, SSL (Only for webOptions)
4510 ²⁾	Inbound	Web Access (TCP) (Only for WebOptions)

¹⁾ Additional ports may be required for specific product or deployment options (e.g. Mobile Applications, Multi-Server)

²⁾ Optional Server ports

	Minimum	Recommended
Network hardware	100 Mbit/s	1 Gbit/s
Client remote connection	The minimum bandwidth specification (sporadic use for viewing data remotely) for download: 6 Mbit/s ¹⁾ , for upload: 1 Mbit/s; ping time (latency): 20 ms to 25 ms ²⁾ . Recommended (routine use in clinical routine): Download 16 Mbit/s, upload 2 Mbit/s; ping time (latency): 10 ms	

- 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.
- 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⁾For CT Dyn Angio 16 Mbit/s as min. bandwidth should be available

²⁾For MR Cardiac consider a min. latency of 10ms, recommended latency is <5 ms